Trilogy Metals Inc.

NI 43-101 Technical Report on the Bornite Project, Northwest Alaska, USA

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GLOSSARY

Acme Analytical Laboratories Ltd.	AcmeLabs
Alaska Department of Environmental Conservation	ADEC
Alaska Department of Fish and Game	ADF&G
Alaska Department of Natural Resources	ADNR
Alaska Department of Transportation	ADOT
Alaska Industrial Development and Export Authority	AIDEA
Alaska Native Claims Settlement Act	ANCSA
Alaska Native Regional Corporations	ANCSA Corporations
Ambler Mining District Industrial Access Project	AMDIAP
Andover Mining Corp.	Andover
Annual Hardrock Exploration Activity	AHEA
atomic absorption	AA
atomic absorption spectroscopy	AAS
atomic emission spectroscopy	ICP_AES
Audio-Frequency Magneto-Telluric	AMT
BD Resource Consulting, Inc.	BDRC
Bear Creek Mining Corporation	BCMC
Bornite Property	the Property
Canadian Institute of Mining, Metallurgy, and Petroleum	CIM
complex resistivity induced polarization	CRIP
Controlled Source Audio-frequency Magneto-Telluric	CSAMT
Dead Creek	Shungnak
Electromagnetic	EM
Environmental Impact Statement	EIS
Environmental Protection Agency	EPA
Exploration Agreement and Option to Lease	NANA Agreement
Fugro Airborne Surveys	Fugro
GeoSpark Consulting Inc.	GeoSpark
inductively coupled plasma	ICP
inductively coupled plasma-mass	ICP-MS
International Organization for Standardization	ISO
Kennecott Exploration Company and Kennecott Arctic Company	Kennecott
Kennecott Research Centre	KRC
liquefied natural gas	LNG
Mine Development Associates	MDA
NANA Regional Corporation, Inc.	NANA
National Environmental Policy Act	NEPA
National Instrument 43-101	NI 43-101
natural source audio-magnetotelluric	NSAMT
naturally occurring asbestos	NOA
net smelter return	NSR
North American Datum	NAD
Northern Land Use Research Inc.	NLUR Inc.

Northwest Arctic Borough	NWAB
Northwest Alaska Native Association	NANA
Trilogy Metals Inc.	Trilogy Metals
NovaGold Resources Inc.	NovaGold
Polarized Light Microscopy	PLM
Quality Assurance/Quality Control	QA/QC
SIM Geological Inc.	SGI
single point	SP
Teck Resources Ltd.	Teck
Universal Transverse Mercator	UTM
Upper Kobuk Mineral Projects	UKMP
US Army Corps of Engineers	USACE
US Geological Survey	USGS
volcanogenic massive sulphide	VMS
WH Pacific, Inc.	WHPacific
Zonge International Inc.	Zonge

1.0 SUMMARY

1.1 INTRODUCTION

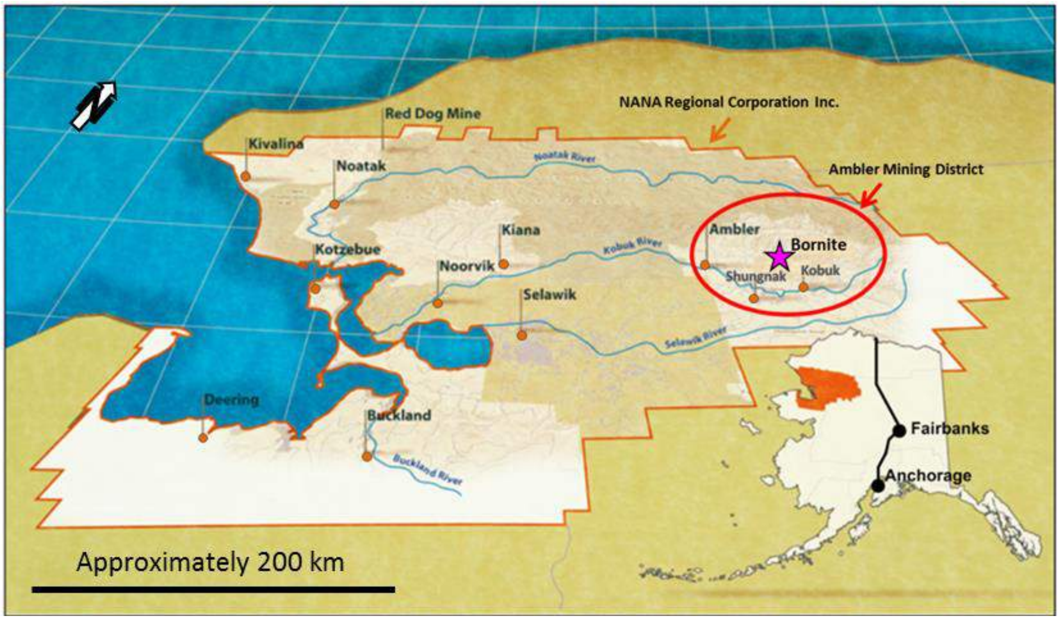
Trilogy Metals Inc. (Trilogy Metals or Trilogy) formerly known as NovaCopper Inc. retained BD Resource Consulting, Inc. (BDRC) and Sim Geological Inc. (SGI), to prepare an updated mineral resource estimate for the Bornite Project and disclose it in a technical report prepared in accordance with National Instrument 43-101 and Form 43-101F1 (collectively "NI 43-101"). The Bornite Property (the Property) is part of the Upper Kobuk Mineral Projects (UKMP) mineral tenure package, which includes the Bornite Deposit, as well as numerous additional mineral showings/deposits. The Property is located in the Ambler mining district of the southern Brooks Range, in the Northwest Arctic Borough (NWAB) of Alaska. The Property is located 248 km east of the town of Kotzebue, 19 km north of the village of Kobuk, and 275 km west of the Dalton Highway, an all-weather state maintained highway. Figure 1-1 shows the location of the Property.

This technical report describes the addition of cobalt estimates to the previous estimate of copper mineral resources for the Bornite Deposit and it includes a description of the 2017 exploration program.

This technical report replaces and supersedes the previous technical report for the Bornite Project which was filed on SEDAR on October 12, 2017 and had an effective date of April 19, 2016. The estimate of copper resources has not changed from the previous technical report, as the 2017 drill holes are spaced too far apart to support the estimation of additional resources at the Bornite deposit. As stated above, this new resource estimate includes resource estimates for cobalt.

All amounts are in US dollars unless otherwise stated.

Figure 1-1: Property Location Map



1.2 PROPERTY DESCRIPTION AND LOCATION

The Bornite Project is located in the Ambler mining district of the southern Brooks Range, in the NWAB of Alaska. The Property is geographically isolated with no current road access or nearby power infrastructure. The Property is located 248 km east of the town of Kotzebue, 19 km north of the village of Kobuk, and 275 km west of the Dalton Highway, an all-weather state maintained highway.

The Property is part of the UKMP mineral tenure package, which includes the Bornite Deposit, as well as numerous additional mineral showings/deposits. In October 2011, Trilogy Metals entered into an exploration agreement with NANA Regional Corporation, Inc. (NANA), the owner of the Property, for the development of the parties' collective resource interests in the Ambler mining district. The agreement consolidates certain land holdings of the parties into an area of interest of an approximately 143,000 ha land package.

1.3 GEOLOGY AND MINERALIZATION

Mineralization in the UKMP area is characterized by two discrete mineralized belts: the Devonian Ambler Schist Belt and the Devonian Bornite carbonate sequence. The Ambler Schist Belt is host to a series of volcanogenic massive sulphide (VMS) deposits related to metamorphose and strongly deformed bimodal Devonian volcanic and sedimentary rocks. A series of notable VMS deposits, including the Arctic, Dead Creek (Shungnak), Sunshine, Horse Creek, Sun, and Smucker deposits, occur in this belt. At Bornite, the focus of this NI 43-101 technical report, mineralization is hosted in less-strongly deformed Devonian clastic and carbonate sedimentary rocks lying immediately south of the Ambler Schist Belt across the Ambler lowlands. Widespread hydrothermal dolomitization is characteristic of the belt and locally hosts the associated copper and cobalt mineralization.

Bornite has characteristics similar to a series of districts and deposits including the Mt Isa district in Australia, the Tynagh deposit in Ireland, the Kipushi deposit in the Congo, and the Tsumeb deposit in Namibia. All of these deposits show: syngenetic to early epigenetic characteristics; emplacement in carbonate stratigraphy; and, early pyrite-dolomite alteration followed by copper dominant sulphide mineralization. All occur in intra-continental to continental margin settings undergoing extensional tectonics and bimodal volcanism. Basin-margin faults seem to play an important role in localizing mineralizing fluids.

Copper mineralization at Bornite is comprised of chalcopyrite, bornite, and chalcocite as stringers, veinlets, and breccia fillings distributed in stacked, roughly stratiform zones exploiting favourable stratigraphy. Stringer and massive pyrite and locally significant sphalerite occur above and around the copper zones, while locally massive pyrite and sparse pyrrhotite occur in association with siderite alteration below and adjacent to copper mineralization.

Cobalt mineralization at Bornite is comprised of cobaltiferous pyrite within and enveloping the copper mineralized zones and carrollite and cobaltite directly associated with copper bearing minerals.

1.4 METALLURGICAL TESTING

Metallurgical test work to date indicates that the Bornite Project can be treated using standard grinding and flotation methods to produce copper concentrates with good results being obtained. Copper recoveries range from 89 to 90 percent resulting in copper concentrate grades in the range of 26 to 28 percent copper.

On-going metallurgical test work is recommended as the geological resource is further outlined, this test work could be considered confirmatory of the results obtained in the test work reported in 2017 at SGS.

Cobalt occurs at grades that are of potential interest to the project economics. Very preliminary analysis of flotation products in test work indicates that the majority (~80%) of the available cobalt reports to the flotation tailings. This cobalt appears to be occurring within cobaltiferous pyrite. Additional metallurgical test work focused on the recovery of cobalt is warranted.

1.5 RESOURCE ESTIMATE

An updated mineral resource estimate has been prepared by Bruce M. Davis, FAusIMM, BDRC and Robert Sim P.Geo., SGI, both “Independent Qualified Persons” as defined in section 1.5 of NI 43-101.

The Cobalt resources presented in this report are with the copper resources that were contained in the October 12, 2017 amended NI 43-101 Technical Report that has an effective date of April 19, 2016. Open pit resources are contained within a pit shell that was generated based on a 0.5% copper cut-off grade by AGP Mining Consultants Inc., and the underground resource is material below the pit shell calculated at a higher cut-off grade of 1.5% copper. Note that although the data supports estimates of copper resources in both the Indicated and Inferred categories, the volume and distribution of available cobalt sample data is considered insufficient to support the estimate of cobalt resources in the Indicated category and, as a result, all of the estimated cobalt resource remains in the Inferred category.

Estimates of the copper and cobalt mineral resources are presented in Table 1-1 and Table 1-2.

Table 1-1: Estimate of Copper Mineral Resources for the Bornite Project

Class	Type	Cut-off (Cu %)	Tonnes (million)	Average Grade Cu (%)	Contained Metal Cu (Mlbs)
Indicated	In-Pit(1)	0.5	40.5	1.02	913
Inferred	In-Pit(1)	0.5	84.1	0.95	1,768
Inferred	Below-Pit	1.5	57.8	2.89	3,683
Inferred	**Total**		**141.9**	**1.74**	**5,450**

(1) Resources stated as contained within a pit shell developed using a metal price of US$3.00/lb Cu, mining costs of US$2.00/tonne, milling costs of US$11/tonne, G&A cost of US$5.00/tonne, 87% metallurgical recoveries and an average pit slope of 43 degrees.
(2) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources will be converted into Mineral Reserves.
(3) It is reasonably expected that the majority of Inferred mineral resources could be upgraded to Indicated mineral resources with additional exploration.

Table 1-2: Estimate of Cobalt Mineral Resources for the Bornite Project

Class	Type	Cut-off (Cu %)	Tonnes (million)	Average Grade Co (%)	Contained Metal Co (Mlbs)
Inferred	In-Pit(1)	0.5	124.6	0.017	45
Inferred	Below-Pit	1.5	57.8	0.025	32
Inferred	**Total**		**182.4**	**0.019**	**77**

(1) Resources stated as contained within a pit shell developed using a metal price of US$3.00/lb Cu, mining costs of US$2.00/tonne, milling costs of US$11/tonne, G&A cost of US$5.00/tonne, 87% metallurgical recoveries and an average pit slope of 43 degrees.

(2) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources will be converted into Mineral Reserves.
(3) It is reasonably expected that the majority of Inferred mineral resources could be upgraded to Indicated mineral resources with additional exploration.
(4) Due to limited sample data, none of the cobalt resource meets the confidence for Indicated class resources. All cobalt resources are considered in the Inferred category.

1.6 INTERPRETATIONS AND CONCLUSIONS

The level of understanding of the geologic controls that influence the distribution of copper mineralization at the Bornite Deposit is relatively good. The drilling, sampling and validation practices utilized by Trilogy Metals during the various campaigns have been conducted in a professional manner and adhere to accepted industry standards. The confidence in older, historic, drilling conducted by Kennecott has been demonstrated through a series of validation checks and, overall, the underlying database is considered sufficient for the estimation of Indicated and Inferred mineral resources.

BDRC and SGI have prepared an updated mineral resource estimate and supporting Technical Report in accordance with NI 43-101. The deposit remains “open” to potential expansion near-surface toward the south, and at depth toward the north, northeast and east. There are also indications that the mineralization may be continuous between the South Reef zone and the Lower Reef zone at Ruby Creek. Further drilling is warranted to test these assumptions.

Metallurgical test work to date is very limited but suggests that potentially marketable concentrates can be produced using standard grinding and flotation methods.

Based on the information to date, the Bornite Project hosts a relatively large copper resource with associated cobalt that is potentially amenable to a combination of open pit and underground extraction methods. It is recommended that Trilogy Metals continue to advance the Project through continued exploration, metallurgical studies, preliminary engineering studies, environmental base line analyses and should consider the generation of a preliminary economic analysis in the near future.

1.7 OPPORTUNITIES AND RECOMMENDATIONS

BDRC and SGI make the following recommendations for the next phase of work on the Bornite Project:

- Infill drilling (8,000m) between holes drilled in 2017 along the northern down-dip part of the deposit in order to provide holes that are spaced less than 200m which can then be used to support the estimation of mineral resources in this area. ($3.5M)

- Continue exploration drilling (8,000m) with holes spaced at 200 m intervals or greater, to test the continuity of mineralization down-dip (Ruby Creek and South Reef). ($3.5M)

- Extend the Deep Penetrating Geochemical (DPG) survey north of the deposit into the Ambler lowlands. ($25,000)

- Continued improvements to the understanding and interpretation of the distribution of lithology, alteration, structural and mineral zoning in and around the Bornite deposit. ($75,000)

- Update mineral resource estimate and technical report. ($75,000)

- Metallurgical studies, including pyrite floatation tests and cobalt leach tests, variability and grinding test work, examination of the process parameters needed to optimize the cleaning circuit, and monitoring of concentrate quality for both copper and cobalt. ($250,000)

- Implement an initial acid base accounting (ABA) waste characterization study suitable to support a PEA level study. ($50,000)

- Maintain environmental baseline monitoring to support environmental and permitting activities ($30,000)

- Undertake a hydrogeological and geotechnical program to develop a better understanding of the groundwater regime and pit slope stability to support PEA-level open pit design. ($500,000)

Total cost of $8.0M excludes site costs such as camp support, overhead and other indirect costs. Additional exploration drilling to test for down-dip extensions to known resources north of Ruby Creek and South Reef will require further expenditures.

Following the successful completion of the work outlined above, it is recommended that Trilogy Metals initiate engineering and economic evaluations to support the generation of a PEA. The estimated cost of a PEA is $800,000.

2.0 INTRODUCTION

2.1 TERMS OF REFERENCE

Trilogy Metals, a company involved in the exploration and development of projects in the UKMP, retained BDRC and SGI to prepare an updated mineral resource estimate for the Bornite Project and disclose it in a technical report prepared in accordance with National Instrument 43-101 and Form 43-101F1 (collectively "NI 43-101").

This report replaces and supersedes the previous resource estimate for the Bornite Project in its entirety. The previous resource estimate was filed on SEDAR on October 12, 2017 and had an effective date of April 19, 2016.

BDRC and SGI Qualified Persons (QPs) are responsible for sections 1 – 12 and 14 - 26 of the current technical report. Trilogy Metals engaged AGP Mining Consultants Inc. of Vancouver, BC to generate a resource limiting pit shell as described in Section 14 of this report. International Metallurgical and Environmental Inc., of Kamloops, BC provided a summary of Bornite metallurgical test work (Section 13.0), and is the responsible QP for this section of this report. BDRC and SGI used the information completed by these contributors to support information in this technical report.

2.2 UNITS OF MEASUREMENT

All units of measurement in this technical report are metric, unless otherwise stated. Specifically, in the section describing historic resource estimates, and when reporting contained copper, imperial units are used.

The monetary units are in US dollars, unless otherwise stated.

2.3 QUALIFIED PERSONS

Bruce Davis, FAusIMM, the president of BDRC, is the principle author of this Technical Report. Robert Sim, P.Geo., the president of SGI, and Jeffrey (Jeff) Austin, P.Eng., the president of International Metallurgical & Environmental Inc., are co-authors of this Technical Report. Bruce Davis, Robert Sim and Jeff Austin are QPs as defined in NI 43-101, *Standards of Disclosure for Mineral Projects*, and in compliance with Form 43-101F1.

Neither Bruce Davis of BDRC, Robert Sim of SGI, nor Jeff Austin of International Metallurgical & Environmental Inc., nor any associates employed in the preparation of this report (Consultants), has any beneficial interest in Trilogy Metals. These Consultants are not insiders, associates, or affiliates of Trilogy Metals. The results of this Technical Report are not dependent on any prior agreements concerning the conclusions of this report, and there are no undisclosed understandings concerning future business dealings between Trilogy Metals and the Consultants. The Consultants are paid a fee for their work in accordance with normal professional consulting practices.

2.4 SITE VISIT

Bruce Davis conducted several site visits to the Bornite Project on July 26-27, 2011, on September 25, 2012, and again on August 10-12, 2015. Figure 2-1 shows the Bornite exploration shaft and the Trilogy Metals exploration camp. The site visits included a review of: drilling procedures, site facilities, historic and recent drill core, logging procedures, data capture, and sample handling. During the 2015 Bornite site visit, Mr. Davis undertook a helicopter traverse along proposed access corridors and potential site layouts within the UKMP, as well as inspected mineralized outcrop within the historic Berg Pit.

Figure 2-1: Bornite Exploration Shaft and the Trilogy Metals Exploration Camp

2.5 INFORMATION SOURCES

Reports and documents listed in Section 27.0 were used to support the preparation of the technical report. Additional information was sought from Trilogy Metals personnel where required.

3.0 RELIANCE ON OTHER EXPERTS

BDRC and SGI have relied entirely on discussions with and information provided by Trilogy Metals' management team, Rick Van Nieuwenhuyse, CEO and Erin Workman, the previous Director of Technical Services at Trilogy and Andy West, Exploration Manager for matters relating to mineral tenure and mining rights permits, surface rights, agreements and encumbrances relevant to this report, including the Trilogy Metals and NANA Exploration Agreement and Option to Lease dated October 19, 2011 (the "NANA Agreement"). BDRC and SGI have not researched the property title or mineral rights for the Bornite Project and express no legal opinion as to the ownership status of the property.

BDRC and SGI believe the data and information provided by Trilogy Metals is essentially complete and correct to the best of their knowledge and that no information was intentionally withheld that would affect the conclusions made herein.

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 LOCATION

The Property is part of the UKMP mineral tenure package, which includes the Bornite Deposit, as well as numerous additional mineral showings/deposits (Figure 4-1) and Figure 4-2). The Property is located in the Ambler mining district of the southern Brooks Range, in the NWAB of Alaska. The Property is located in Ambler River A-2 quadrangle, Kateel River Meridian T 19N, R 9E, sections 4, 5, 8 and 9.

The Bornite Project is located 248 km east of the town of Kotzebue, 19 km north of the village of Kobuk, 275 km west of the Dalton Highway, an all-weather state maintained public road, at geographic coordinates N67.07° latitude and W156.94° longitude (Universal Transverse Mercator (UTM) North American Datum (NAD) 83, Zone 4W coordinates 7440449N, 589811E).

4.2 MINERAL TENURE

The UKMP lands consist of NANA owned patented lands, NANA selected ANCSA lands, State of Alaska mining claims, and patented land owned by Trilogy Metals. The total land tenure package consists of 142,831 ha, 140,500 ha of which are within the NANA/Trilogy Metals "Area of Interest" covered by the NANA/Trilogy Metals Agreement. Twenty contiguous State of Alaska mining claims totaling 2,331 ha are outside of the NANA/Trilogy Metals Area of Interest. A breakdown of the UKMP lands is provided in Table 4-1.

Table 4-1: Summary of UKMP Lands Status

Owner	Number	Type	Acres	Hectares
Trilogy Metals	1366	State Claims (inside AOI)	108,468	43,895
Trilogy Metals	20	State Claims (outside AOI)	5,760	2,331
Trilogy Metals	18 (2 USMS Patents)	Patented	272	110
		Trilogy Metals Total	114,500	46,336
NANA (ANCSA)	N/A	Selected/Patented	240,369	97,274
NANA (Bornite)	25 (2 USMS Patents)	Patented	517	209
		NANA Total	240,885	97,483
		Grand Total	355,385	143,819

Figure 4-1: Upper Kobuk Mineral Projects Lands (Trilogy Metals, 2018)

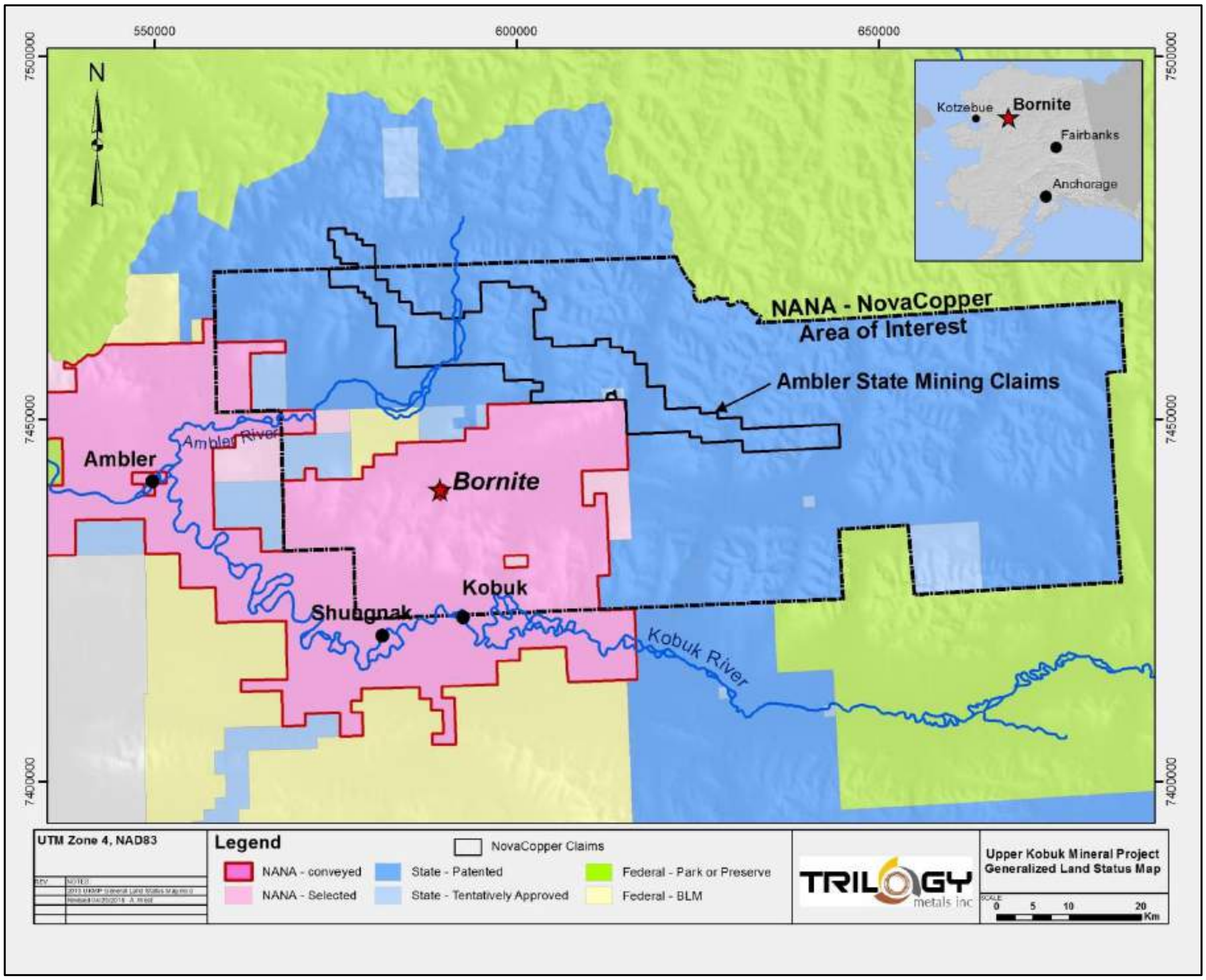
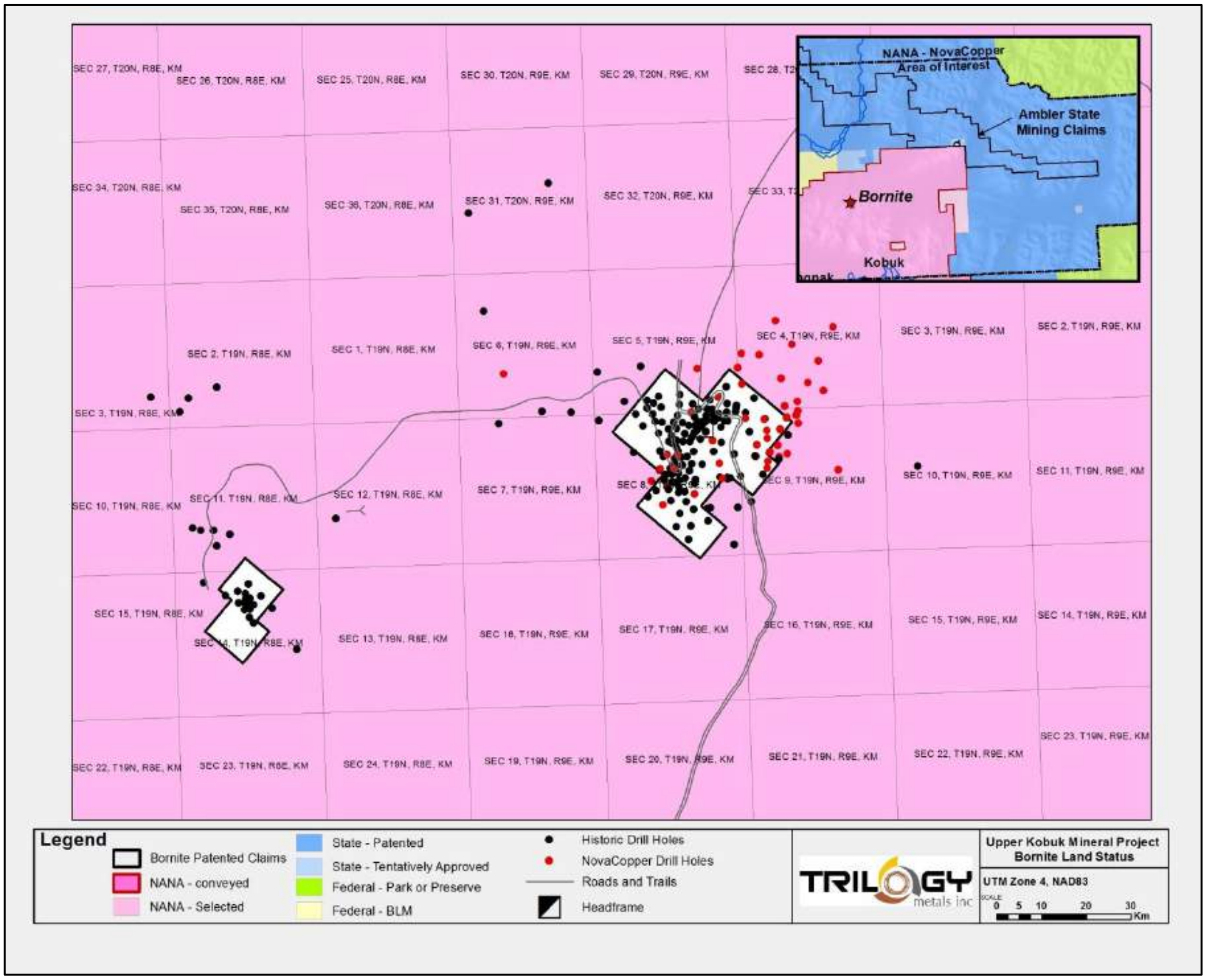


Figure 4-2: Mineral Tenure Plan (Trilogy Metals, 2018)



4.3 ROYALTIES, AGREEMENTS AND ENCUMBRANCES

4.3.1 KENNECOTT AGREEMENTS

On March 22, 2004, Alaska Gold Company, a wholly-owned subsidiary of NovaGold Resources Inc. (NovaGold) completed an Exploration and Option to Earn an Interest Agreement with Kennecott Exploration Company and Kennecott Arctic Company (collectively, Kennecott) on the Ambler land holdings.

On December 18, 2009, a Purchase and Termination Agreement was entered into between Alaska Gold Company and Kennecott whereby NovaGold agreed to pay Kennecott a total purchase price of $29 million for a 100% interest in the Ambler land holdings, which included the Arctic Project, to be paid as: $5 million by issuing 931,098 NovaGold shares, and two installments of $12 million each, due 12 months and 24 months from the closing date of January 7, 2010. The NovaGold shares were issued in January 2010, the first $12 million payment was made on January 7, 2011, and the second $12 million payment was made in advance on August 5, 2011; this terminated the March 22, 2004 exploration agreement between NovaGold and Kennecott. Under the Purchase and Termination Agreement, the seller retained a 1% net smelter return (NSR) royalty that is purchasable at any time by the land owner for a one-time payment of $10 million.

During 2011, NovaGold incorporated the Trilogy Metals entities and transferred its Ambler land holdings, including the Arctic Project from Alaska Gold Company to Trilogy Metals Inc. In April 2012, NovaGold completed a spin-out of Trilogy Metals, with the Ambler lands, to the NovaGold shareholders and made Trilogy Metals an independent publically listed company, listed on the TSX and NYSE-MKT exchanges.

4.3.2 NANA AGREEMENT

In 1971, the US Congress passed the Alaska Native Claims Settlement Act (ANCSA) which settled land and financial claims made by the Alaska Natives and provided for the establishment of 13 regional corporations to administer those claims. These 13 corporations are known as the Alaska Native Regional Corporations (ANCSA Corporations). One of these 13 regional corporations is the Northwest Alaska Native Association (NANA) Regional Corporation, Inc. ANCSA Lands controlled by NANA bound the southern border of the Property claim block. National Park lands are within 25 km of the northern property border. The Bornite Deposit is located entirely on lands owned by NANA.

On October 19, 2011, Trilogy Metals and NANA Regional Corporation, Inc. entered into the "NANA Agreement" for the cooperative development of their respective resource interests in the Ambler mining district. The NANA Agreement consolidates Trilogy Metals' and NANA's land holdings into an approximately 142,831 ha land package and provides a framework for the exploration and development of the area. The NANA Agreement provides that NANA will grant Trilogy Metals the nonexclusive right to enter on, and the exclusive right to explore, the Bornite Lands and the ANCSA Lands (each as defined in the NANA Agreement) and in connection therewith, to construct and utilize temporary access roads, camps, airstrips and other incidental works. The NANA Agreement has a term of 20 years, with an option in favour of Trilogy Metals to extend the term for an additional 10 years. The NANA Agreement may be terminated by mutual agreement of the parties or by NANA if Trilogy Metals does not meet certain expenditure requirements on NANA's lands.

If, following receipt of a feasibility study and the release for public comment of a related draft environmental impact statement, Trilogy Metals decides to proceed with construction of a mine on the lands subject to the NANA Agreement, Trilogy Metals will notify NANA in writing and NANA will have 120 days to elect to either (a) exercise a non-transferrable back-in-right to acquire between 16% and 25% (as specified by NANA) of that specific project; or (b) not exercise its back-in-right, and instead receive a net proceeds royalty equal to 15% of the net proceeds realized by Trilogy Metals from such project. The cost to exercise such back-in-right is equal to the percentage interest in the Project multiplied by the difference between (i) all costs incurred by Trilogy Metals or its affiliates on the project, including historical costs incurred prior to the date of the NANA Agreement together with interest on the historical costs; and (ii) $40 million (subject to exceptions). This amount will be payable by NANA to Trilogy Metals in cash at the time the parties enter into a joint venture agreement and in no event will the amount be less than zero.

In the event that NANA elects to exercise its back-in-right, the parties will, as soon as reasonably practicable, form a joint venture with NANA electing to participate between 16% to 25%, and Trilogy Metals owning the balance of the interest in the joint venture. Upon formation of the joint venture, the joint venture will assume all of the obligations of Trilogy Metals and be entitled to all the benefits of Trilogy Metals under the NANA Agreement in connection with the mine to be developed and the related lands. A party's failure to pay its proportionate share of costs in connection with the joint venture will result in dilution of its interest. Each party will have a right of first refusal over any proposed transfer of the other party's interest in the joint venture other than to an affiliate or for the purposes of granting security. A transfer by either party of a net smelter royalty return on the project or any net proceeds royalty interest in a project other than for financing purposes will also be subject to a first right of refusal.

In connection with possible development on the Bornite Lands or ANCSA Lands, Trilogy Metals and NANA will execute a mining lease to allow Trilogy Metals or the joint venture to construct and operate a mine on the Bornite Lands or ANCSA Lands (the "Mining Lease"). These leases will provide NANA a 2% net smelter royalty as to production from the Bornite Lands and a 2.5% net smelter royalty as to production from the ANCSA Lands.

If Trilogy Metals decides to proceed with construction of a mine on its own lands subject to the NANA Agreement, NANA will enter into a surface use agreement with Trilogy Metals which will afford Trilogy Metals access to the project along routes approved by NANA (the "Surface Use Agreement"). In consideration for the grant of such surface use rights, Trilogy Metals will grant NANA a 1% net smelter royalty on production and an annual payment of $755 per acre (as adjusted for inflation each year beginning with the second anniversary of the effective date of the NANA Agreement and for each of the first

400 acres (and $100 for each additional acre) of the lands owned by NANA and used for access which are disturbed and not reclaimed.

4.4 ENVIRONMENTAL LIABILITIES

Under the NANA Agreement, NANA is required to complete a baseline environmental report following the cleanup of the former mining camp on the Bornite Lands; this work must be completed to Alaska Department of Environmental Conservation standards. Cleanup includes the removal and disposal, as required by law, of all hazardous substances present on the Bornite Lands. NANA has indemnified and will hold Trilogy Metals harmless for any loss, cost, expense, or damage suffered or incurred attributable to the environmental condition of the Bornite Lands at the date of the baseline report which relate to any activities prior to the date of the agreement.

In addition, there are no indications of any known environmental impairment or enforcement actions associated with NovaGold's activities to date. As a result, NovaGold, now Trilogy Metals has not incurred outstanding environmental liabilities in conjunction with its entry into the NANA Agreement.

4.5 PERMITS

Multiple permits are required during the exploration phase of the Property. Permits are issued from Federal, State, and Regional agencies, including: the Environmental Protection Agency (EPA), the US Army Corps of Engineers (USACE), the Alaska Department of Environmental Conservation (ADEC), the Alaska Department of Fish and Game (ADF&G), the Alaska Department of Natural Resources (ADNR), and the NWAB. The State of Alaska permit for exploration on the Property, the Annual Hardrock Exploration Activity (AHEA) Permit, is obtained and renewed every five years through the ADNR – Division of Mining, Land and Water. Trilogy Metals holds an AHEA exploration permit in good standing with the Alaska DNR, and has done so each year since 2004 under Alaska Gold Company, a wholly owned subsidiary of NovaGold and now Trilogy Metals. The Property is within the NWAB thus requiring a Title 9 Miscellaneous Land Use permit for mineral exploration, fuel storage, gravel extraction, and the operation of a landfill. NovaGold held these permits in good standing during the 2004 to 2008 seasons and renewed the permits for the 2010 exploration season to 2015. The permit was renewed again in 2016 for 2016 thru 2020. The Bornite Camp, Bornite Landfill, Dahl Creek Camp, and the to-be-constructed Arctic Camp are permitted by the ADEC.

A number of statutory reports and payments are required to maintain the claims in good standing on an annual basis. As the Bornite Project progresses, additional permits for environmental baseline and detailed engineering studies will be necessary at federal, state, and local levels. A detailed outline of permitting requirements is discussed in Section 20.0.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 ACCESSIBILITY

5.1.1 AIR

Primary access to the Property is by air, using both fixed wing aircraft and helicopters.

There are four well maintained, approximately 1,500 m-long gravel airstrips located near the Property, capable of accommodating charter fixed wing aircraft. These airstrips are located 40 km west at Ambler, 23 km southwest at Shungnak, 19 km south at Kobuk, and 15 km south at Dahl Creek. There is daily commercial air service from Kotzebue to the village of Kobuk, the closest community to the Property. During the summer months, the Dahl Creek Camp airstrip is suitable for larger aircraft, such as C-130 and DC-6.

In addition to the four 1,500 m airstrips, there is a 700 m airstrip located at the Bornite Camp. The airstrip at Bornite is suited to smaller aircraft, which support the Bornite Camp with personnel and supplies.

5.1.2 WATER

There is no direct water access to the Property. During spring runoff, river access is possible by barge from Kotzebue Sound to Ambler, Shungnak, and Kobuk via the Kobuk River.

5.1.3 ROAD

A two-lane, two-wheel drive gravel road links the Bornite Project's main camp to the 1525 m Dahl Creek airstrip and village of Kobuk.

5.2 CLIMATE

The climate in the region is typical of a sub-arctic environment. Exploration is generally conducted from late May until late September. Weather conditions on the Property can vary significantly from year to year and can change suddenly. During the summer exploration season, average maximum temperatures range from 10°C to 20°C, while average lows range from -2°C to 7°C (Alaska Climate Summaries: Kobuk 1971 to 2000). By early October, unpredictable weather limits safe helicopter travel to the Property. During winter months, the Property can be accessed by snow machine, track vehicle, or fixed wing aircraft. Winter temperatures are routinely below -25°C and can exceed -50°C. Annual precipitation in the region averages at 395 mm with the most rainfall occurring from June through September, and the most snowfall occurring from November through January.

5.3 LOCAL RESOURCES

The Property is approximately 248 km east of the town of Kotzebue, on the edge of Kotzebue Sound, 19 km north of the village of Kobuk, 275 km west of the Dalton Highway, and 485 km northwest of Fairbanks. Kobuk (population 151; 2010 US Census) is a potential workforce source for the Bornite Project, and is the location of one of the airstrips near the Property. Several other villages are also near the Property, including Shungnak located 23 km to the southwest with a population of 262 (2010 US Census) and Ambler, 40 km to the west with a population of 258 (2010 US Census). Kotzebue has a population of 3,201 (2010 US Census) and is the largest population centre in the Northwest Arctic Borough. Kotzebue is a potential source of limited mining-related supplies and labourers, and is the nearest centre serviced by regularly scheduled, large commercial aircraft (via Nome or Anchorage). In addition, there are seven other villages in the region that will be a potential source of some of the workforce for the Property. Fairbanks (population 31,036; 2010 US Census) has a long mining history and can provide most mining-related supplies and support that cannot be sourced closer to the Property.

Drilling and mapping programs are seasonal and have been supported out of the Main Bornite Camp and Dahl Creek Camp. The main Bornite Camp facilities are located on Ruby Creek on the northern edge of the Cosmos Hills. The camp provides office space and accommodations for the geologists, drillers, pilots, and support staff. There are four 2-person cabins installed by NANA prior to Trilogy Metals' tenure.

In 2011, the main Bornite Camp was expanded to 20 sleeping tents, 3 administrative tents, 2 shower/bathroom tents, 1 medical tent, and 1 dining/cooking tent. With these additions, the camp capacity was increased to 49 beds. A 30 m by 9 m core logging facility was also built in summer of 2011. An incinerator was installed near the Bornite airstrip to manage waste created by the Bornite Project. Power for the Bornite Project is supplied by a 175 kW Caterpillar diesel generator. Water is provided by a permitted artesian well located 250 m from the Bornite Camp.

In 2012, the camp was further expanded with the addition of a laundry tent, a women's shower/washroom tent, a recreation tent, several additional sleeping tents, and a 2 x enlargement of the kitchen tent. Camp capacity increased to 76 beds. The septic field was upgraded to accommodate the increase in camp population. One of the two-person cabins was winterized for use by the winter caretaker. A permitted landfill was established to allow for the continued cleanup and rehabilitation of the historic shop facilities and surroundings.

The Dahl Creek camp is a leased facility used as an overflow or alternative facility to the main Bornite Camp. The Dahl Creek camp has a main cabin for dining and administrative duties, and a shower facility. Sleeping facilities include two hard-sided sleeping cabins with seven beds (primarily used for staff), one 4-person sleeping tent, and three 2-person sleeping tents for a total of 17 beds. There are support structures, including a shop and storage facilities.

5.4 INFRASTRUCTURE

Proposed infrastructure is discussed in more detail in Section 18.0. Currently, the Bornite Project does not have access to Alaska power and transportation infrastructure.

Beginning in 2009, the Property has been the focus of an access corridor study. The State of Alaska has spent approximately $10 million to identify proposed access routes to the Ambler mining district, and to initiate environmental baseline studies. The working group for this study consists of the Alaska Department of Transportation (ADOT), the ADNR, the Governor's Office, the Alaska Industrial Development and Export Authority (AIDEA), NANA, and Trilogy Metals.

Based on this work the Brooks East route has been selected as the preferred alternative. It is a 322 km road running east from the Property to the Dalton Highway and is now referred to as the Ambler Mining District Industrial Access Project or AMDIAP.

In 2015 AIDEA completed a draft Environmental Impact Statement (EIS) as prescribed under the National Environmental Policy Act process to obtain permits for AMDIAP. On October 21, 2015 the Governor of the State of Alaska authorized AIDEA to begin the EIS process and shortly thereafter, the Consolidated Right of Way application document in respect of AMDIAP was completed and submitted. The application has been reviewed for completeness and a lead federal agency will be identified.

The State and Federal agencies have provided AIDEA with their collective comments on their completeness review and AIDEA is currently formulating a plan to address the comments. Once finalized, the Federal agencies will issue a Notice of Intent (NOI) to formally begin the EIS process under the National Environmental Policy Act (NEPA). The first step will be project scoping which is expected to begin later in 2016.

5.5 PHYSIOGRAPHY

The Bornite Project is located on Ruby Creek on the northern edge of the Cosmos Hills. The Cosmos Hills are part of the southern flank of the Brooks Range in Northwest Alaska. Topography in the area is moderately rugged. Maximum relief in the Cosmos Hills is approximately 1,000 masl with an average of 600 masl. Talus covers the upper portions of the hills; glacial and fluvial sediments occupy valleys.

The Kobuk Valley is located at the transition between boreal forest and Arctic tundra. Spruce, birch, and poplar are found in portions of the valley, with a ground cover of lichens (reindeer moss). Willow and alder thickets and isolated cottonwoods follow drainages, and alpine tundra is found at higher elevations. Tussock tundra and low, heath-type vegetation covers most of the valley floor. Patches of permafrost exist on the Property.

Permafrost is a layer of soil at variable depths beneath the surface where the temperature has been below freezing continuously from a few to several thousands of years (Climate of Alaska 2007). Permafrost exists where summer heating fails to penetrate to the base of the layer of frozen ground and occurs in most of the northern third of Alaska as well as in discontinuous or isolated patches in the central portion of the state.

Wildlife in the Property area is typical of Arctic and Subarctic fauna (Kobuk Valley National Park 2007). Larger animals include caribou, moose, Dall sheep, bears (grizzly and black), wolves, wolverines, coyotes, and foxes. Fish species include salmon, sheefish, arctic char, and arctic grayling. The Kobuk River, which briefly enters the UKMP on its southwest corner, is a significant salmon spawning river. The Caribou on the Property belong to the Western Arctic herd that migrates twice a year – south in August, from their summer range north of the Brooks Range, and north in March from their winter range along the Buckland River.

5.6 SUFFICIENCY OF SURFACE RIGHTS

The Company has sufficient surface rights for its planned mining operations including sufficient land to construct various facilities such as tailings storage areas, potential waste disposal areas, potential stockpile areas and potential processing plants.

6.0 HISTORY

Regional exploration began in the early 1900s when gold prospectors noted copper occurrences in the hills north of Kobuk, Alaska. In 1947, local prospector Rhinehart "Rhiny" Berg along with various partners traversing in the area located outcropping mineralization along Ruby Creek (Bornite) on the north side of the Cosmos Hills. They subsequently staked claims over the Ruby Creek showings and constructed an airstrip for access. In 1957, BCMC, Kennecott's exploration subsidiary, optioned the property from Berg.

Exploration drilling in 1961 and 1962 culminated in the discovery of the "No.1 Ore Body" where drill hole RC-34 cut 20 m of 24% copper (the "No.1 Ore Body" is a historic term used by BCMC that does not connote economic viability in the present context; it is convenient to continue to use the term to describe exploration work and historic resource estimation in a specific area of what is now generally known as Ruby Creek Upper Reef). The discovery of the "No.1 Ore Body" led to the development of an exploration shaft in 1966. The shaft, which reached a depth of 328 m, encountered a significant watercourse and was flooded near completion depth. The shaft was subsequently dewatered and an exploration drift was developed to provide access for sampling and mapping, and to accommodate underground drilling to further delineate mineralization. A total of 59 underground holes were drilled and, after the program, the shaft was allowed to re-flood.

The discovery of the Arctic Project in 1965 prompted a hiatus in exploration at Bornite, and only limited drilling occurred up until 1976.

6.1 GEOCHEMISTRY

In the late 1990s, Kennecott resumed its evaluation of the Bornite deposit and the mineralization in the Cosmos Hills with an intensive soil, stream, and rock chip geochemical sampling program using 32 element ICP analyses. Grid soil sampling yielded 765 samples. Ridge and spur sampling resulted in an additional 850 soil samples in the following year. Skeletonized core samples (85 samples) from key historic drill holes were also analyzed using 32 element ICP analytical methods. Geochemical sampling identified multiple areas of elevated copper and zinc in the Bornite region (Kennecott Annual Ambler Project Reports, 1995-1997).

6.2 GEOPHYSICS

Kennecott completed numerous geophysical surveys as an integral part of exploration throughout their tenure on the property. Various reports, notes, figures, and data files stored in Kennecott's Salt Lake City exploration office indicated that geophysical work included, but was not limited to, the following:

- Airborne magnetic and electromagnetic (EM) surveys (fixed-wing INPUT) (1950s)
- Gravity, single point (SP), Audio-Frequency Magneto-Telluric (AMT), EM, borehole and surface IP/resistivity surveys (1960s)
- Gravity, airborne magnetic, and Controlled Source Audio-frequency Magneto-Telluric (CSAMT) surveys (1990s)

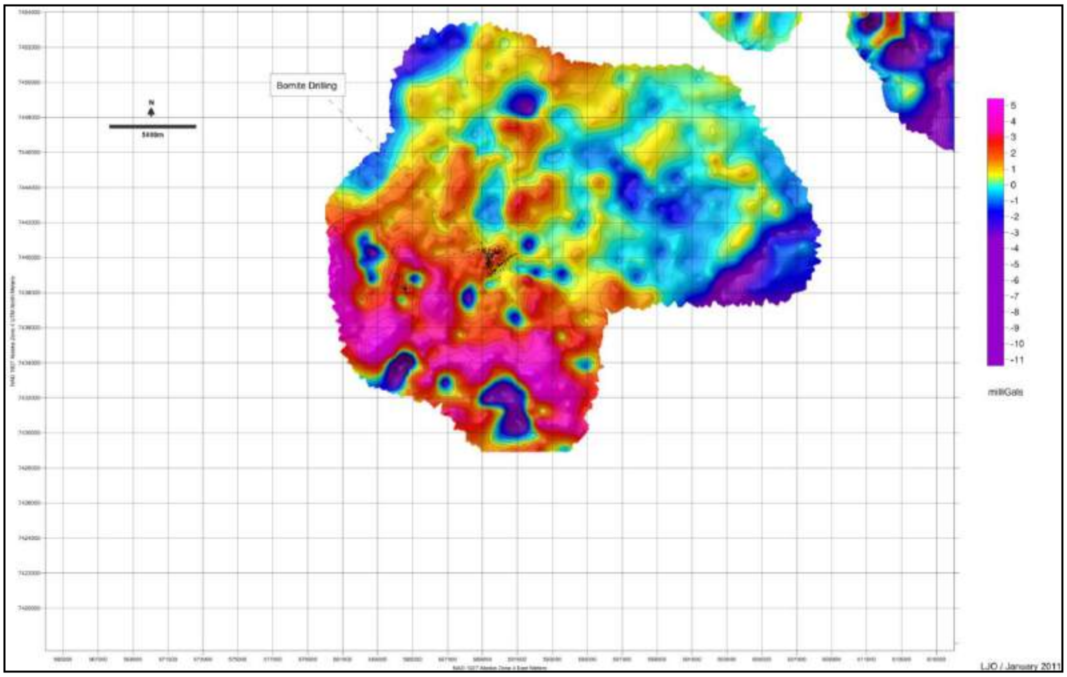
Trilogy Metals has little information or documentation associated with these geophysical surveys conducted prior to the 1990s. Where data are available in these earlier surveys, the lack of details in data acquisition, coordinate systems, and data reduction procedures limit their usefulness. The only complete geophysical report available concerns down-hole IP/resistivity results (Merkel, 1967).

Most notable is the 1996 Bouger gravity survey from the Bornite deposit into the Ambler lowlands. Figure 6-1 shows the terrain-corrected Bouger residual gravity survey anomalies. The Bornite deposit itself is seen as a significant 3 milligal anomaly. Numerous 2 milligal to > 6 milligal anomalies occur under cover in the Ambler lowlands and near the Aurora Mountain and Pardner Hill occurrences.

The wide range of geophysical techniques used in and around the deposit over a span of 40 years indicates the level of difficulty experienced by Kennecott/BCMC while trying to detect mineralization. When applying EM and IP/resistivity methods, the problem appears to be that deeper mineralization is often masked by the response of near-surface conductive rocks.

In addition to the geophysical surveys conducted by Kennecott, the Alaska Department of Natural Resources and Geometries completed an aeromagnetic survey of portions of the Ambler mining district in 1974-1975. Part of this survey is reproduced in Figure 9-3 (Gilbert et al., 1977).

Figure 6-1: 1996 Kennecott Residual Gravity (NovaGold, 2011)



6.3 DRILLING AND UNDERGROUND WORKINGS

Between 1957 and 1976, Kennecott (BCMC) completed 178 holes (including 51 underground holes) totaling 47,801 m. In 1997, Kennecott drilled an additional 3 core holes totaling 928 m.

Drilling for all BCMC/Kennecott campaigns in the Bornite Deposit area (1957 to 1997) totals 181 core holes for a combined 48,729 m. A complete and comprehensive discussion of all the drilling undertaken at the Bornite Deposit is contained in Section 10.0 of this report.

In October 1965, Kennecott began a shaft to further investigate the Ruby Creek Upper Reef “No.1 Ore Body” mineralization. In 1966, the shaft reached the 297 m (975 ft) level. At this level, a 91 m crosscut was driven due north to the mineralized zone. The shaft was continued to 328 m (1,075 ft) deep to prepare a sump and loading pocket. On October 27, 1966, a small blast to excavate a bay at the bottom of the shaft opened a watercourse. The in-flood of water quickly exceeded the pump capacity and within 12 hours the 328 m shaft was flooded to within 13 m from the surface (Hawke, 1966).

Prior to the shaft flooding, six diamond drill holes were completed from the 700 level shaft station and 22 drill holes from the 975 shaft station and crosscut. In 1967, the shaft bottom was partially sealed and then pumped out, and an additional 24 holes were drilled from the 700 level and the 975 level shaft stations. Figure 6-2 and Figure 6-3 show underground diamond drilling from the 700 and 975 levels.

Figure 6-2: Diamond Drilling from the 700 Level of the No. 1 Shaft (Trilogy Metals, 2017)

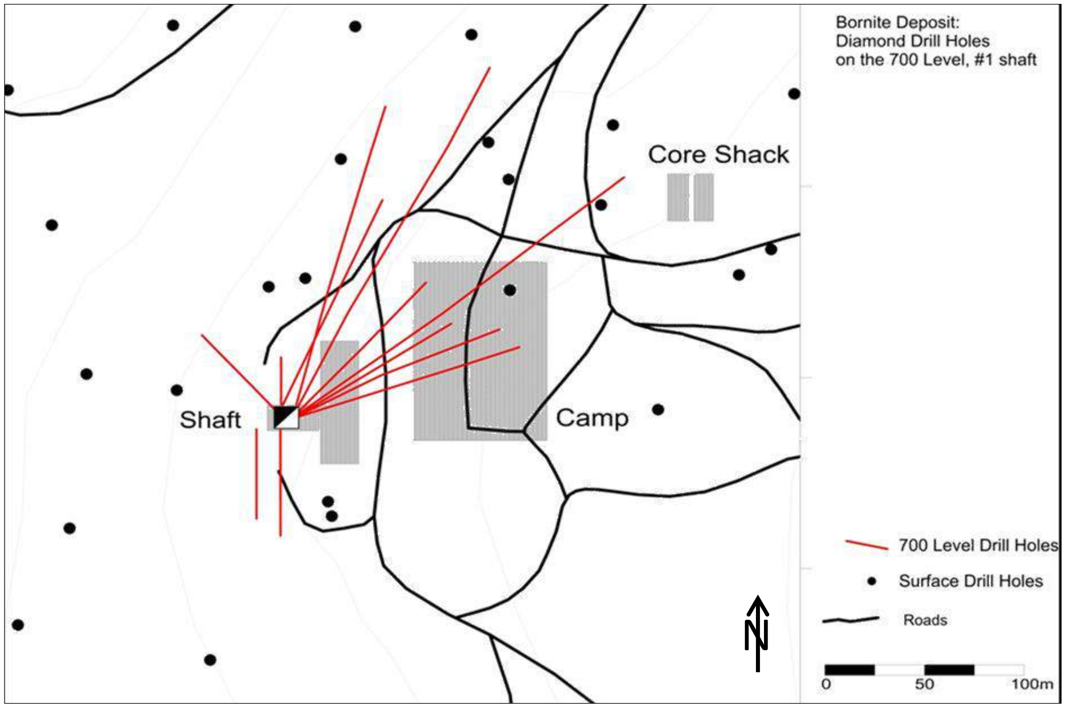
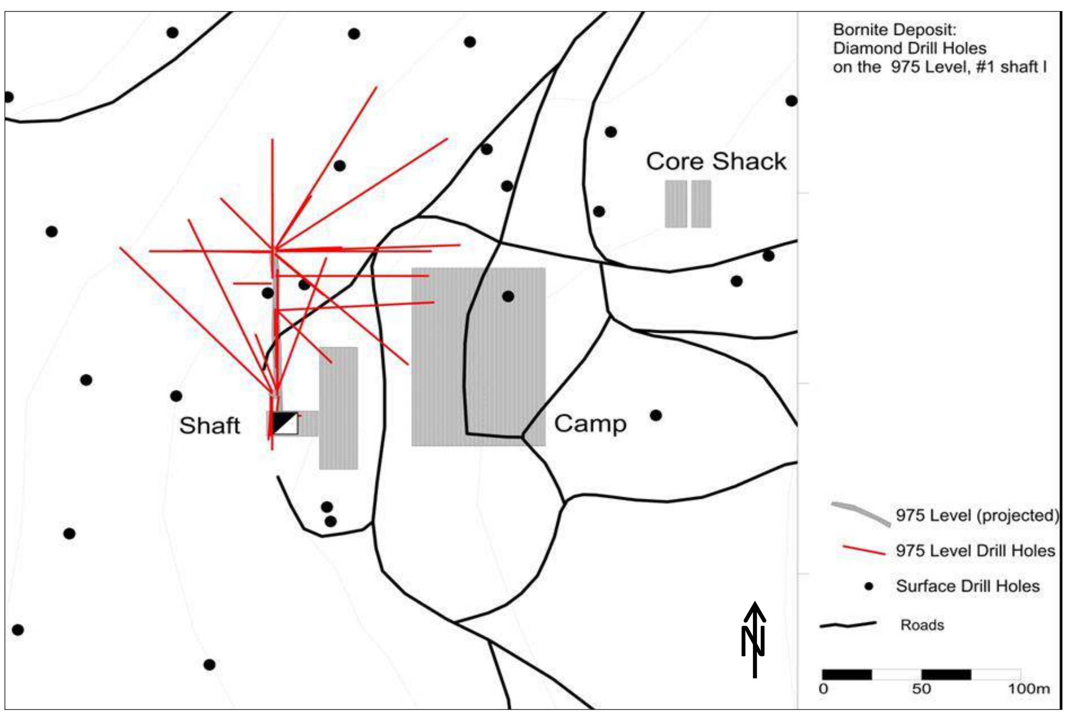


Figure 6-3: Diamond Drilling from the 975 Level of the No. 1 Shaft (Trilogy Metals, 2017)



6.4 Petrology, Mineralogy, and Research Studies

Several studies have been undertaken reviewing the geology and geochemistry of the Bornite deposit. Most notable is Murray Hitzman's PhD dissertation at Stanford University (Hitzman, 1983) and Don Runnel's PhD dissertation at Harvard University (Runnels, 1963). Bernstein and Cox reported on mineralization of the "No. 1 Ore Body" in a 1986 paper in Economic Geology (Bernstein et al, 1986).

In addition to the historical work, Ty Connor at the Colorado School of Mines recently completed a Master's thesis which reported on the timing of alteration and mineralization at the Bornite deposit (Conner, 2015).

6.5 Geotechnical and Hydrological Studies

Kennecott conducted two technical reviews of the groundwater conditions (Vance, 1962) and a summary of the findings related to the flooding of the exploration shaft (Erskine, 1970).

6.6 Metallurgical Studies

In 1961, Kennecott collected 32 coarse reject samples from five drill holes to support preliminary metallurgical test work at Bornite. Samples targeted high-grade (> 10%) copper mineralization from the Upper Reef at Ruby Creek (Lutz, 1961). An extensive discussion of the historic and current metallurgical studies is presented in Section 13.0 of this report.

6.7 Historical Mineral Resource Estimates

All of the historical mineral resource estimates presented below were made prior to the implementation of NI 43-101. They do not conform to NI 43-101 reporting standards and should not be relied upon or interpreted as such. A QP has not done sufficient work to classify the historical estimates as current mineral resources and Trilogy Metals is not treating the historical estimates as current mineral resources. They are presented here for information purposes only and should not be relied upon.

Lund (1961)

The earliest and most widely repeated resource number reported 91 million tons at 1.2% Cu in an unconstrained polygonal resource estimate. At a constrained 1% Cu cut-off grade, 21.2 million tons of 3.04% Cu and at a 2.5% Cu cut-off, 5.2 million tons of 5.83% Cu were reported. The estimation is based on an 11.0 ft^3/ton tonnage factor for the Lower Reef or lower grade mineralization and a 10.0 ft^3/ton tonnage factor for the higher grade Upper Reef mineralization. It is not known if the tonnage factors were based on any direct specific gravity measurements of the Bornite drill core. Metals such as silver and cobalt were not considered in any of the historical estimations.

C.T. Penney (1968)

This estimate is restricted to the "No.1 Ore Body" in the Ruby Creek Upper Reef. The reported resource is 180,000 - 200,000 tons at 8.4% Cu.

Reed (1971)

This estimate is (apparently) tabulated using an unknown grade times thickness (copper x thickness) cut-off criterion. It includes both Ruby Creek Upper Reef and Lower Reef mineralization with a reported total of 35.7 M tons at 2.15% Cu.

Sichermann (1974)

This estimate utilized a polygonal methodology and is not considered entirely accurate as down-hole surveys were not available for all drill holes and mineralization lenses were observed to be erratic. A 10.5 ft^3/ton tonnage factor for >1% Cu mineralization and an 8.0 ft^3/ton tonnage factor for >4% Cu mineralization was applied. Two different resource estimates are reported: 5 million tons (4.56 million tonnes) at 4% Cu and 40 million tons (36.2 million tonnes) at 2% Cu, respectively, without reporting cut-off grades.

Kennecott (1997)

In 1997, Macfarlane conducted a more rigorous resource estimation of the Ruby Creek (Bornite) deposit. This estimation used Vulcan™ 3D modeling and resource estimation software. A series of grade shells at 0.2%, 0.5% and 1.0% copper were manually constructed on sections and imported into Vulcan. Within each shell, separate resource calculations at 0.5%, 1.0%, 2%, and 4.0% copper cut-off grades were made. The grade shells were constructed irrespective of various lithology or mineralization styles. Attempts to create meaningful semi-variograms for copper mineralization were reportedly unsuccessful. An inverse distance squared weighting methodology was used to estimate the resource. Results are shown in Table 6-1.

Table 6-1: Bornite (Ruby Creek) Historical Resource (Kennecott, 1997)

Cut-off	0.2% Grade shell		0.5% Grade shell		1% Grade shell	
(% Cu)	Tonnage (M tonnes)	Grade (Cu %)	Tonnage (M tonnes)	Grade (Cu %)	Tonnage (M tonnes)	Grade (Cu %)
0.5	71.6	1.24	40.5	1.41	17.1	2.02
1.0	27.0	2.09	22.3	1.92	14.2	2.26
2.0	6.6	4.48	4.7	4.02	4.0	4.39
4.0	2.2	8.06	1.5	7.15	1.1	9.54

In an absence of actual measured densities, an approximation of the specific gravity, based on the relationship of copper grade to specific gravity, was used by Kennecott. No support for this approach was presented. Macfarlane noted, using the method, tonnages for massive pyrite areas with low grade copper were significantly underestimated.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 REGIONAL GEOLOGY

The Bornite Project is located within the Arctic Alaska Terrane, a sequence of mostly Paleozoic continental margin rocks that make up the Brooks Range and North Slope of Alaska (Moore, 1992). It is within the Phyllite Belt geologic subdivision, which together with the higher-grade Schist Belt, stretches almost the entire length of the Brooks Range and is considered to represent the hinterland of the Jurassic Brooks Range orogeny. The southern margin of the Phyllite Belt is marked by mélange and low angle faults associated with the Kobuk River fault zone, while the northern boundary is thought to be gradational with the higher-grade metamorphic rocks of the Schist Belt (Till et al., 2008).

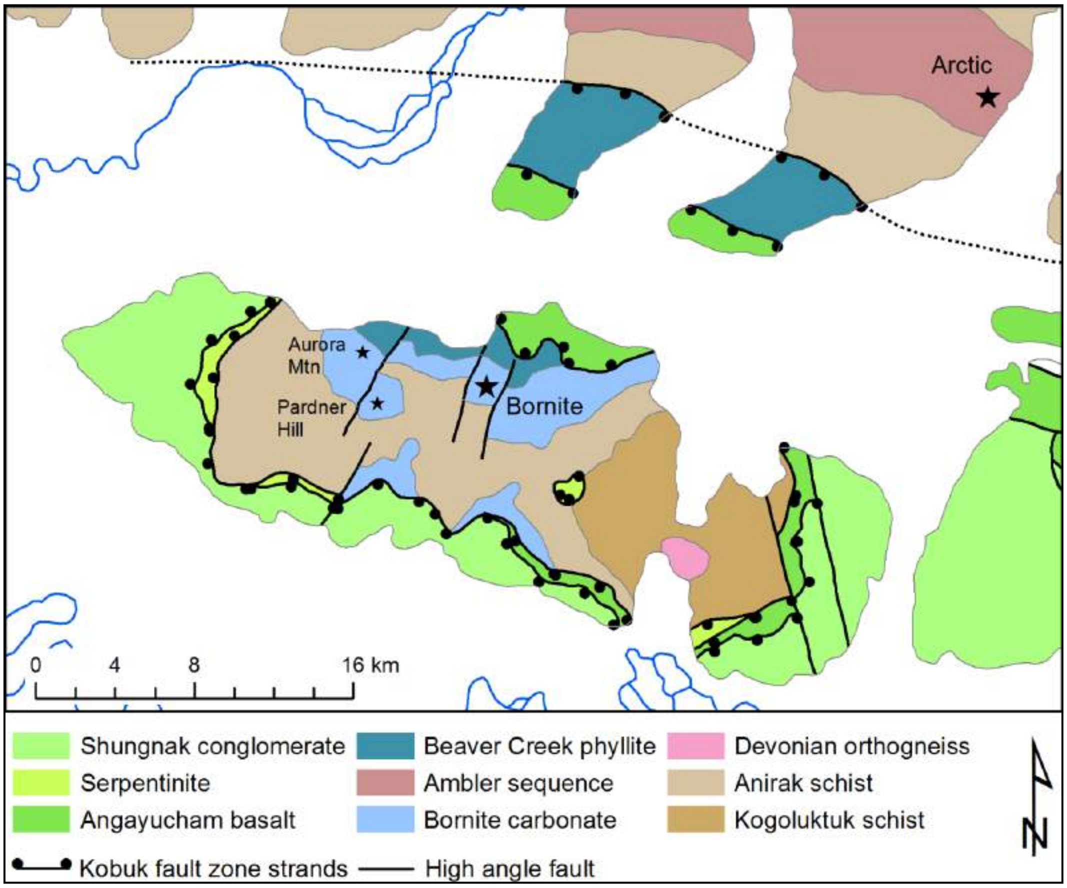
7.2 TECTONIC AND METAMORPHIC HISTORY

The tectonic setting of the project area during mineralization (early Devonian) has been masked by subsequent deformation and remains poorly understood. Dillon et al. (1980) interpret the existence of Devonian granites throughout the Brooks Range as supporting a volcanic arc environment, while Hitzman et al. (1986) point to bimodal volcanic rocks and abrupt sedimentary facies transitions as supporting an extensional tectonic setting. Based on igneous geochemistry, Ratterman et al. (2006) suggest that the Ambler sequence volcanic rocks were emplaced in an extensional back-arc spreading environment; however, the original pre-deformation spatial relationship between the Bornite Project area and the Ambler sequence is still poorly understood.

The project area underwent regional deformation and metamorphism during the Middle Jurassic to Early Cretaceous Brooks Range orogeny. The collision of the Koyukuk Arc Terrane from present-day south caused north-directed imbrication and partial subduction of the Arctic Alaska passive margin sedimentary sequence. Rocks in the Schist Belt were metamorphosed to blueschist facies but were partially exhumed by north-directed faulting prior to full thermal equilibration. Both the Schist Belt and the Phyllite Belt cooled from greenschist conditions during a period of rapid extension and erosion beginning around 103 Ma (Moore et al., 1994, Vogl et al., 2003).

In the project area, a strand of the Kobuk fault zone separates the Cosmos Hills stratigraphy (Schist Belt and Phyllite Belt) from the overlying Angayucham Terrane, and another strand may separate Cosmos Hills from the Ambler sequence to the north (Figure 7-1).

Figure 7-1: Generalized Geologic Map of the Cosmos Hills (Modified from Till et al., 2008)



7.2.1 REGIONAL STRATIGRAPHY

The autochthonous stratigraphy of the district is characterized by lower greenschist to epidote-amphibolite facies, pelitic, carbonate, and local metavolcanic rocks as shown in Figure 7-1 and summarized in Table 7-1.

Table 7-1: Stratigraphic Units of the Cosmos Hills Area (modified from Hitzman et al., 1986)

Unit (age)	Lithology	Metamorphic grade	Approximate thickness
Shungnak conglomerate (Cretaceous)	Pebble conglomerate, sandstone, siltstone, minor intermediate volcanics	Unmetamorphosed	1000m
Angayucham terrane (Devonian-Mississippian) (allochthonous)	Pillow basalt, pillow breccia	Prehnite-Pumpellyite	>500m
Beaver Creek phyllite (Devonian*)	Phyllite, quartzite, marble	Lower Greenschist	>2000m
Ambler sequence (Devonian*)	Metarhyolite, metabasite, tuffaceous metasediments, calcareous metasediments, pelitic schist	Blueschist to Greenschist	700-1850m
Bornite carbonate sequence (Lower Devonian to Upper Silurian*)	Marble, argillaceous marble, dolostone, phyllite, phyllitic marble	Lower Greenschist	200-1000m
Anirak schist (Devonian*)	Pelitic schist, quartzite, marble, minor metabasite	Greenschist	3000m
Kogoluktuk schist (Precambrian to Devonian*)	Pelitic schist, quartzite, metagabbro, minor marble	Epidote-Amphibolite	4000m

*Ages from Till et al., 2008

7.2.2 Igneous Rocks

The intersection of the Cosmos Arch and the Kogoluktuk River drainage 14 km southeast of Bornite exposes a cataclastic orthogneiss of granitic composition which intrudes the Kogoluktuk Schist. Zircons return a syn-mineral uranium-lead age of 386 ± 3 Ma (Till et al., 2008, citing W.C. McClelland).

Higher in the section, the Kogoluktuk Schist is also intruded by sill-form metagabbro bodies of unknown age. Other metamafic ‘greenstones’ are interpreted to have originated as flows and/or tuffaceous sediments (Hitzman, 1986).

Although none occur in the Bornite resource area, discontinuous stratabound greenstone bodies occur in the Anirak Schist and at the base of the Bornite carbonate sequence, particularly west and southwest of Bornite (Hitzman et al., 1982). A gabbroic outcrop approximately 200 m in width outcrops 2 km east of Bornite and is interpreted to be Cretaceous to Tertiary in age.

The most significant igneous rocks in the district are the bimodal volcanic rocks of the Ambler sequence—host of the Ambler VMS district—which outcrop 20 km north of Bornite, but are not observed in the Cosmos Hills (Table 7-1). These include sub-alkaline basaltic flows and sills with an un-depleted mantle geochemical signature. Sub-alkaline rhyolitic to andesitic tuffs and flows have geochemistry consistent with formation from a source that includes melting continental crust. Geochemistry collectively implies origin in an extensional, back-arc basin setting (Ratterman et al., 2006). Uranium-lead zircon dating from Ambler sequence metarhyolites returns ages of 376-387 Ma (McClelland et al., 2006), which are syn- to early post-mineral with respect to the Bornite (Ruby Creek) deposit.

7.2.3 TIMING OF MINERALIZATION IN THE DISTRICT

Sulphide mineralization (chalcopyrite, pyrite, and bornite) from Bornite (Ruby Creek) was dated by Re-Os techniques (Selby et al., 2009), producing an age of 384 ± 4.2 Ma for main stage copper mineralization.

Recent work contained in a Colorado School of Mines thesis (Connor, 2015) suggests a post Juro-Cretaceous age based on two lines of evidence. Albite alteration associated with the mineralizing event cross cuts the pronounced Juro-Cretaceous penetrative fabric at Bornite, and the presence of cymrite, a barium-rich blueschist-stable metamorphic mineral related to the Juro-Cretaceous deformation is common within all the various mineralized assemblages.

The syngenetic VMS deposits in the Ambler sequence are constrained by dating of related felsic volcanic rocks. Early post-mineral metarhyolite at the Arctic deposit yielded a mean uranium-lead zircon age of 378 ± 2Ma. Uranium-lead zircon ages for metarhyolite at the Tom-Tom prospect, 11 km east of Arctic, and the Sun prospect, 60 km east of Arctic, are 381 ± 2 Ma and 386 ± 2 Ma, respectively (McClelland et al., 2006). Since the VMS deposits and Bornite deposit may have a common fluid source, the potential scale of Bornite type mineralization may be much larger than the reefs delineated by current drilling.

7.3 DEPOSIT GEOLOGY

The geology of the Bornite resource area is composed of alternating beds of carbonate rocks (limestone and dolostone) and calcareous phyllite. Limestone transitions laterally into dolostone, which hosts the majority of the mineralization and is considered to be hydrothermal in origin. Spatial relationships and petrographic work establish dolomitization as genetically related to early stages of the copper mineralizing system (Hitzman, 1986).

Trilogy Metals geologists have been unable to identify any meta-igneous rocks in the resource area; all lithologies described are interpreted as meta-sedimentary in origin.

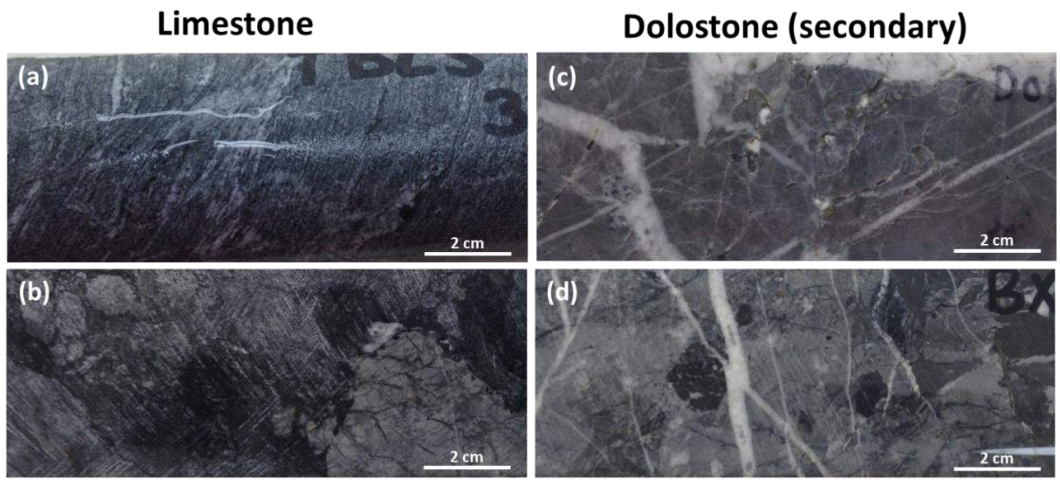
7.3.1 LITHOLOGY UNITS

The current logging system for lithology derives from early BCMC core logs (1960). Original unit descriptions have not been found; however, the units were re-described during re-logging by NovaGold geologists in the summer of 2010. The scheme encompasses not only primary lithology, but also alteration, and compositional and textural variations. Resource-scale geologic interpretation and modeling is based on the hierarchical generalization shown in Table 7-2. Figure 7-2 shows typical dolomitized sedimentary breccias of the Bornite carbonate sequence, which are the principal host of mineralization at Bornite.

Table 7-2: Lithology Units on the Bornite Property

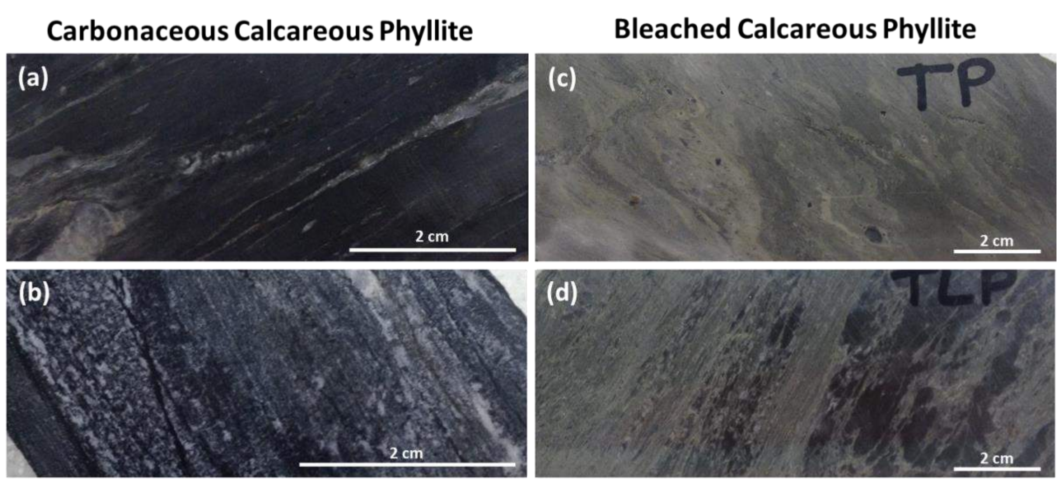
	Lithology	Codes	Description
CARBONATE	Limestone	BXLC, LS, TBLS	Carbonate sedimentary breccia consisting of 10% to 90% polylithic carbonate clasts supported in a calcareous matrix. Clast lithologies include limestone, dolostone, ferroan dolostone, and locally massive pyrite.
	Dolostone (secondary)	BXDC, DOL, ADP	Dolomitized carbonate sedimentary breccia consisting of abundant (±90%), polylithic clasts (0.5 to 50 cm in diameter). Host for mineralization at Bornite.
PHYLLITE	Carbonaceous calcareous phyllite	AP, ALP, APL, ALS, ALCB	Weakly to moderately carbonaceous calcareous phyllite defined by presence of a significant (5 to 95%) shale-rich component in the carbonate section. Phyllites often act as limits or bound mineralization.
	Bleached calcareous phyllite	TS, TLP, TPL, CHPL	Texturally similar to the carbonaceous calcareous phyllite described above and interpreted as altered equivalents. Often characterized by strong sericite component historically misidentified as talc.
ANIRAK SCHIST	Quartz phyllite (Anirak Schist)	QP	Moderately graphitic quartz-rich-phyllite locally moderately calcareous.

Figure 7-2: Typical Limestones and Dolostones of the Bornite Carbonate Sequence (Trilogy Metals, 2017)



(a) Thin Bedded Limestone (TBLS): Limestone textural variant with 1mm scale banding of light and dark grey carbonaceous seams; **(b)** Limestone Clastic Breccia (BXLC): Carbonate sedimentary breccia with carbonate clasts in a calcareous, locally phyllitic matrix; **(c)** Dolostone (DOL): Partially dolomitized carbonate with late dolomite - calcite veining; **(d)** Dolostone Clastic Breccia (BXDC): Polylithic clasts dolostones in a dolostone matrix. Hydrothermal cement of (low Fe) dolomite, pyrite, +/- calcite, chalcopyrite, bornite, sphalerite.

Figure 7-3: Typical Phyllites of the Bornite Carbonate Sequence (Trilogy Metals, 2017)



(a) Argillaceous/Carbonaceous Phyllite (AP): Carbonaceous, weak-mod calcareous phyllite with >75% phyllosilicates. Typically 1-2% pyrite; **(b)** Argillaceous/Carbonaceous Phyllitic Limestone (APL): Carbonaceous limestone (marble) with 5-20% phyllosilicates. Typically 1-2% pyrite; **(c)** Tan Phyllite (TP): Non-carbonaceous, weak-mod calcareous phyllite with > 75% phyllosilicates. Typically contains 1-2% fine-grained pyrite; **(d)** Tan Phyllitic Limestone (TPL): Non-carbonaceous limestone (marble) with 5-20% phyllosilicates. Typically contains 1-2% very fine grained pyrite.

Work by Trilogy Metals in 2015 focused on furthering the understanding of the distribution and nature of the various lithologic units and their context in a sedimentary depositional model. The updated model, based on lithogeochemical signatures of the various units along with their historical visual logging, shows stacked debris flows composed of basal non-argillaceous channelized debris flows breccias with a fining upward sequence of increasingly argillaceous-rich breccias capped by high calcium (Ca) phyllites, confined laterally in channels between either massive or thin-bedded platform carbonates.

Two stacked debris flow sequences are apparent, the Lower and Upper reefs. The Upper reef grades vertically into capping argillaceous limestones instead of discrete high Ca phyllites indicating a shallowing upward or filling of the debris flow channels. Based on this updated interpretation, a series individual debris flow cycles have been modeled and are now the basis for the resource model presented in Section 1.0.

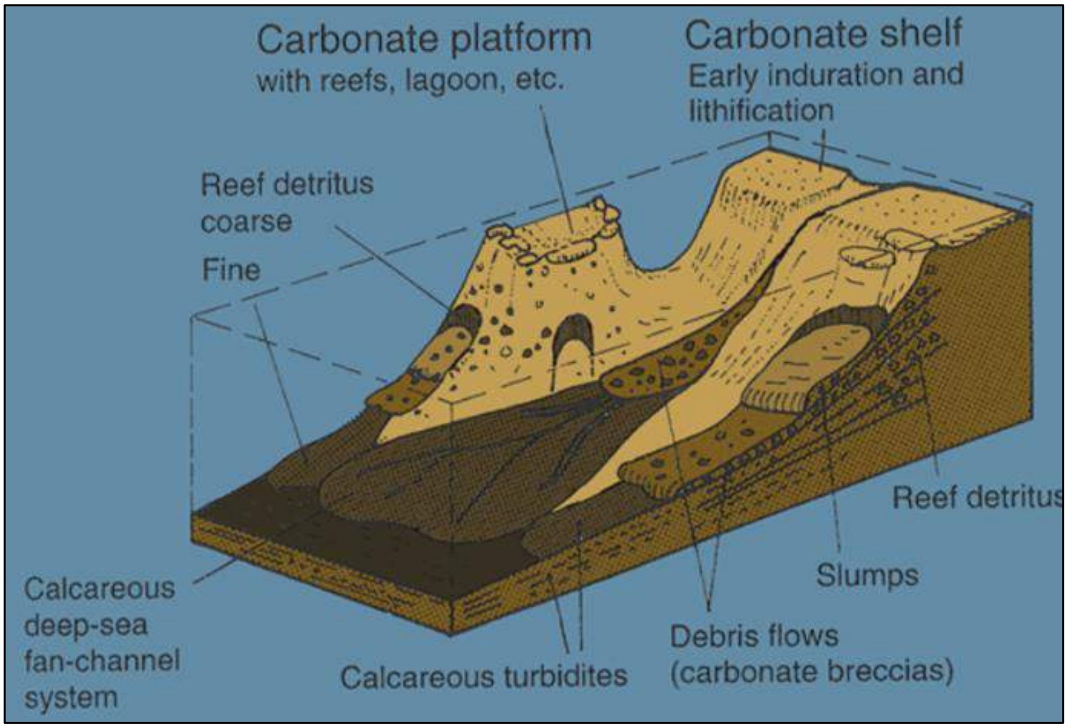
Low calcium (Ca) phyllites, such as the Anirak schist (QP) and the Beaver Creek phyllite respectively underlie and cap the local stratigraphy suggesting different sourcing than the locally derived high Ca phyllites of the debris flow dominated Bornite Carbonate sequence stratigraphy. The Beaver Creek is in structural contact with the Bornite Carbonate Sequence while the contact with the underlying Anirak schist is an unconformity.

In addition to the stacked sedimentary stratigraphy, a crosscutting breccia dubbed the P-Breccia has been identified in and around the recently discovered South Reef mineralization. Though poorly defined by the overall lack of drilling in the area, the body which contains excellent copper grade lies at or near the Iron Mountain discontinuity. It remains unclear whether the P Breccia is a post-depositional structural, hydrothermal or solution-collapse induced breccia.

7.3.2 Lithology Interpretation

Importantly, this new and evolving model does not support the historical Kennecott interpretation of a talus-dominated fore-reef environment for the development of the high energy carbonate breccias. Though somewhat similar in their broad genesis, the debris flows are very extensive lobate sheets extending roughly perpendicular downslope from a carbonate platform. At Bornite, the limits of the debris flows have yet to be determined and at the current limits of drilling are thick and extensive. Conversely, fore-reef talus breccias are often spatially much more limited and form parallel prisms along apparent reef topography. Figure 7-4 shows the typical environment associated with debris flows generated along the margin of carbonate platforms.

Figure 7-4: Schematic Diagram of Debris Flow Environments Along a Carbonate Platform (Einsele, 1998)



7.3.3 STRUCTURE

Structural fabrics observed on the property include bedding and two separate foliations. Bedding (S0) can be measured only rarely where phyllite and carbonate are interbedded and it is unclear to what extent it is transposed. The pervasive foliation (S1) is easily measured in phyllites and may be reflected by colour banding and/or stylolamination (flaggy habit in outcrop) of the carbonates. Core logging shows that S1 is folded gently on the 10 m scale and locally tightly folded at the decimetre scale. S2 axial planar cleavage is locally developed in decimetre scale folds of S1. Both S1 and S2 foliations are considered to be Jurassic in age.

Owing to their greater strength, bodies of secondary dolostone have resisted strain and foliation development, whereas the surrounding limestone and calc-phyllite appear in places to have been attenuated during deformation. This deformation, presumably Jurassic, complicates sedimentological interpretations.

Potentially the earliest and most prominent structural feature in the resource area is the northeast-trending Iron Mountain discontinuity which is still problematic in its interpretation. Numerous holes in the South Reef drill through a thin zone of apparent basal QP stratigraphy into underlying, and in places, mineralized carbonate stratigraphy.

Numerous explanations of the feature have been suggested all of which are somewhat problematic based on logged and spatial observations. Inadequate drilling through the feature into lower stratigraphy and the basal QP has limited its resolution. A series of interpretations have been offered over time and include: 1) a normal growth fault; 2) a thrust fault; 3) a kink fold; and 4) a Quartz Phyllite lens (QP) intercalated within the basal portion of the carbonate sequence.

Numerous observations can be made to support all of these interpretations. Importantly, the recent recognition of the P Breccia at or near the Iron Mountain discontinuity, and its interpretation as a post-depositional structural, hydrothermal or solution-collapse induced breccia suggests a post-lithification origin. Some data would also suggest that the P Breccia is a syn-depositional slump related to Iron Mountain discontinuity and the eastern terminus of the thin QP wedge. Though the spatial distribution of mineralization adjacent to the Iron Mountain feature is unequivocal, an actual direct link between the discontinuity and deposition is as yet undemonstrated.

To the north, the Bornite Carbonate sequence is in low angle fault contact with the Beaver Creek phyllite along the moderately north-dipping Beaver Creek fault. The fault, a thick, brittle structure of potentially regional significance, defines the roughly bedding parallel base of the Beaver Creek phyllite and the Bornite Carbonate sequence in the immediate Bornite area. Both the Beaver Creek fault and the Bornite Carbonate sequence are cut by a series of north-trending high angle structures of apparent small displacement as shown in Figure 7-1 (Hitzman et al., 1982). These mapped structures have not yet been demonstrated in drilling at Bornite.

7.4 MINERAL DEPOSITS

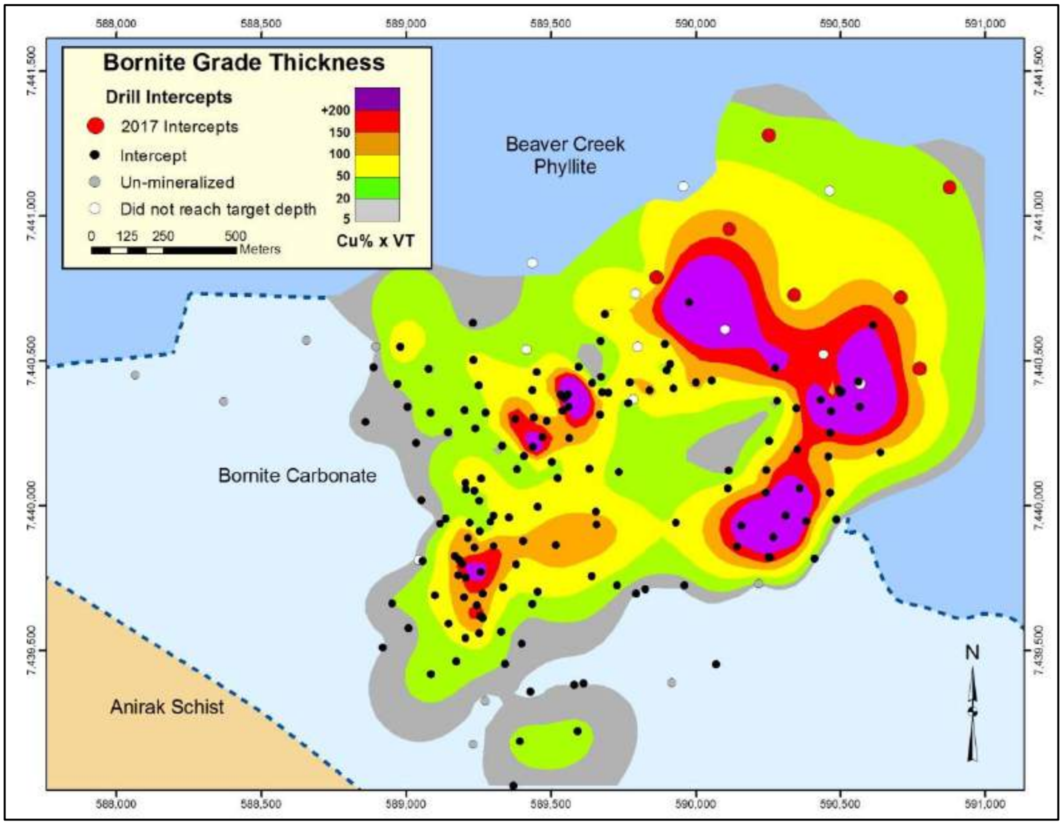
Mineralization at Bornite occurs as tabular mineralized zones that coalesce into crudely stratiform bodies hosted in secondary dolomite. Two significant dolomitic horizons that host mineralization have been mapped by drilling and include: 1) the Lower Reef, a thick 100 to 300 m thick dolomitized zone lying immediately above the basal quartz phyllite (QP) unit of the Anirak Schist; and 2) the Upper Reef, a 100 to 150 m thick dolomite horizon roughly 300 m higher in section.

The Lower Reef dolomite outcrops along the southern margin of the Ruby Creek zone and is spatially extensive throughout the deposit area. It hosts a significant portion of the shallow resources in the Ruby Creek zone as well as higher grade resources down dip and to the northeast in the South Reef. The Upper Reef zone hosts relatively high-grade resources to the north in the Ruby Creek zone. The Upper reef zone appears to lie at an important NE- trending facies transition to the NW of the main drilled area and locally appears to be at least partially thrust over the Lower Reef stratigraphy to the southeast.

Drill results from 2013 show dolomitization and copper mineralization in the Upper and Lower Reefs coalescing into a single horizon along the northern limits of current exploration. The NE- trending Ruby Creek and South Reef zones also coalesce into a roughly 1000 m wide zone of >200 m thick dolomite containing significant copper mineralization dipping north at roughly 5-10 degrees. The 2017 drill results show that the mineralized dolomite horizon continues for at least another 700m down-dip to the northeast.

Figure 7-5 shows the grade thickness (Cu% x thickness in metres) distribution of copper mineralization for the Bornite deposit.

Figure 7-5: Copper Grade Thickness Plan Map for the Bornite Deposit (Trilogy Metals, 2017)



7.4.1 MINERALIZATION

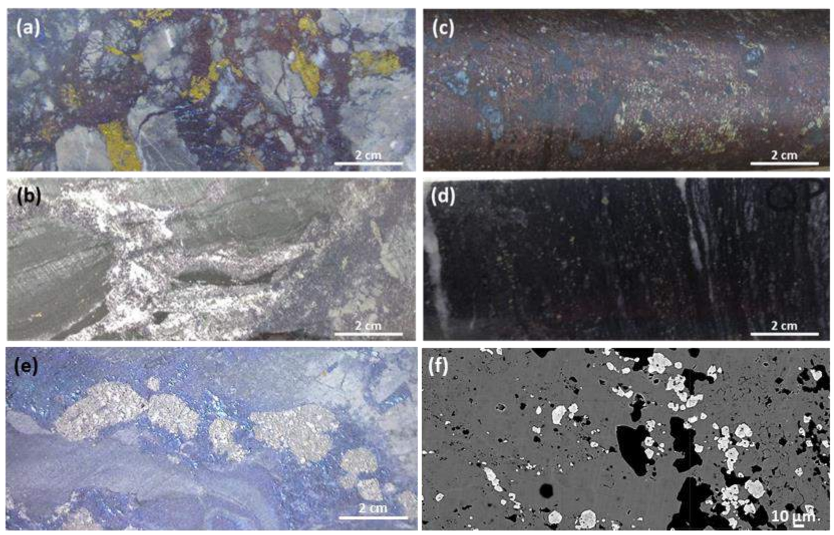
Copper mineralization at Bornite is comprised of chalcopyrite, bornite, and chalcocite distributed in stacked, roughly stratiform zones exploiting favourable stratigraphy within the dolomitized limestone package. Mineralization occurs, in order of increasing grade, as disseminations, irregular and discontinuous stringer-style veining, breccia matrix replacement, and stratiform massive sulphides. Figure 7-6 shows typical mineralization of the Bornite deposit characterized by chalcocite, bornite, chalcopyrite and pyrite mineralization.

The distribution of copper mineral species is zoned around the bottom-centre of each zone, with bornite-chalcocite-chalcopyrite at the core and progressing outward to chalcopyrite-pyrite. Additional volumetrically minor copper species include carrollite, digenite, tennantite-tetrahedrite, and covellite (Bernstein and Cox, 1986). Stringer pyrite and locally significant sphalerite occur above and around the copper zones, while locally massive pyrite and sparse pyrrhotite occur in association with siderite alteration below copper mineralization in the Lower Reef.

In addition to the copper mineralization, significant cobalt mineralization (for example, drill hole RC11-0187 with 34.7 m at 0.10% Co in the South Reef, and drill hole RC11-0184 with 5.5 m at 0.44% Co in the Upper Reef) is found accompanying bornite-chalcocite mineralization. Cobalt occurs with high-grade copper as both carrollite (Co_2CuS_4) and as cobaltiferous rims on recrystallized pyrite grains (Bernstein and Cox, 1986). Preliminary geometallurgical work by Trilogy supports this observation and shows cobalt occurring primarily as cobaltiferous pyrite (approximately 80% of the contained cobalt) and within other cobalt minerals such as carrollite, and cobaltite (CoAsS) present throughout the deposit (Upper Reef, Lower Reef, and South Reef).

Appreciable silver values (for example, drill hole RC11-0184 with 5.5 m at 30.9 g/t Ag) are also found with bornite-rich mineralization in the South Reef and Ruby Creek zones.

Figure 7-6: Typical Mineralization of the Bornite Deposit (Trilogy Metals, 2017)



(a) Typical high-grade chalcocite-bornite-chalcopyrite mineralization; often form stringers, veinlettes, disseminations and breccia fillings; **(b)** Chalcocite (CuS) appears dark grey to black, occurs with massive sulphide zones and typically with bornite. Metallic luster observed by tilting specimen back and forth under light; **(c)** Massive sulphide mineralization, chalcocite-bornite-chalcopyrite of the historically termed "No. 1 Ore Body" Upper Reef - Ruby Creek; **(d)** Typical disseminated 1-2% pyrite in Quartz Phyllite (QP) – Rock unit defines the base of the Bornite carbonate sequence, equivalent to the Anirak Schist; **(e)** Coarse-grained carrollite (Co_2CuS_4) appears shiny and highly reflective resembling aluminum foil and is often found associated with high-grade copper zones; **(f)** back-scattered electron image showing cobaltite (white rounded grains) growing on chalcopyrite (dark gray).

7.4.2 Alteration

Dolomite is the predominant hydrothermal alteration product at Bornite and is particularly pronounced within: 1) certain massive carbonate units; 2) the Lower and Upper reef debris flow breccias; and 3) the P Breccia. Similar to the trend in copper grade, more intense and complete dolomitization is seen at the base of both of the Lower and Upper Reefs.

Importantly, copper grade generally correlates with the intensity of dolomite alteration expressed as Mg/Ca ratios of 0.4 to 0.67. Fe-compositions of the carbonates also have a significant impact on grade. High Fe carbonate species such as siderite and Fe-rich dolomite as ankerite exhibit almost no grade while low Fe dolomites show strong copper mineralization.

The spatial distribution of the Fe-rich dolomites is zoned with high Fe siderite and ankerite localized down the plunge of the lowermost debris flows in the Lower Reef. Low Fe dolomites, zoned around this basal core of high Fe dolomites, are well mineralized and form an annulus or horseshoe around the core of un-mineralized Fe-rich carbonates lying between the Ruby Creek area and the South Reefs. Figure 7-7 shows an oblique NW-looking view of the interpolated distribution of high Fe siderite and ankerite dolomites surrounded by mineralized low Fe dolomites.

The overall dolomite alteration pattern suggests sourcing of a mineralizing fluid to the south and transport to the north down the principal axis of debris flow emplacement. Of critical importance is the limit of Fe-dolomites and the strongly open down dip extension of low Fe dolomites. This is highly supportive of continued significant grade down dip on the combined Lower Reef/South Reef continuation and could constitute a very effective targeting tool elsewhere in the district.

Alteration within the high calcium (Ca) phyllites capping successive debris flows is expressed as albitization of pre-existing K-feldspar and the development of Mg-phengite at the expense of early detrital muscovite, biotite and chlorite. Increased albite and Mg-phengites are characteristically seen as bleaching of the high calcium (Ca) phyllites with highest intensities of alteration immediately below strong copper mineralization in the debris flow breccias.

Figure 7-7: Interpolated High Fe Siderite/Ankerite Alteration with Surrounding Low Fe Mineralized Dolomites (in green) - Oblique NW-looking View (Trilogy Metals, 2016)

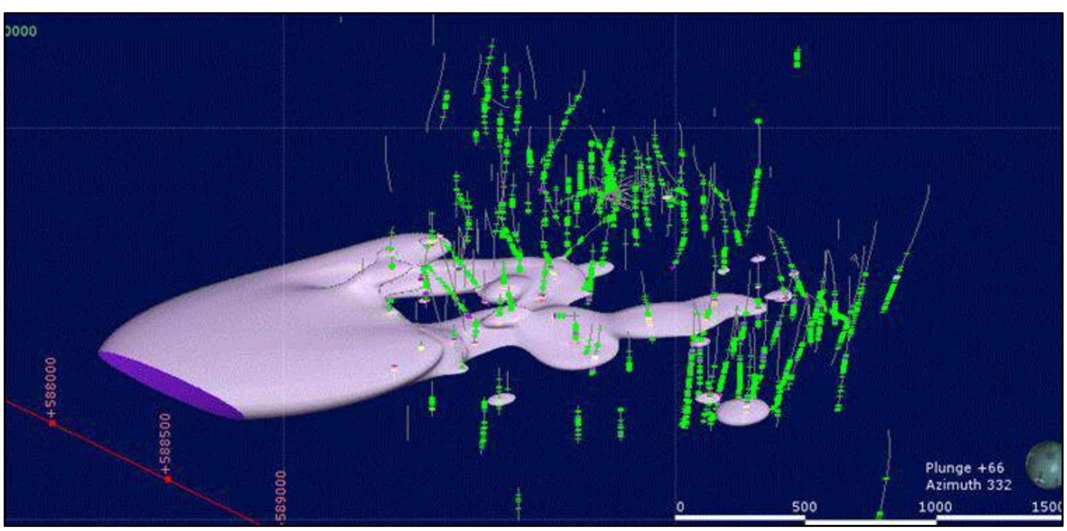
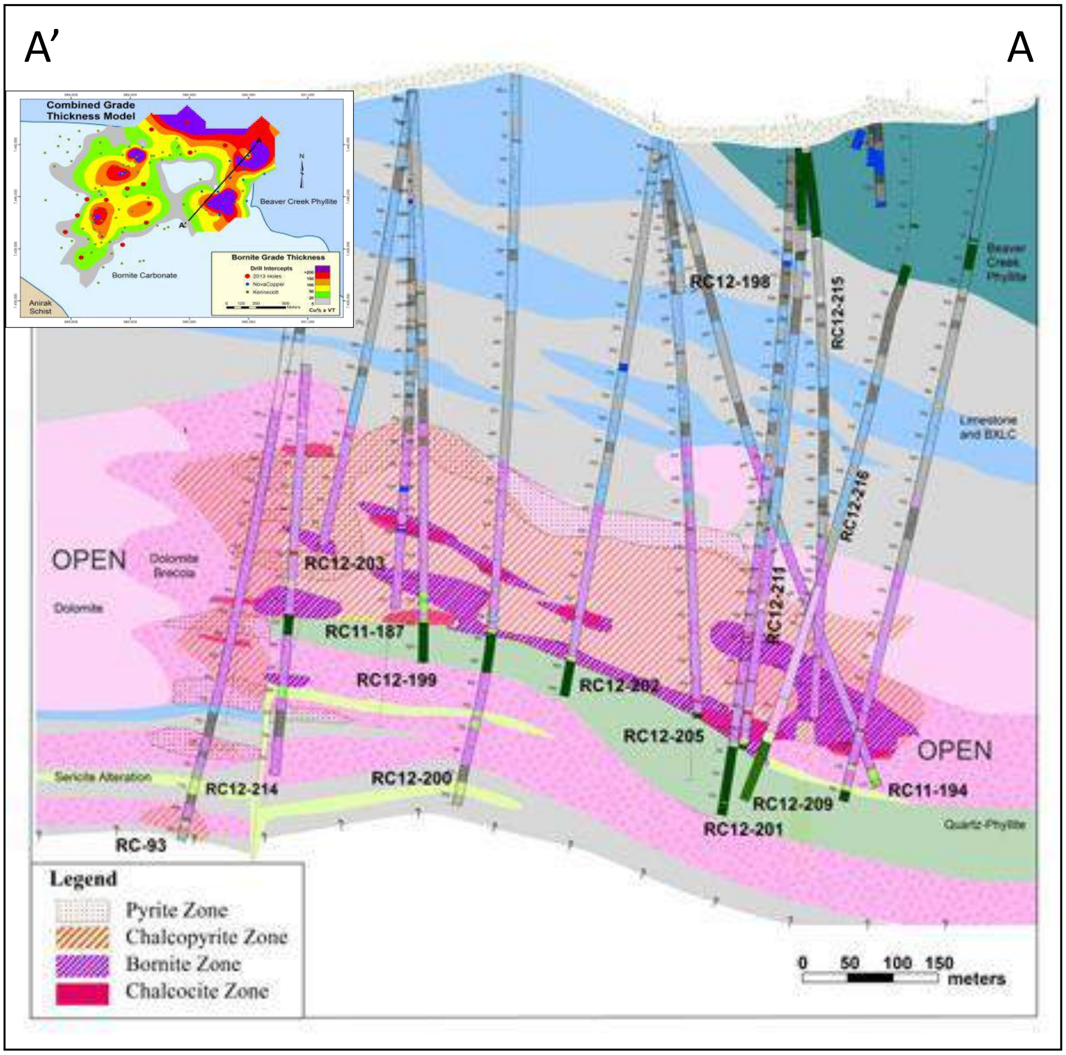


Figure 7-8 shows a southwest-northeast trending schematic section across the South Reef, showing geology, mineralization, and alteration.

Figure 7-8: SW-NE Schematic Section through the South Reef Illustrating Geology, Alteration and Sulphide Mineral Zoning (Trilogy Metals, 2016)



7.5 PROSPECTS/EXPLORATION TARGETS

The Bornite carbonate sequence, host to the mineralization at Bornite, is exposed over approximately 16 km along the north slope of the Cosmos Hills and to a lesser extent on the southern margin of the Cosmos Hills arch (Figure 7-1). Numerous areas of hydrothermal dolomitization and copper mineralization occur across the entire width of outcropping carbonates and are the focus of ongoing regional exploration by Trilogy Metals. Most notable of the known prospects are the Pardner Hill and Aurora Mountain areas, where outcropping mineralization was discovered and drill-tested during the Kennecott era.

The Pardner Hill prospect is located 5 km west of Bornite (Figure 7-1) and consists of a 3 km copper (± zinc) soil and rock geochemical anomaly in rubble cropping dolostone. Kennecott drilled 16 holes in the area and defined a stratiform copper mineralized zone approximately 150 m by 400 m and varying from 5 m to 35 m thick at the southern end of the geochemical anomaly. Mineralization remains open down-dip and to the south.

Dolomitization and anomalous copper and zinc geochemistry also characterize the Aurora Mountain prospect located 6 km west of Bornite (Figure 7-1). Anomalies are distributed along a 2 km mineralized horizon about a third of which has been tested by four Kennecott-era drill holes.

Importantly, the evolving understanding of the spatial distribution of the debris flows breccias and their control on fluid flow along with the alteration vectoring pattern from high Fe dolomites through progressively Fe depleted dolomites provide an important opportunity to target additional mineralization both down dip along the Upper and Lower reefs as well as within the Pardner Hill and Aurora Mountain targets.

7.6 Genesis/Genetic Implications

Recent development of a coherent sedimentary model for the Bornite deposit suggests a marginal carbonate platform environment with a series of stacked channelized debris flows characterized by extremely coarse-grained breccias grading upward into argillaceous-matrixed breccias culminating in fine-grained phyllites which cap each successive debris flow event. Current limits of drilling suggest thickening of the lobate debris flows into a deeper water basin to the north. Controls on the orientation of the debris flow channels as a function of development of adjacent massive and thin-bedded limestones is yet poorly understood but might well represent underlying structural controls.

The overall dolomite alteration distribution suggests sourcing of a mineralizing fluid to the south and transport to the north down the principal axis of debris flow emplacement. The debris flows provide important permeability as well as the intense dolomitization of the section with its resultant volume reduction of the carbonates. Texturally mineralization fills both breccia voids and occupies an overprinted fracture pattern.

From a genetic standpoint, the geochemical trends apparent in the alteration and mineralization along that fluid path show initial or proximal high Fe, Mg and K with overall low S with the system evolving to high Ca, Na and S. Copper is broadly zoned around the high Fe core in low Fe dolomites. Importantly the early assemblage of chlorite, siderite, and pyrrhotite and their reduced Fe signature does not support conventional reasoning that the principal transport mechanism is simply as a highly oxidized saline metal-rich fluid with deposition as a result of encountering potential reductant boundaries including carbonaceous and pyritic phyllites and the surrounding halo of anthroxolite.

Critically the consumption and deposition of available Fe seems to preclude any copper deposition until the bulk of the available Fe has been fixed in the Fe dolomites. Sulfur availability appears to be the key to fixing significant copper. Sourcing of S is seen as critical. Diagenetic pyrite within phyllitic units appears to be too limited in volume to provide a significant source for simple sulfidation of the copper-rich fluid. A more likely scenario of fluid mixing similar to that seen in MVT deposits, might provide an effective source of S. Fluids high in S or H_2S as sour gas could easily occupy the developing breccias both as primary lithological permeability and as a consequence of dolomitization. S-rich fluids or heavy H_2S gas could puddle on phyllitic aquatards resulting in the pronounced local zonation in the sulfides from chalcocite to bornite to chalcopyrite. These extremely sharp gradients apparent between chalcocite, bornite and chalcopyrite stability do not support temperature as an effective depositional mechanism

8.0 DEPOSIT TYPES

Copper-cobalt-silver-zinc mineralization at Bornite occurs as disseminations, veins, and massive sulphides forming stacked, semi-stratiform bodies closely associated with secondary hydrothermal dolomitization. The crosscutting nature of the mineralization along with the presence of early pyrite and sphalerite in sedimentary breccia clasts point to a clearly epigenetic origin, but temporally very close to the formation of the enclosing stratigraphy. Recent Re-Os dating supports this interpretation (Selby et al., 2009).

Data are limited regarding sources of the copper-rich fluids which formed the Bornite deposit, but it suggests that mineralizing fluids may have formed from the interaction of saline basinal fluids with mafic volcanic rocks mapped within the section.

Given these constraints, Bornite has characteristics similar to a series of districts and deposits including: the Mt Isa and McArthur River districts in Australia, the Tynagh deposit in Ireland, the Kipushi deposit in the Congo, and the Tsumeb deposit in Namibia. All of these deposits show: syngenetic to early epigenetic characteristics; emplacement in carbonate stratigraphy; and, early pyrite-dolomite alteration followed by sulphide mineralization.

All of these analogous deposits occur in intra-continental to continental margin settings undergoing extensional tectonics and bimodal volcanism similar to Bornite. Basin-margin faults seem to play an important role in localizing mineralization (Hitzman, 1983) even though the postulated basin margin structures at Bornite have not been directly identified.

9.0 EXPLORATION

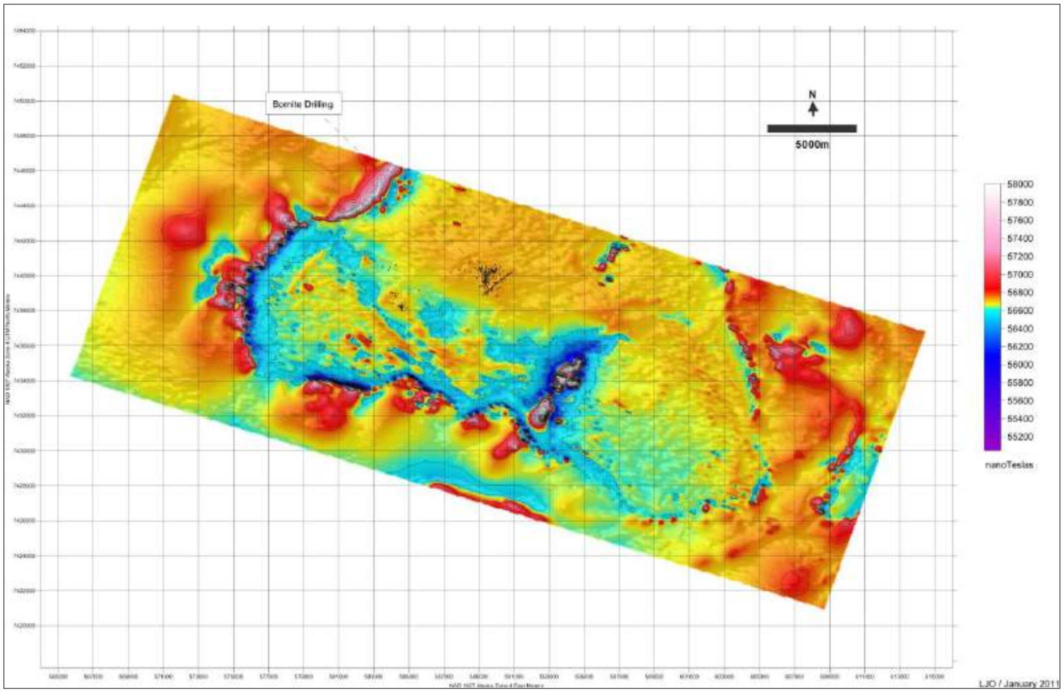
9.1 INTRODUCTION

Exploration work completed by previous operators BCMC and Kennecott (1957 through 1998) is summarized in Section 6.0 of the Report. In addition to extensive drilling, BCMC and Kennecott completed widespread surface geochemical sampling, regional and property scale mapping, and numerous geophysical surveys. The majorities of these data have been acquired by Trilogy Metals and form the bases for renewed exploration, targeting Bornite-style mineralization in the Bornite Carbonate Sequence.

9.2 NOVAGOLD EXPLORATION - 2006

In 2006, NovaGold contracted Fugro Airborne Surveys (Fugro) to complete a detailed helicopter DIGHEM magnetic, EM and radiometric survey of the Cosmos Hills. The survey covered a rectangular block approximately 18 km by 49 km which totaled 2,852 line kilometres. The survey was flown at 300 m line spacing with a line direction of N20E. The DIGHEM helicopter survey system produced detailed profile data of magnetics, EM responses and radiometrics (total count, uranium, thorium, and potassium) and was processed into maps of magnetics, discrete EM anomalies, EM apparent resistivity, and radiometric responses. A report and Fugro-processed maps and grids are available (Fugro, 2007). Figure 9-1 shows total field magnetics from the survey.

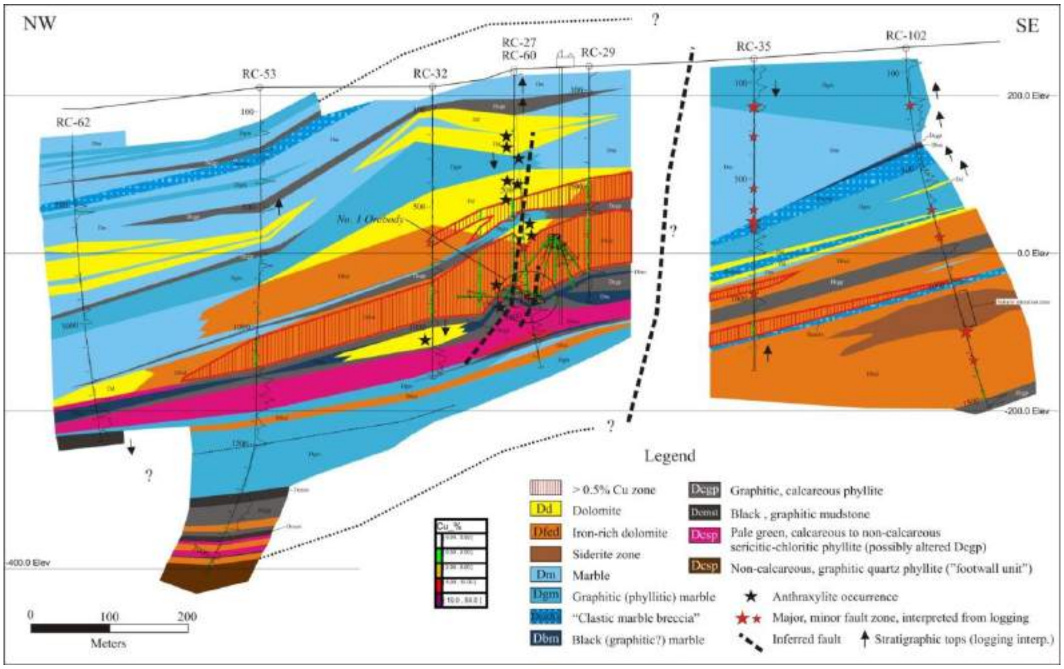
Figure 9-1: DIGHEM Total Field Magnetics (Fugro, 2007)



9.3 NovaGold Exploration - 2010

In 2010, in anticipation of completing the NANA Agreement, NANA granted NovaGold permission to begin low level exploration at Bornite; this consisted of re-logging and re-analyzing select drill holes using a Niton portable XRF. A profile containing Kennecott surface diamond drill holes: RC-27, -29, -32, -35, -53, -0, -62, and -102, and underground drill hole RU-16 were re-logged and re-analyzed in the Bornite camp in July and August 2010 (Figure 9-2). In general, the re-logging compared moderately well with the 1996 Kennecott interpretation. General relationships apparent in Figure 9-2 include: a thick area of dolomitization centered approximately at drill hole RC-60 corresponding with mineralization, and surrounding and overlying the Ruby Creek Upper Reef zone; iron-rich dolomite, forming an inner alteration zone; and, a strong stratigraphic control with mineralization occurring in dolomitized limestones immediately overlying a graphitic phyllite.

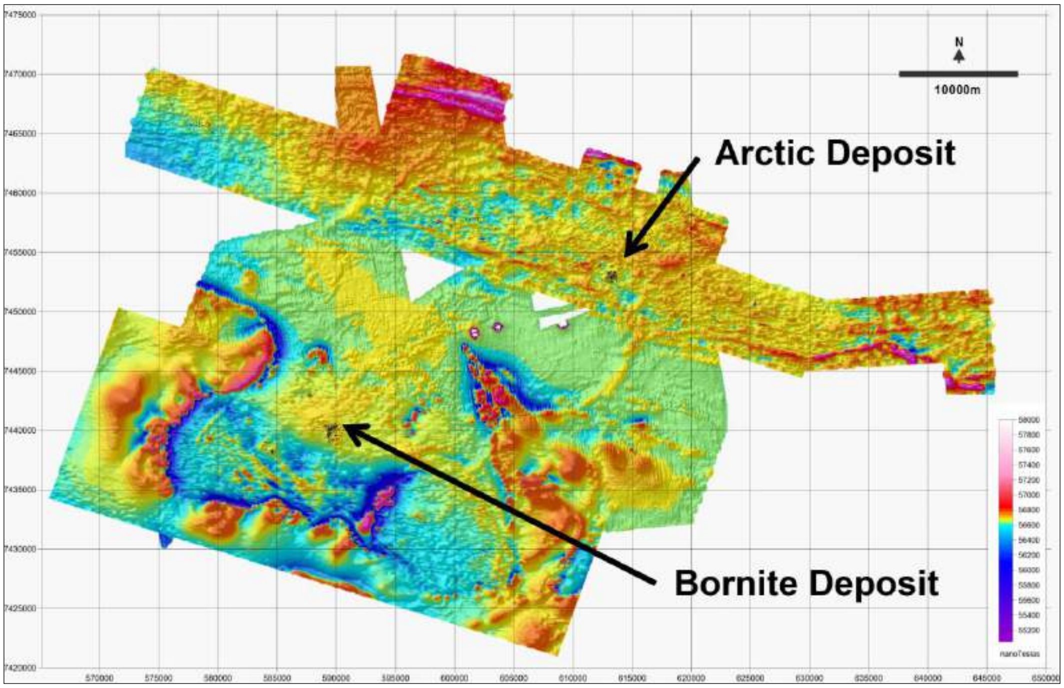
Figure 9-2: NW-SE Re-interpreted Profile across the Bornite Deposit (NovaGold 2010)



One notable distinction from the Kennecott re-logging interpretation was the recognition of a significant stratigraphic and structural discontinuity between the southeastern and northwestern parts of the section. A sharp, apparent truncation or offset of mineralization, dolomitization, and stratigraphic units across this boundary is apparent in the re-logging effort. Interpretation of the discontinuity remains unclear at this time, but it could represent either a post-mineral offset or a major facies transition or both. Interpretation of this discontinuity between the Upper and Lower reef dolomites continues to be problematic in developing a coherent structural and stratigraphic model for the deposit.

In addition to the 2010 re-logging effort, NovaGold contracted a consulting geophysicist, Lou O'Connor, to compile a unified airborne magnetic map for the Ambler mining district from Kennecott, Alaska DNR, and NovaGold airborne geophysical surveys; the compilation is shown in Figure 9-3.

Figure 9-3: District Airborne Magnetics Compiled From Kennecott, AK DNR and NovaGold Surveys (O'Connor, 2010)



9.4 NOVAGOLD EXPLORATION - 2011

In 2011, NovaGold contracted Zonge International Inc. (Zonge) to conduct both dipole-dipole complex resistivity induced polarization (CRIP) and natural source audio-magnetotelluric (NSAMT) surveys over the northern end of the prospect to develop tools for additional exploration targeting under cover to the north.

NSAMT data were acquired along two lines totaling 5.15 line-km, with one line oriented generally north-south through the centre of the survey area and one being the southernmost east-west line in the survey area. CRIP data were acquired on five lines: four east-west lines and one north-south line, for a total coverage of 14.1 line-km and 79 collected CRIP stations. The initial objective of the survey was to investigate geological structures and the distribution of sulphides possibly associated with copper mineralization.

Results from the paired surveys show that wide-spaced dipole-dipole resistivity is the most effective technique to directly target the mineralization package. Broad low resistivity anomalies reflecting pyrite haloes and mineralization appear to define the limits of the fluid package. Well-defined and often very strong chargeability anomalies are also present, but appear in part to be masked by phyllitic units which also have strong chargeability signatures. The NSAMT show similar resistivity features as the IP, but are less well resolved.

9.5 TRILOGY METALS EXPLORATION - 2012

In light of the success of the 2011 geophysical program, Trilogy Metals contracted Zonge to conduct a major district-wide dipole/dipole IP survey, a down-hole IP radial array survey in the South Reef area, and an extensive physical property characterization study of the various lithologies to better interpret the existing historical geophysical data.

Zonge completed 48 line km of 200 m dipole/dipole IP during 2012, infilling and expanding on the 2011 survey, and stretching across the most prospective part of the outcropping permissive Bornite Carbonate sequence. Figure 9-4 and Figure 9-5 show isometric views of the combined 2011 and 2012 surveys for resistivity and IP, respectively. The results show a well-defined low resistivity area associated with mineralization and variable IP signatures attributed both to mineralization and the overlying Beaver Creek phyllite. Numerous target areas occur in the immediate Bornite area with lesser targets occurring in the Aurora Mountain and Pardner Hill areas and in the far east of the survey area. During the 2012 drill program at South Reef, a single drill hole was targeted on a low resistivity area approximately 500 m to 600 m southeast of the South Reef mineralization trend. Although the drill hole intersected some dolomite alteration in the appropriate stratigraphy, no significant sulphides were encountered.

In addition to the extensive ground IP survey, Zonge also completed 9 km of down-hole radial IP using an electrode placed in drill hole RC12-0197 to further delineate the trend and potential in and around the South Reef.

In addition to the 2012 ground geophysical surveys, extensive physical property data including resistivity, chargeability, specific gravity, and magnetic susceptibility were captured for use in modelling the existing ground IP and gravity surveys, and the airborne EM and magnetic surveys. In general, some broad comments can be made concerning geophysical domains in and around mineralization at Bornite. Mineralization is characterized by low resistivity < 20 ohms, ambiguous but elevated, often irregular chargeability highs (> 35 milliradians) marginal to the mineralization, and 3-5 milligal gravity anomalies. Mineralization appears to lie along the flanks of 20-150 nT long wave magnetic anomalies which might reflect deep-seated mafic greenstones deeper in the stratigraphy.

In addition to geophysical focused exploration, a district wide geologic map was compiled integrating Kennecott's 1970's mapping of the Cosmos Hills with selective Trilogy Metals mapping in 2012.

Figure 9-4: Isometric View of 2011 and 2012 Resistivity Profiles (NovaCopper, 2012)

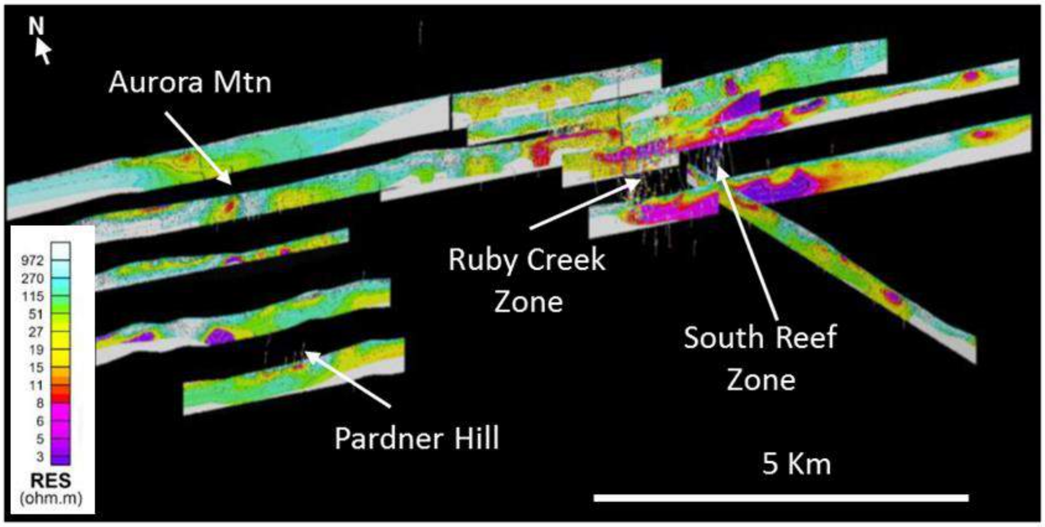
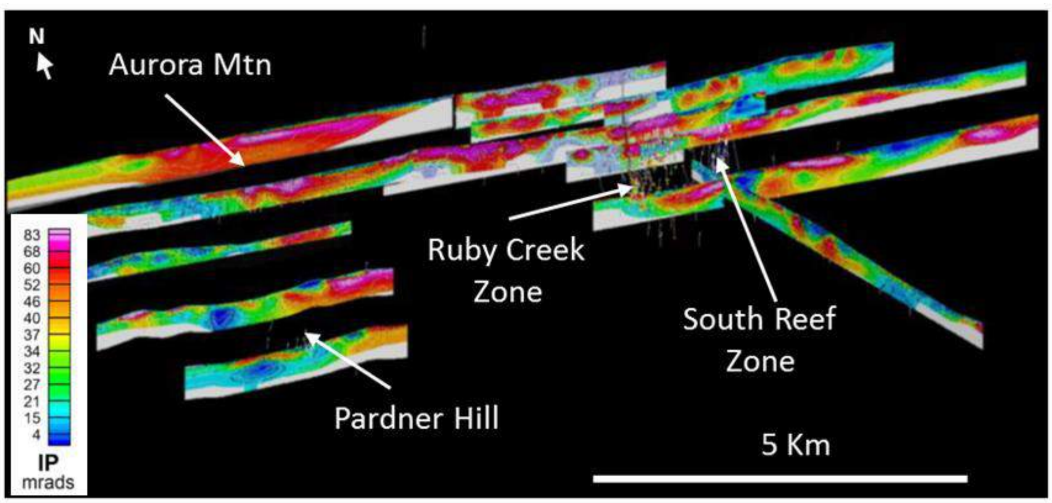


Figure 9-5: Isometric View of 2011 and 2012 Chargeability Profiles (NovaCopper, 2012)



9.6 TRILOGY METALS EXPLORATION - 2013

The emphasis of the 2013 program was to further validate and refine the 2012 geologic map of the Cosmos Hills. A deep penetrating soil and vegetation geochemical orientation survey was completed over the South Reef deposit, utilizing various partial leaches and pH methods. The initial, approximately 1 km, test lines suggest a good response for several of the partial leaches of the soils but little response in the vegetative samples; further follow-up is warranted to the north of the deposit into the Ambler lowlands.

9.7 TRILOGY METALS EXPLORATION - 2014

During 2014, exploration work was limited to a re-logging and re-sampling program of historical Kennecott drill core. Work was conducted out of the Fairbanks warehouse and is described in Section 10.

9.8 TRILOGY METALS EXPLORATION - 2015

As a follow-up to the 2013 field program, a deep penetrating soil and vegetation geochemical survey was extended north of the deposit into the Ambler lowlands. Trilogy Metals geologists completed a lithogeochemical desktop study and a comprehensive update to the 3D lithology model; the updated domains have been utilized in the most recent resource estimation.

9.9 TRILOGY METALS EXPLORATION - 2017

The 2017 field program extended the 2013 and 2015 Deep Penetrating Geochemical (DPG) soil survey another 500m to the northeast. The 2013 soil line was extended 1500m to the east to test over the covered projection of the Two Grey Hills carbonate section. The 3D lithology model was updated to incorporate the 2017 drill program results, which are described in Section 10,

Trilogy Metals also completed a close spaced (100m station spacing) ground gravity survey over a 2 km by 4km grid covering the existing resource area and extending northeast over the 2017 drill target area. The complete Bouguer Anomaly (CBA) residual plot (removes a strong decreasing to the northeast regional gradient) shows good correlation with the Lower Reef mineralization that outcrops on surface with the gravity high gradually decreasing down-dip to the northeast.

As part of the overall gravity program, Mira Geosciences created a petrophysical model for the Bornite Deposit that synthesized the expected gravity response on surface (forward model) for the 2017 gravity stations. This forward model matches very closely with the actual survey data over the deposit area, but diverges on the south end where the expected response of gravity low is actually a strong gravity high that may reflect shallow mineralization up-dip along the South Reef trend. Mira also completed a geologically constrained 3D inversion using the 2017 gravity data. Two areas of anomalously high densities (>2.9 g/cc) were identified. The first area extends up to 750m to the east-northeast of RC17-0239, which was one of the more successful holes in 2017 and is coincident with the Iron Mountain structure. The second anomaly is located just above the Anirak contact (Lower Reef) to the west of the 2017 target area and 700m to the north of the closest drill hole (RC-53), which is weakly mineralized along that horizon. This area falls along the northwest-southeast high grade thickness trend.

9.10 EXPLORATION POTENTIAL

Outcropping exposures of the mineralization-hosting carbonate stratigraphy along with large areas of dolomite alteration occur over approximately 18 km of strike along the northern flank of the Cosmos Hills. Historical exploration drilling has focused solely on outcropping mineralization and subsurface extensions at the Bornite, Aurora Mountain, and Pardner Hill areas. Much of the carbonate belt has yet to be evaluated.

Recent US Geological Survey (USGS) dating of mineralization in the Ambler mining district has shown that the VMS belt that hosts the Arctic deposit and the Bornite carbonate-hosted mineralization are likely contemporaneous though there are some textural and metamorphic observations that suggest a possible Cretaceous or younger age for Bornite (Connor, 2015). As such, mineralization at Bornite is suspected to only slightly post-date enclosing stratigraphy (Selby et al., 2009). This early and extensive syngenetic/early epigenetic signature, along with the overall fluid chemistry of the system investigated by early workers, such as Hitzman (1983 and 1986), point to large saline basin-generated fluid transport as the mechanism controlling the metallogeny of the Ambler mining district. Importantly, similar metallogenies related to saline, basin-generated fluids and their associated deposits form some of the largest copper districts in the world.

Recent exploration by Kennecott and Trilogy Metals has utilized a variety of methodologies.

Airborne geophysics completed in 2006, discussed in Section 9.1, along with district-wide compilations of select third party data, discussed Section 9.2 and shown in Figure 9-3, show that the Bornite carbonate section and bounding stratigraphy simply dip to the north under the Ambler lowlands toward the Ambler Schist Belt. This opens up important potential to explore for high-grade, Bornite-style, carbonate-hosted deposits at depth using new deeper-penetrating geophysical techniques.

The geophysical surveys have delineated significant north-northeast to northeast oriented structures which appear in part to control local basin morphology and mineralization (Figure 9-1). Better understanding of basin development and its structural framework is critical to the exploration of Bornite-style systems.

In 1999, Kennecott completed an initial gravity survey of the lowlands showing significant gravimetric anomalies which may indicate structural dislocations and potential alteration and mineralization (Figure 6-1). In 2011, Trilogy Metals investigated both deep IP and NSAMT geophysical techniques.

Results from the 2011 program led to a 2012 district-wide, 200 m dipole-dipole, deep-penetrating IP survey; the results are summarized in Section 9.4. That survey along with extensive 2012 physical property data capture for all lithologies, and existing ground IP, gravity and airborne EM and magnetic surveys is currently being used to develop a comprehensive geophysical model of the district to support future exploration targeting.

Although a variety of techniques have been utilized in the ongoing exploration at Bornite, Trilogy Metals currently endorses a series of additional exploration methodologies including: continuation and expansion of the gravity survey initiated by Kennecott in 1999 and refined by Trilogy in 2017; a deep seismic reflection survey along the north margin of the Cosmos Hills; deep penetrating soil geochemistry and geochemical vectoring utilizing new zoning tools discussed herein.

Recent test lines utilizing deep penetrating geochemical (DPG) methods which use various selective partial leaches of metals have proved very effective in recognizing margins of South Reef mineralization at significant depths under cover. Further follow-up is warranted and expanded coverage utilizing this soil methodology is planned to the north.

Most importantly, improved understanding of the sedimentological model shows that targeting the projections of mapped debris flow breccias whether recognized in drilling or in surficial mapping could prove very effective in finding zones of increased fluid flow and mineralization.

In addition, recent analysis of the extensive ICP trace element data set at Bornite demonstrates some very significant alteration vectors specifically the iron contents within the various hydrothermal dolomites. Simple XRF analysis of dolomites in the field might prove effective in vectoring toward Fe-poor mineralized dolomite sections.

10.0 DRILLING

10.1 INTRODUCTION

A total of 192 surface core holes and 51 underground core holes, totaling 86,584 m have been drilled, targeting the Bornite deposit during 22 different campaigns dating from 1957 through 2017. All of the drill campaigns, with the exception of the 2011 NovaGold campaign and the 2012, 2013, and 2017 Trilogy Metals campaigns were completed by Kennecott or their exploration subsidiary BCMC. Table 10-1 summarizes operators, annual campaigns, number of drill holes and metres drilled on the deposit. All drill holes listed in this table, except RC13-230 and RC13-232 which have been reserved for metallurgical studies, and 2017 drill holes that targeted too far from the existing resource to be used, were utilized in the estimation of the current resource.

In the 2017 drilling campaign, nine holes were initiated but two abandoned due to drilling problems. The seven drill holes completed in 2017 stepped-out between 250 to 400m from the previous drill holes, distances considered too far to support the estimation of mineral resources. Additional, closer-spaced drill holes are required in this area to provide the degree of confidence required to support resource estimates.

Between 2012 and 2014 Trilogy Metals geologists re-logged and re-sampled historical drill holes in the Ruby Creek and South Reef areas which were previously drilled and only selectively sampled by Kennecott. Table 10-3 summarizes target areas and drill holes by year. These assays were utilized in the estimation of the current resource, except where duplicates of Kennecott samples were collected – in the case of duplicates the original assay information was given priority in the resource database.

Table 10-1: Summary Bornite Drill Hole Campaigns by Operator

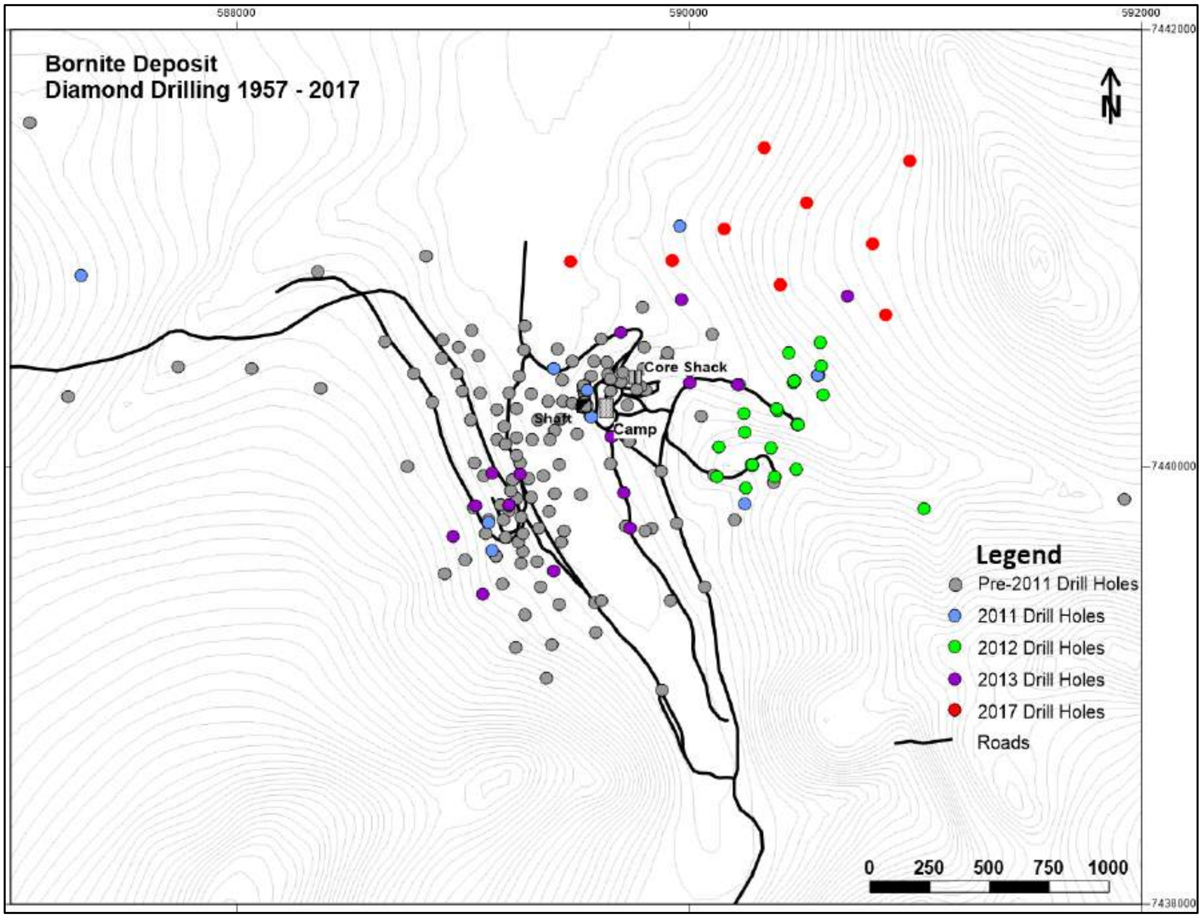
Year	Surface DH's	UG DH's	Metres	Operator
1957	8		1,749	BCMC
1958	10		2,150	Kennecott/BCMC
1959	14		4,932	Kennecott/BCMC
1960	13		4,083	Kennecott/BCMC
1961	33		13,590	Kennecott/BCMC
1962	24		8,450	Kennecott/BCMC
1963	1		396	Kennecott/BCMC
1966	0	26	1,384	Kennecott/BCMC
1967	0	21	1,862	Kennecott/BCMC
1968	8	4	3,210	Kennecott/BCMC
1969	2		781	Kennecott/BCMC
1970	2		733	Kennecott/BCMC
1971	2		829	Kennecott/BCMC
1972	2		712	Kennecott/BCMC
1974	1		456	Kennecott/BCMC
1975	1		316	Kennecott/BCMC
1976	6		2,168	Kennecott/BCMC
1997	3		928	Kennecott/BCMC
2011	14		5,819	NovaGold
2012	22		15,457	Trilogy Metals
2013	17		8,142	Trilogy Metals
2017	9		8,437	Trilogy Metals
Total	192	51	86,584	

Sprague and Henwood, a Pennsylvania-based drilling company, completed all of the Kennecott drilling, with the exception of the 1997 program (three drill holes) completed by Tonto Drilling Services, Inc. (a NANA-Dynatech company). The 2011 thru 2013 NovaGold/Trilogy Metals programs used Boart Longyear Company as the drill contractor. The 2017 program used Tuuq drilling, a NANA company, who sub-contracted Major Drilling. Table 10-2 summarizes the drill campaigns, the core sizes used, and the drilling contractors.

Table 10-2: Summary of Bornite Drill Hole Campaigns by Drill Contractor

Year	Total DH's	Metres	Core Size	Drill Contractor
1957	8	1,749	AX	Sprague and Henwood
1958	10	2,150	AX	Sprague and Henwood
1959	14	4,932	AX & BX	Sprague and Henwood
1960	13	4,083	AX & BX	Sprague and Henwood
1961	33	13,590	AX, BX, & NX	Sprague and Henwood
1962	24	8,450	AX, BX, & NX	Sprague and Henwood
1963	1	396	BX	Sprague and Henwood
1966	26	1,384	EX & AX	Sprague and Henwood
1967	21	1,862	EX & AX	Sprague and Henwood
1968	12	3,210	BX & AX	Sprague and Henwood
1969	2	781	BX	Sprague and Henwood
1970	2	733	BX	Sprague and Henwood
1971	2	829	BX?	Sprague and Henwood
1972	2	712	BX?	Sprague and Henwood
1974	1	456	NX & BX	Sprague and Henwood
1975	1	316	NX & BX	Sprague and Henwood
1976	6	2,168	NXWL & BXWL	Sprague and Henwood
1997	3	928	NX & HQ	Tonto
2011	14	5,819	NQ & HQ	Boart Longyear
2012	22	15,457	NQ & HQ	Boart Longyear
2013	17	8,142	NQ & HQ	Boart Longyear
2017	9	8,437	NQ & HQ	Tuuq & Major Drilling
Total	243	86,584		

Figure 10-1: Plan Map Showing Drill Hole Locations by Year (Trilogy Metals, 2018)



10.2 DRILL CORE PROCEDURES

In the initial years of drilling at Bornite, Kennecott relied on AX core (1.1875 in or 30.2 mm diameter), but, as drilling migrated towards deeper targets, a change to BX core (1.625 in or 41.3 mm diameter) was implemented to help limit deviation. From 1966 to 1967, drilling activity at Bornite moved underground and EX diameter core (0.845 in or 21.5 mm diameter) was implemented to define the Ruby Creek Upper Reef zone "No.1 Ore Body". Drilling activity moved back to the surface in 1968, and, from 1968 to 1972, BX core was most commonly drilled. In later years, core size increased to NX (2.125 in or 54.0 mm diameter) and finally, in 2011, core size increased to NQ (1.874 in or 47.6 mm diameter) and HQ (2.5 in or 63.5 mm diameter). Progressively larger diameter drill rods have been continually used over the years in an attempt to minimize drill hole deviations.

The Kennecott and Trilogy Metals era drilling have been conducted using drill equipment utilizing imperial measurement units. All Imperial units have been converted to metric equivalents in the Trilogy Metals database for the purposes of data management. Trilogy Metals works exclusively in metric units.

10.2.1 BCMC/Kennecott Procedures

There is only partial knowledge of specific drill core handling procedures used by Kennecott during their tenure at the Bornite Deposit. All of the drill data collected during the Kennecott drilling programs (1958 to 1997) was logged on paper drill logs, copies of which are stored in the Kennecott office in Salt Lake City, Utah. Electronic scanned copies of the paper logs, in PDF format, are held by Trilogy Metals.

Drill core was sawed or split with a splitter, with half core submitted to various assay labs and the remainder stored in the Kennecott core storage facility at the Bornite Deposit. In 1995, Kennecott entered the drill assay data, the geologic core logs, and the down hole collar survey data into an electronic format. In 2009, NovaGold geologists verified the geologic data from the original paper logs against the Kennecott electronic format and then merged the data into a Microsoft™ SQL database.

Sampling of drill core by Kennecott and BCMC focused primarily on the moderate to high grade mineralized zones. Intervals of visible sulphide mineralization containing roughly >0.5 to 1% copper were selected for analysis by Union Assay Office Inc. of Salt Lake City, Utah. This approach left numerous intervals containing weak to moderate copper mineralization un-sampled in the historic drill core. During the 2012 exploration program, Trilogy Metals began sampling a portion of this remaining drill core in select holes in the South Reef area. Trilogy Metals extended this sampling program to the Ruby Creek area in 2013 and 2014 (Table 10-3).

10.2.2 NovaGold/Trilogy Metals Procedures

Throughout Trilogy Metals' tenure at Bornite, the following core handling procedures have been implemented. Core is slung by helicopter, or transported by truck or ATV, from the drill rig to the core-logging facility. Upon delivery, geologists and geotechnicians open and inspect the core boxes for any irregularities. They first mark the location of each drilling block on the core box, and then convert footages on the blocks into metric equivalents. Geotechnicians or geologists measure the intervals (or "from/to") for each box of core and include this information, together with the drill hole ID and box number, on a metal tag stapled to the end of each box.

Geotechnicians then measure the core to calculate percent recovery and rock quality designation (RQD). RQD is the sum of the total length of all pieces of core over 12 cm in a run. The total length of core in each run is measured and compared to the corresponding run length to determine percent recovery.

Core is then logged with lithology and visual alteration features captured on observed interval breaks. Mineralization data, including total sulphide (recorded as percent), sulphide type (recorded as a relative amount), and gangue and vein mineralogy are collected for each sample interval with an average interval of approximately 2 m. Structural data is collected as point data.

Geologists then mark sample intervals to capture each lithology or other geologically appropriate intervals. Sample intervals of core are typically between 1 m and 3 m in length but are not to exceed 3 m in length. Occasionally, if warranted by the need for better resolution of geology or mineralization, smaller sample intervals have been employed. Geologists staple sample tags on the core boxes at the start of each sample interval, and mark the core itself with a wax pencil to designate sample intervals. This sampling approach is considered sound and appropriate for this style of mineralization and alteration.

Drill core is digitally photographed prior to sampling.

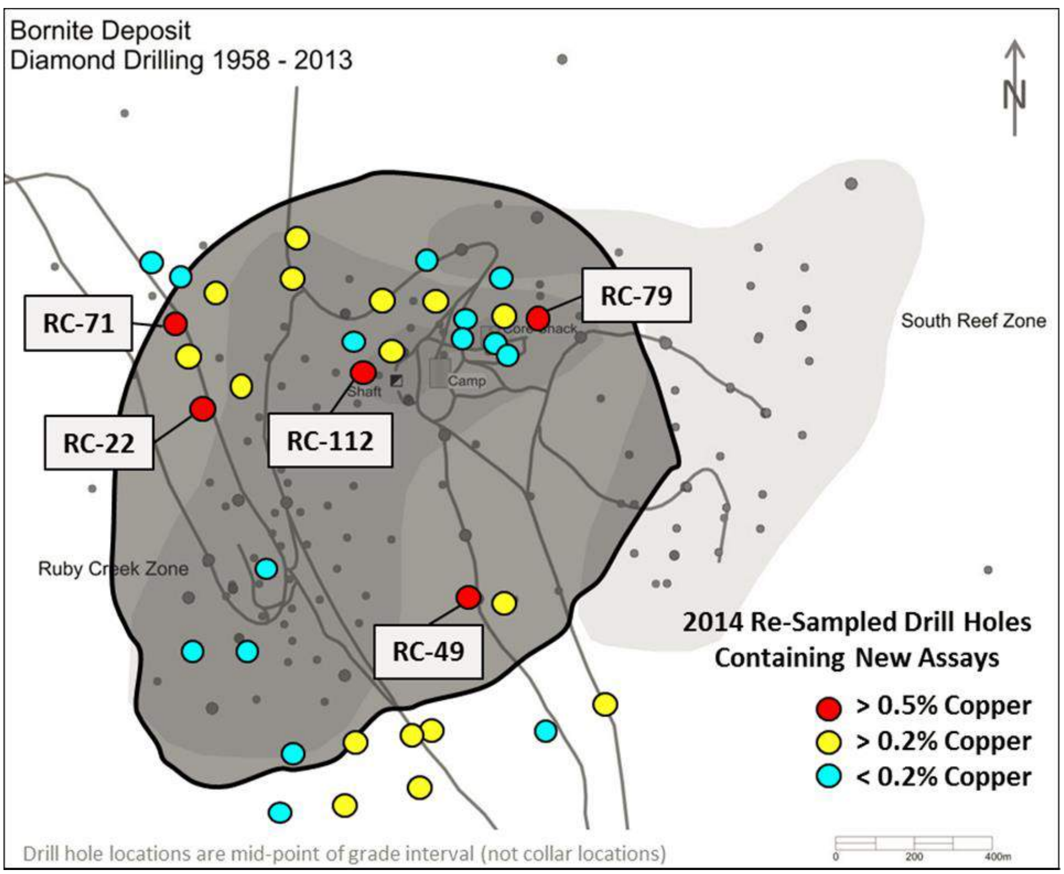
Drill core is cut in half using diamond core saws. Specific attention to core orientation is maintained during core sawing to ensure that representative samples are obtained. One-half of the core is retained in the core box for storage on site, or at Trilogy Metals' Fairbanks warehouse, and the other half bagged and labeled for analysis. Samples are selected for specific gravity measurements as discussed in Section 11.0 of this report.

In 2013, 33 historic drill holes in the Ruby Creek area, and in 2014, 37 historic drill holes in the Ruby Creek area were re-logged, re-sampled and re-assayed as these holes had previously only been selectively sampled by Kennecott. Entire holes were re-logged utilizing Trilogy Metals protocols discussed above. Samples were submitted either as half-core, where previously sampled, or whole core where un-sampled (this was done to ensure that a sufficient volume of material was provided for analysis). Sample intervals were matched to historic intervals whenever possible, or selected to reflect Trilogy Metals sampling procedures described above. The objectives of the re-assay/re-logging program were threefold: 1) to implement a QA/QC program on intervals previously sampled by Kennecott in order to confirm the validity of their results; 2) to identify additional lower-grade (0.2-0.5% copper), which was not previously sampled; and 3) to provide additional multi-element ICP data to assist in the geologic interpretation of the deposit. A further discussion of the program and its results are incorporated in Sections 11 and 14 of this report.

Table 10-3: BCMC/Kennecott era Drill Holes Re-logged & Re-assayed by Trilogy Metals

Year Re-logged/ Re-assayed	Area	Drill Holes
2012	South Reef	RC-92, RC-93, RC-95, RC-96, RC-99, RC-102, RC-163, RC-168, RC-174
2013	Ruby Creek	RC-3, RC-4, RC-19, RC-29, RC-30, RC-34, RC-35, RC-35W, RC-37, RC-48, RC-50, RC-51, RC-54, RC-55, RC-57, RC-61, RC-64, RC-66, RC-67, RC-68, RC-73, RC-83, RC-84, RC-86, RC-87, RC-111, RC-151, RC-152, RC-153, RC-165, RC-166, RC-169, RC-172
2014	Ruby Creek	RC-22, RC-25, RC-26, RC-32, RC-33, RC-40, RC-44, RC-45, RC-47, RC-49, RC-53, RC-56, RC-58, RC-59, RC-60, RC-65, RC-69, RC-70, RC-71, RC-72, RC-74, RC-77, RC-79, RC-80, RC-81, RC-85, RC-97, RC-100, RC-105, RC-107, RC-112, RC-114, RC-150, RC-157, RC-164, RC-170, RC-173

Figure 10-2: Plan Map Showing Historic Drill Holes Re-Sampled in 2014 (Trilogy Metals, 2016)



The 2011 thru 2014 and in 2017 NovaGold/Trilogy Metals diamond drilling and re-logging/re-sampling programs used a commercial, computer-based core logging system for data capture; GeoSpark Logger© developed by GeoSpark Consulting Inc. During each drill program, all logging data was captured on individual laptops in a Microsoft™ SQL database and then validated and merged into the camp server. In 2012, the system was modified to allow each laptop to sync daily to the Data Logger database residing on the Bornite Camp server. The server was periodically backed up and the database was sent to Vancouver, British Columbia for integration into the master database. The camp server is stored in the Fairbanks field office at the end of each field season. Hardcopies of the 2011 thru 2013 drill core logs are stored in the Fairbanks office. Scanned copies of the Kennecott-era drill logs are also stored in the Fairbanks field office.

10.3 Drill Core Recovery

Table 10-4 shows the core recovery data compared to various rock types with available recovery data for all campaigns through to 2013. In general, core recovery averaged >87.8% with only slightly poorer recoveries in phyllitic rocks. The dolostone and the dolostone clastic breccia, principal hosts of mineralization, show recoveries of 87.3% and 90.3 respectively. Similar core recoveries were achieved during the 2017 drilling program.

Table 10-4: Core Recovery versus Lithology

Lithology	% Recovery	Standard Deviation	Number of Samples	Length (m)
Argillaceous Carbonaceous Phyllite	87.1	21.1	4719	8661
Argillaceous Dolomitic Phyllite	77.2	26.3	16	23
Argillaceous Limestone Clastic Breccia	92.5	34.8	2253	3833
Dolostone & Thinly Bedded Dolostone	87.3	27.0	5008	5493
Dolostone Clastic Breccia	90.3	24.2	7187	8255
Fault Zone	61.0	32.4	229	401
Limestone & Thinly Bedded Limestone	90.6	25.4	2205	3505
Limestone Clastic Breccia	89.9	21.1	5540	9541
Massive Sulfides	94.8	17.3	210	168
Quartz Phyllite	82.4	24.5	652	1305
Talc Phyllite & Talc Lime Phyllite	83.8	36.6	979	1272
Undefined	55.0	38.9	88	527
Total	87.8	26.2	29,086	42,985

10.4 COLLAR SURVEYS

10.4.1 KENNECOTT TENURE

Kennecott provided NovaGold with collar coordinates for all historical holes in UTM coordinates using the NAD27 datum. During the 2011 field season, the collar locations of 63 historic surface holes were re-surveyed in UTM NAD83 zone 4N datum. The results of this re-survey were compared to the original Kennecott collar survey data as described below.

Horizontal errors were found to cluster tightly around zero, with a mean difference of +1.61 m Easting and -0.80 m Northing. Absolute total horizontal error ranged from 0.39 m to a maximum 24.27 m, with a median absolute error of 1.22 m. The 24.27 m difference was considered to be the result of an individual surveying error. Based on these results, the remaining 68 un-surveyed Kennecott drill hole collars were accepted without application of a horizontal correction.

Vertical errors were identified in the 2011 collar re-survey campaign. The checks revealed a semi-systematic elevation error of about +10 m vertical for most of the historic collar locations compared to the 2011 re-survey. Elevation differences in the existing database were found to range from -2.17 m to +10.91 m, with a median error of +9.61 m. While these errors show some systematic patterns in space and time, a unifying correction factor for elevation based on the survey results was considered inappropriate. Ultimately, Trilogy Metals assigned collar elevations for all historic drill holes that could not be re-surveyed based on the 2010 PhotoSat 1 m resolution digital terrain model (DTM). The collar elevations for the 63 re-surveyed holes were assigned elevations from the 2011 re-survey.

Also, the benchmark for the shaft and the elevation control for the underground drill hole collar surveys could not be located during the re-survey exercise to provide a reasonable elevation check between the underground survey and the surface elevations of the DTM. Therefore, the underground holes were given a blanket +10 m vertical correction consistent with the error observed in the re-surveyed surface holes around the underground workings. As a quantitative check, it was confirmed that the lithological contacts constructed from the adjusted drill holes aligned well with the lithological contacts encountered in the 2011 drilling.

10.4.2 TRILOGY METALS TENURE

Collar locations for the 14 holes drilled in 2011 were surveyed by NovaGold using a differential GPS relative to benchmark 'AAA-1' established by Karl Spohn, PLS, WH Pacific, Inc. (WHPacific), in 2010. An Ashtech ProMark2 GPS instrument was used for these surveys.

In 2012, collar locations for 17 of the 22 holes drilled in 2012 were surveyed by WHPacific professional land surveyors using a differential GPS relative to benchmark

‘AAA-1’. The remaining five holes were surveyed by Trilogy Metals using an Ashtech ProMark2 GPS instrument relative to benchmark ‘AAA-1’.

In 2013, collar locations for all 17 drill holes were surveyed by Trilogy Metals using an Ashtech ProMark2 GPS instrument relative to benchmark ‘AAA-1’. All 2011, 2012 and 2013 holes were surveyed in the UTM NAD83 zone 4N datum coordinate system. The 2017 collar locations were surveyed using a hand-held GPS. These collars will be surveyed with a differential GPS unit in 2018.

10.5 Down-Hole Surveys

Approximately one half of the drill holes in the database have associated down-hole surveys. On a core-length basis, this represents approximately 71% of the drilling, as the more recent holes, which typically have down-hole surveys, tend to be longer compared to the historic drilling.

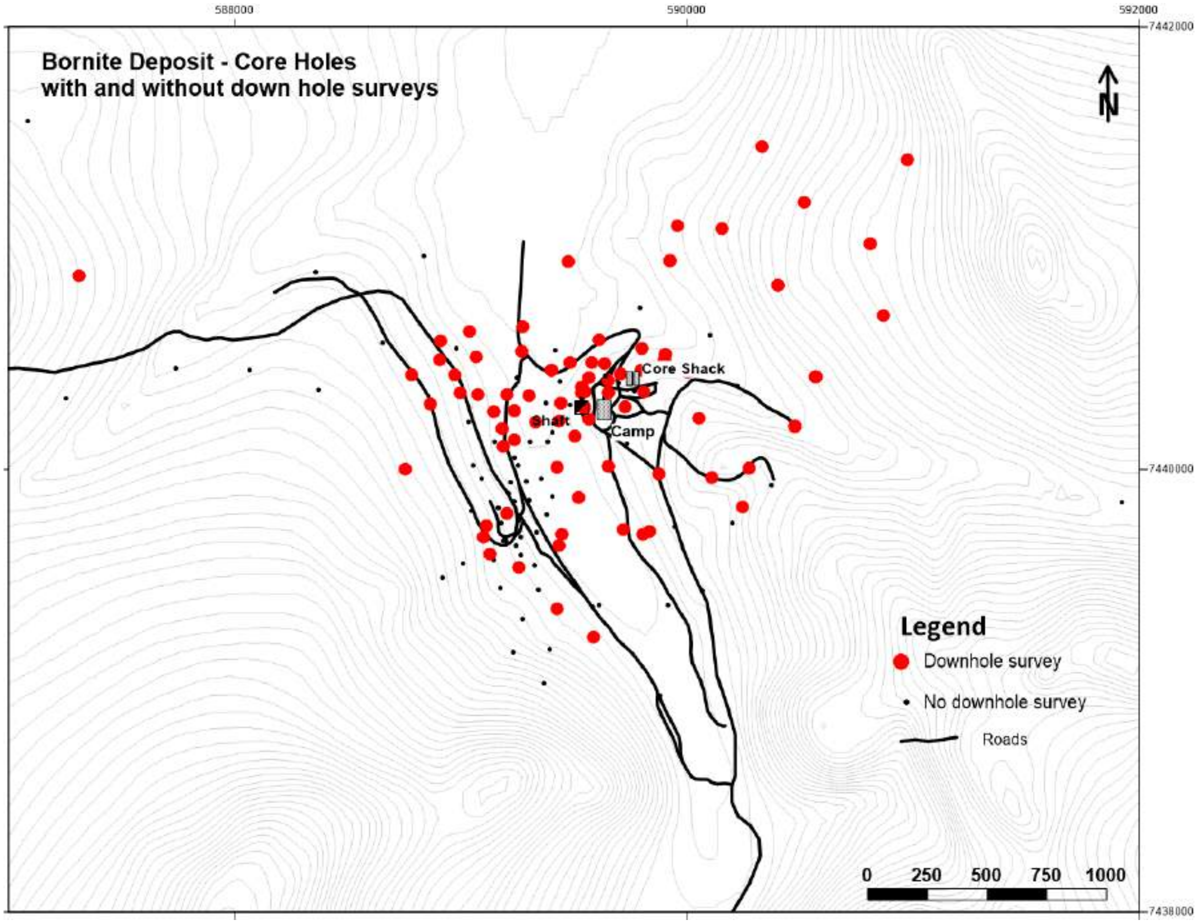
Since 1961, Sperry-Sun single shot surveys were conducted on drill holes that encountered significant mineralization. Drill holes with marginal mineralization were often not surveyed. In 1961, Kennecott attempted to conduct down-hole surveys in holes drilled in 1959 and 1960. Of the 51 underground holes, only 11 are surveyed. From 1968 through 1997, down-hole surveys were sporadic. The first six holes of the 1968 campaign, and all holes drilled in 1971 and 1997 were not surveyed.

Four Kennecott drill holes at South Reef that were never surveyed have been assigned projected deviations based on nearby (surveyed) holes (down-hole surveys have been assigned to holes RC-96, RC-95, RC-99 and RC-163). The resulting locations of mineralized intervals in these drill holes mesh better with the overall geologic interpretation of the deposit.

Many of the Kennecott holes in the Ruby Creek are relatively short and, therefore, deviation is not a significant issue. In the deeper drilling at South Reef, Trilogy Metals has appropriately used implied deviations based on local experience. It is felt that the lack of down-hole survey data in some of the Kennecott drill holes does not have a material effect on the estimation of mineral resources at Bornite.

NovaGold (in 2011) and Trilogy Metals (in 2012, 2013, and 2017) completed down-hole surveys of all of their drill holes using a Reflex Easy-Shot instrument. The 2011 and 2017 holes were surveyed every 30 m, and the 2012 and 2013 holes were surveyed every 45 m. Figure 10-3 shows surface drill holes with down-hole survey data.

Figure 10-3: Surface Drilling with Down-Hole Surveys (Trilogy Metals, 2018)



11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 SAMPLE PREPARATION

The sampling procedures are described in Section 10 of this report. Once drill core was sawed, one half was retained for future reference and the other half was sent to ALS Minerals (formerly ALS Chemex) in Vancouver for analyses.

Shipment of core samples from the Bornite camp occurred whenever backhaul capacity was available on the chartered aircraft, which was generally 5 to 6 days a week. Rice bags, containing two to four individual poly-bagged core samples, were marked and labeled with the ALS Minerals address, project name (Bornite), drill hole number, bag number, and sample numbers enclosed. Rice bags were secured with a pre-numbered plastic security tie, assembled into loads for transport by chartered flights on a commercial airline to Fairbanks, and directly delivered by a contracted expeditor to the ALS Minerals preparation facility in Fairbanks. In addition to the core samples, control samples were inserted into the shipments at the approximate rate of one standard, one blank and one duplicate per 17 core samples:

- Standards: four to five certified standards were used each year at the Bornite Project. Standard reference material was purchased from a commercial supplier (CDN located in Vancouver BC). Standards were "blindly" incorporated into the sample sequence. When required, the core cutter inserted a sachet of the appropriate standard, as well as the sample tag, into the sample bag.

- Blanks: were composed of un-mineralized marble drill core from an abandoned hole, which was split to mimic a regular core sample. Blanks were also incorporated "blindly" into the sample sequence. When required, the core cutter inserted about 150 g of blank, as well as the sample tag, into the sample bag.

- Duplicates: the assay laboratory was instructed to split the sample and run both splits as two separate samples. The core cutter inserted a sample tag into an empty sample bag.

Samples were logged into a tracking system on arrival at ALS Minerals, and weighed. Samples were then crushed, dried, and a 250 g split was pulverized to greater than 85% passing 75 µm.

Table 11-1: Standard Reference Materials Used by Year

2011	2012	2013	2014	2017
Std-ME09	CDN-ME-09	CDN-ME-09	CDN-ME-09	CDN-ME-09
Std-OREAS-111	CDN-ME-18	CDN-ME-18	CDN-ME-1201	CDN-ME-1208
Std-OREAS-75a	GBMS304-5	OREAS-24b	CDN-ME-1210	CDN-ME-1409
Std-OREAS-90	STd-OREAS-90	OREAS-92	OREAS-24b	GBM 911-11
		Std-OREAS-90		OREAS-165
				OREAS-24b

11.1.1 Density Determinations

Density determinations were not conducted by BCMC/Kennecott on any of the older drill holes. Trilogy Metals has conducted SG measurements on some select historic drill holes during the 2013 and 2014 re-sampling programs.

In total, 5,366 valid SG determinations were collected during 2011, 2012 2013, and 2014, ranging from 2.12 to 4.94. NovaGold and Trilogy Metals geologists collected "full-assay-width" SG determinations from available historic split core and NovaGold/Trilogy Metals whole core. The samples averaged 2.01 m in length and were collected continuously within mineralized zones estimated as having ≥ 1% chalcopyrite ($CuFeS_2$) or its equivalent copper content (0.3% Cu). In un-mineralized zones, samples were collected every 10 to 15 m. A digital Intell-Lab Balance was utilized to determine a weight-in-air value for dried core, followed by a weight-in-water value. The wet-value was determined by submerging the entire assay interval within a wire basket into a water-filled tote. The SG value was then calculated using the following formula:

$$\frac{\text{Weight in air}}{[\text{Weight in air} - \text{Weight in water}]}$$

Samples were not sealed with wax prior to measuring the weight-in-water. There is relatively little porosity evident in the rocks at Bornite and, as a result, this is not considered to be a significant factor in determining density measurements. The density measurements appear to be appropriate for a deposit of this type.

11.2 Security

Security measures taken during historical Kennecott and BCMC programs are unknown to Trilogy Metals; however, Trilogy Metals is not aware of any reason to suspect that any of these samples have been tampered with. The 2011 to 2013 samples were either in the custody of NovaGold or Trilogy Metals personnel or the assay laboratories at all times, and the chain of custody of the samples is well documented.

11.3 ASSAYING AND ANALYTICAL PROCEDURES

The laboratories used during the various exploration, infill, and step-out drill analytical programs completed on the Bornite Project are summarized in Table 11-2.

Gold assays in 2011 and 2012 were determined using fire analysis followed by an atomic absorption spectroscopy (AAS) finish; gold was not analyzed in 2013 or 2014. The lower detection limit was 0.005 ppm gold; the upper limit was 10 ppm gold. An additional 48-element suite was assayed by inductively coupled plasma-mass (ICP-MS) and atomic emission spectroscopy (ICP-AES) methodologies, following a four acid digest. Over limit (>1.0%) copper and zinc analyses were completed by atomic absorption (AA), following a four acid digest.

ALS Minerals has attained International Organization for Standardization (ISO) 9001:2000 registration. In addition, the ALS Minerals laboratory in Vancouver is accredited to ISO 17025 by Standards Council of Canada for a number of specific test procedures including fire assay of gold by AA, ICP and gravimetric finish, multi-element ICP and AA assays for silver, copper, lead and zinc. Trilogy Metals has no relationship with any primary or check assay labs utilized.

Table 11-2: Analytical Laboratories Used by Operators of the Bornite Project

Laboratory Name	Laboratory Location	Years Used	Accreditation	Comment
Unknown	Unknown	Pre-2011, specific years unknown	Unknown	
ALS Analytical Lab	Fairbanks, Alaska	2011 2012 2013 2014 2017	In 2004, ALS Chemex held ISO 9002 accreditations but changed to ISO 9001 accreditations in late 2004. ISO/International Electrotechnical Commission (IEC) 17025 accreditation was obtained in 2005.	2011, 2012 and 2013 Primary Assay Lab, 2014 & 2017 Prep-Lab Facility
ALS Analytical Lab	Vancouver, BC	2011 2014 2017	In 2004, ALS Chemex held ISO 9002 accreditations but changed to ISO 9001 accreditations in late 2004. ISO/International Electrotechnical Commission (IEC) 17025 accreditation was obtained in 2005.	2011 Secondary Check Sample Lab 2014 & 2017 Primary Assay Lab

Laboratory Name	Laboratory Location	Years Used	Accreditation	Comment
Acme Analytical Laboratories Ltd. (Acme Labs)	Vancouver, BC	2012 2013 2015 2017	Since inception in 1971, AcmeLabs® has been recognized as one of the leading geochemical and assaying laboratories to geologists and stock exchanges world-wide. Hold ISO 9001 and ISO/IEC 17025:2005 accreditations	2012 and 2013 Secondary Check Sample Lab and DPG soil geochemistry
SGS	Vancouver, BC	2014 2017	ISO/IEC 17025 Scope of Accreditation	2014 & 2017Secondary Check Sample Lab

11.4 QUALITY ASSURANCE/QUALITY CONTROL

11.4.1 CORE DRILLING SAMPLING QA/QC

Previous data verification campaigns are described in the “Technical Report for the Bornite Deposit, South Reef and Ruby Creek Zones, Northwest Alaska, USA” (Trilogy Metals, 2013).

During 2012, 2013 and 2014, Trilogy Metals staff performed continuous validation of the drill data; both while logging was in progress and after the field program was complete (West, 2013; Morris, 2014). Trilogy Metals also retained independent consultant Caroline Vallat, P.Geo. of GeoSpark Consulting Inc. (GeoSpark) to: 1) import digital drill data to the master database and conduct QA/QC checks upon import, 2) conduct a QA/QC review of paired historical assays and Trilogy Metals 2012, 2013 and 2014 re-assays; 3) monitor an independent check assay program for the 2012, 2013 and 2014 campaigns; and 4) generate a QA/QC report for the 2012, 2013 and 2014 campaigns along with a 2017 review of the cobalt data. Below is a summary of the results and conclusions of the GeoSpark QA/QC review.

TRILOGY METALS QA/QC REVIEW ON HISTORICAL ANALYTICAL RESULTS

The 2014 re-logging and re-sampling of the Bornite drill core has added a substantial amount of sample assays to the database, and in addition has provided new assays covering previously analyzed intervals of the drill core. Similar re-sampling also took place during the 2012 and 2013 exploration programs at the Bornite Project.

A detailed review of the 2012, 2013 and 2014 re-assay analytical results compared to the historic analytical results for copper has provided insight into the reliability and potential bias within the original, historic results. Looking at the scatter and difference plots related to the re-sample copper assays shows overall no significant bias, whereby variation at higher sample grade is likely attributable to the nature of the mineralization at the project.

QA/QC Review on Trilogy Metals (2011 to 2014) Analytical Results

GeoSpark has conducted a series of QA/QC reviews on the NovaGold and Trilogy Metals Bornite Project 2011, 2012, 2013, 2014, and 2017 analytical results. These QA/QC reviews serve to infer the accuracy and precision of the analytical assay results through examination of duplicate, standard, and blank control samples.

QA/QC Report For Bornite Project, Cobalt Assays Reported From 2011 to 2017

GeoSpark conducted a QA/QC review of all NovaGold and Trilogy era Co analyzes used in the 2017 Co resource update. The review of control samples, duplicate sample pairs, and secondary lab check duplicates shows overall very good quality for cobalt results within the 2011 to 2017 Bornite Project assay database.

The QA/QC reviews are documented in a series of memos (Vallat 2012, 2013a, 2013b, 2014, and 2017). The reviews are summarized in the following subsections by year of campaign.

2011

The 2011 exploration program QAQC was monitored by NovaGold. GeoSpark saw no indication of significant assay quality deficiency.

2012

The 2012 exploration program at the Bornite Project included the drilling of 20 new drill holes (RC12-0195 to RC12-0215w) and a re-sampling and re-assaying program on 9 historic drill holes. The 2012 sampling amounted to 6,764 samples covering 14,818.63 m.

The review of the control sample analytical results indicates assay results of sufficient quality to adequately represent the drill hole results for the Bornite Project.

2013

The 2013 exploration program at the Bornite Project included the drilling of 17 new drill holes (RC13-0217 to RC13-0233) and a large re-sampling and re-assaying program on 33 historic drill holes (31 prefixed RC and 2 prefixed NANA). The 2013 sampling amounted to 9,045 samples covering 18,656.71 m.

The review of the control sample analytical results indicates assay results of sufficient quality to adequately represent the drill hole results for the Bornite Project.

2014

The 2014 exploration program at the Bornite Project included a large re-sampling and re-assaying program on 37 historic drill holes. Of the 5,819 submitted samples, 5,134 (11,149 m) were from previously un-sampled and un-assayed drill core. The remaining

685 samples (1,503 m) were from drill core that was previously sampled by Kennecott and sent for re-assaying to confirm results.

The review of the control sample analytical results indicates assay results of sufficient quality to adequately represent the drill hole results for the Bornite Project.

2017

The 2017 exploration program at the Bornite Project included the drilling of 9 new drill holes (RC17-0234 to RC13-0242). The 2017 sampling amounted to 2,846 samples covering 5,177.88 m.

The review of the control sample analytical results indicates assay results of sufficient quality to adequately represent the drill hole results for the Bornite Project.

11.4.2 Density Determinations QA/QC

QA/QC review of the 2011, 2012, 2013, and 2017 SG determinations for the Bornite Project were conducted by Trilogy Metals staff and are documented in a series of memos. Where SG determinations have matching assay from/to intervals, a stoichiometric check was completed (West, 2014). The 2011 and 2012 wet/dry measurements compare well with the stoichiometrically estimated values. In addition, extreme SG determinations (below 2.0 and above 5.0) were flagged and evaluated individually by the project geologist.

11.5 11.5 Author's Opinion

BDRC and SGI believe the database meets or exceeds industry standards of data quality and integrity. They further believe the sample preparation, security, and analytical procedures are adequate to support resource estimation.

12.0 DATA VERIFICATION

12.1 VERIFICATIONS BY BD RESOURCE CONSULTING, INC. AND SIM GEOLOGICAL INC. (2011-2015)

Bruce Davis, FAusIMM, BD Resource Consulting, Inc., examined a series of randomly selected drill core intervals from the Ruby Creek and South Reef zones during his site visits in July 2011, September 2012, and August 2015. In all cases, the type and content of observed copper-bearing minerals supported the copper grades found in the Bornite Project database.

Following the generation of the South Reef resource model in 2012, Robert Sim, P.Geo., SIM Geological Inc., randomly selected four Trilogy Metals-era drill holes for manual validation. The collar, survey, and assay information for these holes in the electronic database was checked against original data sources and no significant errors or differences were found.

Following the completion of the 2013 resource model, an additional 5 holes drilled by Trilogy Metals during the recent program, were randomly selected for validation purposes. Once again, no significant errors or differences were found.

During the summer of 2014, Trilogy Metals added some additional samples to the database collected from previously un-sampled core intervals drilled by Kennecott.

Following the generation of the cobalt resource estimates presented in this report, 7 holes (representing about 5% of the database) were randomly selected and the copper and cobalt grades were manually compared to the certified assay certificates. No significant errors were found.

12.2 CONCLUSIONS

Bruce Davis and Robert Sim have reviewed Trilogy Metals' drilling and sampling procedures and confirm that they follow accepted industry standards. The accuracy and precision of all Trilogy Metals samples have been maintained through the application of a QA/QC program that follows accepted industry standards. Trilogy Metals has conducted a series of validation checks that exhibit a reasonable degree of confidence in the location and assay results from the older Kennecott drill holes.

Given the assay check results, the review of the drilling and core sampling, and the comparison of certificates to the electronic database, the sample assay data are within acceptable limits of precision and accuracy to generate a mineral resource estimate.

BDRC and SGI believe the database has been generated using accepted industry standards and the contained data are sufficient for the estimation of Indicated and Inferred mineral resources.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 METALLURGICAL TEST WORK REVIEW

13.1.1 INTRODUCTION

Metallurgical studies were conducted in 1961, 2012 and 2017 with metallurgical test work campaigns undertaken at the Kennecott Research Centre (KRC), ALS Metallurgy (Kamloops) and SGS (Vancouver). Studies to date are limited to the extraction of copper from the rocks at Bornite. There have been no studies to date that evaluate the process characteristics of the cobalt mineralization present at the Bornite deposit.

13.1.2 HISTORICAL TEST WORK REVIEW

In 1961, Kennecott collected 32 coarse reject samples from five drill holes (RC-34, RC-54, RC-60, RC-61, and RC-65) to support preliminary metallurgical test work at Bornite. Samples targeted high-grade (> 10%) copper mineralization from the Upper Reef Ruby Creek zone ("No.1 Ore Body") (BCMC, 1961).

All sample intervals, in total weighing approximately 68 kg (150 lbs), were composited using weighted compositing methodology. Prior to compositing, each sample was crushed and screened to pass a 10-mesh screen. The composite sample assayed 13.9% Cu.

Locked-cycle laboratory test work suggested that 97.64% of the copper was recoverable in a concentrate assaying 43.90% copper. Fine grinding to 5% passing +200-mesh was required to obtain the liberation of copper minerals from pyrite necessary for such a high recovery. Mineralogical test work on the composite sample showed high-grade mineralization of the "No.1 Ore Body" is dominated by bornite with subordinate chalcocite and chalcopyrite.

It is not known whether the test work conducted by Kennecott used samples representative of the various types of high-grade mineralization, or whether any deleterious elements were encountered during the tests.

13.1.3 METALLURGICAL TEST WORK - TRILOGY METALS

INTRODUCTION

In 2012, Trilogy Metals contracted ALS Metallurgy of Kamloops, BC to conduct preliminary sample characterization and flotation test work on samples produced from South Reef zone mineralization of the Bornite Deposit. To the extent known, the samples are representative of the styles and types of South Reef zone mineralization and do not represent proposed open pit recoverable resources at the Ruby Creek zone. The test work program at ALS Metallurgy was based on traditional grinding and flotation test work aimed at producing saleable copper concentrates. Copper recovery test work was conducted using an assumed process flowsheet.

A detailed report was prepared by ALS Metallurgy entitled; "Metallurgical Assessment of the Bornite Deposit" dated June 30, 2013. The results of this report are summarized as follows.

In 2013, Trilogy Metals drilled two holes (RC13-232 and RC13-234) specifically to collect materials for metallurgical test work in the Ruby Creek zone. In 2016, Trilogy Metals contracted SGS of Vancouver, BC to conduct detailed metallurgical test work on these same samples that represent lower-grade mineralization that is potentially amenable to open pit extraction methods. . This test work followed the preliminary flowsheet and process options outlined in the 2012 test work and included traditional grinding and flotation process simulation to produce a saleable copper concentrate. A report entitled "An Investigation into comminution and flotation studies of Samples from Bornite project" was issued on December 11, 2017.

Test Samples

The 2012 test program used 71 individual drill core sample intervals totaling 262 kg from the Bornite Deposit. Individual samples were combined into four composites, which were prepared to represent a range of copper grades (0.5 – 1.0 % Cu, 1.0 – 2.0 % Cu, 2.0 – 10.0 % Cu, and > 10.0 % Cu). The samples were obtained from drill holes completed in 2012 in the South Reef zone and typically represent high grade materials located between 400 and 600 m below surface.

The 2016 test work program at SGS prepared 5 major composite samples (Development Composites) from two drill holes, for use in detailed flotation test work. As well, 15 variability samples were prepared as sub-samples for use in grinding test work from this same drill core.

The chemical composition of the various metallurgical test composites used in flotation test work are summarized in Table 13-1.

Table 13-1: Summary of Chemical Analysis of Metallurgical Composites used in Flotation

Sample	Cu %	CuOx %	CuCN %	Fe %	S %	Zn %	Au g/t	Ag g/t
2012 Samples (ALS)								
Composite 0.5 – 1.0	0.65	0.04	0.08	4.9	2.04	0.02	0.01	<1.0
Composite 1.0 – 2.0	1.21	0.07	0.31	4.9	3.29	0.01	0.01	1.0
Composite 2.0 – 10.0	4.04	0.28	2.21	11.6	13.9	0.70	0.12	1.0
Composite > 10.0	17.3	0.41	6.60	14.6	18.1	0.71	0.24	13.0

2016 Samples(SGS)								
Dev. Composite 1	1.11	-	-	7.72	8.29	0..21	0.02	<0.02
Dev. Composite 2	0.91	-	-	5.97	4.91	0.11	0.05	<0.02
Dev. Composite 3	0.91	-	-	6.01	4.87	0.1	0.03	<0.02
Dev. Composite 4	1.45	-	-	10.4	11.6	0.09	0.04	<0.02
Dev. Composite 5	1.00	-	-	9.12	10.2	0.16	0.03	0.04

Sample Hardness Test Results

Various composite samples from both 2012 and 2016 samples were subject to a Bond Ball Mill Work Index determination and the results are summarized in Table 13-2. Based on these results, the Bornite materials can be considered to be soft or easily ground in traditional grinding mills. The classification size used in the test work was 150 microns.

Table 13-2: Summary of Bond Ball Mill Work Index Determinations

Sample	Bond Ball Mill Work Index kWhr/tonne
2012 Samples(ALS)	
Composite 0.5 – 1.0	10.9
Composite 1.0 – 2.0	8.5
Composite 2.0 – 10.0	9.7
Composite > 10.0	9.9
2017 Samples(SGS)	
Var. Composite 1	9.4
Var. Composite 2	9.9
Var. Composite 3	10.8
Var. Composite 4	9.1
Var. Composite 5	8.8
Var. Composite 6	9.9
Var. Composite 7	9.6
Var. Composite 8	10.3
Var. Composite 9	9.4
Var. Composite 10	9.7
Var. Composite 11	10.0
Var. Composite 12	10.4
Var. Composite 13	9.7
Var. Composite 14	10.1
Var. Composite 15	10.1

MINERALOGICAL INVESTIGATION

ALS Metallurgy (Kamloops) completed mineralogical studies on each of the four metallurgical composites to determine targets for grinding and liberation requirements prior to the start of flotation test work. SGS also completed detailed mineralogical analysis of 15 variability samples and observed similar conclusion in terms of liberation requirements and mineral textures in the Bornite sample materials.

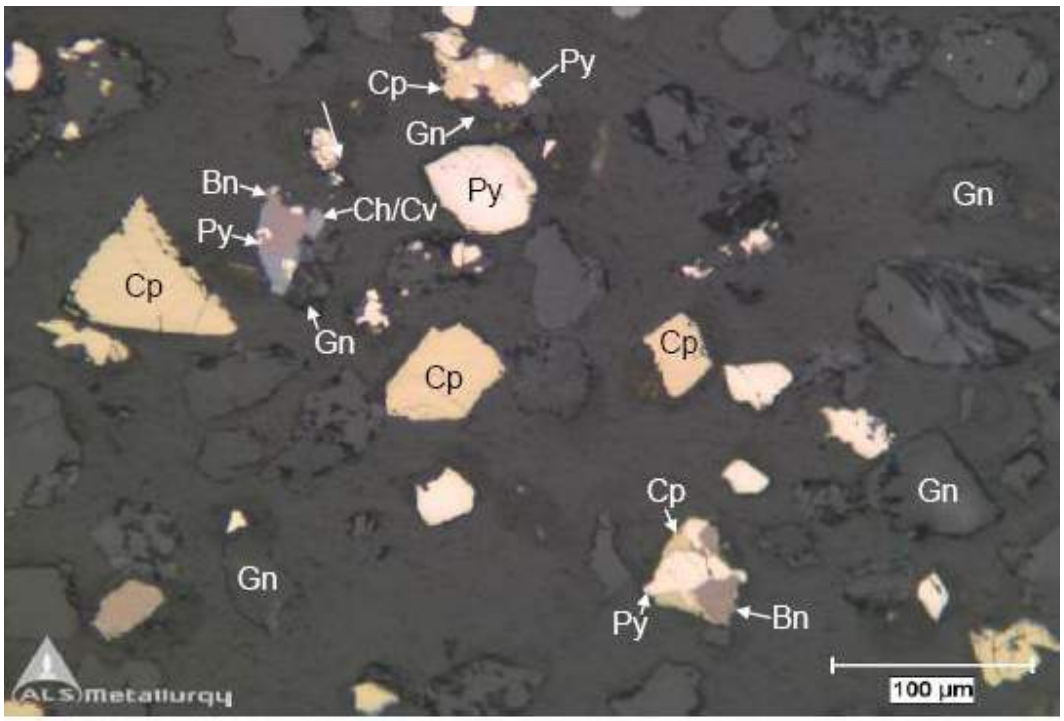
In summary, the Bornite materials require grinding to approximately 100 microns to achieve liberation targets supporting a rough flotation stage in order to maximize the recovery of copper.

Re-grinding of copper rougher flotation concentrates requires fine grinding in the range of 10 to 20 microns in order to achieve liberation targets for final concentrate production.

A typical photomicrograph of the 1.0 - 2.0 % composite from the 2012 ALS Metallurgical test program is shown below in Figure 13-1. Shown within the photomicrograph are typical liberated copper minerals as well as somewhat complex chalcopyrite/pyrite/bornite multiphase particles.

It should be noted that higher grade materials contain significant concentrations of bornite, chalcocite and covellite which may lead to the production of higher than average copper concentrates when the flotation process is finally optimized.

Figure 13-1: Typical Grain Size Distribution Observed at the Bornite Deposit (Trilogy, 2018)



*Cp-Chalcopyrite, Bn-Bornite, Ch/Cv-Chalcocite/Covellite, Py-Pyrite, Gn-Gangue.

FLOTATION TEST RESULTS

ALS Metallurgy and SGS have both provided a detailed test report outlining the results of flotation test programs. All test composites responded well to the recovery of copper minerals using the flow sheet shown in Figure 13-2. The proposed process is expected to incorporate the following key unit operations, which are industry standard:

1) Primary crushing

2) SAG milling and ball milling to approximately 100 microns

3) Rougher flotation

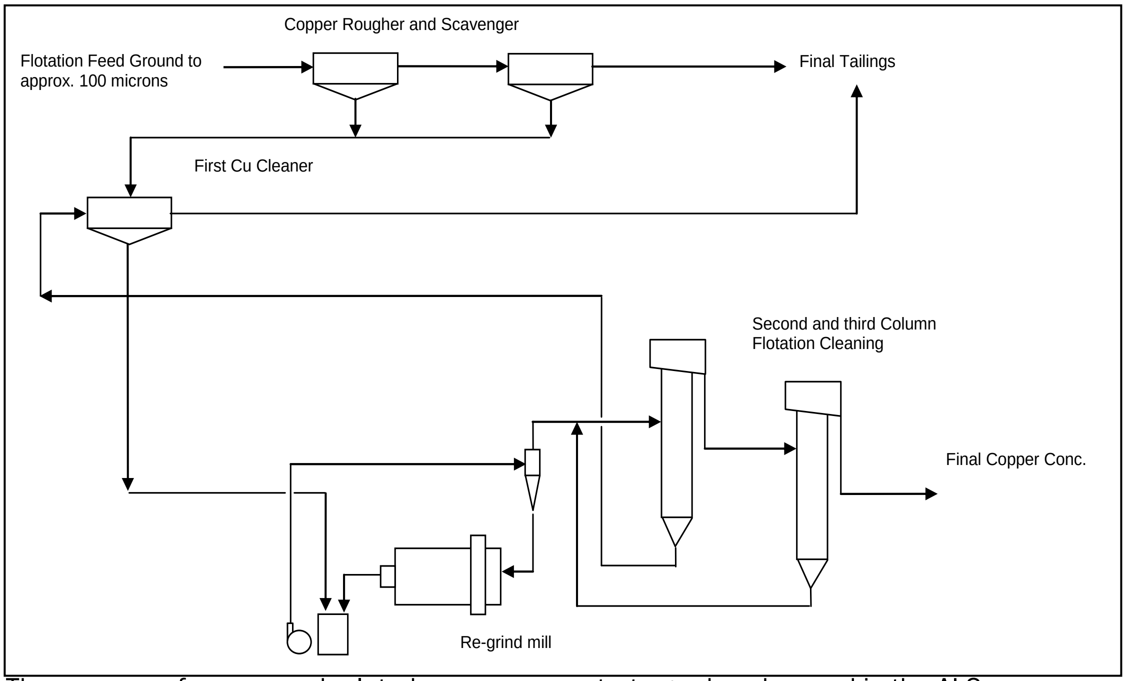
4) Rough concentrate re-grinding to approximately 10 to 20 microns

5) Flotation cleaning to produce final copper concentrates

6) Concentrate de-watering

7) Tailings deposition of tailings solids

Figure 13-2: Bornite Flotation Flowsheet



The recovery of copper and related copper concentrate grades observed in the ALS Metallurgy and the SGS test work are summarized in Table 13-3. Generally speaking, the test work conducted in the ALS Metallurgy test program was not optimized and is preliminary in terms of results. The SGS flotation test work, by comparison, is more exhaustive in terms of process optimization and these results show higher copper recoveries and better overall results.

Flotation parameters used in the test work are considered typical of a copper operation and included copper flotation collectors such as xanthates, and aerophine copper collectors. Lime was used for pH control in the flotation process.

Table 13-3: Summary of Process Simulation Test Work Results

Sample	Feed Grade % Cu	Copper Recovery %	Final Conc. Grade % Cu
2012 ALS Met.			
Composite 0.5 – 1.0	0.65	67.5	30.9
Composite 1.0 – 2.0	1.21	78.0	29.4
Composite 2.0 – 10.0	4.04	85.2	24.5
Composite > 10.0	17.3	98.0*	30.0*
2017 SGS			
Dev. Composite 1	1.11	90.4	30.3

Dev. Composite 2	0.91	87.0	24.3
Dev. Composite 3	0.91	89.7	25.6
Dev. Composite 4	1.45	91.6	33.5
Dev. Composite 5	1.00	90.9	28.0

*open circuit test result only due to high grade feed sample

Based on the preliminary test results and subsequent optimized results obtained at SGS, it is expected that copper recoveries will be 89-90 percent and copper concentrate grades will range from 26 to 28 percent copper. Concentrate Quality Targets

The four composites were each used to generate separate saleable copper concentrates during the course of flotation test work. Detailed analysis of the final concentrates was completed and the results are summarized in Table 13-4.

Table 13-4: Summary of Concentrate Analysis – Final Copper Concentrate Results

Element	Symbol	Unit	0.5 - 1 Percent Test 49 Cu Con V	1-2 Percent Test 50 Cu Con IV & V	2-10 Percent Test 51 Cu Con IV & V	>10 Percent Test 45 Cu Con
Aluminum	Al	%	0.084	0.074	0.059	0.24
Antimony	Sb	g/t	330	32	96	44
Arsenic	As	%	0.036	0.019	0.044	0.12
Bismuth	Bi	g/t	<20	<20	<20	<20
Cadmium	Cd	g/t	24	11	145	45
Calcium	Ca	%	1.41	2.02	1.66	2.26
Carbon	C	%	1.14	1.59	0.95	1.28
Cobalt	Co	g/t	290	340	2240	4460
Copper	Cu	%	30.1	29.4	24.5	31
Fluorine	F	g/t	90	80	70	150
Gold	Au	g/t	0.2	0.14	0.27	0.42
Iron	Fe	%	29.6	27.3	27	23.5
Lead	Pb	g/t	32	486	1903	92
Magnesium	Mg	%	0.51	0.79	0.65	0.96
Manganese	Mn	%	0.02	0.028	0.027	0.037
Mercury	Hg	g/t	5	3	48	41
Molybdenum	Mo	%	0.001	0.001	0.019	0.012
Nickel	Ni	g/t	76	74	312	1118
Palladium	Pd	g/t	0.12	0.08	0.05	0.07
Phosphorus	P	g/t	118	111	79	98

Platinum	Pt	g/t	0.11	0.07	0.06	0.06
Selenium	Se	g/t	<20	<20	<20	<20
Silicon	Si	%	0.18	0.18	0.13	0.45
Silver	Ag	g/t	10	10	5	25
Sulphur	S	%	35.1	34.2	37.1	31.7
Zinc	Zn	%	0.29	0.09	4.1	1.27

The concentrates are unlikely to contain payable precious metals as these appear to be below accepted splitting limits within traditional concentrate sales terms.

The concentrates are also considered to contain low levels of penalty elements and elements such as arsenic, antimony, mercury and cadmium. The concentrates will likely not incur any financial penalty under traditional sales terms. Zinc may incur a payable penalty if levels are consistently above about 3 percent zinc. It would be an added transportation expense at those levels as well. Zinc is typically not payable within copper concentrates.

Cobalt Speciation Studies

A preliminary cobalt mineral speciation investigation was undertaken by Trilogy in 2017 utilizing both the tails and concentrate test products of the 2012 and 2016 metallurgical test work. Microprobe analysis and backscatter electron mapping of the products show that the majority of cobalt (~80%) is contained within cobaltiferous while the remaining cobalt occurs within carrollite and/or cobaltite.

13.2 Recommended Test Work

Additional metallurgical test work is required to support the Bornite Project as it moves through the development process. Key areas that require additional test work are:

1. Additional sample material is needed to be tested as the resource is better defined by additional exploration. This is to better understand the potential variability (both grade and spatial variability) that may be present in the deposit. This additional test work can take the form of additional grinding and flotation test work, along the lines of the recently completed SGS work.

2. It is also recommended that dedicated metallurgical test work be undertaken to define the potential to recover cobalt from the deposit.

3. Concentrate quality should continue to be monitored in any future test work.

4. At some point, detailed test work involving settling and filtering test work will be required for concentrates and tailings produced from test work.

14.0 MINERAL RESOURCE ESTIMATE

14.1 INTRODUCTION

This section describes the generation of an updated mineral resource estimate for the Bornite Project. The mineral resource estimate has been prepared by Bruce M. Davis, FAusIMM, BD Resource Consulting, Inc. (BDRC) and Robert Sim, P.Geo., SIM Geological Inc. (SGI). Both are "Independent Qualified Persons (QPs)" as defined in NI 43-101. Trilogy Metals has filed several technical reports on the Bornite deposit, the most recent one with an effective date of April 19, 2016. During the summer of 2017, Trilogy Metals drilled seven holes testing the area down-dip continuity of the northern part of the Bornite deposit. These drill holes successfully tested the mineralized target horizon but the spacing of these holes is considered too far to support the generation of additional mineral resource estimates. As a result, the estimate of copper resources remains unchanged from those reported in April 2016.

During the period from 2011 through 2017, Trilogy implemented an expanded program of re-sampling and re-assaying for an extended suite of elements including cobalt. This report includes a description of the procedures used to estimate cobalt resources for the Bornite deposit. The effective date of the mineral resource estimate is June 5, 2018.

This section describes the resource estimation methodology and summarizes the key assumptions considered by the QPs. In the opinion of the QPs, the resource evaluation reported herein is a sound representation of the copper and cobalt mineral resources for the Bornite Project at the current level of sampling. The mineral resources have been estimated in conformity with generally accepted CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines and are reported in accordance with the Canadian Securities Administrators' NI 43-101. Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the mineral resource will be converted into mineral reserve.

The database used to estimate the Bornite Project mineral resource was audited by the QPs. The QPs are of the opinion that the current drilling information is sufficiently reliable to confidently interpret the boundaries for copper and cobalt mineralization and the assay data are sufficiently reliable to support mineral resource estimation.

The resource estimate was generated using MineSight® v12.50. Some non-commercial software, including the Geostatistical Library (GSLib) family of software, was used for geostatistical analyses.

14.2 SAMPLE DATABASE AND OTHER AVAILABLE DATA

Trilogy Metals provided the Bornite database in Microsoft™ Excel format, exported from the master (GeoSpark Core Database System) database. The files contain collar, survey, assay, lithology, and specific gravity data, and other geological and geotechnical information.

The Project database comprises a total of 243 diamond drill (core) holes totalling 86,584 m; 173 holes target the Ruby Creek zone and 45 holes target the South Reef zone. The remaining 25 holes in the database are exploratory in nature and test for satellite mineralization proximal to the Bornite Deposit or represent holes that encountered problems and were abandoned. The database contains a total of 32,138 samples that have been analyzed for copper content and 26,574 that have been analyzed for cobalt content. Most holes drilled by Trilogy Metals, plus a few select holes drilled by Kennecott, contain additional analyses for elements such as zinc, lead, gold, silver, and cobalt; at this time only copper and cobalt show any significant economic potential and the others have been excluded from the estimation of mineral resources. Note: the number and total length of drill holes here represents the database used to generate the estimate of mineral resources. These values may differ slightly from those described in Section 10 of this report.

During the 2012, 2013 and 2014 field seasons, Trilogy Metals collected samples from drill hole intervals that were never originally sampled by Kennecott. It is assumed that Kennecott never sampled these intervals because, visually, they did not exhibit the presence of high-grade copper mineralization (amenable to underground mining). In previous resource estimates, these un-sampled intervals were assigned a default grade of 0% Cu. At this stage, the majority of the core drilled by Kennecott has been sampled and analyzed for copper content. The sampling and assaying for cobalt is less extensive. Where assay data is not available, the intervals are assigned zero grade for copper (0% Cu) when the host rocks are phyllite, or they remain as “missing” when the host rocks are carbonates. There have been no adjustments made to intervals where cobalt grades are missing, resource estimates are estimated using the available sample data.

Individual sample intervals range from 3 cm to 18.48 m in length and average 2.14 m. Average sample lengths are 2.15 m at Ruby Creek and 2.20 m at South Reef.

Drill hole spacing at Ruby Creek varies from approximately 10 m to 20 m for underground holes and 50 m to 100 m or more for holes drilled from surface. All holes testing the South Reef zone are collared from surface and typically intersect mineralization at approximately 100 m to 200 m spacing.

Specific gravity (SG) measurements have been conducted on 7,016 samples in the database and range from a minimum of 2.02 to a maximum of 4.94 and average 2.88. The distribution of SG data is considered sufficient to support block model estimation.

Drill core recovery has been recorded for approximately one half of the holes at Ruby Creek and in essentially all of the South Reef drill holes. Overall, core recoveries are considered to be very good with an average of 88% for the Project. Only 8% of samples have recoveries ≤ 50% and approximately 84% of samples have core recoveries ≥ 75%. There is no apparent correlation between copper grade and drill core recovery. There have been no adjustments or omissions to the resource database in response to drill core recoveries.

Trilogy Metals provided a topographic digital terrain surface derived from a 2010 PhotoSat 1 m resolution model. Drill hole collar locations, surveyed using a differential GPS, correlate very well with the local digital terrain (topographic) surface.

The distribution of copper grades in drill holes is shown in Figure 14-1. The distribution of cobalt grades in drill holes appears in Figure 14-2. The distribution of drilling by vintage, including the re-sampling done in 2012, 2013 and 2014, is shown in Figure 14-3 and is summarized in Table 14-1.

Figure 14-1: Copper Grades in Drill Holes

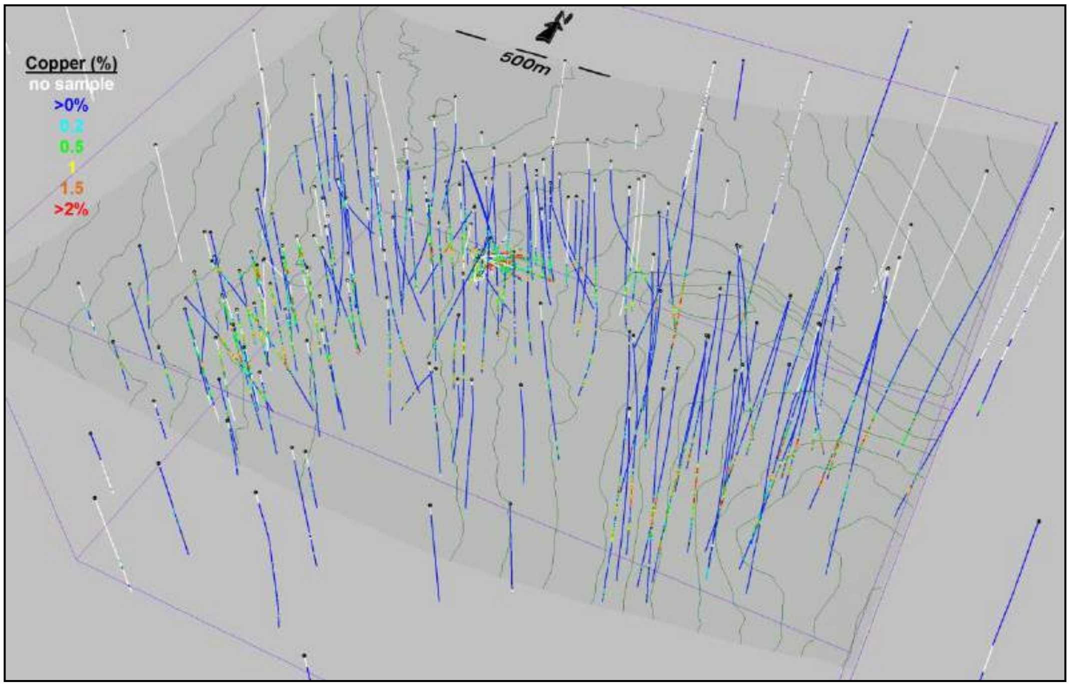


Figure 14-2: Cobalt Grades in Drill Holes

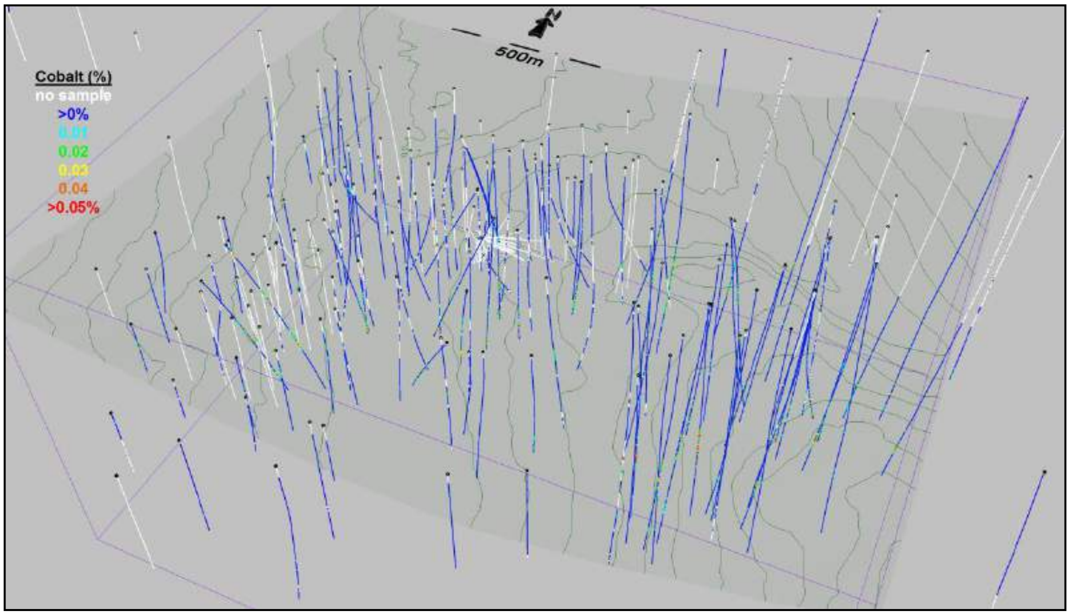


Figure 14-3: Vintage of Drilling and Sampling

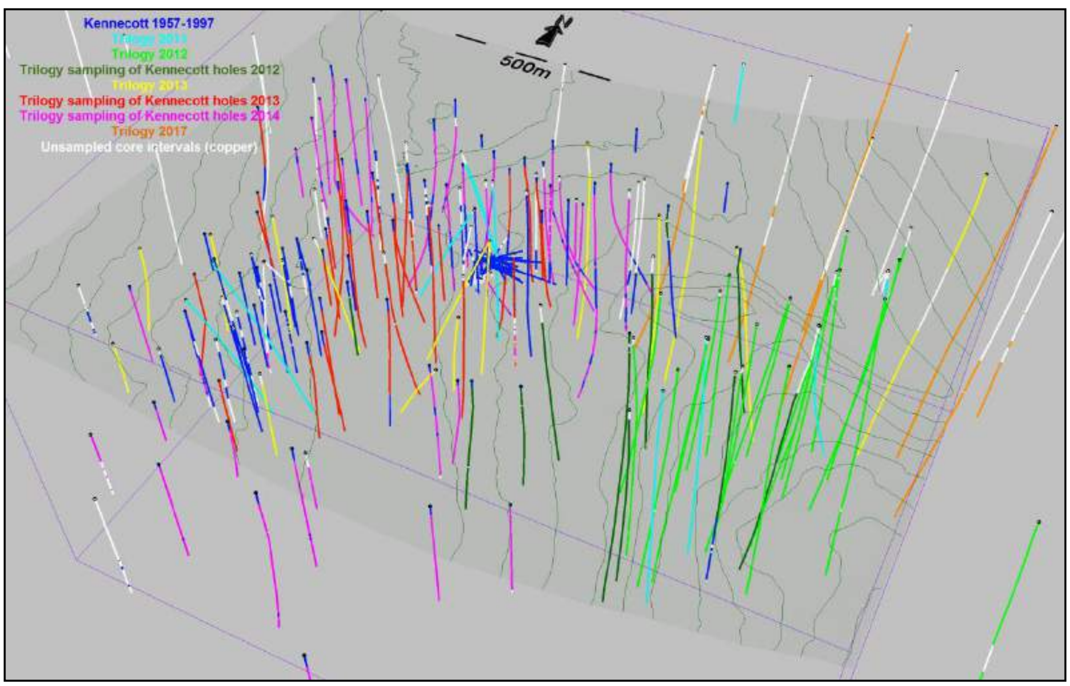


Table 14-1: Summary of Drilling Data for the Bornite Project

Company	Years	Number of Drill Holes	Number of Samples	Total Sample Length (m)
Kennecott	1957 - 1997	182	7,503	15,963
Trilogy Metals	2011	14	2,328	5,497
Trilogy Metals	2012	22	6,698	14,464
Trilogy Metals sampling of Kennecott holes	2012	11	2,148	4,743
Trilogy Metals	2013	15	3,109	6,701
Trilogy Metals sampling of Kennecott holes	2013	31	4,535	9,703
Trilogy Metals sampling of Kennecott holes	2014	41	5,060	10,965
Trilogy	2017	7	2,762	5,047

Historic drilling at the Bornite Project was conducted by Kennecott, a leading technical exploration company during its tenure, known for rigorously controlled drilling programs which typically included the insertion of quality control samples. Unfortunately, records from the Kennecott-era are incomplete and direct validation of some portions of the database cannot be made. A comparison of declustered data sets, derived from the two vintages of drilling, indicate that both the Kennecott and Trilogy Metals drilling produce essentially the same results. For validation purposes, Trilogy Metals re-sampled drill core originally sampled and analyzed by Kennecott as described in Section 11 of this report. There is no reason to believe the sample results produced during historic drilling are significantly different from those being generated by Trilogy Metals.

With the drilling completed by Trilogy Metals, plus the additional re-sampling of the historic drill core, the original Kennecott sample data represents a relatively minor proportion of the overall database. All of the historic drilling has been included in the Bornite mineral resource estimate and there have been no adjustments made to any of this historical data.

14.2.1 Geologic Model

The geologic model interpreted for the Bornite deposit consists primarily of a series of inter-bedded carbonate and phyllitic rocks that dip gently to the north and overlay a quartz-phyllite footwall. Copper and associated cobalt mineralization primarily occurs as massive, semi-massive, stringer, veinlet and disseminated accumulations of chalcopyrite, bornite and chalcocite in dolomitized portions of the sedimentary host rocks. Cobalt minerals such as carrolite and cobaltiferous rims on pyrite tend to be associated with the copper mineralization. The geologic model is comprised of 17 individual phyllite domains and 15 separate carbonate domains plus separate domains representing the hanging wall Beaver Creek phyllite, the footwall quartz-phyllite Anirak Schist and the overlying overburden. Some of the phyllite and carbonate units are continuous across the whole deposit area and others “pinch out” and are more localized. Figure 14-4 shows a general stratigraphic column of the lithologic units in the Ruby Creek and South Reef areas. Figure 14-5 and Figure 14-6 show vertical cross sections through the lithologic model in the Ruby Creek and South Reef areas, respectively.

Figure 14-4: General Stratigraphic Column for the Ruby Creek and South Reef Lithologies (Trilogy, 2016)

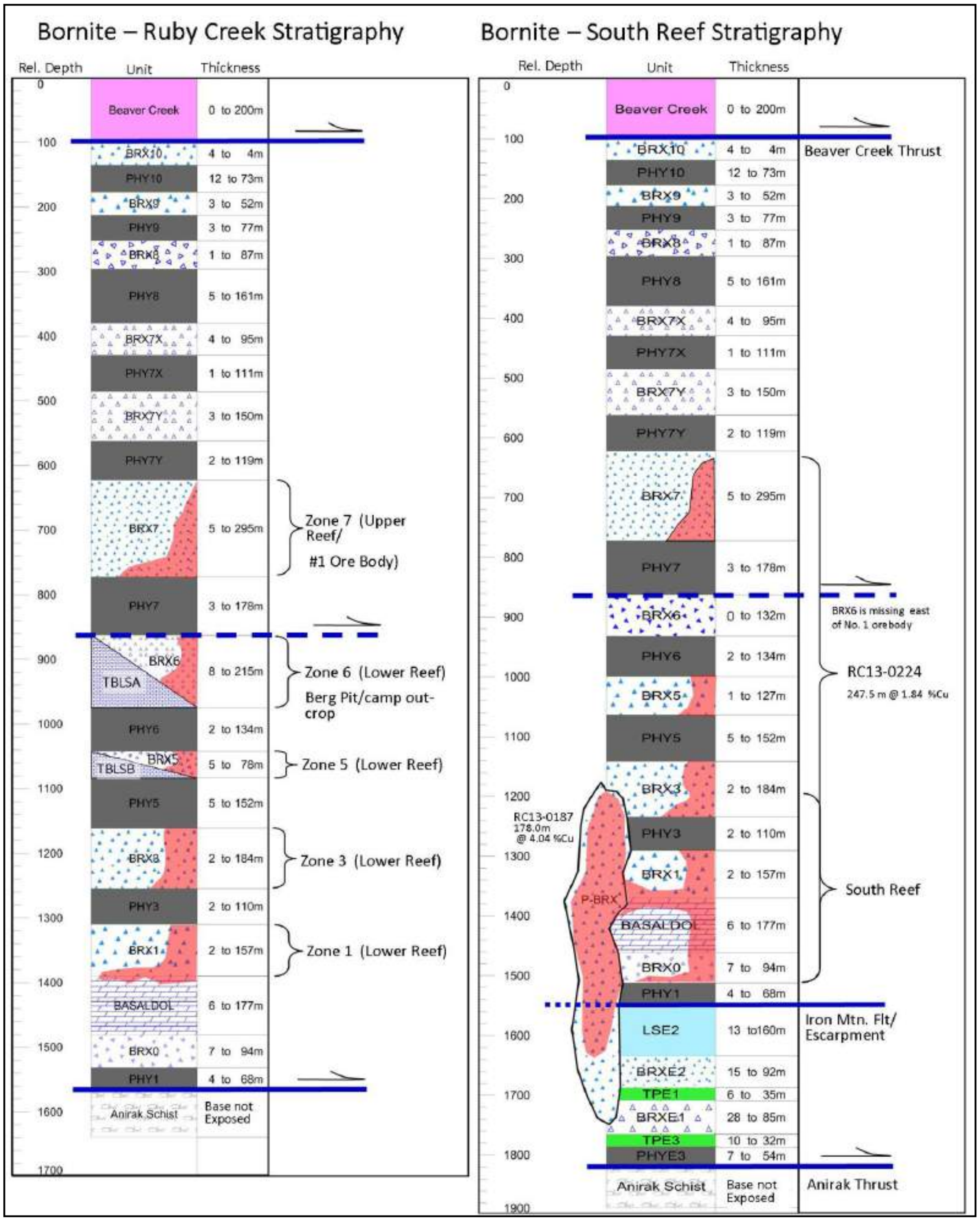


Figure 14-5: Cross Section Showing Lithology Domains in the Ruby Creek Area

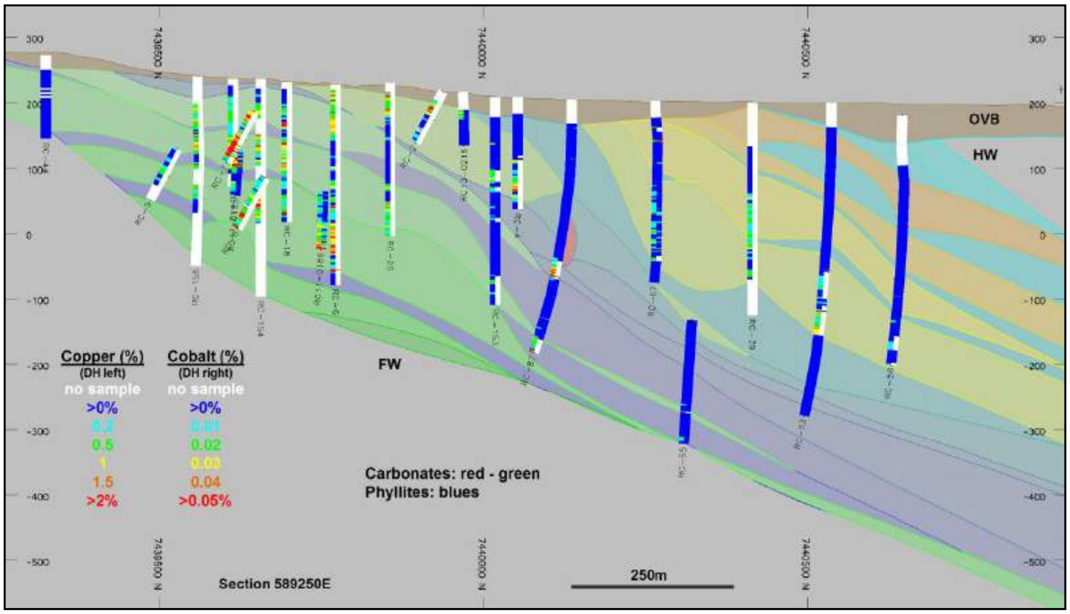
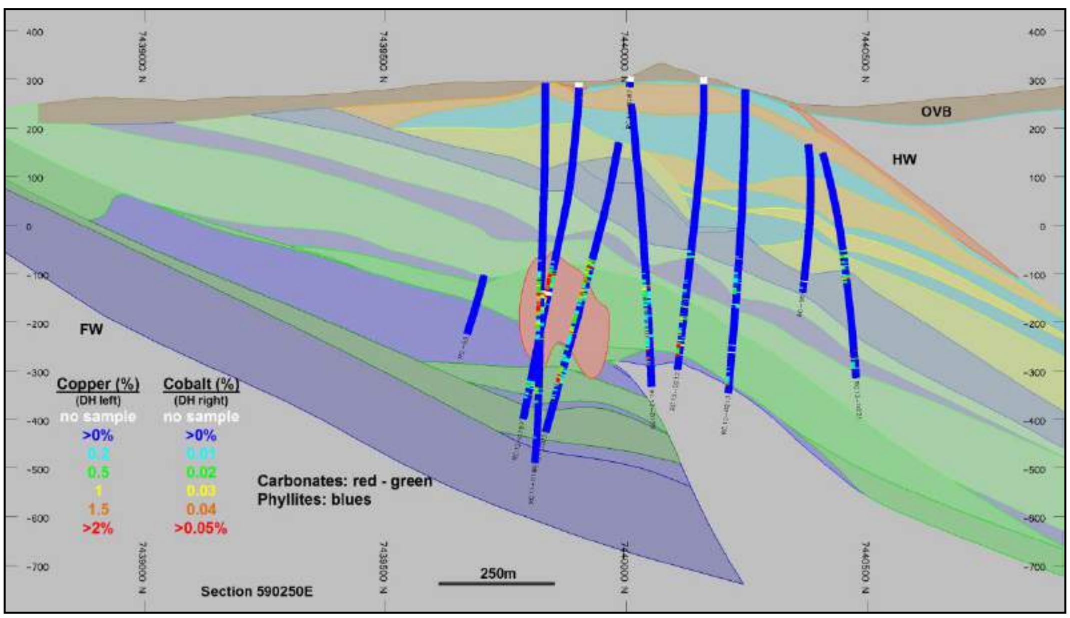
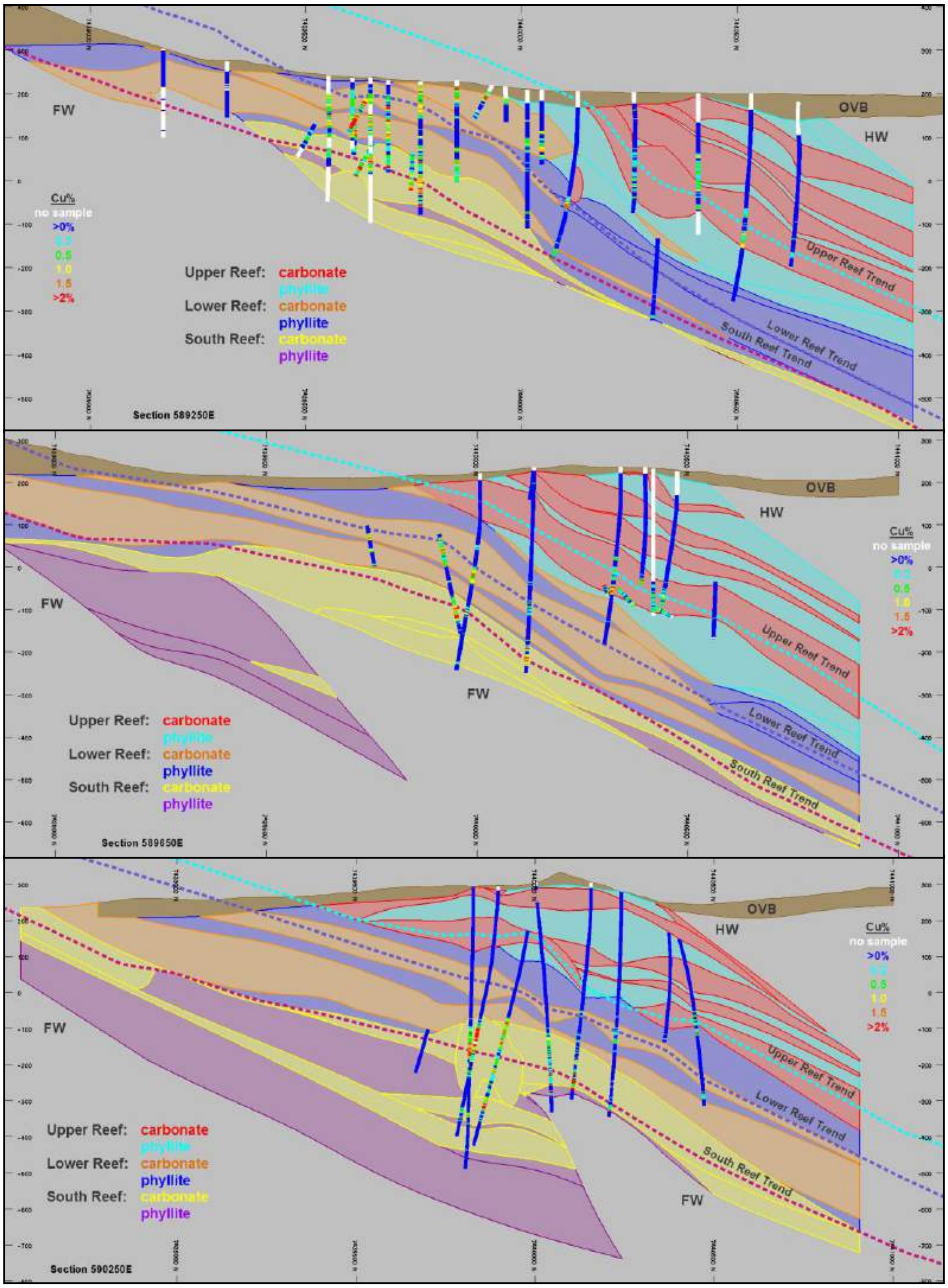


Figure 14-6: Cross Section Showing Lithology Domains in the South Reef Area



In order to replicate the stratiform nature of the mineralization in the resource model, a dynamic anisotropy approach relative to the overall trend of copper and cobalt mineralization has been applied. Three-dimensional planes are interpreted that represent the general trend of the copper mineralization, one plane for the South Reef units, one for the Lower Reef, and another for the Upper Reef lithologic units. The vertical cross sections in Figure 14-7 show the interpreted *trend planes*, shown as dashed lines, across several areas of the deposit. These trend planes are used to control search orientations during subsequent interpolations in the model. Variograms are generated using distances relative to the trend planes rather than the true sample elevations. This approach essentially flattens out the zone during interpolation relative to the defined trend plane.

Figure 14-7: Vertical Cross Sections Showing Trend Planes Used to Control Dynamic Isotropy



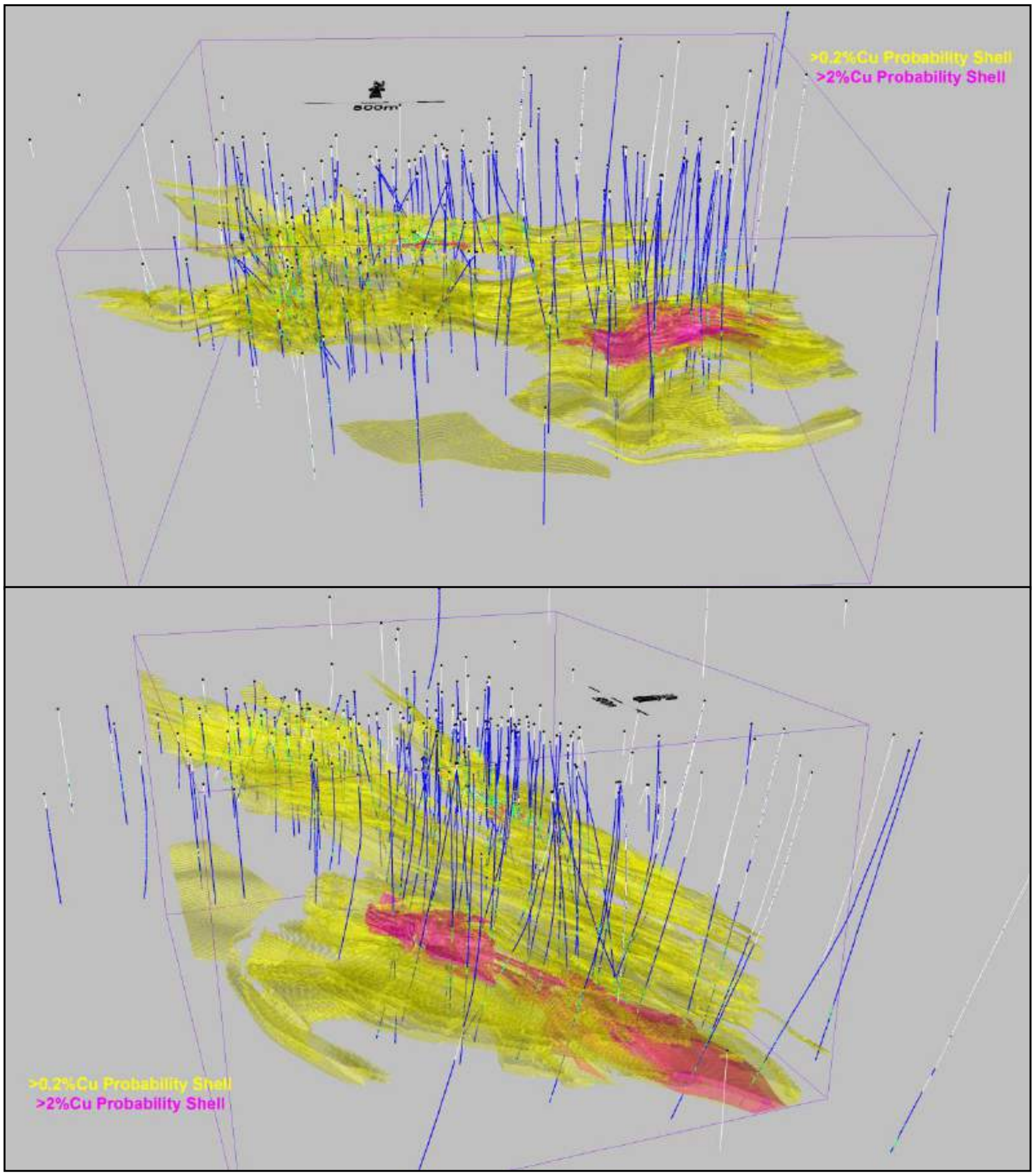
The highest grade parts of the deposit occur within areas where semi-massive and massive sulphides are present. The density of drilling is insufficient in most areas to allow for the interpretation of these massive sulphide domains and a probability shell approach is used to identify areas where higher grade mineralization is likely to occur.

Two probability shells have been generated: one at a threshold of 2% copper and another at a threshold of 0.2% copper. The 2% copper shell generally correlates with the presence of massive and semi-massive zones of bornite and chalcopyrite mineralization where the 0.2% copper shell correlates with the visual presence of chalcopyrite mineralization. Cobalt mineralization is strongly associated with both sets of copper mineralization. The higher grade shell occurs mainly in the South Reef area and is based primarily on visual observations of the distribution of sample data suggesting that a relatively continuous zone of higher grade copper mineralization occurs above a threshold grade of 2% copper. Note that approximately 90% of the sample data in the South Reef area is below 2% copper and 10% of the data is greater than 2% copper. A relatively small >2% copper probability shell is also generated in the Upper Reef area of Ruby Creek.

Approximately one half of the samples in the carbonate domains have copper grades above the lower grade threshold of 0.2% copper. This limit roughly segregates areas of “mineralized” verses “unmineralized” (including cobalt) rocks and is still below the anticipated cut-off grade of the resource, ensuring that sufficient internal dilution is retained in the resource model. There are also areas where the phyllite domains contain appreciable copper or cobalt grades (above the 0.2% copper threshold), but these tend to be rare and localized occurrences.

Indicator values are assigned to 2 m composites at the grade thresholds described here and indicator variograms are produced. Probability values are estimated in model blocks using ordinary kriging; the vertical range and locations are controlled dynamically using elevations relative to the trend planes described previously. A series of shells are generated at varying probability thresholds and compared to the distribution of the underlying sample data. The higher grade shell represents areas where there is greater than a 30% probability that the grade will be more than 2% copper. The lower grade shell envelopes areas where there is a greater than 50% probability that the grade will exceed 0.2% copper. The shape and location of the probability shells are shown in Figure 14-8. Note as shown in Section 14.4, the distribution of appreciable cobalt occurs primarily in the copper probability shells and, as a result, these are also utilized in the estimation of cobalt grades in the resource block model.

Figure 14-8: Copper Probability Shells



14.2.2 Summary of Geologic Domains

The interpreted geologic domains are summarized in Table 14-2.

Table 14-2: Summary of Lithology and Probability Shell Domains for Copper and Cobalt

Reef	Lithology Unit	DOMN	Lithology Unit	DOMN
	Carbonate domains		Phyllite domains	
Upper Reef	BRX10	214	PHY10	117

	BRX9	213	PHY9	116
	BRX8	212	PHY8	115
	BRX7x	211	PHY7x	114
	BRX7y	210	PHY7y	113
	BRX7	209	PHY7	112
			LS6,TBLSA	111
Lower Reef	BRX6	208	PHY6	110
	BRX5	207	TBLSB	109
	BRX3	206	PHY5	108
			PHY3	107
South Reef	PBRX	301	PHYL1	106
	BRX1	205	PHY1lower	105
	Basal Dol	204	LSE2	104
	BRX0lower	203	TPE1	103
	BRXE2	202	TPE3	102
	BRXE1	201	PHYE3	101
Probability Shells	2% Cu Prob Shell in South Reef and Upper Reef areas			
	0.2% Cu Prob Shell in Upper, Lower and South Reefs			

14.3 COMPOSITING

Compositing drill hole samples standardizes the database for further statistical evaluation. This step eliminates any effect the sample length may have on the data. To retain the original characteristics of the underlying data, a composite length that reflects the average, original sample length is selected: a composite that is too long can sometimes result in a degree of smoothing that can mask certain features of the data.

At Ruby Creek, the average sample length is 2.08 m and at South Reef the average is 2.20 m. As a result, a composite length of 2 m has been selected for the Bornite Deposit.

Drill hole composites are length-weighted and are generated down-the-hole, meaning composites begin at the top of each drill hole and are generated at constant intervals down the length of the hole. Composites were broken at lithology domain boundaries. Once composites were generated, probability shell codes were assigned on a majority basis. Several holes were randomly selected and the composited values were checked for accuracy. No errors were found.

14.4 Exploratory Data Analysis

Exploratory data analysis (EDA) involves statistically summarizing groups of samples to quantify the characteristics of the data. The main purpose of EDA is to determine if there is any evidence of spatial distinctions in grade; if this occurs, a separation and isolation of domains during interpolation may be necessary. An unwanted mixing of data is prevented by applying separate domains during interpolation: the result is a grade model that better reflects the unique properties of the deposit. However, applying domain boundaries in areas where the data are not statistically unique may impose a bias in the distribution of grades in the model.

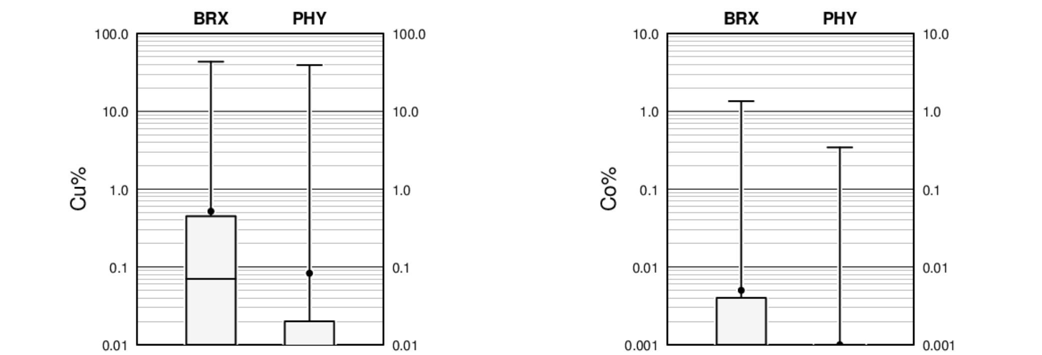
A domain boundary, which segregates the data during interpolation, is typically applied if the average grade in one domain is significantly different from that of another domain. A boundary may also be applied when there is evidence that a significant change in the grade distribution exists across the contact.

The original variable length drill hole samples have been composited to 2 m intervals prior to analysis. The interpreted wireframe domains were then used to “backtag” the composited sample data, assigning unique domain codes. The EDA described here is based on composited sample data which are segregated based on the interpreted wireframe domains. While the EDA focuses on copper, cobalt mineralization tends to be related to the copper mineralization. Cobalt is largely contained within the estimation domains developed for copper as demonstrated in the contact profile in Figure 14-20.

This EDA consists primarily of a series of boxplots and contact profiles. Boxplots summarize many aspects of the frequency distributions of the data in simple graphical displays for comparison purposes. Contact profiles evaluate the nature of grade trends between two domains: they graphically display the average grades at increasing distances from the contact boundary. The numbers beside the data points represent the amount of data averaged together at a particular separation distance. Those contact profiles that show a marked difference in grade across a domain boundary indicate that the two domain datasets should be isolated during interpolation. Conversely, if a more gradual change in grade occurs across a contact, the introduction of a hard boundary (e.g., segregation during interpolation) may result in a much different trend in the grade model; in this case, the change in grade between domains in the model is often more abrupt than the trends seen in the raw data. Finally, a flat contact profile indicates no grade changes across the boundary; in this case, hard or soft domain boundaries will produce similar results in the model.

The boxplot in Figure 14-9 shows there is a major difference between the grades in the carbonate breccias versus the phyllite domains. The contact profile, shown in Figure 14-10, shows the difference in the vicinity of the boundaries. The carbonate breccias delimit zones of higher copper and cobalt grades.

Figure 14-9: Boxplots of Total Copper and Cobalt in Carbonate Breccias and Phyllites



	BRX	PHY
Number of data	18669	13373
Mean	0.519	0.083
Variance	3.313	0.604
Skewness	11.719	32.067
Coef of Variation	3.508	9.393
Maximum	43.46	39.22
Upper quartile	0.45	0.02
Median	0.07	0.0
Lower quartile	0.01	0.0
Minimum	0.0	0.0

	BRX	PHY
Number of data	14801	11360
Mean	0.005	0.001
Variance	0.001	0.0
Skewness	23.002	42.163
Coef of Variation	4.997	3.601
Maximum	1.346	0.343
Upper quartile	0.004	0.001
Median	0.001	0.001
Lower quartile	0.0	0.0
Minimum	0.0	0.0

Figure 14-10: Contact Profiles for Total Copper and Cobalt between Carbonate Breccias and Phyllites

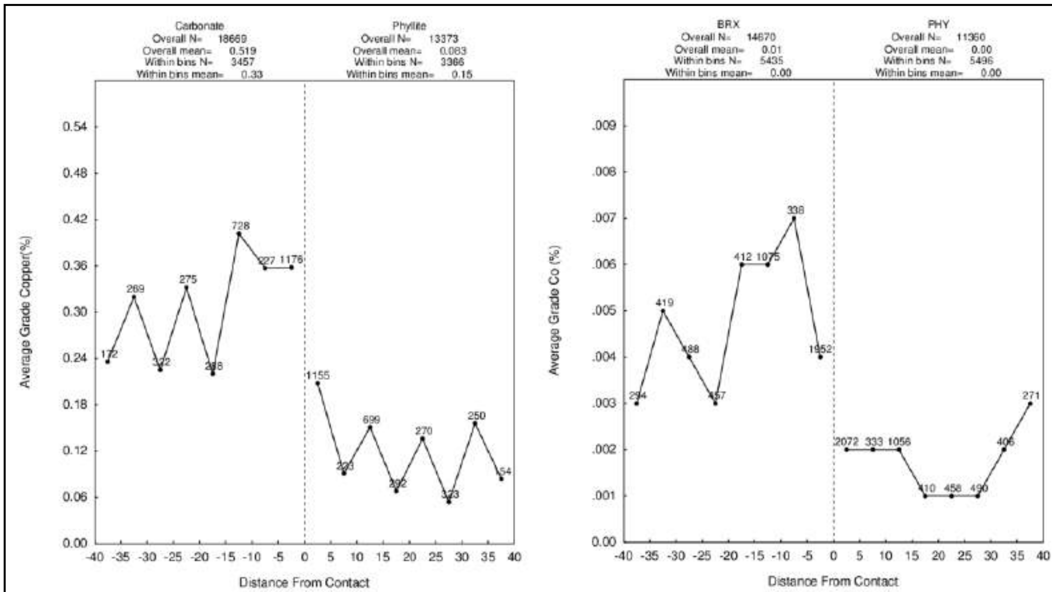
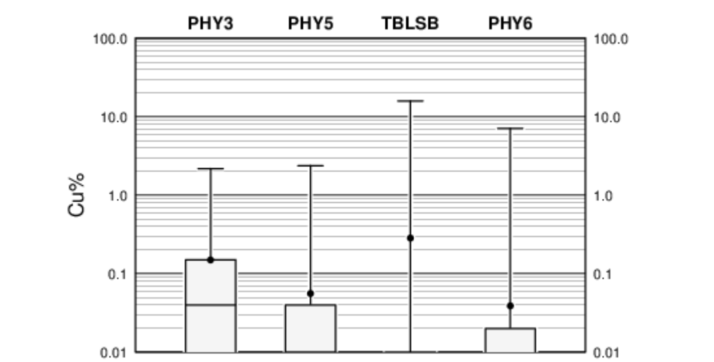


Figure 14-11 shows the boxplots for copper in the phyllites in the Lower Reef. Note that while a large majority of the sample grades fall below 0.1% copper, there are a few high-grade samples present showing that localized copper mineralization does exist in the phyllite units. This is a pattern that is also repeated in the South and Upper Reefs. The very high grades occurring in the TBLSB unit tend to be isolated and cannot be associated with high grades in other units or with any geological feature, such as structure.

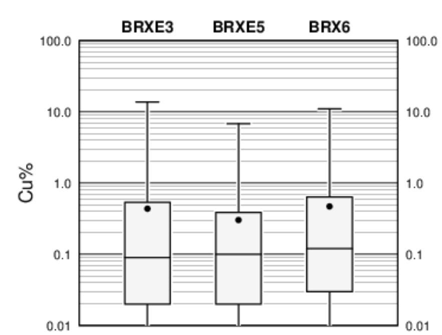
Figure 14-12 shows the copper sample grade distribution boxplots for the Lower Reef breccias. The distributions have a significantly greater number of high-grade areas than in the phyllites. The carbonate breccia domains tend to be a better host to mineralization, but, as the boxplots show, there are still volumes of lower grade within the carbonate breccia units. This pattern of breccias hosting better mineralization applies to cobalt as well as copper.

Figure 14-11: Boxplots for Copper in the Lower Reef Phyllite Do



	PHY3	PHY5	TBLSB	PHY6	
Number of data	689	2186	279	2390	Number of data
Mean	0.15	0.056	0.285	0.039	Mean
Variance	0.087	0.035	1.664	0.041	Variance
Skewness	3.5	7.332	6.614	19.902	Skewness
Coef of Variation	1.971	3.327	4.533	5.178	Coef of Variation
Maximum	2.19	2.39	15.97	7.14	Maximum
Upper quartile	0.15	0.04	0.01	0.02	Upper quartile
Median	0.04	0.01	0.0	0.0	Median
Lower quartile	0.0	0.0	0.0	0.0	Lower quartile
Minimum	0.0	0.0	0.0	0.0	Minimum

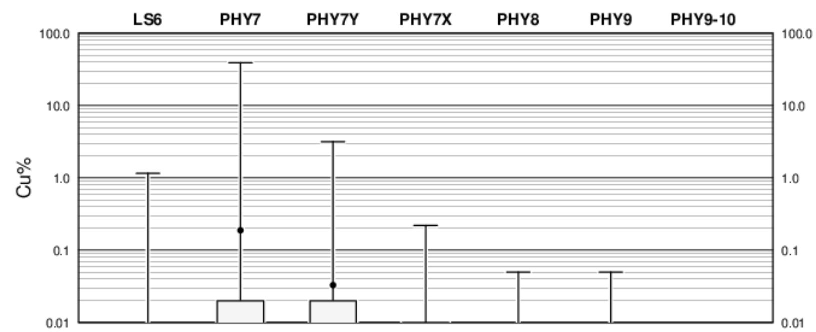
Figure 14-12: Boxplot for Copper in the Lower Reef Carbonate Breccia Domains



	BRXE3	BRXE5	BRX6	
Number of data	2756	2158	935	Number of data
Mean	0.438	0.304	0.472	Mean
Variance	0.802	0.249	0.697	Variance
Skewness	5.775	3.98	4.863	Skewness
Coef of Variation	2.047	1.641	1.769	Coef of Variation
Maximum	13.77	6.82	11.01	Maximum
Upper quartile	0.54	0.39	0.64	Upper quartile
Median	0.09	0.1	0.12	Median
Lower quartile	0.02	0.02	0.03	Lower quartile
Minimum	0.0	0.0	0.0	Minimum

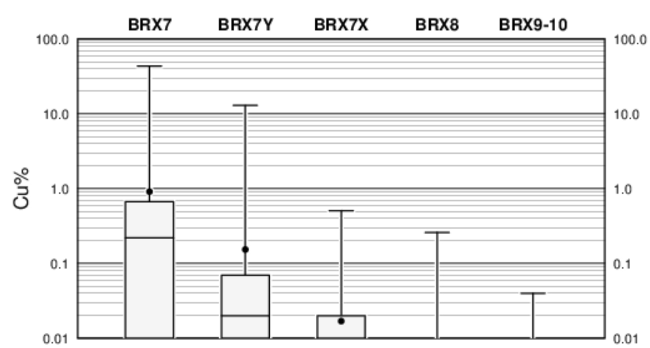
Figure 14-13 and Figure 14-14 show boxplots for copper in the phyllites and carbonate breccias for the Upper Reef. The phyllites are less mineralized than in the Lower Reef, but very high values continue to occur in all the phyllite units. Breccia units higher up in the stratigraphic section tend to be less well-mineralized with very little mineralization occurring above unit BRX7. The same pattern applies to cobalt.

Figure 14-13: Boxplots for Copper in the Upper Reef Phyllite Domains



	LS6	PHY7	PHY7Y	PHY7X	PHY8	PHY9	PHY9-10	
Number of data	873	1910	887	828	1682	344	50	Number of data
Mean	0.006	0.189	0.033	0.008	0.003	0.002	0.0	Mean
Variance	0.003	3.259	0.031	0.0	0.0	0.0	0.0	Variance
Skewness	15.543	16.602	12.811	5.518	3.15	3.589	0.0	Skewness
Coef of Variation	9.166	9.538	5.39	1.99	2.314	2.653	0.0	Coef of Variation
Maximum	1.16	39.22	3.18	0.22	0.05	0.05	0.0	Maximum
Upper quartile	0.0	0.02	0.02	0.01	0.0	0.0	0.0	Upper quartile
Median	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Median
Lower quartile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Lower quartile
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Minimum

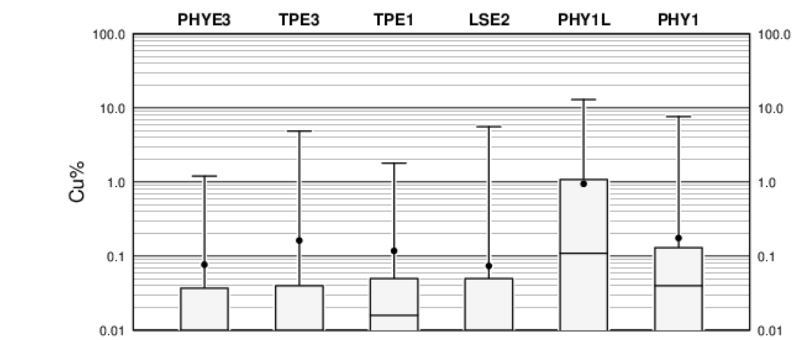
Figure 14-14: Boxplots for Copper in the Upper Reef Carbonate Domains



	BRX7	BRX7Y	BRX7X	BRX8	BRX9-10	
Number of data	4627	1644	1010	974	143	Number of data
Mean	0.915	0.154	0.017	0.004	0.002	Mean
Variance	9.346	0.301	0.001	0.0	0.0	Variance
Skewness	7.817	12.638	6.687	11.508	3.778	Skewness
Coef of Variation	3.342	3.554	1.779	4.024	2.534	Coef of Variation
Maximum	43.46	12.97	0.51	0.26	0.04	Maximum
Upper quartile	0.67	0.07	0.02	0.0	0.0	Upper quartile
Median	0.22	0.02	0.01	0.0	0.0	Median
Lower quartile	0.01	0.01	0.0	0.0	0.0	Lower quartile
Minimum	0.0	0.0	0.0	0.0	0.0	Minimum

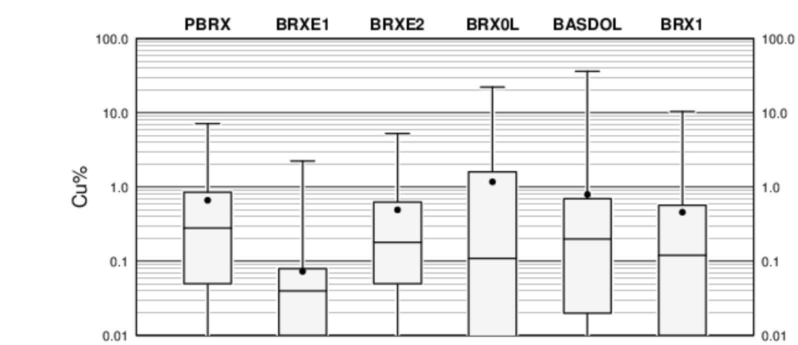
The boxplots in Figure 14-15 and Figure 14-16 show the grade distributions in South Reef. The grade distribution in PHY1L tends to be more like a carbonate breccia grade distribution, and BRXE1 breccia behaves like a phyllite grade distribution. As in the other reefs, the phyllite units continue to host a sprinkling of high-grade samples. At this level of drill coverage, there is no indication of misclassification of either the PHY1L or BRXE1 domains.

Figure 14-15: Boxplots for Copper in the South Reef Phyllite Domains



	PHYE3	TPE3	TPE1	LSE2	PHY1L	PHY1
Number of data	121	95	116	487	197	239
Mean	0.077	0.163	0.118	0.074	0.95	0.176
Variance	0.039	0.481	0.097	0.094	3.675	0.357
Skewness	3.748	5.72	3.563	14.252	3.625	9.393
Coef of Variation	2.554	4.242	2.643	4.134	2.018	3.392
Maximum	1.2	4.91	1.81	5.59	12.99	7.68
Upper quartile	0.037	0.04	0.05	0.05	1.082	0.13
Median	0.01	0.01	0.016	0.01	0.11	0.04
Lower quartile	0.0	0.0	0.0	0.0	0.0	0.0
Minimum	0.0	0.0	0.0	0.0	0.0	0.0

Figure 14-16: Boxplots for South Reef Carbonate Domains



	PBRX	BRXE1	BRXE2	BRX0L	BASDOL	BRX1
Number of data	792	301	229	486	1787	1619
Mean	0.665	0.073	0.494	1.179	0.797	0.459
Variance	0.982	0.03	0.651	5.004	5.019	0.71
Skewness	2.61	9.776	3.375	3.908	8.945	4.873
Coef of Variation	1.49	2.396	1.634	1.898	2.809	1.837
Maximum	7.2	2.24	5.3	22.25	36.4	10.45
Upper quartile	0.85	0.08	0.63	1.612	0.7	0.57
Median	0.28	0.04	0.18	0.11	0.2	0.12
Lower quartile	0.05	0.01	0.05	0.0	0.02	0.01
Minimum	0.0	0.0	0.0	0.0	0.0	0.0

Figure 14-17 shows a drill-hole vertical section with the sample grades and the interpreted phyllite and carbonate breccia units. The section illustrates the fact that mineralization in breccia units occurs in more limited volumes, and, therefore, it is necessary to confine the interpolation of grades in the breccias, and rarely in the mineralized phyllites, to the mineralized volumes. In order to properly constrain the interpolation of grade, probability shells were constructed, as described in Section 14.2.1 and they are used in conjunction with the stratigraphic units, segregating areas using both stratigraphy and probability shell domains during block grade interpolation. Figure

14-18 shows an example of the 0.2% copper probability shell overlain on the stratigraphic units.

Figure 14-17: Section 589250 E with Interpreted Stratigraphic Units

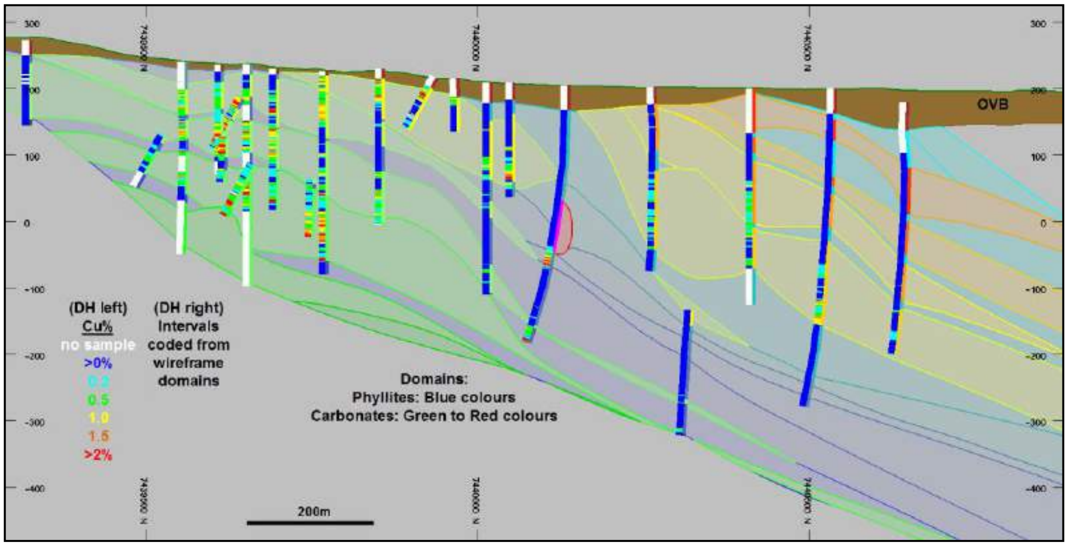


Figure 14-18: Section 589250 E with 0.2% Copper Probability Shell

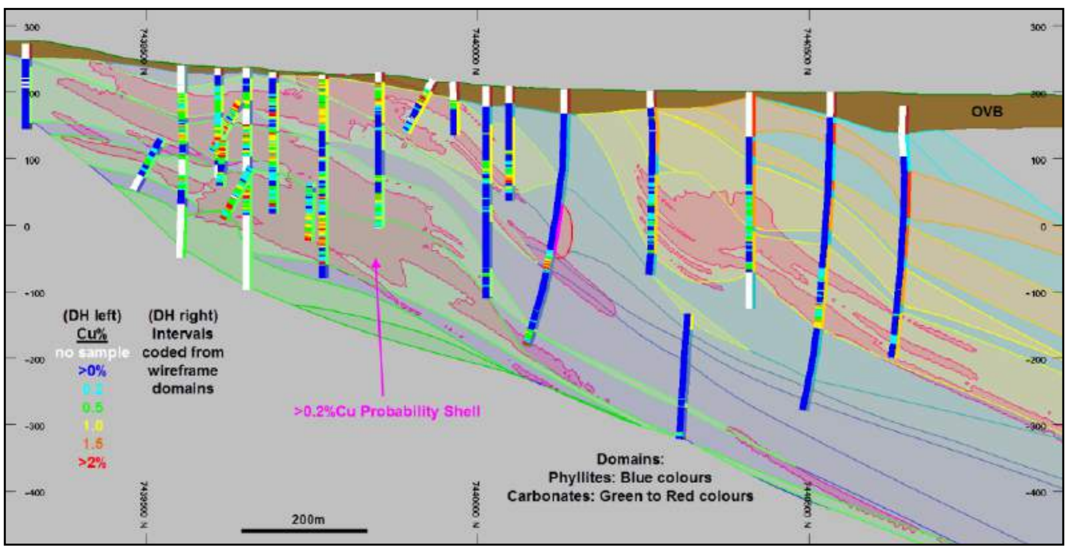


Figure 14-19 compares copper samples in the 2% copper shell with samples in the surrounding 0.2% copper shell. At the scale of the block size in the model (5 m), there is a pronounced change in grade at this boundary suggesting that it should be recognized during block grade estimation. A similar change in cobalt grade also occurs at the boundary of these two domains.

Figure 14-19: Contact Profile of Copper in 2% vs. 0.2% Copper Shells

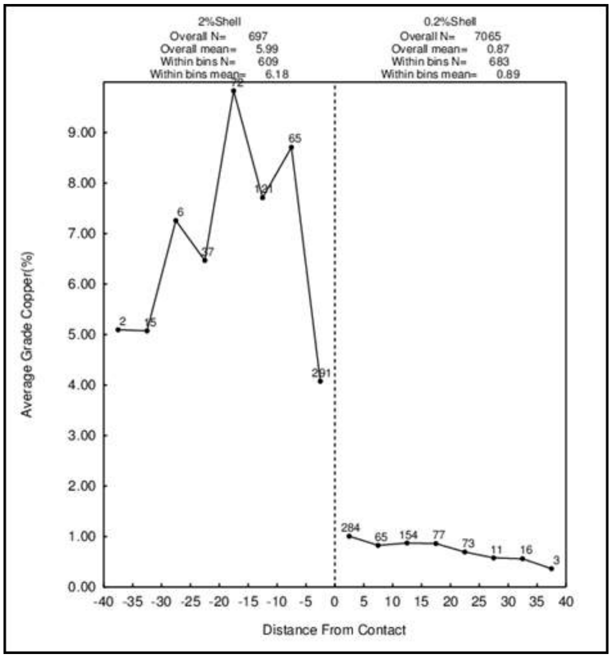
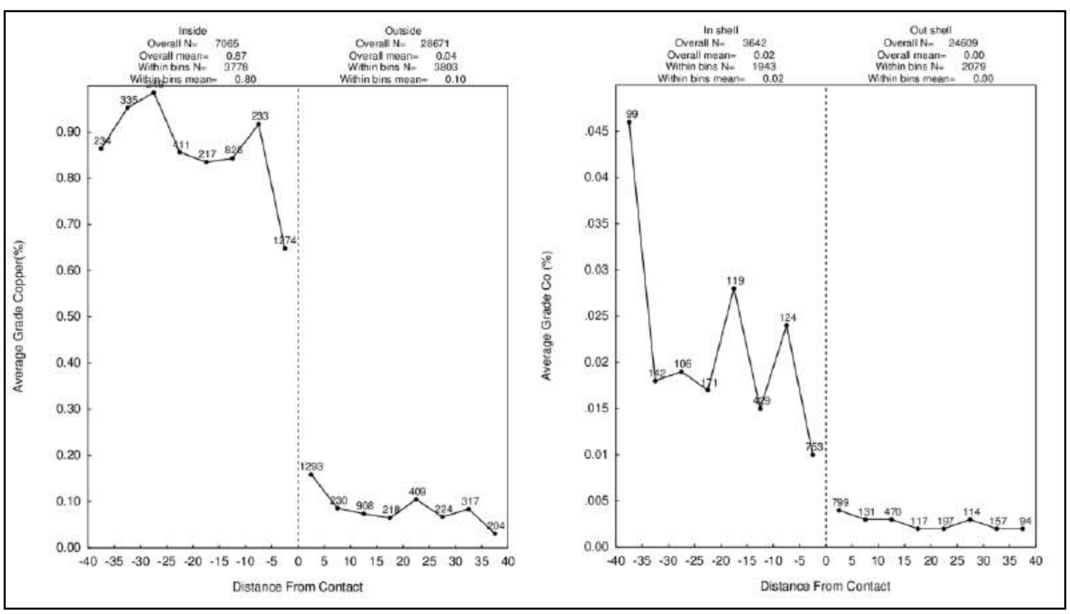


Figure 14-20 shows distinct changes in copper and cobalt grade at the 0.2% copper shell boundary. This is an indication that the 0.2% copper shell does, in general, segregate mineralized from unmineralized rocks.

Figure 14-20: Contact Profile of Copper and Cobalt In/Out of the 0.2% Copper Shell



14.4.1 MODELLING IMPLICATIONS

The boxplot and contact profiles analysis shows distinct differences in sample data contained in carbonate and phyllite domains and that these data should remain segregated during the estimation of copper grades in the block model. Analysis of the probability grade shells also indicate that these encompass differing populations of samples that should not be mixed during copper grade interpolations.

Based on these results, a combination of lithology and probability grade shell domains are used to control the distribution of copper in the resource block model. These "estimation domains" are summarized in Table 14-13 . These domains are generally segregated with the typically mineralized carbonates on the left and the typically unmineralized phyllite domains on the right side. Each estimation domain is further separated during grade interpolation by the probability shells.

Table 14-3: Summary of Copper/Cobalt Estimation Domains (Listed Stratigraphically Top to Bottom)

Reef	DOMN	ESTDM	DOMN	ESTDM
	Carbonate domains		Phyllite domains	
Upper Reef	213,214 (BRX9, BRX10)	22	117 (PHY10)	29
	212 (BRX8)	21	116 (PHY9)	28
	211 (BRX7x)	20	115 (PHY8)	27
	210 (BRX7y)	19	114 (PHY7x)	26
	209 (BRX7)	18	113 (PHY7y)	25
			112 (PHY7)	24
			111 (LS6,TBLSA)	23
Lower Reef	208 (BRX6)	13	110 (PHY6)	17
	207 (BRX5)	12	109 (TBLSB)	16
	206 (BRX3)	11	108 (PHY5)	15
			107 (PHY3)	14
South Reef	204, 205, 301 (BRX1, Basal Dol, PBRX)	4	106 (PHYL1)	10
	203 (BRX0lower)	3	105 (PHY1lower)	9
	202 (BRXE2)	2	104 (LSE2)	8
	201 (BRXE1)	1	103 (TPE1)	7
			102 (TPE3)	6
			101 (PHYE3)	5
>2% Copper Probability Shell – used as hard boundary domain together with Estimation domains				
>0.2% Copper Probability Shell – used as hard boundary domain together with Estimation domains				

14.5 TREATMENT OF OUTLIER GRADES

Histograms and probability plots were generated from 2 m composited sample data to show the distribution of copper in each estimation domain. These were used to identify the existence of anomalous outlier grades in the composite database. The physical locations of these potential outlier samples were reviewed in relation to the surrounding data and it was decided that their effects could be primarily controlled through the use of outlier limitations. An outlier limitation approach limits samples above a defined threshold to a maximum distance of influence during grade estimates. In the South Reef domains, drill holes tend to intersect the mineralized zone at roughly 100 m intervals and, as a result, samples above the outlier threshold are limited to a maximum distance of influence of 50 m during block grade interpolation (½ the distance between drill holes). In the Lower and Upper Reef domains, drilling tends to be more closely spaced and, therefore, samples above the outlier thresholds are limited to a maximum distance of influence of 25 m during block grade interpolation. One exception applies to the 2% copper shell in the Upper Reef, which is densely drilled with numerous closely-spaced underground drill holes. Here, samples above the outlier threshold grade of 20% copper are limited to a maximum range of 10 m during block grade interpolation. In addition to the outlier limitations described here, samples inside the 2% copper probability shell in the South Reef area were top-cut to 30% copper prior to block grade interpolation.

Table 14-4 and Table 14-5 summarize the treatment of outlier sample data and the resulting effects on the estimate of contained metal in the models.

Table 14-4: Summary of Treatment of Outlier Copper Sample Data

	Carbonate Domains				Phyllite Domains			
			Grade Threshold (Cu%)				Grade Threshold (Cu%)	
Reef	DOMN	ESTDM	Inside 0.2% Cu Shell	Outside 0.2% Cu Shell	DOMN	ESTDM	Inside 0.2% Cu Shell	Outside 0.2% Cu Shell
Upper Reef	213,214 (BRX9, BRX10)	22	-	-	117 (PHY10)	29	-	-
	212 (BRX8)	21	-	-	116 (PHY9)	28	-	-
	211 (BRX7x)	20	-	-	115 (PHY8)	27	-	-
	210 (BRX7y)	19	5	-	114 (PHY7x)	26	-	-
	209 (BRX7)	18	25	2	113 (PHY7y)	25	1.5	1.5
					112 (PHY7)	24	-	1.5
					111 (LS6,TBLSA)	23	-	-

Lower Reef	208 (BRX6)	13	-	2	110 (PHY6)	17	1.5	1.5
	207 (BRX5)	12	-	2	109 (TBLSB)	16	10	-
	206 (BRX3)	11	6	2	108 (PHY5)	15	-	2
					107 (PHY3)	14	-	1
South Reef	204, 205, 301 (BRX1, Basal Dol, PBRX)	4	7	-	106 (PHYL1)	10	-	2
	203 (BRX0lower)	3	2	2	105 (PHY1lower)	9	4	0.5
	202 (BRXE2)	2	2	2	104 (LSE2)	8	-	2
	201 (BRXE1)	1	-	-	103 (TPE1)	7	-	-
					102 (TPE3)	6	-	-
					101 (PHYE3)	5	-	-
South Reef	Inside 2% Cu Prob Shell		Samples top-cut to 30% Cu. Samples above 15% Cu limited to 50 m maximum range during block grade interpolation.					
Upper Reef	Inside 2% Cu Prob Shell		Samples above 20% Cu limited to 10 m maximum range during block grade interpolation.					

Table 14-5: Metal Lost Due to Treatment of Outlier Copper Sample Data

DOMN Group	% Metal Lost
UR Carb	-1.9%
UR Phyl	-14.8%
LR Carb	-4.0%
LR Phyl	-6.6%
SR Carb	-2.8%
SR Phyl	-12.0%
SR 2% Prob Shell	-9.1%
UR 2% Prob Shell	-16.6%

The proportion of metal lost is calculated in model blocks in the combined Indicated and Inferred categories. The amount of copper metal lost in the carbonate domains average between 2% and 4%. Greater losses in the phyllites are due to the effects of these limitations on the skewed grade distributions in these domains. The effect of these measures also tends to be more effective on the high-grade parts of the deposit inside the 2% copper probability shell. Overall, the limitations applied to potentially anomalous sample data have reduced the contained copper in the Ruby Creek area (western part of the deposit) by 3.2% and in the South Reef area (eastern part of deposit) by 6.9%. The proportions of metal lost due to top cutting and outlier restriction measures are considered appropriate for a project with this level of delineation drilling.

Due to the more limited distribution of sample data, potentially anomalous cobalt samples were evaluated in a somewhat more generalized approach, with outlier grade thresholds of 0.40%, 0.20% and 0.40% applied to the carbonate units in the upper, lower and south reef zones, respectively. The threshold in the phyllite units was 0.04% cobalt. All samples above the threshold grade limits were restricted to a maximum distance of 35m during block grade interpolation. Overall, these measures have reduced the contained cobalt in the model by 6%.

14.6 SPECIFIC GRAVITY DATA

Specific gravity (SG) measurements have been conducted on 5,366 samples in the database and range from a minimum of 2.12 to a maximum of 4.94 and average 2.91. Approximately 40% of the available SG data occur in the probability grade shell domains. The remaining SG data represent phyllite and carbonate rocks outside of the grade shells. Copper content and SG are moderately correlated. There is little variation in the SG values in the various estimation domains with coefficient-of-variation values that are typically less than 0.1.

SG data is available in the majority of drill holes with measurements typically made at 10 m to 20 m intervals down drill holes with continuous sampling through the mineralized areas.

The distribution of SG data is considered sufficient to support estimation in the resource model. The relatively low variability in the sample data indicates that SG values can be estimated into model blocks using inverse distance-squared moving averages. The copper grade estimation domains are used as hard boundaries during the estimation of densities in the model.

14.7 VARIOGRAPHY

The degree of spatial variability and continuity in a mineral deposit depends on both the distance and direction between points of comparison. Typically, the variability between samples is proportionate to the distance between samples. If the variability is related to the direction of comparison, then the deposit is said to exhibit anisotropic tendencies which can be summarized by an ellipse fitted to the ranges in the different directions. The semi-variogram is a common function used to measure the spatial variability within a deposit.

The components of the variogram include the nugget, the sill, and the range. Often samples compared over very short distances (including samples from the same location) show some degree of variability. As a result, the curve of the variogram often begins at a point on the y-axis above the origin; this point is called the nugget. The nugget is a measure of not only the natural variability of the data over very short distances, but also a measure of the variability which can be introduced due to errors during sample collection, preparation, and assay.

Typically, the amount of variability between samples increases as the distance between the samples increase. Eventually, the degree of variability between samples reaches a constant or maximum value; this is called the sill, and the distance between samples at which this occurs is called the range.

The spatial evaluation of the data was conducted using a correlogram instead of the traditional variogram. The correlogram is normalized to the variance of the data and is less sensitive to outlier values; this generally gives cleaner results.

Many of the individual estimation domains do not contain sufficient sample data from which to generate reasonable correlograms. As a result, separate correlograms for copper and cobalt have been generated for samples inside the 0.2% copper probability shell in each of the South, Lower and Upper Reefs, and these are applied to each of the respective carbonate domains. A separate correlogram has been produced from all samples outside of the 0.2% copper probability shell and this is used to estimate grades in the phyllite domains. Finally, a separate correlogram has been used to estimate the distribution of copper and cobalt inside of the 2% copper probability shell domain. Correlograms were generated using the commercial software package SAGE2001 developed by Isaaks & Co. Correlograms were generated using elevations relative to the trend planes described in Section 2.1 of this report. This ensures that the local undulations of the typically banded mineralization are replicated in the block model. The correlograms are summarized in Table 14-6 and Table 14-7.

Table 14-6: Copper Correlogram Parameters

Domain	Nugget	S1	S2	1st Structure Range (m)	1st Structure AZ	1st Structure Dip	2nd Structure Range (m)	2nd Structure AZ	2nd Structure Dip
UR carbonates	0.100	0.784	0.116	23	319	61	554	212	11
	Spherical			11	170	25	538	54	78
				6	74	13	73	123	-4
LR carbonates	0.150	0.761	0.089	96	91	43	1079	181	0
	Spherical			28	333	26	95	91	0
				10	223	36	38	32	90
SR carbonates	0.150	0.787	0.063	24	77	34	2427	215	0
	Spherical			21	292	51	562	125	0
				9	179	18	33	146	90
Phyllites	0.450	0.519	0.031	27	280	51	573	343	37
	Spherical			22	38	21	413	77	5
				12	321	-31	381	354	-52
2% Cu Prob Shell	0.200	0.724	0.076	35	216	80	1871	137	0
	Spherical			11	111	3	438	47	42
				6	20	10	52	46	-48

Note: Correlogram generated from 2 m composited sample data using elevations relative to trend plane of mineralization.

Table 14-7: Cobalt Correlogram Parameters

Domain	Nugget	S1	S2	1st Structure			2nd Structure		
				Range (m)	AZ	Dip	Range (m)	AZ	Dip
UR carbonates	0.155	0.528	0.317	191	39	-7	273	348	-16
	Spherical			49	123	43	225	3	74
				3	317	46	10	79	-4
LR carbonates	0.450	0.335	0.215	51	31	38	321	135	5
	Spherical			23	315	-17	272	11	81
				7	244	47	15	46	-8
SR carbonates	0.400	0.262	0.338	66	354	51	768	133	-3
	Spherical			52	140	34	82	165	87
				4	242	17	15	43	2
Phyllites	0.250	0.627	0.123	17	311	0	289	347	75
	Spherical			12	221	84	186	159	15
				7	221	-6	12	70	-2
2% Cu Prob Shell	0.519	0.247	0.234	86	0	0	58	0	90
	Spherical			86	90	0	46	0	0
				8	0	90	46	90	0

Note: Correlogram generated from 2 m composited sample data using elevations relative to trend plane of mineralization.

14.8 MODEL SETUP AND LIMITS

A block model was initialized with the dimensions shown in Table 14-8. A nominal block size of 5 x 5 x 5 m is considered appropriate, based on current drill hole spacing, for a project at this stage of evaluation. Since the deposit contains both underground and open pit potential resource, the 5 x 5 x 5 m selective mining unit (SMU) is primarily driven by the underground extraction potential of the deposit. Evaluations of the open pit extraction potential of the resource may require combining these blocks into a larger SMU size. Further engineering studies are required to evaluate the viability of the Bornite deposits. The limits of the block model are represented by the purple cube shown in the previous isometric views Figure 14-1, Figure 14-2, and Figure 14-3.

Table 14-8: Block Model Limits

Direction	Minimum (m)	Maximum (m)	Block size (m)	Number of Blocks
X-axis (W-E)	588800	590800	5	400
Y-axis (N-S)	7439300	7440900	5	320
Elevation	-600	450	5	210

Using the domain wireframes, blocks in the model are assigned estimation domain code values on a majority basis. Blocks with more than 50 percent of their volume inside a wireframe domain are assigned a zone code value of that domain.

14.9 INTERPOLATION PARAMETERS

Copper and cobalt grades in model blocks were estimated using ordinary kriging. The ordinary kriging models were evaluated using a series of validation approaches as described in Section 14.10 of this report. The interpolation parameters have been adjusted until the appropriate results were achieved. In general, the ordinary kriging models have been generated using a relatively limited number of composited sample data. This approach reduces the amount of smoothing (also known as averaging) in the model and, while there may be some uncertainty on a localized scale, this approach produces reliable estimates of the potentially recoverable grade and tonnage for the overall deposit. Interpolation parameters for copper and cobalt in the various estimation domains are summarized in Table 14-9 and Table 14-10.

Table 14-9: Copper Interpolation Parameters

Domain	Search Ellipse Range (m)			Number of Composites (2 m)			Other
	X	Y	Z (1)	Min/block	Max/block	Max/hole	
UR Carb	500	500	3	1	12	4	1DH per Octant
LR Carb	500	500	3	1	12	3	1DH per Octant
SR Carb	500	500	3	1	9	3	1DH per Octant
Phyllite	500	500	4	1	15	5	1DH per Octant
2% Cu Shell	500	500	5	1	15	5	1DH per Octant
Specific Gravity	500	500	7	1	21	7	ID2

(1) Vertical range relative to distances from trend plane of mineralization

Table 14-10: Cobalt Interpolation Parameters

Domain	Search Ellipse Range (m)			Number of Composites (2 m)			Other
	X	Y	Z (1)	Min/block	Max/block	Max/hole	
UR Carb	500	500	5	1	12	4	1DH per Octant
LR Carb	500	500	5	1	12	4	1DH per Octant
SR Carb	500	500	5	1	12	4	1DH per Octant
Phyllite	500	500	5	1	12	4	1DH per Octant
2% Cu Shell	500	500	5	1	15	5	1DH per Octant

(1) Vertical range relative to distances from trend plane of mineralization

During grade and SG estimation, search orientations were designed to follow the mineralization trend surface interpreted to represent the general trend of the mineralization in the deposit. Although the maximum XY range is set at 500 m, estimation of block grades is generally made using data limited from the nearest 3 or 4 drill holes; this criterion is often met within a maximum distance of less than 100 m. For example, the average distance to data used in block grade estimates inside the resource limiting pit shell is 64 m. In areas where drill holes are spaced at 200 m intervals, at depth or on the fringes of the deposit, the search range is large enough so that multiple drill holes are captured and, guided by the variogram, used in the block grade estimates. It should be noted that, although actual search ranges may extend for over 200 m in some areas, only blocks within a maximum distance of 100 m from a drill hole are included in the Inferred category.

Block estimates of specific gravity are done using the inverse distance (ID2) interpolation method, and all estimation domains were recognized as hard boundaries.

14.10 BLOCK MODEL VALIDATION

The block models were validated through several methods: a thorough visual review of the model grades in relation to the underlying drill hole sample grades; comparisons with the change of support model; comparisons with other estimation methods; and, grade distribution comparisons using swath plots.

14.10.1 VISUAL INSPECTION

Detailed visual inspection of the block model was conducted in both section and plan to compare estimated grades against underlying sample data. This included confirmation of the proper coding of blocks within the respective zone domains. Examples of the distribution of copper grades in the block model are shown in cross section in Figure 14-21 and Figure 14-22. An example of the cobalt grades is shown in cross section for Ruby Creek in Figure 14-23.

Figure 14-21: North-South Vertical Section of Copper Estimates in the Block Model in the Ruby Creek Area

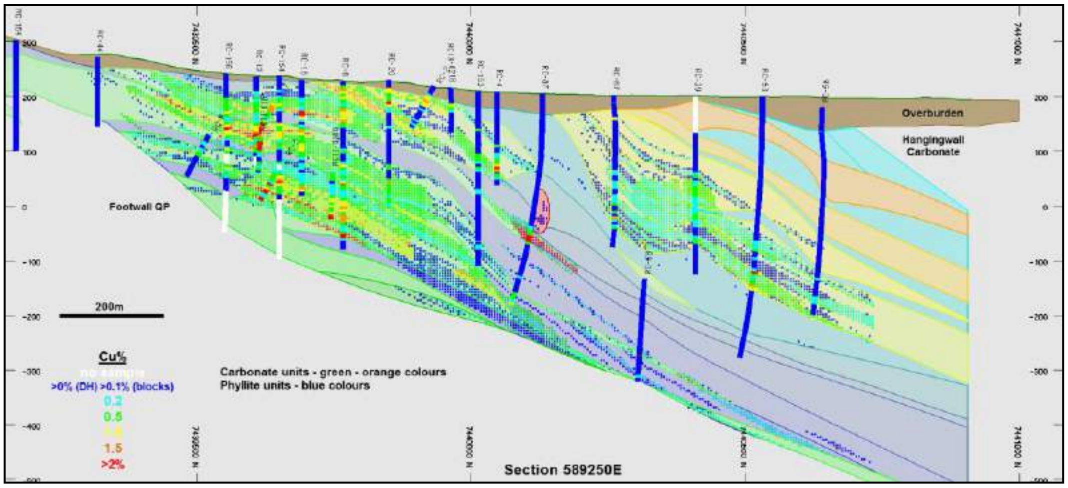


Figure 14-22: North-South Vertical Section of Copper Estimates in the Block Model in the South Reef Area

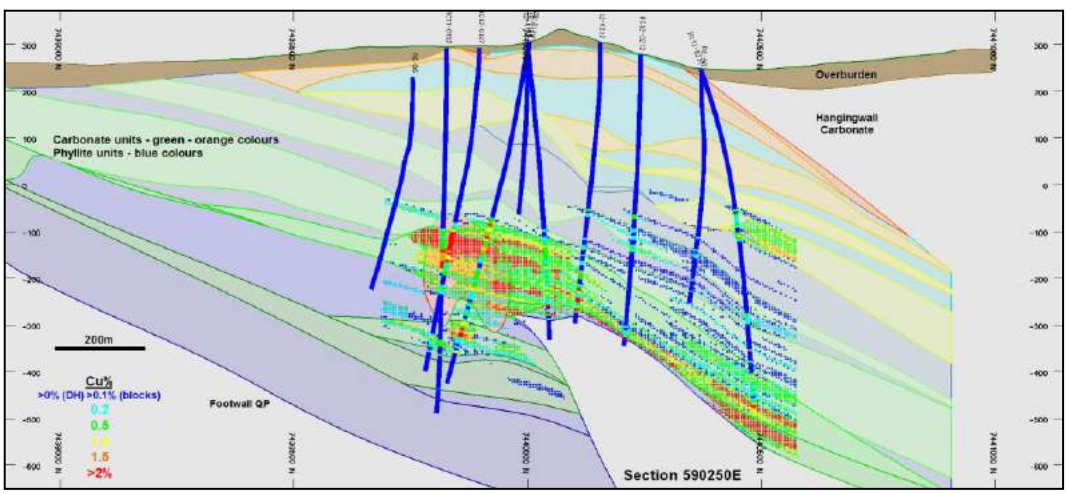


Figure 14-23: North-South Vertical Section of Cobalt Estimates in the Block Model in the Ruby Creek Area

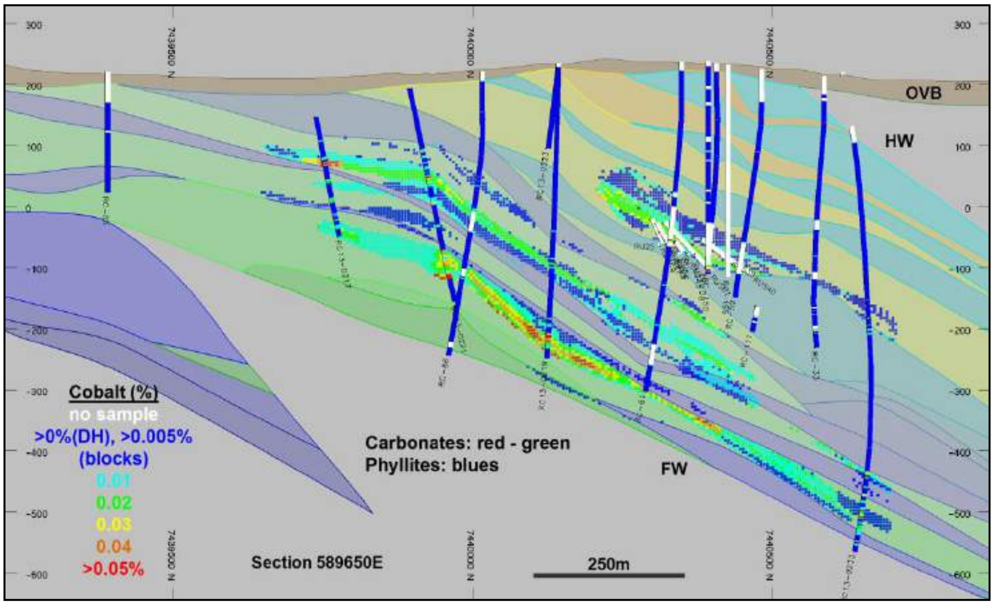
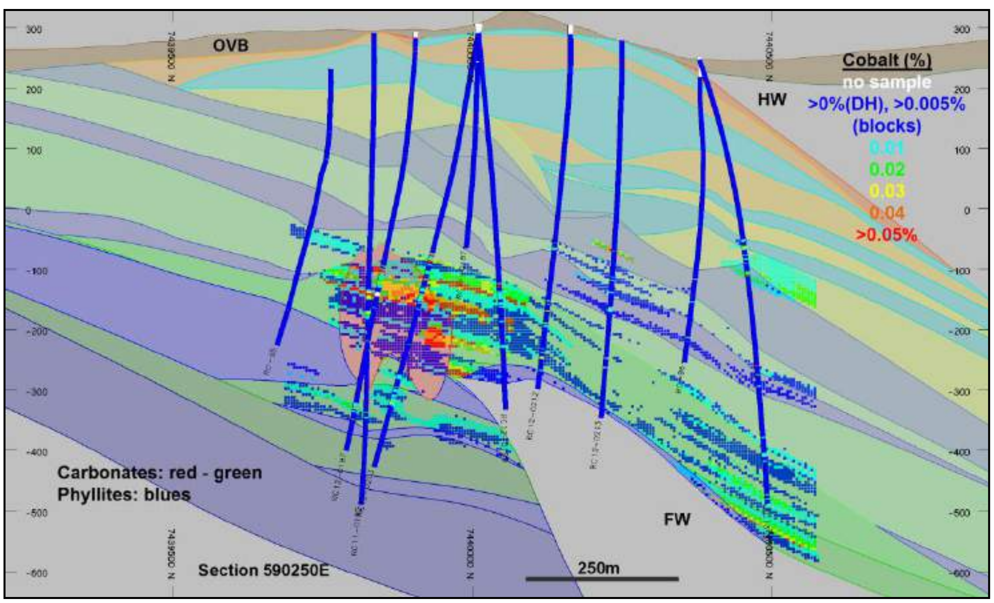


Figure 14-24: North-South Vertical Section of Cobalt Estimates in the Block Model in the South Reef Area



14.10.2 MODEL CHECKS FOR CHANGE OF SUPPORT

The relative degree of smoothing in the block estimates was evaluated using the Hermitian Polynomial Change of Support (Herco) method, also known as the Discrete Gaussian Correction (Journel and Huijbregts, 1978). With this method, the distribution of the hypothetical block grades can be directly compared to the estimated ordinary kriging model through the use of pseudo-grade/tonnage curves. Adjustments are made to the block model interpolation parameters until an acceptable match is made with the Herco distribution. In general, the estimated model should be slightly higher in tonnage and slightly lower in grade when compared to the Herco distribution at the projected cut-off grade. These differences account for selectivity and other potential ore-handling issues which commonly occur during mining.

The Herco distribution is derived from the declustered composite grades which have been adjusted to account for the change in support moving from smaller drill hole composite samples to the larger blocks in the model. The transformation results in a less skewed distribution, but with the same mean as the original declustered samples.

At this stage of project evaluation, it is felt that copper is the main economic contributor at Bornite and it is assumed that cobalt will act as a secondary, or byproduct, metal. Therefore, the change of support calculations are directed primarily at the copper content in the deposit. The available cobalt will be reported based on a copper cut-off grade threshold. Examples of Herco change of support grade/tonnage plots for copper, calculated for each Reef formation limited to blocks inside the 0.2% copper probability shell, are shown in Figure 14-25 and Figure 14-26.

Figure 14-25: Herco and Model Grade / Tonnage Plots for Inside the 0.2% Copper Shell at Upper and Lower Reefs

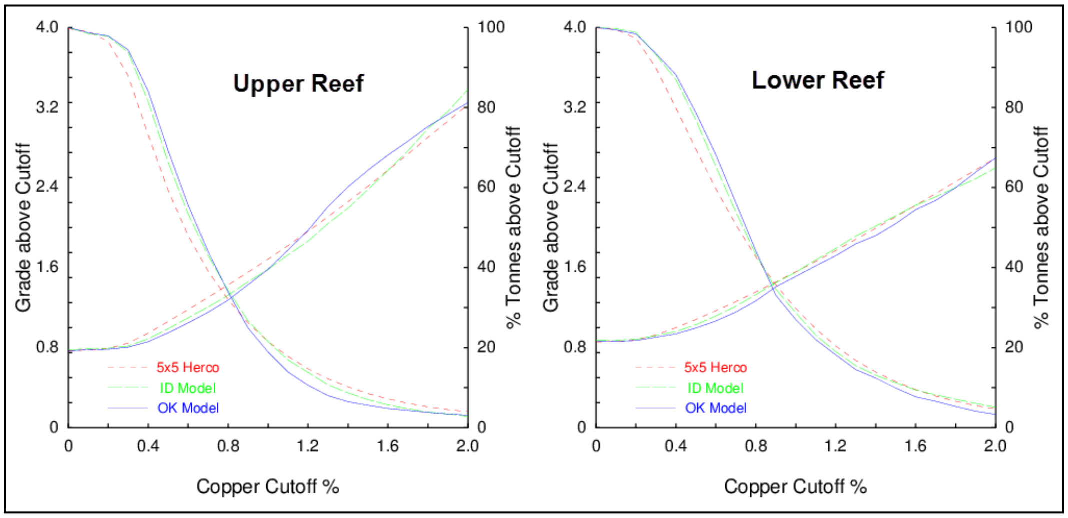
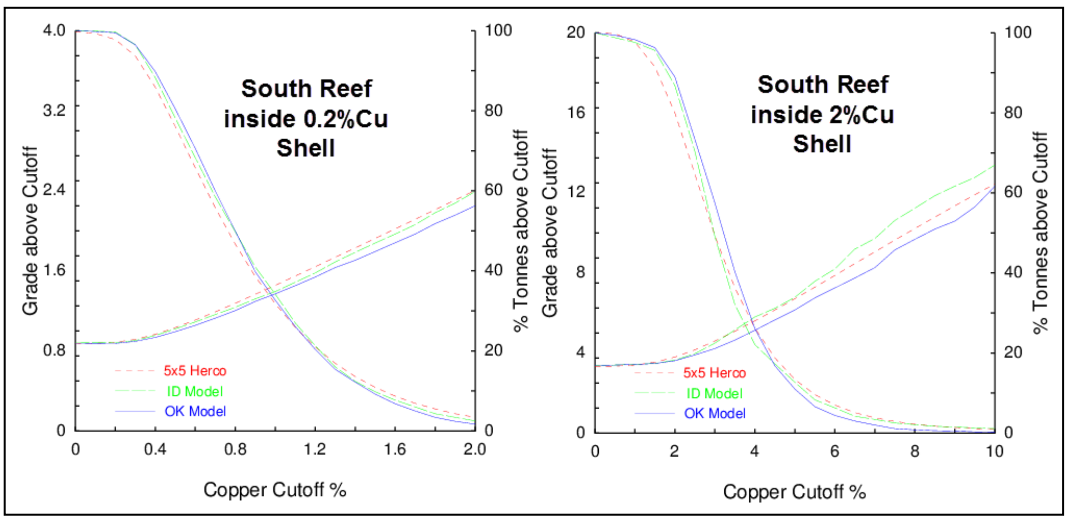


Figure 14-26: Herco and Model Grade / Tonnage Plots for the 0.2% Copper Shell and 2% Copper Shell at South Reef

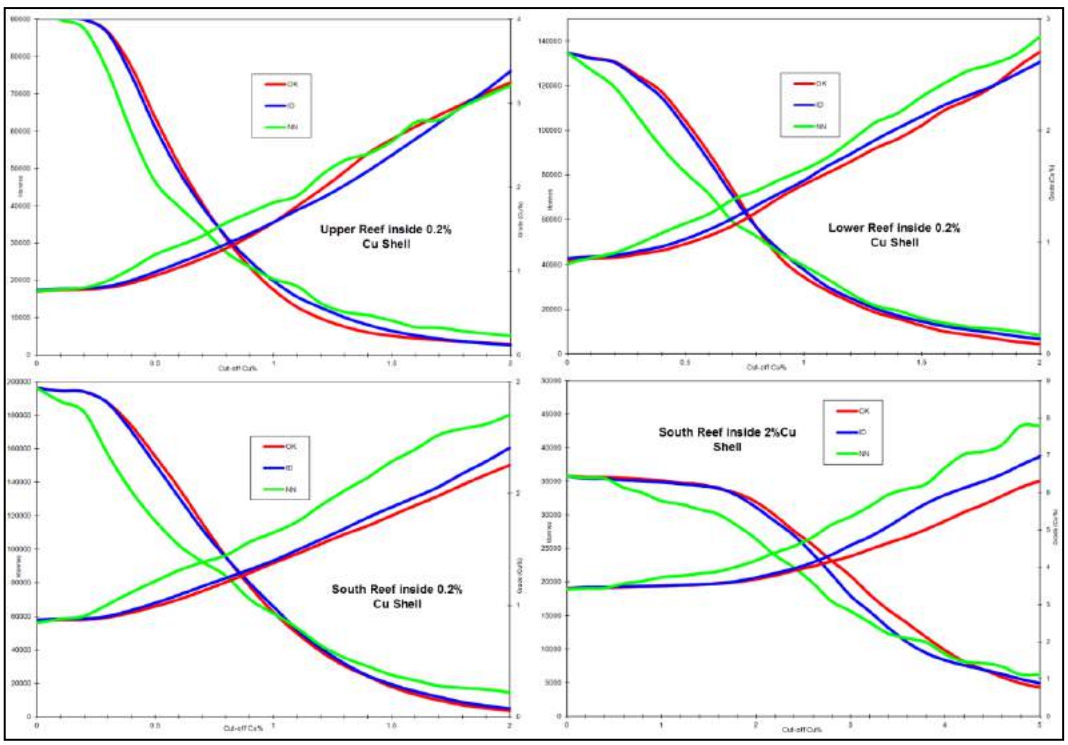


Overall, the desired degree of correlation between models has been achieved. It should be noted that the change of support model is a theoretical tool intended to direct model estimation. There is uncertainty associated with the change of support model, and its results should not be viewed as a final or correct value.

14.10.3 COMPARISON OF INTERPOLATION METHODS

For comparison purposes, additional grade models were generated using the inverse distance weighted (ID) and nearest neighbour (NN) interpolation methods. The NN model was created using data composited to 5 m lengths to ensure all sample data are used in the model. The results of these models are compared to the ordinary kriging (OK) models at various cut-off grades using a grade/tonnage graph. The example shown in Figure 14-27 compares copper models within the combined 2% copper and in the 0.2% copper shells for the Upper, Lower and South Reefs. There is good correlation between model types. The correspondence among the grade tonnage curves is typical for the interpolation methods being compared. The NN grades and tonnages above cut-off are correct under the assumption that perfect selection of material above and below the cut-off can be executed at the scale of the composite samples. It is included to show the results of the averaging that takes place in the other two methods. The ordinary kriging curves show the lowest grades and highest tonnages. The correct amount of averaging for the chosen block size is ensured for the ordinary kriging by the change of support calculation described in the preceding section. Similar relationships among the interpolation methods were achieved with the cobalt models, however, the resource cobalt content will be based on copper cut-off grades and not on cobalt cut-off grades

Figure 14-27: Comparison of Copper Model Types in Carbonates inside Grade Shell Domains



14.10.4 SWATH PLOTS (DRIFT ANALYSIS)

A swath plot is a graphical display of the grade distribution derived from a series of bands, or swaths, generated in several directions throughout the deposit. Using the swath plot, grade variations from the ordinary kriging model are compared to the distribution derived from the declustered nearest neighbour grade model.

On a local scale, the nearest neighbour model does not provide reliable estimations of grade, but, on a much larger scale, it represents an unbiased estimation of the grade distribution based on the underlying data. Therefore, if the ordinary kriging model is unbiased, the grade trends may show local fluctuations on a swath plot, but the overall trend should be similar to the nearest neighbour distribution of grade.

Swath plots were generated in three orthogonal directions that compare the ordinary kriging and nearest neighbour estimates for copper and cobalt in each of the estimation domains.

Examples from each of the three Reefs, limited to blocks inside the 0.2% copper probability shell, together with the 2% copper shells for copper are shown in Figure 14-28. Figure 14-29 shows the cobalt swaths for all (combined) carbonate units inside the 0.2% copper probability shell. There is good correlation between models and the degree of smoothing in the OK models (shown in red) is evident in the swaths. Areas where there are large differences between the models tend to be the result of “edge” effects, where there is less available data to support a comparison. The validation results indicate that the OK copper and cobalt models are reasonable reflections of the underlying sample data.

Figure 14-28: Swath plots of Copper in Carbonates inside Grade Shells

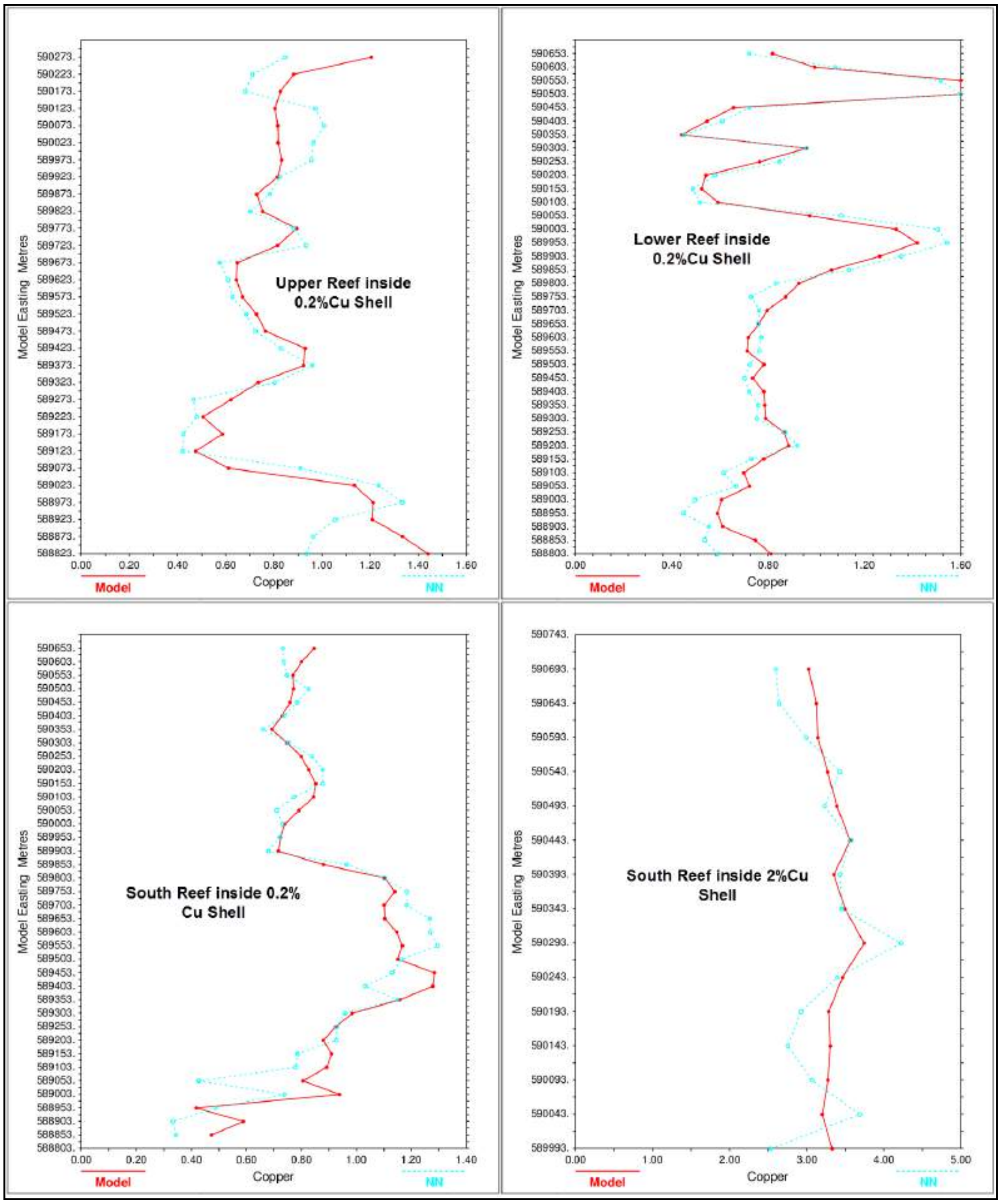
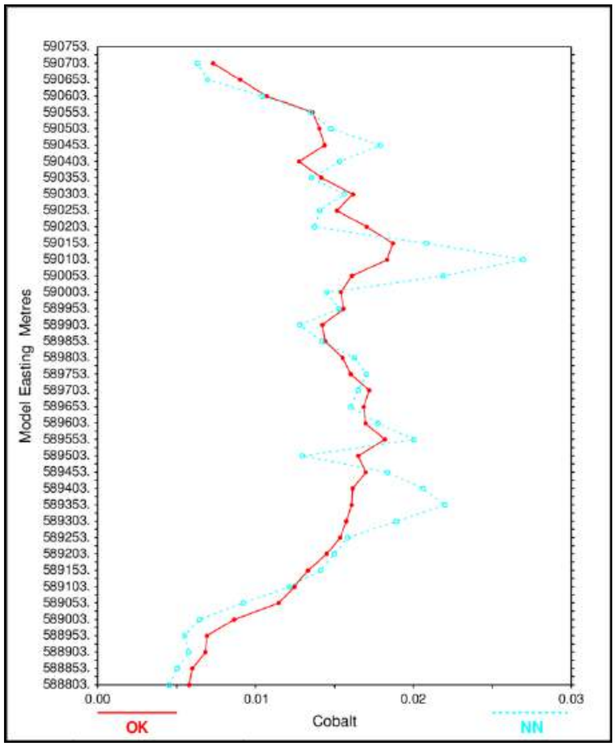


Figure 14-29: Swath plots of Cobalt in Carbonates inside the Grade Shell Domains



14.11 RESOURCE CLASSIFICATION

The mineral resources were classified in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (May 2014). The classification parameters are defined relative to the distance between sample data and are intended to encompass zones of reasonably continuous mineralization that exhibit the desired degree of confidence in the estimate.

Classification parameters are generally linked to the scale of a deposit: a large and relatively low-grade porphyry-type deposit would likely be mined at a much higher daily rate than a narrow, high-grade deposit. The scale of selectivity of these two examples differs significantly and this is reflected in the drill-hole spacing required to achieve the desired level of confidence to define a volume of material that represents, for example, a year of production. At this stage of evaluation for the Bornite deposit, it is becoming apparent that it may be amenable to a combination of open pit and underground extraction methods. The actual scale of extraction is unknown and further engineering work is required to gain a better understanding of these concepts. However, most of the significant copper mineralization in the (western) Ruby Creek area occurs at depths generally less than about 500 m below surface and these resources are potentially amenable to open pit extraction methods. Copper mineralization in the (eastern) South Reef area occurs at greater depths below surface and it is assumed that these resources would likely be amenable to underground extraction methods.

Copper and cobalt grade and indicator variograms were evaluated to provide information regarding the range of continuity of mineralization. This was combined with visual observations regarding the nature of the deposits with respect to the distribution of available sample information.

A portion of the copper only mineral resources in the Ruby Creek area are included in the Indicated category because this part of the deposit is potentially amenable to open pit extraction methods and current drill hole distribution, at 75 m spacing, provides a sufficient level of confidence in the grade and continuity of mineralization. None of the cobalt mineral resources can be classified in the Indicated category due to the wider spatial distribution of sample data for cobalt. All of the cobalt mineral resources in the Ruby Creek area and in South Reef are classified in the Inferred category. The current drill hole spacing in the South Reef area is insufficient to define any of the copper mineral resources in the Indicated category because it appears that this part of the Bornite deposit is likely amenable to underground extraction methods. Delineation of resources for underground extraction purposes requires delineation drilling with holes spaced at distances much less than 75 m.

The following classification criteria are defined for the Bornite deposit:

- Indicated Mineral Resources includes blocks in the model that are potentially amenable to open pit extraction methods and are delineated by drilling with holes spaced at a maximum distance of 75 m, and exhibit a relatively high degree of confidence in the grade and continuity of mineralization.

- Inferred Mineral Resources require a minimum of one drill hole within a maximum distance of 100 m and exhibit reasonable confidence in the grade and continuity of mineralization.

Some manual “smoothing” of these criteria was conducted that includes areas where the drill hole spacing locally exceeds the desired grid spacing, but still retains continuity of mineralization or, conversely, excludes areas where the mineralization does not exhibit the required degree of confidence. This process resulted in two areas in the Ruby Creek area that contain resources in the Indicated category.

The spacing of drill holes completed in 2017, that test the down dip mineralized horizon along the northern edge of the deposit, are considered too far to confidently support the estimation of mineral resources. As a result, mineral resources are constrained by holes RC13-0220, RC11-0194, RC13-0231 and RC13-0224 in the South Reef area. As a somewhat conservative measure, the extent of Inferred resources down-dip of these drill holes has been truncated at reduced distances of 65 to 75 m from these holes. Although the results of the 2017 drilling suggests the mineralization continues down-dip to the north, additional infill drilling is required to provide the level of confidence to support the estimate of resources in this area.

14.12 MINERAL RESOURCE ESTIMATE

CIM Definition Standards for Mineral Resources and Mineral Reserves (May 2014) defines a mineral resource as:

“A mineral resource is a concentration or occurrence of solid material of economic interest in or on the Earth’s crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a mineral resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling”.

The “reasonable prospects for eventual economic extraction” requirement generally implies that quantity and grade estimates meet certain economic thresholds and that mineral resources are reported at an appropriate cut-off grade which takes into account the extraction scenarios and the processing recovery. At this stage of project evaluation, it is felt that copper is the main economic contributor at Bornite and it is assumed that cobalt will act as a secondary, or byproduct, metal. Therefore, reasonable prospects for eventual economic extraction is directed at only the copper content in the deposit and the available cobalt is reported based on a copper cut-off grade threshold. It is very rare that appreciable cobalt grades occur where there is no associated copper mineralization.

The Bornite deposit comprises several zones of relatively continuous moderate- to high-grade copper mineralization that extends from surface to depths of more than 800 m below surface. The deposit is potentially amenable to a combination of open pit and underground extraction methods. The “reasonable prospects for eventual economic extraction” was tested using a floating cone pit shell derived based on a series of technical and economic assumptions considered appropriate for a deposit of this type, scale and location. These parameters are summarized in Table 14-11.

Table 14-11: Parameters Used to Generate a Resource Limiting Pit Shell

Optimization Parameters	
Open Pit Mining Cost	US$2/tonne
Milling Cost	US$11/tonne
G&A	US$5/tonne
Pit Slope	43 degrees
Metallurgical Recovery	87%
Copper Price	US$3.00/lb

* No adjustments for mining recovery or dilution

It is important to recognize that these discussions of underground and surface mining parameters are used solely for the purpose of testing the "reasonable prospects for economic extraction," and do not represent an attempt to estimate mineral reserves. No mineral reserves have been calculated for the Bornite Project. These preliminary evaluations are used to assist with the preparation of a Mineral Resource Statement and to select appropriate reporting assumptions.

Using the parameters defined in Table 14-11, a pit shell was generated in the Ruby Creek area that extends to a depth of approximately 500 m below surface. Table 14-12 and Table 14-13 list the copper and cobalt mineral resources contained within and below the pit shell. Estimates of resources are stated separately because, although the copper data supports estimates of mineral resources in both the Indicated and Inferred categories, the distribution of cobalt sample data is sufficient to support estimates in only the Inferred category. It is assumed that extraction from the Bornite deposit is based on the copper content in the rocks and that cobalt would be a secondary contributor to the potential economic viability of the deposit. As a result, both copper and cobalt mineral resource estimates are defined based on a copper cut-off grade threshold. Mineral resource estimates are reported based at two cut-off grades; 0.5% Cu for material that is amenable to open pit extraction and 1.5% Cu for resources that occur below the pit shell. The cut-off grade of resources amenable to underground extraction is based on an underground mining cost of US$65/tonne. The distribution of mineral resources is presented with a series of isometric views in Figure 14-30

There are no known factors related to environmental, permitting, legal, title, taxation, socio-economic, marketing, or political issues which could materially affect the mineral resource.

Table 14-12: Estimate of Copper Mineral Resources for the Bornite Project

Class	Type	Cut-off (Cu %)	Tonnes (million)	Average Grade Cu (%)	Contained Metal Cu (Mlbs)
Indicated	In-Pit(1)	0.5	40.5	1.02	913
Inferred	In-Pit(1)	0.5	84.1	0.95	1,768
Inferred	Below-Pit	1.5	57.8	2.89	3,683
Inferred	**Total**		**141.9**	**1.74**	**5,450**

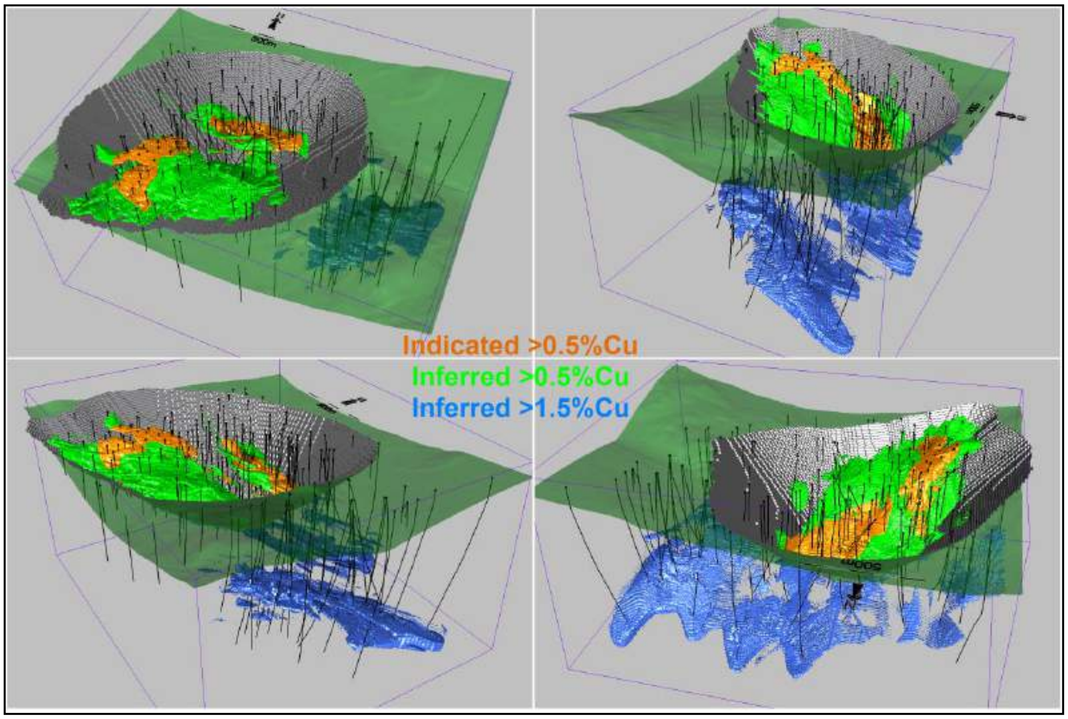
(1) Resources stated as contained within a pit shell developed using a metal price of US$3.00/lb Cu, mining costs of US$2.00/tonne, milling costs of US$11/tonne, G&A cost of US$5.00/tonne, 87% metallurgical recoveries and an average pit slope of 43 degrees.
(2) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources will be converted into Mineral Reserves.
(3) It is reasonably expected that the majority of Inferred mineral resources could be upgraded to Indicated mineral resources with additional exploration.

Table 14-13: Estimate of Cobalt Mineral Resources for the Bornite Project

Class	Type	Cut-off (Cu %)	Tonnes (million)	Average Grade Co (%)	Contained Metal Co (Mlbs)
Inferred	In-Pit(1)	0.5	124.6	0.017	45
Inferred	Below-Pit	1.5	57.8	0.025	32
Inferred	**Total**		**182.4**	**0.019**	**77**

(1) Resources stated as contained within a pit shell developed using a metal price of US$3.00/lb Cu, mining costs of US$2.00/tonne, milling costs of US$11/tonne, G&A cost of US$5.00/tonne, 87% metallurgical recoveries and an average pit slope of 43 degrees.
(2) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources will be converted into Mineral Reserves.
(3) It is reasonably expected that the majority of Inferred mineral resources could be upgraded to Indicated mineral resources with additional exploration.
(4) Due to limited sample data, none of the cobalt resource meets the confidence for Indicated class resources. All cobalt resources are considered in the Inferred category.

Figure 14-30: Isometric Views of Bornite Mineral Resource



14.13 GRADE SENSITIVITY ANALYSIS

For information purposes, resources are summarized at a series of cut-off thresholds for resources within the pit shell in Table 14-14 and Table 14-15 and for resources below the pit shell in Table 14-16. The base case cut-off limit, about which the mineral resource statement has been derived, is highlighted. The reader is cautioned that the figures presented in these tables should not be misconstrued with a Mineral Resource Statement. The figures are only presented to show the sensitivity of the block model estimates to the selection of the cut-off grade.

Table 14-14: Sensitivity to Cut-off Grade of Copper Mineral Resources inside the Pit Shell

	Indicated			Inferred		
Cut-off (Cu %)	Tonnes (million)	Cu %	Contained Cu (Mlbs)	Tonnes (million)	Cu (%)	Contained Cu (Mlbs)
0.2	51.6	0.89	1,007	114.5	0.79	1,999
0.25	50.6	0.90	1,002	108.0	0.83	1,969
0.3	49.6	0.91	996	103.8	0.85	1,944
0.35	48.2	0.93	987	100.4	0.87	1,918
0.40	46.4	0.95	972	95.6	0.89	1,880

0.45	43.8	0.98	947	89.9	0.92	1,828
0.50	**40.5**	**1.02**	**913**	**84.1**	**0.95**	**1,768**
0.55	37.3	1.07	877	77.9	0.99	1,696
0.60	34.1	1.11	837	71.8	1.02	1,618
0.65	30.9	1.16	793	65.5	1.06	1,533
0.70	27.8	1.22	748	59.3	1.10	1,443

1) Base Case cutoff grade of 0.50% Cu is highlighted in table.
2) Resources stated as contained within a pit shell developed using a metal price of US$3.00/lb Cu, mining costs of US$2.00/tonne, milling costs of US$11/tonne, G&A cost of US$5.00/tonne, 87% metallurgical recoveries and an average pit slope of 43 degrees.
3) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources will be converted into Mineral Reserves.
4) It is reasonably expected that the majority of Inferred mineral resources could be upgraded to Indicated mineral resources with additional exploration.

Table 14-15: Sensitivity to Cu-off Grade of Cobalt Inferred Mineral Resources inside the Pit Shell

Cut-off (Cu %)	Tonnes (million)	Co (%)	Contained Co (Mlbs)
0.2	166.1	0.015	53
0.25	158.6	0.015	52
0.3	153.4	0.015	52
0.35	148.6	0.016	51
0.40	142.1	0.016	49
0.45	133.7	0.016	48
0.50	**124.6**	**0.017**	**46**
0.55	115.3	0.017	43
0.60	105.9	0.018	41
0.65	96.4	0.018	38
0.70	87.2	0.019	36

1) Base Case cutoff grade of 0.50% Cu is highlighted in table.
2) Resources stated as contained within a pit shell developed using a metal price of US$3.00/lb Cu, mining costs of US$2.00/tonne, milling costs of US$11/tonne, G&A cost of US$5.00/tonne, 87% metallurgical recoveries and an average pit slope of 43 degrees.
3) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources will be converted into Mineral Reserves.
4) It is reasonably expected that the majority of Inferred mineral resources could be upgraded to Indicated mineral resources with additional exploration.

Table 14-16: Sensitivity to Cut-off Grade of Inferred Mineral Resources Below the Pit Shell

Inferred					
		Average Grade:		Contained Metal:	
Cut-off (Cu %)	Tonnes (million)	Cu %	Co %	Cu (Mlbs)	Co (Mlbs)
0.5	238.1	1.35	0.015	7,081	78
1.0	107.0	2.11	0.020	4,990	47
1.5	**57.8**	**2.89**	**0.025**	**3,683**	**32**
2.0	39.4	3.45	0.030	2,993	26
2.5	29.1	3.88	0.035	2,488	22
3.0	22.6	4.21	0.038	2,094	19

1) Base Case cutoff grade of 1.50% Cu is highlighted in table.
2) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources will be converted into Mineral Reserves.
3) It is reasonably expected that the majority of Inferred mineral resources could be upgraded to Indicated mineral resources with additional exploration.

15.0 MINERAL RESERVE ESTIMATES

The Bornite Project is an early exploration project; there are presently no mineral reserves at the Project.

16.0 MINING METHODS

The Bornite Project is an early exploration project; no mining methods have been investigated for the Project.

17.0 RECOVERY METHODS

The Bornite Project is an early exploration project and process design remains to be conceptually-based on limited metallurgical test work results. None-the-less, the Bornite project has been shown to respond well to traditional process test work and a traditional process design is expected for the project. This will include the following key unit operations:

1) Primary crushing

2) SAG milling and ball milling to approximately 100 microns

3) Rougher copper flotation

4) Rough concentrate re-grinding to approximately 10 to 20 microns

5) Flotation cleaning to produce final copper concentrates

6) Concentrate de-watering

7) Tailings deposition of tailings solids

Results of copper recovery test work are detailed in Section 13 of this report and is based on the use of a proposed flowsheet which is shown in Figure 13-2. There has been no work completed that evaluates the potential recovery of cobalt.

18.0 PROJECT INFRASTRUCTURE

18.1 ROAD

Although all projects in the Ambler mining district are at the exploration or early development stage, including Trilogy Metals' Bornite Project, Trilogy Metals and NANA are supporting the State of Alaska's efforts to develop infrastructure into the region, specifically AMDIAP, under the 'Alaska Roads to Resources' program. Between 2009 and 2012, the State of Alaska funded over $10 million to study access to the Ambler mining district. During that period, a working group consisting of ADOT, the Governor's office, AIDEA, NANA, and Trilogy Metals was developed to advance AMDIAP. An additional $8.5 million was funded by the Alaskan government for permitting activities during the 2013/2014 fiscal year.

Efforts from 2009 to 2011 focused on identifying optimal access routes and, after input from local communities and a review of a series of options, the Brooks East Access Route was chosen for further assessment. In 2012, the Alaska State Legislature approved an additional $4 million to allow the ADOT to initiate environmental baseline studies on the Brooks East Access Route connecting the Ambler mining district with the Dalton Highway 322 km to the east. In the fall of 2012, a project description for AMDIAP was prepared by AIDEA, the project proponent to finalize the proposed action and identify the lead federal agency for impact analysis and determine the state and federal cooperating agencies to assure permit coordination. Also, initial meetings between all of the permitting and licensing agencies and initial community engagement meetings were held in August 2013. On October 21, 2015 the Governor of the State of Alaska authorized AIDEA to begin the EIS process. In 2015 AIDEA completed a Consolidated Right-of-Way Application (form SF-299) to the relevant federal permitting agencies, including: The National Park Service (NPS); the US Army Corps of Engineers (ACE) the Bureau of Land Management (BLM). The Consolidated Right-of-Way Application (SF-299) application was reviewed and deemed Complete and Compliant by the National Park Service, the Army Corps of Engineers and the BLM in August 2016. In Feb, 2017 the BLM as Lead Federal Agency issued the Notice of Intent (NOI) and thereby initiated an Environmental Impact Study. The Scoping comment period was completed at the end of January, 2018 and the Draft EIS is scheduled to be completed by March 2019 with the Final EIS at the end of 2019. The current schedule for permitting the AMDIAP is available on the BLM's website at http://eplanning.blm.gov.

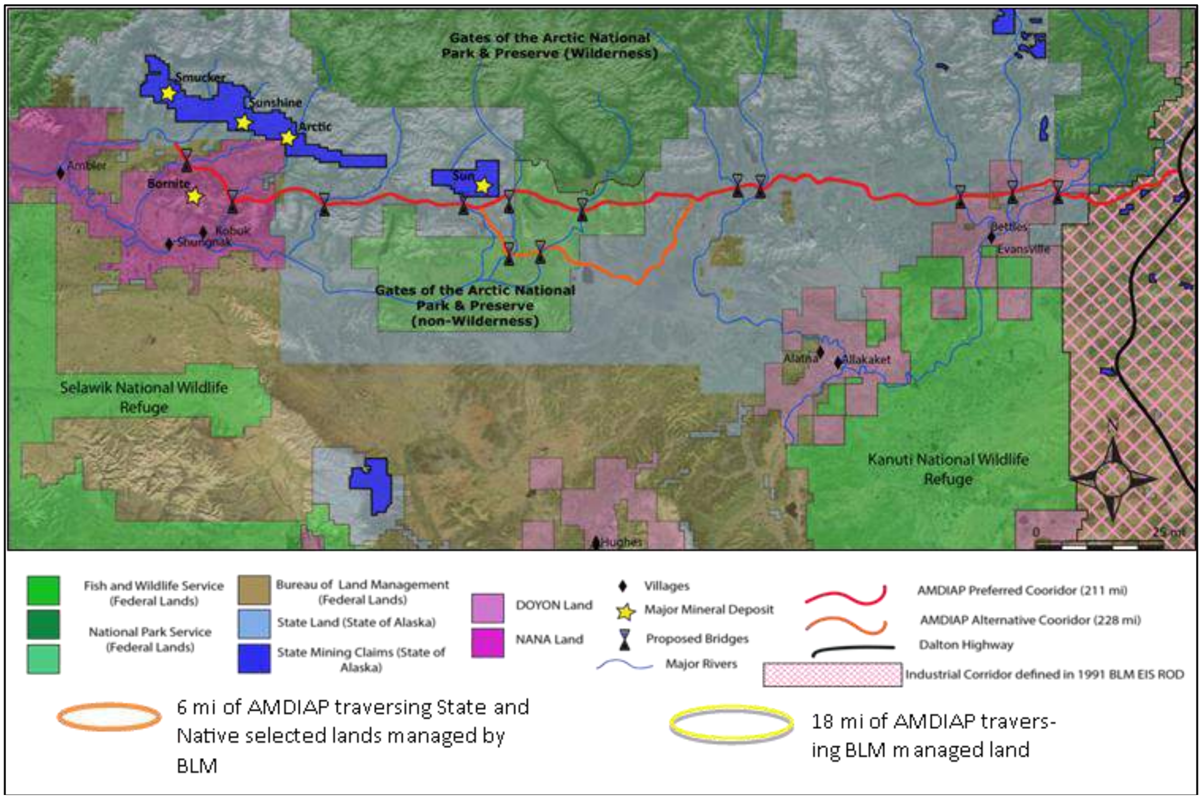
Figure 18-1 shows the Brooks East Access Route in orange in relationship to the existing Dalton Highway in black and the Alaska Railroad in blue. Figure 18-2 shows the preferred access option (Brooks East Access Route) in dark orange, and a variation of the route in light orange.

18.2 POWER

Remote projects typically use diesel fuel for power generation. Trilogy Metals is investigating the viability of using liquefied natural gas (LNG) as a potential power source for the Bornite Project. In July 2013, AIDEA published a feasibility study to investigate the viability of trucking LNG to Fairbanks so as to supply local utilities which would use the LNG to fuel their power generation plants. The feasibility study estimated that the use of LNG could significantly lower electrical power generation costs in Fairbanks. In January, 2014 AIDEA selected a commercial participant to develop a North Slope LNG liquefaction plant that will produce LNG for delivery to the Fairbanks North Star Borough via trucking. Several other potential sources of LNG are also being investigated.

Figure 18-1: Brooks East Route Access to the UKMP (Trilogy Metals, 2017)

Figure 18-2: Brooks East Route Access to the UKMP – Preferred Route (Trilogy Metals, 2017)



19.0 MARKET STUDIES AND CONTRACTS

The Bornite Project is an early exploration project; no market studies have been completed.

20.0 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

This section characterizes the existing and ongoing environmental baseline data collection for the Bornite Project area, makes suggestions for additional studies that would provide a basis for the eventual mine permitting efforts, describes the major environmental permits that will likely be required for the Bornite Project, and identifies potential significant social or community impacts.

20.1 ENVIRONMENTAL STUDIES

The Bornite Project area includes NANA's Bornite and ANCSA lands, the Ruby Creek drainage (a tributary of the Shungnak River), the Shungnak River drainage, and portions of the Ambler Lowlands. Since 2008, baseline environmental data collection has occurred in the area including archaeology, aquatic life surveys, sediment sampling, wetlands mapping, surface water quality sampling, hydrology, meteorological monitoring, and subsistence. The existing data are summarized in Sections 20.1.1 to 20.1.7.

20.1.1 ARCHAEOLOGY

Limited work was done in 2008 by Northern Land Use Research Inc. (NLUR Inc.) to identify sites that could have potential cultural significance within the Bornite Project area. NLUR concluded "No Historic Properties Affected" with regards to the 2008 work plan. Additional archaeological assessment work will be done to determine archaeological resources potentially impacted by development at Bornite.

20.1.2 AQUATIC LIFE AND FISHERIES

All aquatic life and fisheries sampling efforts were conducted in 2010 by TetraTech Inc. Tetra Tech's sampling efforts included baseline aquatic life surveys in the area along the proposed road alternatives between the Bornite airstrip and the Arctic airstrip, and along the Arctic airstrip to Arctic Deposit road in Subarctic Creek. The purpose of this study was to characterize the aquatic life within the Shungnak River and potentially impacted tributaries. Opportunistic observations were also collected in the Kogoluktuk River.

The Alaska Department of Fish and Game conducted aquatic surveys near Bornite in 2016 and 2017 including both fish and macroinvertebrates abundance and diversity. Metals analysis of fish tissues was also performed and compared to background water quality results.

20.1.3 ECOSYSTEM AND SOILS

Soil sampling was done in 2011 to determine the presence of naturally occurring asbestos (NOA). Sampling was done at the Bornite Camp, Bornite Airstrip, and along the

Kobuk to Bornite Road. Analysis of the samples was conducted using a Polarized Light Microscopy (PLM) detection method.

Wetlands delineation was done in 2010 for the road corridor between the Bornite Airstrip and the Arctic Airstrip by TetraTech using the standard three-parameter approach required by the US Army Corps of Engineers. Thirty-three sampling locations were evaluated reflecting the fourteen vegetation communities observed in the field. Vegetation communities were characterized using the Alaska Vegetation Classification system. A wetlands map for the Bornite Project Area was produced in 2011 using aerial photography and extrapolating data collected during the 2010 wetlands study. A project wide wetlands delineation was done in 2015 by DOWL HKM including the Bornite Lands and possible facilities locations.

20.1.4 Hydrology

Surface water quality sampling has been conducted within the Bornite Project area since 2010, with the exception of 2011. Samples were analyzed for dissolved metals, total metals, and common environmentally significant parameters including pH, conductivity, dissolved oxygen and nitrates. Velocity, depth, width and discharge (cubic feet per second) were measured using a Marsh McBirney sensor, and then later a Doppler current meter.

Two hydrologic gauging stations have been installed within the Bornite Project area, one on Ruby Creek and one on the Shungnak River. These stations measure the height of the water, pH, and conductivity.

20.1.5 Meteorology, Air Quality, and Noise

Meteorological data have been collected year-round at the Arctic Airstrip since September, 2011. Site data has been collected hourly for humidity, barometric pressure, precipitation, solar radiation, temperature, wind speed, and wind direction.

20.1.6 Subsistence

In 2012, Stephen R. Braund & Associates completed a subsistence data gap analysis under contract to the Alaska Department of Transportation and Public Facilities as part of the baseline studies associated with a proposed road to the Ambler mining district. The purpose of this analysis was to identify what subsistence research had been conducted for the potentially affected communities and determine if subsistence uses and use areas overlap with or may be affected by the project The gap analysis attempted to identify additional information (i.e., data gaps) needed in order to accurately assess potential effects to subsistence.

20.1.7 Avian

ABR Inc. conducted an avian survey of the Bornite area including the Ambler lowlands. The survey included a spring survey to determine nest locations, followed by a summer study to determine species and fledging rate.

Table 20-1: Summary of Existing Environmental Baseline Studies Reports

Discipline	Year	Report Title	Author
Archaeology	2008	Assessment of Cultural Resources and Site Potential of Proposed Geologic Exploration Drill Areas	Neely, Burr and Proue, Molly (NLUR Inc.)
Aquatic Life and Fisheries	2010	Arctic Deposit Access Environmental Baseline Data Collection Aquatics	TetraTech Inc.
Ecosystem and Soils	2010	Arctic Deposit Access Environmental Baseline Data Collection Wetlands & Vegetation	TetraTech Inc.
	2011	Ambler Project Asbestos Soil Sampling Report	Craig, Cal (Trilogy Metals)
	2015	NovaCopper Wetlands Assessment	DOWL
Hydrology			
	2008	Trip Report-Arctic Deposit and Bornite August 13-18, 2008	Bergstrom, Frank (Amerikanuak Inc.)
	2010	Arctic Deposit Access Environmental Baseline Data Collection Hydrology	TetraTech Inc.
	2012	Stream Gauge Install	DOWL HKM
	2012	Water Quality Monitoring Report: Fall 2012	Craig, Cal (NovaCopper)
	2012	NovaCopper Weather Station and Streamflow Gauging Data Collection Year-End Report	DOWL HKM
	2013	Water Quality Monitoring Report: First Quarter 2013 Water Quality Monitoring Report: Second Quarter 2013	Craig, Cal (NovaCopper)
	2014	Water Quality Monitoring Report: Third Quarter 2014	Craig, Cal (NovaCopper)
	2015	Water Quality Monitoring Report: Third Quarter 2015	Craig, Cal (NovaCopper)
	2016	Water Quality Monitoring Report: Third Quarter 2016 Water Quality Monitoring Report: Third Quarter 2016	Craig, Cal (NovaCopper)

	2017	Water Quality Monitoring Report: April 2017 Water Quality Monitoring Report: May 2017 Water Quality Monitoring Report: July 2017 Water Quality Monitoring Report: August 2017 Water Quality Monitoring Report: September 2017 Water Quality Monitoring Report: December 2017	Craig, Cal (NovaCopper)
Meteorology, Air Quality, and Noise	2012	NovaCopper Weather Station and Streamflow Gauging Data Collection Year-End Report	DOWL HKM
Subsistence	2012	Ambler Mining District Access Project Subsistence Data Gap Memo	Braund, Stephen (Stephen R. Braund and Associates
Avian	2016	Upper Kobuk Raptors Final Report 2016	ABR Inc.
	2017	Upper Kobuk Raptors Final Report 2017	ABR Inc.

20.1.8 Additional Baseline Data Requirements

Additional baseline environmental data in NANA's Bornite and ANCSA lands, the Ruby Creek drainage, the Shungnak River drainage, portions of the Ambler Lowlands, and downstream receiving environments will be required to support future mine design, development of an EIS, permitting, construction and operations. Trilogy Metals will consult with state, local and federal regulatory agencies and their consultants to further develop a comprehensive environmental baseline program. Owing to the long lead-time to collect data (years), it is important that the comprehensive environmental baseline program generates adequate data in terms of type, quality and quantity for each of the disciplines of interest. Recommendations for additional baseline studies are included in Table 20-2.

Table 20-2: Additional Recommended Environmental Baseline Studies

Discipline	Recommended Studies
Acid-Base Accounting	Static test work of waste domains within and adjacent to the proposed open pit, potential underground resources, and static investigation of borrow sources and tailings followed by kinetic test work.
Archaeology	Assessment of cultural resources, cultural site clearance
Aquatic Life	Expanded aquatic surveys (invertebrates)
Ecosystem and Soils	Permafrost and wetlands delineation mapping; vegetation surveys
Fisheries	Expanded fisheries surveys

Hydrogeology	Installation and monitoring of groundwater wells in the Ruby Creek drainage areas near the site of, and down gradient of, any proposed pit, any proposed tailings and waste rock storage facilities and alternative sites for tailings and waste rock disposal locations. A large scale pumpdown test will also be needed to understand the connectivity of the aquifers.
Hydrology	Additional streamflow measurements, hydrological modeling and snow survey data collection.
Meteorology, Air Quality, and Noise	Expansion of the meteorological program to additional locations to be determined; air quality monitoring
Wildlife	Avian survey, large mammal survey, analysis of subsistence resources

All of the data are important to the development of an accurate environmental baseline and water balance model for the Bornite Project area. These studies would need to be completed in sufficient depth to cover all reasonably foreseeable baseline work that may be requested by the regulatory agencies. The risks that come with insufficient baseline data include delays in the permitting process, poorly constrained pre-mining characterizations, inappropriate trigger levels in permits and inaccurate water balance models that can negatively affect operations and otherwise result in unforeseen and potentially costly circumstances during permitting or mine operations and closure.

20.2 PERMITTING

Development of the Bornite Project will require a significant number of permits and authorizations from state, federal, and regional organizations. Much of the groundwork to support a successful permitting effort must be undertaken prior to submission of permit applications so that issues can be identified and resolved, baseline data can be acquired, and regulators and stakeholders can become familiar with the proposed project.

The comprehensive permitting process for the Bornite Project can be divided into three categories:

Exploration state and regional permitting: required to obtain approval for drilling, camp operations, engineering, and environmental baseline studies.

Pre-application phase: conducted in conjunction with engineering feasibility studies. This stage includes the collection of environmental baseline data and interaction with stakeholders and regulators to facilitate the development of a project that can be successfully permitted.

The National Environmental Policy Act (NEPA) phase: formal agency review of the Federal and State requirements for public and agency participation to determine if and how the Project can be done in an acceptable manner.

Table 20-3 lists the typical permits that may be required for the Project.

Table 20-3: Permits that May Be Required for the Bornite Project

Authority	Permit
FEDERAL	
Environmental Protection Agency (EPA)	Spill Prevention Containment and Contingency (SPCC) Plan
U.S. Army Corps of Engineers (USACE)	CWA Section 404 Permit (wetlands dredge and fill)
	River and Harbors Act (RHA) Section 10 (structures in navigable waters)
	RHA Section 9 (dams and dykes in navigable waters-interstate commerce)
U.S. Coast Guard	RHA Section 9 Construction Permit (bridge across navigable waters)
Bureau of Alcohol, Tobacco, and Firearms	License to Transport Explosives
	Permit and License for Use of Explosives
Federal Aviation Administration	Notice of Landing Area Proposal (existing airstrip)
	Notice of Controlled Firing Area for Blasting
U.S. Department of Transportation	Hazardous Materials Registration
U.S. Fish and Wildlife Service	Section 7 of the Endangered Species Act, Consultation requiring a Biological Assessment or Biological Opinion
STATE	
Division of Mining, Land, and Water	Plan of Operations
	Reclamation Plan Approval
	Mining License
	Land Use Permits and Leases
	Right-of-Ways, Easements, Material Sales, etc.
	Certificate of Approval to Construct a Dam
	Certificate of Approval to Operate a Dam
	Temporary Water Use Permit
	Water Rights Permit/Certificate to Appropriate Water
State Historic Preservation Office	Section 106 Historical and Cultural Resources Protection Act clearance
Department of Fish and Game	Fish Habitat Permit
	Wildlife Hazing Permit
	Culvert/Bridge Installation Permit

Table 20.3: Permits that May Be Required for the Bornite Project – Cont'd

Authority	Permit
FEDERAL	
Division of Water	Section 401 Water Quality Certification (CWA 402 permit)
	Waste water Disposal Permits
	Non-Domestic Wastewater Disposal Permit
	Storm Water Discharge Pollution Prevention Plan
	Domestic Waste water Disposal Permit
	Approval to Construct and Operate a Public Water Supply System
Division of Environmental Health	Solid Waste Disposal Permits
	Food Sanitation Permit
	Class III Municipal Solid Waste Landfill Permit
Division of Air Quality	Air Quality Construction Permit (first 12 months)
	Air Quality PSD Title V Operating Permit (after 12 months)
	Air Quality permit to Open Burn
REGIONAL	
Northwest Arctic Borough	Title 9 Land Use Permit
	Fuel Storage Permit
	Commercial Transporter Authorization
	Master Plan of Operations

The permit review process will determine the number of management plans required to address all aspects of the Project to ensure compliance with environmental design and permit criteria. Each plan will describe the appropriate environmental engineering standard and the applicable operations requirements, maintenance protocols, and response actions.

20.3 SOCIAL OR COMMUNITY CONSIDERATIONS

The Bornite Project is located approximately 19 km north of the village of Kobuk, 23 km northeast of the village of Shungnak, and 40 km east of the village of Ambler. The populations in these villages are approximately 151 in Kobuk (2010 Census), 262 in Shungnak (2010 Census) and 258 in Ambler (2010 US Census). Residents live a largely subsistence lifestyle with incomes supplemented by trapping, guiding, local development projects, government aid and other work in and outside of the villages.

The Bornite Project has the potential to significantly improve work opportunities for village residents in the region. Trilogy Metals is working directly with the villages to employ residents in the ongoing exploration program as geotechnicians, drill helpers, environmental technicians, and a myriad of other camp support positions. Trilogy Metals and NANA have established a Workforce Development Subcommittee to assist with developing a local workforce. In addition, Trilogy Metals has existing contracts with native-affiliated companies (such as NANA Management Services and Kuna Engineering, formerly WHPacific Inc.) that provide camp catering and environmental services for the project.

In October 2011, Trilogy Metals signed an agreement with NANA. In addition to consolidating landholdings in the Ambler mining district and Bornite, the agreement has language establishing native hiring preferences and preferential use of NANA subsidiaries for contract work. Furthermore, the agreement formalized an Oversight Committee, with equal representation from Trilogy Metals and NANA, to regularly review project plans and activities. The agreement also includes a scholarship funded annually by Trilogy Metals that promotes education opportunities for Shareholders in the region. Trilogy Metals meets periodically during the field season, with the residents of Kobuk, Shungnak and Ambler, the three villages closest to the project area. Trilogy Metals also meets occasionally with eight other NANA region villages including Noatak, Kivalina, Kotzebue, Kiana, Deering, Buckland, Selawik and Noorvik, for the purpose of updating residents on project plans and fielding their questions and concerns. Trilogy Metals has also developed a good working relationship with the NWAB government.

In general terms, rural Alaska residents are often concerned about potential mining impacts to wildlife and fish for those projects within their traditional use areas. Trilogy Metals acknowledges these views and concerns and is taking substantive steps to address them during the current exploration stage of the Bornite Project.

Local community concerns will also be formally recognized during the scoping stage at the beginning of the NEPA process. At that time, the lead federal agency (likely the USACE) will hold scoping meetings in rural villages to hear and record the concerns of the local communities so that they can be addressed during the development of the EIS. In addition, the USACE would have government-to-government consultations with the Tribal Councils in each of the villages, as part of the NEPA process, to discuss the project and discuss Council concerns.

Characterizing the level of support or opposition to the Bornite Project would be speculative at this time. A poll conducted by Dittman Research for the 2011 NANA Shareholder opinion survey asked if Shareholders supported or opposed road projects on NANA land to assist in economic and potential mineral development. Eighty-three percent supported the concept while fifteen percent opposed. Surveys of this sort show a broad support for infrastructure and of mineral development in the region as long as regional interests are met. Regional engagement by Trilogy Metals has also encountered a strong desire for the economic benefits that come with mining projects. However, like most mining projects there will likely be some opposition to this project.

20.4 RECLAMATION

20.4.1 BORNITE MINE LEGACY CLEANUP

Under the NANA Agreement signed on October 19th, 2011, NANA is required to complete a baseline environmental report following completion of cleanup of the former mining camp on the Bornite Lands, to the standards required by the ADEC and "to the reasonable satisfaction of Trilogy Metals". This includes "*removal and disposal as required by law of all hazardous substances present on the Bornite Lands. NANA has indemnified and will hold Trilogy Metals harmless for any loss, cost, expense, or damage suffered or incurred attributable to the environmental condition of the Bornite Lands at the date of the baseline report which relate to any activities prior to the date of the agreement.*"

Travis/Peterson Environmental Consulting Inc. completed a site characterization for Bornite in 2007. The report identified several safety and environmental issues and possible mitigation solutions. Identified in the report are asbestos-containing structures, petroleum ground contamination, an open shaft which presents a safety hazard, and environmental liabilities due to out of service vehicles. Full results are available in the report, *Bornite Mine Camp Site Characterization Report* (Travis/Peterson Environmental Consulting, Inc., 2007).

NANA has completed the all of the planned work and is believed to have satisfied the requirements laid out in the Agreement. NANA delivered the final baseline environmental report in 2014 for review by Trilogy Metals. If the work has been done satisfactorily and the report is complete, Trilogy Metals will sign off on it, thereby releasing NANA from legacy environmental obligations at the Bornite Site.

20.4.2 RECLAMATION OF EXPLORATION ACTIVITIES

Reclamation of mineral exploration activities at the Bornite Project is completed under the guidelines presented by the State of Alaska in the Multi-Year Hardrock Exploration Permit #2183 issued by the Department of Natural Resources Division of Mining, Land, and Water. Key components include the following:

- Topsoil will be stockpiled.
- The area will be reshaped to blend with surrounding topography.
- Organic material will be spread over the site to prevent erosion.
- Reclamation will be done in the same season as disturbance.
- Drill casing will be removed or cut off at ground level.
- Drill holes will be plugged with bentonite clay or equivalent.
- Reseeding will be done as necessary.

- Disturbance will be held to a minimum.

21.0 CAPITAL AND OPERATING COSTS

The Bornite Project is an early exploration project; no capital or operating costs have been estimated.

22.0 ECONOMIC ANALYSIS

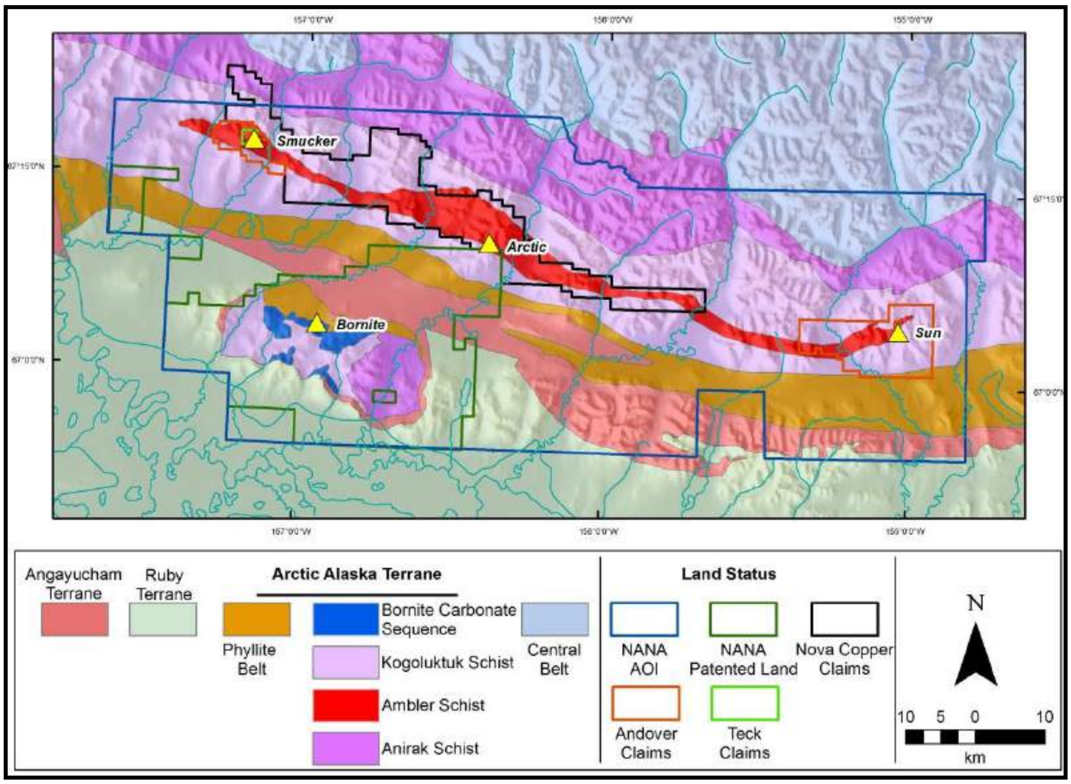
The Bornite Project is an early exploration project; no economic analysis has been completed.

23.0 ADJACENT PROPERTIES

There is no data from any adjacent properties that has been used in the estimation of mineral resources for the Bornite Project.

Adjacent to Trilogy Metals' land holdings, which encompass the Bornite Deposit, are two VMS deposits: the Sun Deposit owned by Enirgi Group Corporation (Enirgi) and the Smucker Deposit owned by Teck Resources Ltd. (Teck). Both prospects are located in the Ambler Schist Belt (Figure 23-1). Sun is the only adjacent property which contains a current mineral resource estimate. These two properties are briefly described in the following sections.

Figure 23-1: Adjacent Properties and Land Status (Trilogy Metals, 2016)



23.1 SUN DEPOSIT

The following information was primarily derived and summarized from an Andover Mining Corp. (Andover) Technical Report dated September 30, 2013 (Gustin and Ronning). The QPs have not verified any of the information contained in the 2013 technical report on the Sun Project. The Sun property is located in the Ambler Schist Belt, roughly 79 km east of Trilogy Metals' Bornite deposit. Andover has an aggregate land position of 45,920 acres in the Ambler Schist Belt.

Andover has a 20 person camp at the Sun project along with a 457 m airstrip built in 2007. The camp consists of living quarters, core-logging facilities, geological office, mess facility, showers, laundry facilities, generator and tool storage, and indoor and outdoor core storage.

The Sun Property includes copper-zinc-silver-lead-gold mineralization on the Main Sun Deposit, S.W. Sun Deposit, and a number of other prospects. In total, 97 drill holes totaling 19,123 m have been completed on the Sun Property. Andover completed 48 holes during 2007, 2011 and 2012, with 49 drill holes completed by previous operators Anaconda, Noranda, Cominco and Bear Creek.

The mineral resource estimate contained in the 2013 technical report for the Sun Deposit is listed in Table 23-1. The authors of this report have not reviewed the estimate of mineral resources for the Sun deposit and cannot validate or verify the estimate.

Table 23-1: Mineral Resource Estimate for the Sun Project (November 2012)

Classification	Tonnes (millions)	Zn %	Cu %	Pb %	Ag g/t	Au g/t	Mlbs Zn	Mlbs Cu	Mlbs Pb	Moz Ag	Koz Au
Indicated	2.165	4.1	1.4	1.1	57.6	0.21	196	68	51	4.0	14
Inferred	11.648	3.9	1.1	1.4	76.8	0.24	1,005	293	351	28.8	89

Notes:
1) Using cutoff of $75/Tonne "in-ground value"
2) Metal prices at Cu = $3.00/lb, Pb = $0.95/lb, Zn = $0.95/lb, Ag = $25/oz, Au = $1,300/oz

Andover announced in 2013 that it had filed a Notice of Intention to make a proposal for its reorganization under the Bankruptcy and Insolvency Act (Canada), and was deemed bankrupt on February 12, 2014. In 2015, the Trustee in the bankruptcy completed the sale of Andover's material assets to Enirgi, as described in Andover's most recent press release dated March 16, 2015.

23.2 SMUCKER DEPOSIT

Teck owns a 100% interest in the Smucker Property, located 26 km west-northwest of the Bornite Deposit in the same terrane and lithological sequence as the Arctic and Sun Deposits. Like the Arctic and Sun Deposits, the Smucker Deposit is described as a polymetallic copper-lead-zinc-gold-silver VMS prospect. Currently in target delineation stage, the Smucker Property does not have a current NI 43-101 compliant resource estimate.

Significant drilling by Anaconda in the 1970s intersected precious metal-rich VMS mineralization analogous to the other prospects of the Ambler Sequence (Ambler Schist Belt). An unclassified historical "resource estimate" for the Smucker Deposit totals 7.2M tonnes at 0.5% Cu, 4.9% Zn, 1.7% Pb, 156g/t Ag and 1.1g/t Au. There is no defined cut-off threshold for this figure.

This historic resource estimate is considered relevant but not reliable. The QP has not done any work to validate or verify this historical estimate and it should not be considered to be a mineral resource estimate as defined under NI 43-101.

24.0 OTHER RELEVANT DATA AND INFORMATION

There is no additional data or information that is relevant to the Bornite Project.

25.0 INTERPRETATION AND CONCLUSIONS

The level of understanding of the geologic controls that influence the distribution of copper mineralization at the Bornite Deposit is relatively good. The drilling, sampling and validation practices utilized by Trilogy Metals during the various campaigns have been conducted in a professional manner and adhere to accepted industry standards. The confidence in older, historic, drilling conducted by Kennecott has been demonstrated through a series of validation checks and, overall, the underlying database is considered sufficient for the estimation of copper resources in the Indicated and Inferred categories and cobalt mineral resources in the Inferred category. Estimates of mineral resources that are amenable to a combination of open pit and underground extraction methods are summarized in Table 25-1 and Table 25-2.

Table 25-1: Estimate of Copper Mineral Resources for the Bornite Project

Class	Type	Cut-off (Cu %)	Tonnes (million)	Average Grade Cu (%)	Contained Metal Cu (Mlbs)
Indicated	In-Pit(1)	0.5	40.5	1.02	913
Inferred	In-Pit(1)	0.5	84.1	0.95	1,768
Inferred	Below-Pit	1.5	57.8	2.89	3,683
Inferred	**Total**		**141.9**	**1.74**	**5,450**

(1) Resources stated as contained within a pit shell developed using a metal price of US$3.00/lb Cu, mining costs of US$2.00/tonne, milling costs of US$11/tonne, G&A cost of US$5.00/tonne, 87% metallurgical recoveries and an average pit slope of 43 degrees.

(2) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources will be converted into Mineral Reserves.

(3) It is reasonably expected that the majority of Inferred mineral resources could be upgraded to Indicated mineral resources with additional exploration.

Table 25-2: Estimate of Cobalt Mineral Resources for the Bornite Project

Class	Type	Cut-off (Cu %)	Tonnes (million)	Average Grade Co (%)	Contained Metal Co (Mlbs)
Inferred	In-Pit(1)	0.5	124.6	0.017	45
Inferred	Below-Pit	1.5	57.8	0.025	32
Inferred	**Total**		**182.4**	**0.019**	**77**

(1) Resources stated as contained within a pit shell developed using a metal price of US$3.00/lb Cu, mining costs of US$2.00/tonne, milling costs of US$11/tonne, G&A cost of US$5.00/tonne, 87% metallurgical recoveries and an average pit slope of 43 degrees.

(2) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources will be converted into Mineral Reserves.
(3) It is reasonably expected that the majority of Inferred mineral resources could be upgraded to Indicated mineral resources with additional exploration.
(4) Due to limited sample data, none of the cobalt resource meets the confidence for Indicated class resources. All cobalt resources are considered in the Inferred category.

The deposit remains “open” to potential expansion near-surface toward the south, and at depth toward the north, northeast and east. These directions were partially tested with drilling conducted in 2017, the results of which suggest that Bornite mineralization continues to the northeast. In addition, there are also indications that the mineralization may be continuous between the South Reef zone and the Lower Reef zone at Ruby Creek. Further drilling is warranted to test these assumptions.

Metallurgical test work to date indicates that the Bornite Project can be treated using standard grinding and flotation methods to produce copper concentrates. Initial testing indicates copper recoveries of approximately 87% resulting in concentrate grades of approximately 28% copper with very low potential penalty elements. Further metallurgical test work is warranted to test these assumptions. There has been essentially no metallurgical test work that evaluates the extraction of cobalt. This work is recommended.

Based on the information to date, the Bornite Project hosts a relatively large copper resource with associated cobalt that is potentially amenable to a combination of open pit and underground extraction methods. It is recommended that Trilogy Metals continue to advance the Project through continued exploration, metallurgical studies, preliminary engineering studies, environmental base line analyses and should consider the generation of a preliminary economic analysis in the near future.

A significant proportion of the current mineral resource occurs in the Inferred category, which, by definition, has a high degree of uncertainty whether it is economically viable. Significant changes to the estimate of mineral resources could result from further drilling or studies related to engineering, metallurgy or environmental issues. It is expected that the majority of resources in the Inferred category could be upgraded to the Indicated mineral resources with continued exploration.

26.0 RECOMMENDATIONS

BDRC and SGI make the following recommendations for the next phase of work on the Bornite Project:

- Infill drilling (8,000m) between holes drilled in 2017 along the northern down-dip part of the deposit in order to provide holes that are spaced less than 200m which can then be used to support the estimation of mineral resources in this area. ($3.5M)
- Continue exploration drilling, (8,000m) with holes spaced at 200 m intervals or greater, to test the continuity of mineralization down-dip (Ruby Creek and South Reef). ($3.5M)
- Extend the Deep Penetrating Geochemical (DPG) survey north of the deposit into the Ambler lowlands. ($25,000)
- Continued integration of lithology, alteration, structural and mineral zoning domains in the interpretation of the geologic model. ($75,000)
- Update mineral resource estimate and technical report. ($75,000)
- Metallurgical studies, including pyrite floatation tests and cobalt leach tests, variability and grinding test work, examination of the process parameters needed to optimize the cleaning circuit, and monitoring of concentrate quality for both copper and cobalt. ($250,000)
- Implement an initial acid base accounting (ABA) waste characterization study suitable to support a PEA level study. ($50,000)
- Maintain environmental baseline monitoring to support environmental and permitting activities ($30,000)
- Undertake a hydrogeological and geotechnical program to develop a better understanding of the groundwater regime and pit slope stability to support PEA-level open pit design. ($500,000)

Total cost of $8.0M excludes site costs such as camp support, overhead and other indirect costs. Additional exploration drilling to test for down-dip extensions to known resources north of Ruby Creek and South Reef will require further expenditures.

Following the successful completion of Phase 1 of the proposed work, it is recommended that Trilogy Metals conduct internal engineering and economic evaluations to support moving forward with a PEA. The estimated cost of a PEA is $800,000.

27.0 REFERENCES

ALS Metallurgy, 2013, Metallurgical Assessment of the Bornite Deposit, internal report prepared for NovaCopper Inc.

Avé Lallemant, H.G., Gottschalk, R.R., Sisson, V.B., and Oldow, J.S., 1998, Structural analysis of the Kobuk fault zone, north-central Alaska, in Oldow, J.S., and Avé Lallemant, H.G., eds., Architecture of the Central Brooks Range Fold and Thrust Belt, Arctic Alaska: Boulder, Colorado, Geologic Society of America Special Paper 324.

Beisher, G., 2000, Ruby Creek Copper Prospect Bornite Carbonate Sequence, NANA Regional Corporation Lands Northwest Alaska report submitted to M.I.M. (USA) Inc.

Bergstrom, Frank, 2008, Trip Report – Arctic and Bornite, August 13 thru 18, 2008 MEMO, Amerikanuak, Inc.

Bernstein, L.R., and Cox, D.P., 1986, Geology and Sulfide Mineralization of the Number One Orebody, Ruby Creek Copper Deposit, Alaska: Economic Geology, 81, p. 1675-1689.

Bigelow, Charles G., 1963, Facies distribution, structure and mineralization, Ruby Creek Development project, Alaska June 1963: Bear Creek Mining company internal report.

Braund, S.R., et al, 2012, Ambler Mining District Access Project, Subsistence Data Gap Memo, prepared for Alaska Department of Transportation and Public Facilities.

Christiansen, P.P. and Snee, L.W., 1994, Structure, metamorphism, and geochronology of the Cosmos Hills and Ruby Ridge, Brooks Range Schist Belt, Alaska: Tectonics, 13, p. 193-213.

CIM. (May 2014). CIM Definition Standards - For Mineral Resources and Mineral Reserves. Retrieved from: http://web.cim.org/UserFiles/File/CIM_DEFINITION_STANDARDS_MayNov_20140.pdf.

Conner, D.T., 2015, The Geology of the Bornite Copper-Zinc-Cobalt Carbonate-Hosted Deposit, Southwestern Brooks Range, Alaska: M.Sc. thesis submitted to the Colorado School of Mines.

Craig, C., 2013, Water Quality Monitoring Report: First Quarter 2013, internal report prepared for NovaCopper Inc.

Craig, C., 2013, Water Quality Monitoring Report: Second Quarter 2013, internal report prepared for NovaCopper Inc.

Craig, C., 2011, Ambler Project Asbestos Soil Sampling Report, Internal Report Prepared for the Alaska Gold Company.

Craig, C., 2013, 2012 Water Quality Monitoring Report Third Quarter, Internal Report prepared for NovaCopper US Inc.

Craig, C., 2013, 2013 Water Quality Monitoring Report First Quarter, Internal Report prepared for NovaCopper US Inc.

Craig, C., 2013, 2013 Water Quality Monitoring Report Third Quarter, Internal Report prepared for NovaCopper US Inc.

Craig, C., 2014, 2014 Water Quality Monitoring Report Third Quarter, Internal Report prepared for NovaCopper US Inc.

Craig, C., 2015, 2015 Water Quality Monitoring Report Third Quarter, Internal Report prepared for NovaCopper US Inc.

Crupi, Steven R., 2007, Ambler Project 2007 Environmental Baseline Sampling Alaska Gold Co., Shaw Alaska, Inc.

Crupi, Steven R., 2008, Shaw Hydraulics Data Report July 2008 Event Final, Shaw Environmental, Inc.

Crupi, Steven R., 2008, Water Quality Report July 2008 Event Final, Shaw Environmental, Inc.

Crupi, Steven R., 2009, Hydraulics Data Report July 2009 Event Draft, Shaw Environmental, Inc.

Crupi, Steven R., 2009, Water Quality Report July 2009 Event Final, Shaw Alaska, Inc.

Davis, Bruce, 2012, Resource Estimate – Ruby Creek Zone, Bornite Deposit, Upper Kobuk Mineral Project, Northwest Alaska, NI 43-101 Technical Report.

Davis, B. and Sim, R., 2013, Resource Estimate – South Reef and Ruby Creek Zones, Northwest Alaska, USA, NI 43-101 Technical Report (Effective Date: January 31, 2013, Release Date: February 8, 2013)

Davis, B., Sim, R., and Austin, J., 2014, Bornite Project, Northwest Alaska, USA, NI 43-101 Techincal Report (Effective Date: March 18, 2014, Release Date: April 1, 2014).

Dillon, J.T., Pessel, G.H., Chen, J.H., and Veach, N.C., 1980, Middle Paleozoic magmatism and orogenesis in the Brooks Range, Alaska: Geology, 8, p. 338-343.

DOWL HKM, 2012, DOWL HKM September 2012 Trip Report, DOWL HKM.

DOWL HKM, 2012, DOWL HKM Stream Gage Install July-August 2012 Trip Report.

DOWL, 2015, NovaCopper Wetlands Assessment, DOWL

Dryden, James, 2012, Dryden Stream Gage Install Aug 2012 Trip Report.

Einsele, G, 1998, Event stratigraphy: Recognition and Interpretation of Sedimentary Event Horizons. In: Doyle P, Bennett MR (eds) Unlocking the stratigraphic record: advances in modern stratigraphy, Wiley, Chichester, pp 145–193.

Erskine, C. F., 1970, Summary Report on Ground Water Investigations at Ruby Creek Division, Bornite, Alaska, November 1966 through April 1968: Metal Mining Division – Engineering Department internal report for Kennecott Copper Corporation.

Exploration Agreement and Option to Lease between NovaCopper US Inc. and NANA Regional Corporation, Inc. dated October 19, 2011, as amended.

Gustin, M. M. and Ronning, P., 2013, NI 43-101 Technical Report on the Sun Project, prepared by Mine Development Associates of Reno, Nevada for Andover Mining Corp.

Hale, C., 1996, 1995 Annual Ambler District Report: Kennecott Exploration Internal report.

Hale, C., 1997, Ruby Creek-Cosmos Hills Geology, 1997 Results: Kennecott Exploration Internal report.

Hawke Engineering, 1966, Flooding on October 27, 1966 exploration shaft at Bornite Alaska: Hawk Engineering internal report for Ruby Creek development Kennecott Copper Corp.

Hitzman, M.W., Smith, T.E., and Proffett, J.M., 1982, Bedrock Geology of the Ambler District, Southwestern Brooks Range, Alaska: Alaska Division of Geological and Geophysical Surveys Geologic Report 75, 1:50,000.

Hitzman, M.W., 1983, Geology of the Cosmos Hills and its relationship to the Ruby Creek copper-cobalt deposit: Unpublished Ph.D. dissertation, Stanford, CA, Stanford University, 266p.

Hitzman, M.W., 1986, Geology of the Ruby Creek Copper Deposit: Economic Geology, 81, p. 1644-1674.

Hitzman, M.W., Proffett, J.M., Schmidt, J.M., Smith, T.E., 1986, Geology and Mineralization of the Ambler District, Northwest Alaska: Economic Geology, 81, p. 1592-1618.

Journel A. , Huijbregts, C. J. (1978). Mining Geostatics. London: Academic Press.

Lutz, Norman R. 1960, Progress report Ruby Creek thru 1959: Bear Creek Mining Company internal report.

Lutz, Norman R., 1961, Memo: Bear Creek Mining Co.

McClelland, W.C., Schmidt, J.M., and Till, A.B., 2006, New U-Pb SHRIMP ages from Devonian felsic volcanic and Proterozoic plutonic rocks of the southern Brooks Range, AK: Geologic Society of America Abstracts with Programs, v. 38, n. 5, p. 12.

Moore, T.E., 1992, The Arctic Alaska Superterrane, p. 238-244, in Bradley, D.C., and Dusel-Bacon, C., eds., Geologic Studies in Alaska by the U.S. Geological Survey, 1991: U.S. Geological Survey Bulletin 2041.

Moore, T.E., Wallace, W.K, Bird, K.J., Karl, S.M., Mull, C.G., and Dillon, J.T., 1994, Geology of northern Alaska, in Plafker, G., and Berg, H.C., eds., The Geology of Alaska: Boulder, Colorado, Geologic Society of America, The Geology of North America, v. G-1.

NANA Regional Corporation, Inc., 2010, Kobuk Village Profile.

Neely, Burr, and Proue, Molly, 2008, Assessment of Cultural Resources and Site Potential of Proposed Geologic Exploration Drill Areas, Northwest Alaska, Northern Land Use Research, Inc.

NovaCopper, 2013, Technical Report for the Bornite Deposit South Reef and Ruby Creek Zones, Northwest Alaska, USA: prepared by BD Resource Consulting Inc.

Penny, C. T., 1966, Annual Report Ruby Creek Division, Kennecott Copper Corp. Internal report.

Penny, C. T., 1968, Review Ruby Creek Division 1964 – 68: Kennecott Exploration Internal report.

Piekenbrock, J., 2015, Lithogeochemical Review: NovaCopper Inc. Internal report.

Ratterman, N.S., McClelland, W.C., and Presnell, R.D., 2006, Geochronology and lithogeochemistry of volcanic rocks of the Ambler District, Southern Brooks Range, Alaska: Geologic Society of America Abstracts with Programs, v. 38, n. 5, p. 69.

Robinson, J., 2010, The Ruby Creek Deposit in 2009, NovaGold Resources Internal report.

Roskowski, J., 2011, Bornite Collar Corrections, NovaCopper Internal memo.

Runnells, D. D., 1963, The copper deposits of Ruby Creek, Cosmos Hills, Alaska: Ph.D. Thesis, Harvard University, Cambridge Massachusetts, University Microfilms Inc., Ann Arbor, Michigan, 274p.

Selby, D., Kelley, K.D., Hitzman, M.W., Zieg, J., 2009, Re-Os sulfide (bornite, chalcopyrite, and pyrite) systematics of the carbonate-hosted copper deposits at Ruby Creek, southwestern Brooks Range, Alaska: Economic Geology, 104, p. 437-444.

TetraTech, 2010, Arctic Deposit Access Environmental Baseline Data Collection Aquatics, TetraTech, Inc.

TetraTech, 2010, Arctic Deposit Access Environmental Baseline Data Collection Hydrology, TetraTech, Inc.

TetraTech, 2010, Arctic Deposit Access Environmental Baseline Data Collection Wetlands & Vegetation, TetraTech, Inc.

Till, A.B., Dumoulin, J.A., Harris, A.G., Moore, T.E., Bleick, H.A., and Siwiec, B.R., 2008, Bedrock geologic map of the Southern Brooks Range, Alaska and accompanying conodont data: U.S. Geologic Survey Open File Report 2008-1149.

Travis/Peterson Environmental Consulting, Inc., 2007, Bornite Mine Camp Site Characterization Report, prepared for NANA Regional Corporation.

Vallat, C., 2012, Quality Assurance and Quality Control Report on NovaCopper, Bornite and Arctic Projects 2012 Northwest Alaska, internal memo prepared for NovaCopper.

Vallat, C., 2013a, Quality Assurance and Quality Control Report on the NovaCopper Bornite Project 2013 Northwest Alaska, internal memo prepared for NovaCopper.

Vallat, C., 2013b, NovaCopper Inc. 2012 and 2013 Bornite Re-Assay Results Compared With Original Results, internal memo prepared for NovaCopper.

Vallat, C., 2014, Quality Assurance and Quality Control Report on the NovaCopper Bornite Project 2014 Northwest Alaska, internal memo prepared for NovaCopper.

Vallat, C., 2017, QAQC Report for Bornite Project Cobalt Assays Reported From 2011 to 2017, internal memo prepared for Trilogy Metals.

Vance, T., 1962, A Preliminary Study of Ground-Water Conditions at Ruby Creek, Alaska: internal report for Bear Creek Mining Company.

Vogl, J.J., 2003, Thermal-baric structure and P-T history of the Brooks Range metamorphic core, Alaska: Journal of Metamorphic Geology, 21, p. 269-284.

West, A., 2013, 2013 Bornite Drill Data Validation, internal memo prepared for NovaCopper.

West, A., 2014, Identified 2013 Erroneous SG Measurements, internal memo prepared for NovaCopper.

Williams 1988, Bornite Data Summaries internal report, Kennecott Internal report.

Zimmerley, S. R, 1961, Amenability of Samples from the Ruby Creek, Alaska, Copper Prospect – Exploration Lot D-378, Letter to R. D. Hutchinson, District Geologist, Bear Creek Mining Company.

28.0 CERTIFICATES OF QUALIFIED PERSONS

28.1 BRUCE M. DAVIS, FAUSIMM

CERTIFICATE OF QUALIFIED PERSON

Bruce M. Davis, FAusIMM, BD Resource Consulting, Inc.

I, Bruce M. Davis, FAusIMM, do hereby certify that:

1. I am an independent consultant of:

BD Resource Consulting, Inc.
4253 Cheyenne Drive
Larkspur, Colorado USA 80118

2. I graduated from the University of Wyoming with a Doctor of Philosophy (Geostatistics) in 1978.
3. I am a Fellow of the Australasian Institute of Mining and Metallurgy, Number 211185.
4. I have practiced my profession continuously for 40 years and have been involved in mineral resource and reserve estimations and feasibility studies on numerous underground and open pit base metal and gold deposits in Canada, the United States, Central and South America, Europe, Asia, Africa and Australia.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am the principle author of the technical report titled *NI 43-101 Technical Report on the Bornite Project, Northwest Alaska,* dated July 20, 2018, with an effective date of June 5, 2018 (the "Technical Report"). I am responsible for Sections 2-6, 11, 12, 17, 18, 20, 23, 27 and portions of 1, 14, 25 and 26.
7. I visited the Bornite Property on 26-27 July 2011 and on 25 September 2012 and on 10-12 August 2015.

8. I have had prior involvement with the property that is the subject of the Technical Report. I was a co-author of three previous Technical Reports dated February 8, 2013, April 1, 2014 and October 12, 2017.

9. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

10. I am independent of Trilogy Metals Inc. applying all of the tests in Section 1.5 of NI 43-101.

11. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

Dated this 20th day of July, 2018

"original signed and sealed"

____

Bruce M. Davis, FAusIMM

28.2 ROBERT SIM, P.GEO.

CERTIFICATE OF QUALIFIED PERSON

Robert Sim, P.Geo, SIM Geological Inc.

I, Robert Sim, P.Geo, do hereby certify that:

1. I am an independent consultant of:

SIM Geological Inc.
508 – 1950 Robson St., Vancouver
British Columbia, Canada V6G 1E8

2. I graduated from Lakehead University with an Honours Bachelor of Science (Geology) in 1984.

3. I am a member, in good standing, of the Association of Professional Engineers and Geoscientists of British Columbia, License Number 24076.

4. I have practiced my profession continuously for 34 years and have been involved in mineral exploration, mine site geology and operations, mineral resource and reserve estimations and feasibility studies on numerous underground and open pit base metal and gold deposits in Canada, the United States, Central and South America, Europe, Asia, Africa and Australia.

5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am a co-author of the technical report titled *NI 43-101 Technical Report on the Bornite Project, Northwest Alaska*, dated July 20, 2018, with an effective date of June 5, 2018 (the "Technical Report"), and accept professional responsibility for Sections 7-10, 14 and portions of 1, 12, 25 and 26.

7. I have not visited the Bornite Property.

8. I have had prior involvement with the property that is the subject of the Technical Report. I was a co-author of three previous Technical Reports dated February 8, 2013, April 1, 2014 and October 12, 2017.

9. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

10. I am independent of Trilogy Metals Inc. applying all of the tests in Section 1.5 of NI 43-101.
11. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

Dated this 20th day of July, 2018.

"original signed and sealed"

Robert Sim, P.Geo

28.3 JEFFREY B. AUSTIN, P.ENG.

Jeffrey B. Austin, P.Eng., International Metallurgical & Environmental Inc.

I, Jeffrey B. Austin, P.Eng., do hereby certify that:

1. I am employed as President of International Metallurgical & Environmental Inc., located at 906 Fairway Crescent, Kelowna, B.C. V1X 7L4, Canada.

2. I graduated with a Bachelors of Applied Science specializing in Mineral Process Engineering from the University of British Columbia in 1984.

3. I am a member, in good standing, of the Association of Professional Engineers and Geoscientists of British Columbia, License Number 15708.

4. I have practiced my profession continuously for 34 years and have been involved in the design, evaluation and operation of mineral processing facilities during that time. A majority of my professional practice has been the completion of test work and test work supervision related to feasibility and pre-feasibility studies of projects involving flotation technologies.

5. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.

6. I am responsible for the preparation of Section 13 of the Technical Report titled “Technical Report on the Bornite Project, Northwest Alaska, USA” dated July 20, 2018, with an effective date of June 5, 2018 (the “Technical Report”).

7. I have not visited the Bornite property.

8. I have had prior involvement with the property that is the subject of the Technical Report. I was a co-author of previous Technical Reports dated April 1, 2014 and October 12, 2017.

9. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to make the Technical Report not misleading.

10. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

11. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on websites accessible by the public, of the Technical Report.

Dated this 20th day of July, 2018.

"original signed and sealed"

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Jeffrey B. Austin, P.Eng.