



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

### Location/Identification

<b>MINFILE Number:</b>	092INE023	<b>National Mineral Inventory Number:</b>	092110 Cu3
<b>Name(s):</b>	<b>NEW AFTON</b> AFTON, AFTON MINE, POTHOOK, COQUIHALLA WEST, CLIFF (L.899), DOMINION (L.1595)		
<b>Status:</b>	Producer	<b>Mining Division:</b>	Kamloops
<b>Mining Method</b>	Underground, Open Pit	<b>Electoral District:</b>	Kamloops-South Thompson
<b>Regions:</b>	British Columbia	<b>Resource District:</b>	Thompson Rivers Natural Resource District
<b>BCGS Map:</b>	092I068		
<b>NTS Map:</b>	092I09W, 092I10E	<b>UTM Zone:</b>	10 (NAD 83)
<b>Latitude:</b>	50 39 40 N	<b>Northing:</b>	5615087
<b>Longitude:</b>	120 30 54 W	<b>Easting:</b>	675628
<b>Elevation:</b>	663 metres		
<b>Location Accuracy:</b>	Within 500M		
<b>Comments:</b>	Afton open pit, just south of the Trans-Canada highway (1-97), 10 kilometres west of Kamloops (Property File - Geology maps). See also Ajax (West), 092INE012; Ajax (East), 092INE013; and Crescent, 092INE026.		

### Mineral Occurrence

**Commodities:** Copper, Gold, Silver, Molybdenum, Palladium

<b>Minerals</b>	<b>Significant:</b>	Copper, Chalcocite, Bornite, Chalcopyrite, Covellite, Conichalcite, Molybdenite, Tennantite, Gold	
	<b>Significant Comments:</b>	Trace and minor amounts of covellite, conichalcite, molybdenite, tennantite and native gold.	
	<b>Associated:</b>	Magnetite, Pyrite, Hematite	
	<b>Alteration:</b>	Magnetite, Hematite, Biotite, K-Feldspar, Carbonate, Albite, Clay, Epidote	
	<b>Alteration Comments:</b>	Also chlorite, quartz, limonite, gypsum, cuprite, malachite, azurite and sericite.	
	<b>Alteration Type:</b>	Oxidation, Potassic, Carbonate, Propylitic, Argillic	
<b>Deposit</b>	<b>Mineralization Age:</b>	Unknown	
	<b>Character:</b>	Stockwork, Disseminated	
	<b>Classification:</b>	Porphyry, Hydrothermal	
	<b>Type:</b>	L03: Alkalic porphyry Cu-Au	
	<b>Shape:</b>	Tabular	<b>Modifier:</b> Fractured, Faulted
	<b>Dimension:</b>	600x520x90 metres	<b>Strike/Dip:</b> 290/55S
<b>Comments:</b>	Afton orebody.		

### Host Rock

**Dominant Host Rock:** Plutonic

<b>Stratigraphic Age</b>	<b>Group</b>	<b>Formation</b>	<b>Igneous/Metamorphic/Other</b>
Upper Triassic	Nicola	Undefined Formation	-----
Triassic-Jurassic	-----	-----	Iron Mask Batholith
<b>Isotopic Age</b>	<b>Dating Method</b>	<b>Material Dated</b>	
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-----	-----	-	
<b>Lithology:</b>	Diorite, Diorite Porphyry, Monzonite, Syenite, Latite Porphyry, Latite Dike, Volcanic Breccia, Andesite		
<b>Comments:</b>	Hostrocks are Cherry Creek unit diorite of the Iron Mask pluton which forms part of the Iron Mask batholith. Age date from Bulletin 77.		

### Geological Setting

**Tectonic Belt:** Intermontane      **Physiographic Area:** Thompson Plateau

## Inventory

**Ore Zone:** TOTAL **Year:** 2019  
**Category:** Combined **Report On:** Y  
**Quantity:** 57,000,000 tonnes **NI 43-101:** Y

Commodity	Grade
Silver	2.1 grams per tonne
Gold	0.61 grams per tonne
Copper	0.74 per cent

**Comments:** Measured and indicated mineral resource using a 0.40 per cent copper equivalent cut-off grade.

**Reference:** New Gold Inc. (2020-02-28): Technical Report on the New Afton Mine, British Columbia, Canada

**Ore Zone:** TOTAL **Year:** 2019  
**Category:** Combined **Report On:** Y  
**Quantity:** 47,300,000 tonnes **NI 43-101:** Y

Commodity	Grade
Silver	1.9 grams per tonne
Gold	0.66 grams per tonne
Copper	0.77 per cent

**Comments:** Proven and probably mineral reserves.

**Reference:** New Gold Inc. (2020-02-28): Technical Report on the New Afton Mine, British Columbia, Canada

**Ore Zone:** TOTAL **Year:** 2019  
**Category:** Inferred **Report On:** Y  
**Quantity:** 14,000,000 tonnes **NI 43-101:** Y

Commodity	Grade
Silver	1.3 grams per tonne
Gold	0.38 grams per tonne
Copper	0.42 per cent

**Comments:** Using a 0.40 per cent copper equivalent cut-off grade.

**Reference:** New Gold Inc. (2020-02-28): Technical Report on the New Afton Mine, British Columbia, Canada

**Ore Zone:** TOTAL **Year:** 2018  
**Category:** Measured **Report On:** Y  
**Quantity:** 20,950,000 tonnes **NI 43-101:** Y

Commodity	Grade
Silver	2.0 grams per tonne
Gold	0.68 grams per tonne
Copper	0.89 per cent

**Comments:**

**Reference:** <http://www.newgold.com>

**Ore Zone:** TOTAL **Year:** 2018  
**Category:** Combined **Report On:** Y  
**Quantity:** 52,642,000 tonnes **NI 43-101:** Y

Commodity	Grade
Silver	1.9 grams per tonne
Gold	0.64 grams per tonne
Copper	0.78 per cent

**Comments:** Combined Proven and Probable reserves.

**Reference:** <http://www.newgold.com>

**Ore Zone:** TOTAL

**Year:** 2018

**Category:** Combined

**Report On:** Y

**Quantity:** 52,407,000 tonnes

**NI 43-101:** Y

Commodity	Grade
Silver	2.2 grams per tonne
Gold	0.63 grams per tonne
Copper	0.77 per cent

**Comments:** Combined Measured and Indicated resources.

**Reference:** <http://www.newgold.com>

**Ore Zone:** TOTAL

**Year:** 2018

**Category:** Indicated

**Report On:** Y

**Quantity:** 31,457,000 tonnes

**NI 43-101:** Y

Commodity	Grade
Silver	2.3 grams per tonne
Gold	0.60 grams per tonne
Copper	0.69 per cent

**Comments:**

**Reference:** <http://www.newgold.com>

**Ore Zone:** TOTAL

**Year:** 2018

**Category:** Inferred

**Report On:** Y

**Quantity:** 13,564,000 tonnes

**NI 43-101:** Y

Commodity	Grade
Silver	1.4 grams per tonne
Gold	0.39 grams per tonne
Copper	0.45 per cent

**Comments:**

**Reference:** <http://www.newgold.com>

### ***Capsule Geology***

The Iron Mask batholith lies in the southern part of the Quesnel trough, also known as the Nicola belt. The most important pre-Tertiary rocks in this belt are Upper Triassic volcanic and sedimentary rocks of the Nicola Group. The batholith is a subvolcanic, multiple intrusion which is comagmatic and coeval with the Nicola rocks. It is situated along the southwest side of a regional northwest trending fracture zone and is itself cut by numerous northwesterly faults. The batholith comprises two major northwest trending plutons separated by 6 kilometres of Eocene Kamloops Group volcanic and sedimentary rocks. The Tertiary rocks occupy what appears to be a graben structure resulting from renewed fault movement around the margins of the plutons during Paleocene or Early Eocene time (Bulletin 77). The larger pluton, the 18 kilometre long southern part of the batholith, is called the Iron Mask pluton. The smaller Cherry Creek pluton farther northwest, outcrops on either side of Kamloops Lake. The combined exposure of the batholith, including the intervening younger rocks, is about 33 kilometres long and 5 kilometres wide. Sedimentary and volcanic rocks of the Kamloops Group unconformably overlie the Nicola rocks and the Iron Mask batholith. These include tuffaceous sandstone, siltstone and shale with minor conglomerate, as well as basaltic to andesitic flows and agglomerates with minor dacite, latite and trachyte.

In the vicinity of the batholith, the Nicola Group is dominated by volcanic and volcanoclastic sedimentary rocks. They are generally recognized by albitization of feldspars, occurrence of patchy epidote, and/or rare hematite alteration. On the southwestern flank of the Iron Mask pluton, well-indurated, massive and bedded tuff, breccia and interbedded flows and flow breccia are prominent and are weakly metamorphosed. On the northeast flank, less well-indurated and less altered tuff and tuff breccia predominate. However, adjacent to the intrusive contact, these rocks are also well indurated and epidotized and are locally mineralized with sulphides. At the southeastern tip of the Iron Mask pluton and locally along the southwestern flank, the Nicola rocks comprise distinctive porphyritic augite-hornblende basalt.

The Iron Mask pluton comprises four major, successively emplaced units designated as the Iron Mask Hybrid, Pothook, Sugarloaf and Cherry Creek units. Locally, an additional Picrite unit also occurs which is probably not genetically related to the batholith. The smaller Cherry Creek pluton consists entirely of the Cherry Creek unit. Isotopic dates (194 to 204 Ma +/- 6 Ma) indicate that all of these units are of Late Triassic or earliest Jurassic age (Bulletin 77).

The component units (except the Picrite unit) of the multiphase batholith are largely controlled by major systems of northwesterly, northerly and northeasterly trending fractures or faults. Most units show some degree of alteration and/or contamination which may be intense locally. Weak to moderate saussuritization is ubiquitous in all batholithic rocks while potassium feldspathization is more prominent in rocks of the Cherry Creek unit. The units are briefly described in order of oldest to youngest (determined mainly on crosscutting relationships). The Iron Mask Hybrid unit forms the spine of the Iron Mask pluton. It is mostly agmatitic, consisting of rounded to angular fragments of various sizes, texture and composition in a dioritic matrix. The fragments include mainly coarse and fine-grained diorite and coarse-grained gabbro with lesser amounts of medium to coarse-grained hornblende and scattered xenoliths of Nicola Group volcanic rocks. All rock varieties in the unit contain magnetite which is often more than 10 per cent by volume. Mineralization, particularly of iron and copper, is almost ubiquitous in this unit. The Iron Mask mine (092INE010), a former copper producer, is located in this unit, but is also associated with picrite.

The Pothook unit occurs mainly in the northwestern half of the Iron Mask pluton, appearing frequently as narrow, gradational zones between the Iron Mask Hybrid and Cherry Creek units. Rocks of this unit are uniformly of dioritic composition and are medium to coarse grained. The Pothook unit is locally mineralized with copper and iron.

The Picrite unit consists of rocks of basaltic composition with abundant clinopyroxene and serpentinized olivine phenocrysts. These rocks generally occur as steeply dipping, poorly exposed and relatively small lenticular bodies in many parts of the batholith. They appear to be associated with recurring, northwesterly trending fracture systems and copper mineralization frequently occurs in their vicinity. Because picrite basalt has been observed far from the two component plutons of the batholith, it is probable that this unit is not part of the batholith.

The Sugarloaf unit occurs mainly along the southwest side of the Iron Mask pluton and as small, enclosed bodies in the southern half of the pluton. Rocks of this unit are mainly porphyritic with hornblende, minor clinopyroxene and plagioclase in a greyish green matrix. They are of fairly uniform diorite-andesite composition. Several copper occurrences are hosted by the Sugarloaf rocks. The Ajax deposit (092INE012) east of Jacko Lake is located within brecciated and albitized Sugarloaf rocks.

The Cherry Creek unit is the most widely distributed phase of the batholith. It constitutes the entire Cherry Creek pluton. The unit consists of rocks with composition ranges from diorite, monzonite, syenite to their porphyritic and fine-grained equivalents as well as local intrusive breccias. Copper and minor iron mineralization is prominent in the Cherry Creek unit, particularly in zones of intense brecciation associated with alkali metasomatism. Afton mine lies at the western termination of a narrow, 4 kilometre long, easterly trending zone of intense intrusive brecciation that is located at the northern edge of the Iron Mask pluton. The brecciation is considered to have resulted from high-level venting events.

The Afton orebody lies completely within the Cherry Creek unit of the Iron Mask pluton. Salient characteristics of the deposit include two unique features; these are the absence of a well-defined hypogene alteration pattern about the orebody, and the abundance of native copper in the supergene zone without apparent copper enrichment (Bulletin 77). The orebody is separated from the Tertiary rocks to the north mainly by faults and locally by a rather flat-lying unconformity which postdates the supergene event. The Cherry Creek rocks intrude the Nicola Group rocks; the contact is steep, southward dipping and partly sheared. Within this simplified framework, local complications arise because of the highly fractured and altered nature of the host rocks, similarity of both texture and composition of the intrusive and extrusive rocks, gradational contacts between various phases of the intrusive rocks, and the inclusion of large slabs of one rock type in another.

The copper deposit consists of shattered rocks in which the ore minerals occupy fractures and are disseminated. Ignoring complexities, the deposit, as defined by a 0.25 per cent copper cutoff, is a tabular body that strikes about 290 degrees, with an average dip of 55 degrees south. If viewed from the south as a vertical longitudinal slice, it appears to be triangular and increasingly narrow downward between a steep western limit and an eastern limit inclined moderately westward. The deposit measures 520 metres long, 90 metres in average width and as much as 600 metres in drilled depth. Widening and deepening of the deposit westward results in about half the mineable tonnage occurring in the western third of the orebody, where the grade is generally highest as well. Despite the foregoing generalization, the detailed shape of the deposit is complex.

Within a planned open pit 274 metres deep, the proven (measured geological) start-up reserves of the Afton orebody were 30.84 million tonnes grading 1.0 per cent copper, 0.58 grams per tonne gold and 4.19 grams per tonne silver at a cutoff grade of 0.25 per cent copper and a waste-to-ore

Within the Afton open pit itself, six rock units are distinguished. They are designated as Cherry Creek diorite, monzonite and syenite, Nicola volcanic rocks, latite dykes and Tertiary sediments and volcanic rocks. The Cherry Creek intrusive rocks, the most abundant rock type in the open pit, are typically fine grained, slightly porphyritic in texture and range from syenite to diorite in composition; diorite generally predominates over the other varieties. Plagioclase grains in all varieties of rock are completely albitized. Potassic feldspar, typically microcline, occurs mainly in the fine-grained matrix, frequently rims plagioclase and rarely occurs as phenocrysts. In the dioritic and monzonitic varieties, potassium feldspar frequently occurs in a patchy habit including and grading into aggregates of epidote or biotite. Discrete potassium feldspar veins commonly show a chloritic envelope. Sericite, carbonate and clay replacements are present in feldspars but are rarely very intense. Partially altered clinopyroxene forms up to 10 per cent of the rock in the eastern portion of the pit while amphibole and its alteration products are the principal mafic minerals elsewhere.

Nicola volcanic rocks within the Afton pit and its vicinity are of several varieties. In the southern portion of the open pit, hard massive green volcanic breccia, with predominantly hornblende fragments, is particularly abundant. This breccia commonly contains epidote +/- carbonate +/- sulphides veins and is locally pervasively replaced by carbonate +/- chlorite. In the northeastern portion, the Nicola volcanic rocks consist of highly saussuritized andesite. Elsewhere and in drill cores, the Nicola Group rocks range from fine-grained andesite to pebbly sandstone.

Latite dykes in the open pit are invariably massive, fine-grained, and very slightly porphyritic rocks. Potassium feldspar is concentrated in the matrix. Plagioclase is typically albitized. Based on mineralogy and alteration, it is concluded that these latites are probably of pre-Tertiary age.

Arranged in order of decreasing abundance, sandstone, arkose, conglomerate, lithic wacke, carbonaceous argillite, and streaks of coal are among the Tertiary sedimentary rocks observed in the open pit. Tertiary volcanic rocks include dacite, trachytic flow breccia, amygdaloidal andesite, and massive andesite. Where most plagioclase grains in these rocks remain intact, mafic minerals are typically replaced by ankerite.

Compared to other porphyry copper deposits, the Afton deposit does not exhibit well-defined hydrothermal alteration patterns. The most obvious supergene alteration is the disintegration of the rock mass and accompanying intense, pervasive introduction of hematite. Strong phyllic and argillic alteration assemblages are absent. Argillic alteration may be supergene, because its products include montmorillonite, the principal clay mineral in a composite sample of supergene ore. The hypogene alteration is difficult to distinguish due to the prevalence of supergene effects. It exhibits the following successive stages, the distribution and relative intensities of which are poorly known: potassic alteration characterized by secondary potassium feldspar and locally by hydrothermal biotite; saussuritic alteration, chiefly with epidote-chlorite-magnetite and only rarely quartz and calcite; and phyllic (quartz-sericite) alteration. Potassic alteration is sporadic and possibly related to the distribution of latite porphyry. Saussuritic alteration is more general and is related to a widespread propylitic alteration seen in pyritic rocks south of the deposit. As far as carbonate alteration is concerned, calcite predominates over ankerite in the eastern portion of the pit and the reverse is true elsewhere. Although calcite is an expected product of propylitic alteration, surprisingly most calcite at Afton occurs as late fracture-fillings that postdate the supergene event and are common to the nearby Tertiary strata.

A large-scale zoning of magnetite, pyrite and copper minerals is crudely evident in the vicinity of the Afton orebody. Abundant hydrothermal magnetite forms a 300 metre wide zone trending northwestward from the Magnet shaft (092INE022) to the Afton orebody, a distance of 800 metres. The magnetite zone contains the orebody and is flanked by barren pyrite zones. The southwestern pyrite zone forms the hanging wall of the orebody. The pyrite zone widens to about 300 metres at Afton, beyond which it swings westward and is widest near its termination 600 metres farther on. South of Afton, it contains up to 10 per cent pyrite by volume, chiefly as fracture-fillings in Cherry Creek rocks and disseminations in Nicola rocks. Within the boundary of large-scale zoning of pyrite and magnetite, ore appears to be most consistently associated with hydrothermal biotite.

At Afton mine, supergene mineralization dominates to a depth of approximately 400 metres in the western, and 250 metres in the eastern portions of the orebody. It is characterized by a native copper to chalcocite ratio in excess of 2:1 and accounts for 80 per cent of the orebody. Chalcocite in this zone is mostly of the sooty variety and occurs mainly in veins less than 3 millimetres wide. Native copper occurs in stockworks as scales, films and dendrites, and also as granules associated with specularite. In the east end of the pit, isolated specks of native copper occur in magnetite, which occurs as veins, patches, and rare disseminations. Whereas native copper and chalcocite commonly occur in the same horizon, they rarely occupy the same vein. Thus, replacement features between the two are uncommon; in crosscutting relationships, veinlets of native copper are always younger. Thin coatings of cuprite are found on many native copper crystals; malachite, azurite, conichalcite and some poorly crystalline copper sulphate hydrates(?) occur locally in trace amounts. These minerals, like minor amounts of gypsum and late calcite veinlets, are probably products of post-supergene alteration processes.

In the hypogene zone, bornite and chalcopyrite are equally abundant, and chalcocite is subordinate. Bornite commonly encloses chalcopyrite in carbonate-free veins cutting highly chloritized rocks or as sulphide patches located within chloritized mafic phenocrysts themselves; chalcopyrite enclosing bornite is less common. In either case, bornite commonly exhibits exsolution rims of chalcocite and covellite. Bornite and grey chalcocite, either together or separately, also occur as disseminations in feldspar-rich monzonitic rocks that have accessory secondary biotite.

In addition to its association with bornite, chalcopyrite also occurs with pyrite in carbonate veins and is particularly abundant in epidote-rich rocks. At the southern rim of the open pit at an elevation of 610 metres, there are isolated occurrences of chalcopyrite and molybdenite, and chalcopyrite and hematite veins about 1 centimetre wide. These veins commonly show a 2 centimetre wide potassium feldspar selvage. Rare monomineralic

chalcopyrite veins up to 2 centimetres wide exhibit prominent albite selvages. In rocks intensively replaced by carbonate, chalcopyrite locally accompanies tennantite and/or pyrite. This assemblage also survived locally in the supergene zone.

Whereas gold and silver are significant byproducts of the copper ore, their mode of occurrence is still open to speculation. In the eastern part of the orebody, only one example of native gold coating disseminated bornite, which is incompletely altered to chalcocite, has been observed. Limited spectrochemical analyses also indicate a positive correlation between copper sulphides and gold. Possibly, native gold occurs as microdispersions in the sulphide phases and aggregates visible only after partial destruction of the host minerals. The highest ore grades for the two elements do not necessarily coincide. Tennantite, commonly observed in carbonate-altered and adjacent rocks, is also a likely host for silver and some gold. Quantitatively insignificant sulphosalts, associated with the copper sulphides, may also play a significant role in hosting the gold and silver contained in the ore (Bulletin 77).

Faults, evidenced by gouge, breccia and slickensides, are so numerous at Afton that they generally defy correlation. Many of the faults probably predate the supergene event and some possibly the hypogene period, although late effects are common. Three principal fault sets are recognized, largely because of their effect on the contact of Eocene strata (Kamloops Group rocks). These sets are strike faults (west or west-northwest), oblique faults (northeast or east-northeast) and cross faults (north-northeast). Southerly dips appear to prevail for strike and oblique faults. Cross faults are chiefly represented by an inferred 30 metre wide fault zone adjoining the western end of the deposit. A late fault of unusual type disrupts the uppermost western extremity of the orebody and the Eocene rocks, and is a low angle cylindrical fault of normal displacement. Apparent displacement on this fault is 30 to 40 metres.

A detailed study of the distribution of minerals in the Afton open pit indicates that primary mineralization took place in a roof pendant environment characterized by a diversified array of rock types. Hydrothermal alteration proceeded under a condition of low fluid/rock ratio such that primary mineralogy controlled the appearance of the secondary minerals. Whereas little meteoric water was involved in the hypogene mineralization, supergene alteration was dominated by irreversible mineral-solution (groundwater) interactions. The Afton protore is likely a byproduct of magmatic differentiation, generated at the early Cherry Creek stage when portions of the fractionating magma were intruded into a subvolcanic environment. Local trapping of late magmatic fluids remobilized and concentrated sulphides, which were disseminated in the pluton, to form the hypogene ore. Supergene alteration at Afton is unique; the dominance of native copper and the lack of copper enrichment in the supergene zone relate to the relatively mafic composition of the wallrocks, and to the paucity of sulphides produced during hypogene mineralization (Bulletin 77).

The Pothook zone is 1000 metres south-southwest of the main Afton pit and is the original discovery zone on the property. The main rock type at the Pothook pit is Cherry Creek unit microdiorite porphyry which is the predominant host for copper-gold mineralization. The microdiorite intrudes a highly altered inlier of andesite porphyry of the Nicola volcanics. Just to the south of this altered unit is a porphyritic hornblende diorite assigned to the Sugarloaf unit. Small dyke-like syenite bodies are also observed in the pit.

Potassic and propylitic alteration mineral assemblages are confined to the diorite and syenite units. The earliest observed alteration is a phase of albitization. Intensity of this alteration ranges from creamy white albite envelopes formed along microfractures to the development of pervasively albitized zones. This is succeeded by a period of potassic alteration represented by veinlets, veins and envelopes of pink potassium feldspar accompanied by less frequent biotite. The entire Pothook area falls within a zone of propylitic alteration. The most common propylitic minerals are chlorite, epidote, calcite and possibly additional albite. Calcite is ubiquitous and formed throughout the alteration period ending with a final pulse of white calcite veining.

The Pothook zone has undergone extensive faulting and brecciation. The dominant fault orientation is west-northwest with steep southerly dips. These faults are the broad control for rock emplacement and ultimately for mineralization. The best mineralized area near the main shaft is coincident with "crackle breccia" development.

Copper mineralization in the Pothook zone is of two basic types. Pyrite and pyrite-chalcopyrite mineralization are concentrated on the south and west forming a halo averaging 1 per cent pyrite. To the north and east, including the main zone about the Pothook shaft, the association becomes chalcopyrite with magnetite and then native copper, chalcocite and hematite. Bornite is also present as a primary sulphide. The sulphide mineralization occurs as disseminations and veinlets. The supergene copper minerals are found as disseminations, blebs and fracture-fillings in crackle breccia. Alteration of hypogene sulphides to supergene minerals is seldom as complete as in the Afton orebody. Consequently, ore mineralogy in the supergene areas tends to consist of chalcocite, native copper and remnant bornite and chalcopyrite. Surficial weathering with formation of copper oxides and carbonates is limited to a metre below subcrop.

Gold mineralization is associated with copper but is not totally grade related. Gold values are highest at the extreme east end of the main zone with higher grade ore favouring the east and footwall sides. Copper values are more broadly distributed. Gold-copper ratios are significantly higher in the Pothook deposit as opposed to the main Afton pit. Some of the highest gold values actually occur with minimal copper grades. These variations may indicate multiple phases of gold-copper mineralization.

The Afton property has a long history of exploration and development. The Pothook claim was first reported on in 1897 but some work had apparently been done prior to that date. On the adjacent Bonanza claim owned in 1897 by W. Ford, A. Darby, and associates, a shaft had been sunk 16 metres and from it a crosscut driven 18 metres. In 1898, the Pothook claim was optioned by a Mr. Croft of Victoria. Exploration work during the

year in a shaft and drift exposed considerable mineralization. The Scottish Copper Mines of British Columbia, Limited, acquired the property in 1899. A double compartment shaft was sunk to 100 metres and drifts totalling 274 metres were driven on four levels. Eight claims, the Pothook, Gold Mask, Midnight, Bonanza, Boss, Night Hawk, Cliff and Piper (Lots 893 900 respectively), were Crown granted to the above company in 1901. No further work was reported except for a period during 1916 when the workings were dewatered to the No. 2 level, and a carload of ore was shipped from the dump. All the claims, with the exception of the Cliff claim (Lot 899), subsequently reverted to the Crown for taxes.

In 1949, prospector Axel Berglund staked the 8 claim Afton group in the vicinity of the Pothook showings. Kennco Explorations (Canada) Limited in 1952 optioned the Afton group and expanded the property to 58 claims. The company carried out a program of geological mapping, geophysical surveys, and 1388 metres of diamond drilling in 14 holes. This work indicated a substantial tonnage of submarginal material. Work was discontinued in August 1952.

Cadamet Mines Limited reportedly held the Afton group and adjacent claims surrounding the Cliff and Gift Crown grants in 1958. During the year the property was optioned to Noranda Exploration Company, Limited, and a program of geological mapping, electromagnetic and self-potential surveys, trenching and 244 metres of diamond drilling was carried out; the option was dropped late in the year. New Jersey Zinc Exploration Company (Canada) Ltd. held an option on the property in 1960. In 1964, C.F. Millar, a geological engineer who was then a drilling contractor, persuaded Colonial Mines Limited to do percussion drilling near the Pothook shaft. The Afton 1-7, Afton Fraction and Add 1 26 claims were optioned by the Company from Axel Berglund. During the year several percussion holes were drilled in the vicinity of the Pothook shaft. Drilling to that date is reported to have indicated approximately 544,260 tonnes of 0.63 per cent copper. This programme was short lived and in 1965 Mr. Millar formed a private syndicate (Tamarack Mining Syndicate) to acquire the option agreement and continue exploration near the Pothook and on some newly staked claims (Pot 1 5 Fractions, Pot 6 9, and Add 27 30) close to the Trans-Canada Highway. In addition, Mineral Lease M 22 E (Dominion claim, Lot 1595) was purchased from Alfred Holmwood. The option was transferred to Afton Mines Ltd. in February 1966. An induced polarization survey in 1966 indicated anomalous zones which correlated to a large extent with geochemical anomalies located in previous work. Further geochemical soil survey work was carried out in 1968 and 1969 and diamond drilling totalling 1011 metres was done in 17 holes. Work in 1970 included 5 diamond-drill holes totalling 762 metres. Four of these holes, on the Afton 1 4 and Dominion claims, extended the Pothook mineralized zone 30 metres farther north. The fifth drill hole (70-4) was put down about 1006 metres northwest of the Pothook shaft on an induced polarization anomaly which corresponded closely to an electromagnetic conductive zone, a geochemical anomaly, and a saline lake (Lake zone). This hole intersected significant amounts of native copper, abundant magnetite, and virtually no pyrite. The diamond drill programme was suspended incomplete, and Duval Corporation was given the right of first refusal in exchange for an engineering report.

During the spring and summer of 1971, the property was under option to Quintana Minerals Corporation who carried out geological mapping, and 1554 metres of percussion drilling in 21 holes, none of which were within 305 metres of hole 70 4. The option was subsequently dropped.

At this point the property reverted back to Afton Mines Ltd. which, under the direction of C.F. Millar, in September 1971 began a new series of percussion holes in the immediate vicinity of DDH 70 4. During the month, 17 percussion holes on 30 metre centres and to a depth of 91 metres were put down in an area 122 by 122 metres; most of the holes bottomed in ore grade material. Drilling was suspended in order to arrange further financing through a stock underwriting; percussion and diamond drilling resumed in November 1971. An agreement was reached with Placer Development Limited, through its subsidiary, Canadian Exploration, Limited, in March 1972 for additional financing through the purchase of Afton treasury shares in the amount of \$350,000 with the first right of refusal for 12 months to participate in further financing.

Teck Corporation Limited and an associate company, Iso Mines Limited, on May 31, 1972, completed the purchase of just over 50 per cent of Afton shares on the open market. On June 1, 1972, Afton reached an agreement with Canadian Exploration under which the latter company would carry out further exploration and feasibility studies and if warranted place the property in production, thereby acquiring a 30 per cent interest in Afton. Work on the property was suspended in June 1972 by a Court order due to litigation between Canadian Exploration and Teck Corporation over control of the property. Work by Afton Mines during the period September 1971 to June 1972 included 7400 metres of diamond drilling in 30 holes, 8504 metres of percussion drilling in 93 holes, and 5902 metres of rotary drilling in 26 holes.

The company name, Canadian Exploration, was changed in October 1972 to Canex Placer Limited. The Courts upheld the Canex Afton agreement and although management of Afton was taken over by Teck, Canex Placer retained management of the property. Drilling was resumed by Canex Placer early in January 1973 but discontinued in April 1973 due to further litigation. An agreement was reached in May 1973 whereby Teck Corporation agreed to pay Canex Placer 4 million dollars for its interest in Afton Mines.

During 1973 Teck carried out an induced potential survey over 56 line kilometres, a magnetometer survey over 69 line kilometres, a geochemical soil survey (1165 samples) over 69 line kilometres, 14,793 metres of diamond drilling in 54 holes, 2051 metres of rotary drilling in 18 holes, and 3253 metres of percussion drilling in 55 holes. Ore reserves within the planned open pit, extending to a depth of 274 metres, were estimated at 30,841,400 tonnes averaging 1.0 per cent copper.

During 1974 diamond, percussion and rotary drilling was done in several holes. The decision to proceed with the construction of a mine, mill and smelter complex was made in October 1975. Open pit preparation began in April 1977 and the newly installed 6350 tonne-per-day mill produced its first concentrates on December 9, 1977. The smelter, based on the top blown rotary converter process (TBRC) with a daily capacity of up to 272 tonnes of copper concentrate, produced its first blister copper on March 23, 1978.

Teck Corporation Limited by 1978 held directly and indirectly (through Iso Mines Limited) a 73 per cent share interest in Afton. The company name was changed in August 1978 to Teck Corporation. In September 1979 Iso Mines was merged with Teck. A reorganization was carried out in 1981 whereby Teck converted its 73 per cent share interest in Afton Mines to a 73 per cent direct working interest in a partnership under the name Afton Operating Corporation, which was incorporated in June 1981 with Teck holding a 73 per cent working interest and an affiliate of Metallgesellschaft Canada Limited a 27 per cent partnership interest.

Seven holes drilled in 1973 and 1980 outlined a "reserve" of 5.9 million tonnes grading 1.55 per cent copper, 1.6 grams per tonne gold and 6.86 grams per tonne silver (Afton Annual Report, 1980). One hole hit 2.5 per cent copper and 1.06 grams per tonne gold over 200 metres. Another hole assayed 3.3 per cent copper over 85 metres, including 5.6 per cent copper over 32 metres. The mineralization is in hypogene (sulphides) and has a true width of approximately 90 metres.

The operation was closed by strike action from November 21, 1981 to March 15, 1982. Operations were suspended June 22, 1982 due to a cycle of low-grade ore and low copper prices. Operations resumed in May 1983 with assistance under the Federal Government Unemployment Insurance Act and the Provincial Government's Community Recovery Program. The copper smelter was closed permanently in late July 1983 due to economic factors; the closure was several years ahead of its planned phase out as the orebody changes from native copper to sulphides at depth. Reserves at September 30, 1982 were reported as: open pit - 12,608,690 tonnes at 0.82 per cent copper, 0.754 gram per tonne gold; underground - 9,524,555 tonnes at 1.50 per cent copper, 1.02 grams per tonne gold (Teck Corporation 1982 Annual Report).

Mining commenced at Afton in 1977. Open pit reserves of the main orebody (Afton pit) were depleted in July 1987; mining then moved to the Pothook zone. The Pothook deposit was mined from July 1987 to May 1988 and then the Crescent deposit (see 092INE026) from October 1988 to March 1989.

An estimated 3 million tonnes grading 1.5 per cent copper is reported to remain in the southwest wall of the Afton pit (Information Circular 1997-1, page 9).

In June 1989, mining commenced at the Ajax (West) deposit (092INE012), 10 kilometres to the south-southeast of the Afton open pit. Ore is hauled via a new road to the Afton mill complex. See Ajax (West) for complete deposit description. In 1990, Afton Mines Ltd., a subsidiary of Teck Corp., was the operator of the mine. In August 1991, the Afton operations ceased mining.

Reserves for the Afton-Ajax deposits (092INE012, 13) estimated by the company at January 1, 1995 were 13.2 million tonnes grading 0.34 gram per tonne gold and 0.42 per cent copper (Information Circular 1996-1, page 7).

In 1996, Teck Exploration Ltd. discovered the Coquihalla West zone adjacent to the Pothook pit. Here gold-bearing but copper-poor mineralization occurs in Nicola volcanics and Iron Mask intrusive rocks.

In 2000, 21 NQ diamond-drill holes (9319 metres) outlined a wide "feeder zone" below and to the southwest of the Afton open pit. The mineral zone is a steeply dipping tabular body 365 metres long, averaging 76 metres wide and extending to at least 303 metres below pit bottom. The zone is open in all directions with no indication of narrowing except towards surface.

As of November 2001, J.J. McDougall estimates resources as follows: Indicated - Afton Main Zone - 22.5 million tonnes grading 2.0 per cent copper, 1.54 grams per tonne gold, 0.137 gram per tonne palladium and 6.86 grams per tonne silver. Indicated - Southwest Zone - 10.01 million tonnes grading 1.58 per cent copper, 1.03 grams per tonne gold, 0.034 gram per tonne palladium and 2.74 grams per tonne silver. Indicated - Northeast Zone - 1.56 million tonnes grading 0.93 per cent copper, 0.69 gram per tonne gold, 0.069 gram per tonne palladium and 4.11 grams per tonne silver. Total indicated 34.07 million tonnes grading 1.83 per cent copper, 1.37 grams per tonne gold, 0.103 gram per tonne palladium and 5.49 grams per tonne silver. Inferred resources are: Southwest Zone - 3.98 million tonnes grading 1.19 per cent copper, 1.03 grams per tonne gold, 0.206 gram per tonne palladium and 1.71 grams per tonne silver; Northeast Zone - 1.93 million tonnes grading 0.77 per cent copper, 0.34 gram per tonne gold, 0.034 gram per tonne palladium and 4.11 grams per tonne silver. Total inferred resources are 5.91 million tonnes grading 1.05 per cent copper, 0.79 gram per tonne gold, 0.137 gram per tonne palladium and 3.5 grams per tonne silver (DRC website ([www.drcresources.com](http://www.drcresources.com)), June 2001).

In 2000 and 2001, DRC Resources Corp. drilled a total of 23,800 metres in 49 holes to test the mineralized zone measuring 850 metres in length, 775 metres in depth and 80 metres in width. Indicated reserves for the Afton Main is 34.3 million tonnes grading 1.55 per cent copper, 1.14 grams per tonne gold, 3.42 grams per tonne silver and 0.125 gram per tonne palladium. Indicated reserves for the Northeast zone is 1.1 million tonnes grading 1.02 per cent copper, 0.86 gram per tonne gold, 5.49 grams per tonne silver and 0.1 gram per tonne palladium (Stockwatch - October 25, 2002).

DRC has drilled more than 38 000 metres since 2000, including about 10,000 metres in 25 holes in 2002 (Exploration and Mining in BC 2002).

In 2003, DRC mainly drilled deep infill holes in the Afton main zone, which extends southwesterly from the bottom of the pit. The zone is now known to measure 800 metres in length, 90 metres in average width and to extend at least 300 metres below the bottom of the open pit. The drilling results were incorporated into a December 2003 mineral resource calculation that concluded that measured and indicated resources total 68,700,000



tonnes at a 0.70% copper equivalent cutoff (Press Release, December 18, 2003). The measured resource is reported as 9,540,000 tonnes grading 1.289 per cent copper, 0.945 grams per tonne gold, 3.438 grams per tonne silver and 0.117 grams per tonne palladium, and the indicated resource is 59,160,000 tonnes grading 1.049 per cent copper, 0.829 grams per tonne gold, 2.487 grams per tonne silver and 0.119 grams per tonne palladium. Total contained product in these categories is about 744,000 tonnes of copper (1.64 billion pounds) and 58 tonnes of gold (1.9 million ounces). An additional inferred resource is reported to be 7,450,000 tonnes grading 0.924 per cent copper, 0.784 grams per tonne gold, 2.341 grams per tonne silver and 0.12 grams per tonne palladium.

DRC commenced a major underground exploration program in December of 2004.

In June of 2005, DRC Resources changed its name to New Gold Inc. In 2005 and early 2006, a total of 78 underground drill holes, totalling 30,058 metres, and 10 surface drill holes, totalling 3627 metres, were completed. Exploration drilling during 2006 and 2007 resulted in the discovery of the C zone located below the main body of mineralization.

In September 2006, a mineral resource estimate of 65,660,000 tonnes measured and indicated grading 1.02 per cent copper, 0.77 gram per tonne gold and 2.59 grams per tonne silver was reported (Shillabeer, J. (2007-04-01): NI 43-101 Independent Technical Report - New Afton Project).

In September 2009, an updated mineral resource reported with 65.0 million tonnes measured and indicated grading 1.07 per cent copper, 0.80 gram per tonne gold, 2.5 grams per tonne silver and 0.10 gram per tonne palladium with an additional inferred resource of 25.2 million tonnes grading 0.66 per cent copper, 0.54 gram per tonne gold, 1.7 grams per tonne silver and 0.08 gram per tonne palladium (Bergen, R.D. (2009-12-31): Technical Report on the New Afton Project). Also at this time a probable mineral reserve of 47.4 million tonnes grading 0.95 per cent copper, 0.69 gram per tonne gold and 2.03 grams per tonne silver was reported (Bergen, R.D. (2009-12-31): Technical Report on the New Afton Project).

In February 2012 New Gold Inc. reported updated reserves and resources for New Afton:  
(New Gold Inc. Press Release February 2, 2012)

Category	tonnes	Au(g/t)	Ag(g/t)	Cu(%)
Probable	47,900,000	0.64	2.0	0.90
Measured &	69,800,000	0.78	2.4	1.03
Indicated				
Inferred	29,200,000	0.51	1.6	0.61

In June of 2012 New Gold Inc. started production at New Afton. The company forecasts that it will produce approximately 1,090 to 1,400 kilograms of gold and 13,600 to 15,900 tonnes of copper in 2012.

In 2014, the mill operated at a rate of 13,100 tonnes per day on feed from an underground block cave mine and produced 38,328,555 kilograms of copper and 2,962.5 kilograms gold. Between the start of commercial production in July 2012 and the end of 2014, New Afton produced approximately 83,914,588 kilograms of copper and 6,492 kilograms of gold (Bergen, R.D. (2015-02-23): Technical Report on the New Afton Mine).

In February 2015 New Gold Inc. reported updated reserves and resources for New Afton:  
(New Gold Inc. Press Release February 4, 2015)

Category	tonnes	Au(g/t)	Ag(g/t)	Cu(%)
Probable	42,026,000	0.56	2.3	0.84
Measured				
& Indicated	73,042,000	0.75	2.2	0.87
Inferred	14,085,000	0.43	1.4	0.46
Calculated at 0.40% Cu equivalent cut-off				
Includes A&B-zone, C-zone and HW Lens				

In 2016, New Gold Inc. completed a program of geological mapping, ground geophysical surveys and 26 diamond drill holes, totalling 13 094 metres, on the New Afton deposit. This work focussed on the strike and dip extensions of the C zone, expansion of the HW lens, and delineation of the Gold zone, a satellite body of mineralization located just north of the main New Afton orebody. The following year, further infill diamond drilling, totalling 8934 metres in 17 holes, was completed on the C zone and four holes, totalling 1086 metres, were drilled in the West B3 area, which encountered Gold zone-type mineralization.

Updated Reserves and Resources reported by New Gold Inc. for New Afton as of December 31, 2018 are as follows:  
[www.newgold.com](http://www.newgold.com)

Category	tonnes	Au(g/t)	Ag(g/t)	Cu(%)
Proven + Probable	52,642,000	0.64	1.9	0.78
Measured	20,950,000	0.68	2.0	0.89
Indicated	31,457,000	0.60	2.3	0.69
Measured + Indicated	52,407,000	0.63	2.2	0.77
Inferred	13,564,000	0.39	1.4	0.45
Calculated at 0.40% Cu equivalent cut-off				
Includes A&B-zone, C-zone and HW Lens				

In 2019, New Gold Inc. completed 49 diamond drill holes, totalling 11 454 metres, on the New Afton project. This work focused on the D-zone and the sub-level cave (SLC) area located just below the current stoping blocks and to the east of the B3 area.

In December 2019, New Gold Inc. reported an updated measured and indicated mineral resource of 57 000 000 tonnes grading 0.61 gram per tonne gold, 2.1 grams per tonne silver and 0.74 per cent copper with an additional inferred resource of 14 000 000 tonnes grading 0.38 gram per tonne gold, 1.3 grams per tonne silver and 0.42 per cent copper using a 0.40 per cent copper equivalent cut-off grade (New Gold Inc. [2020-02-28]: Technical Report on the New Afton Mine, British Columbia, Canada). Also at this time, proven and probably mineral reserves were reported to be 47 300 000 tonnes grading 0.66 gram per tonne gold, 1.9 grams per tonne silver and 0.77 per cent copper (New Gold Inc. [2020-02-28]: Technical Report on the New Afton Mine, British Columbia, Canada).

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<b>Date Coded:</b>	1985/07/24	<b>Coded By:</b>	BC Geological Survey (BCGS)	<b>Field Check:</b>	Y
<b>Date Revised:</b>	2022/03/31	<b>Revised By:</b>	Karl A. Flower (KAF)	<b>Field Check:</b>	Y