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TREVALI MINING CORPORATION

TECHNICAL REPORT ON THE CARIBOU MINE, BATHURST, NEW BRUNSWICK, CANADA

NI 43-101 Report

Qualified Persons:
Torben Jensen, P.Eng.
Ian T. Blakley, P.Geo., EurGeol
Tracey Jacquemin, Pr.Sci.Nat.
Shaun C. Woods, P.Eng.

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Lead Author	Torben Jensen Ian T. Blakley Tracey Jacquemin Shaun C. Woods	(Signed) (Signed) (Signed) (Signed)	
Peer Reviewer	Jason Cox	(Signed)	
Project Manager Approval	Torben Jensen	(Signed)	
Project Director Approval	Graham Clow	(Signed)	

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Roscoe Postle Associates Inc.
55 University Avenue, Suite 501
Toronto, ON M5J 2H7
Canada
Tel: +1 416 947 0907
Fax: +1 416 947 0395
mining@rpacan.com

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1 SUMMARY

EXECUTIVE SUMMARY

Roscoe Postle Associates Inc. (RPA) was retained by Trevali Mining Corporation (Trevali) to prepare a Technical Report on the Caribou underground zinc-lead-silver mine, located 50 km west of Bathurst, New Brunswick, Canada. The purpose of this report is to support the disclosure of the Caribou mine Mineral Resource and Mineral Reserve estimates, prepared by Trevali and reviewed by RPA as at December 31, 2017. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. RPA visited the property from February 20 to 22, 2018. All currency in this report is US dollars (US$) unless otherwise noted.

Trevali is a zinc focused, base metals mining company with four commercially producing operations. Trevali is actively producing zinc and lead-silver concentrates from its 2,000 tonnes per day (tpd) Santander mine in Peru and its 2,000 tpd Rosh Pinah mine in Namibia. In addition, Trevali is producing zinc concentrates from its 2,000 tpd Perkoa mine in Burkina Faso.

Trevali wholly owns the Caribou mine and mill complex, consisting of a historically developed underground mine and a fully permitted 3,000 tpd processing mill, flotation recovery plant, metallurgical and geochemical laboratories, a water treatment plant (WTP), and a tailings management facility (TMF). The Caribou mine produces zinc and lead concentrates with silver as a by-product. Concentrates are shipped through the Port of Belledune, located 75 km from the Caribou mill site. The Caribou mine has been in commercial operation since July 1, 2016.

Trevali also owns the Restigouche project, a formerly producing zinc-lead-silver mine located approximately 27 km west-southwest of the Caribou mine.

Caribou Mineral Resources, estimated as at December 31, 2017 and reviewed by RPA, are summarized in Table 1-1.

TABLE 1-1 MINERAL RESOURCE SUMMARY – AS AT DECEMBER 31, 2017
Trevali Mining Corporation – Caribou Mine

Classification	Tonnes (M)	Grade Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	Contained Metal Zn (Tonnes)	Pb (Tonnes)	Cu (Tonnes)	Ag (000 oz)
Measured	5.87	6.11	2.27	0.37	67	358,400	133,100	21,700	12,600
Indicated	3.03	6.11	2.32	0.39	70	185,000	70,300	11,800	6,800
Measured and Indicated	**8.89**	**6.11**	**2.28**	**0.38**	**68**	**543,400**	**203,400**	**33,800**	**19,400**
Inferred	7.0	5.7	2.1	0.3	65	388,400	148,100	21,000	14,600

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources are estimated at a 5% zinc equivalent cut-off grade with metal prices of: US$1.21/lb zinc, US$1.00/lb lead, US$18.50/oz silver, FX: US$/C$0.80.
4. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
5. Numbers may not add due to rounding.

Caribou Mineral Reserves, estimated as at December 31, 2017 and reviewed by RPA, are summarized in Table 1-2.

TABLE 1-2 MINERAL RESERVE SUMMARY – AS AT DECEMBER 31, 2017
Trevali Mining Corporation – Caribou Mine

Classification	Tonnes (M)	Grade Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	Contained Metal Zn (Tonnes)	Pb (Tonnes)	Cu (Tonnes)	Ag (000 oz)
Proven	2.62	5.82	2.14	0.35	64.3	152,900	56,000	9,200	5,400
Probable	2.48	5.85	2.17	0.39	62.1	145,200	53,800	9,600	5,000
Proven and Probable	**5.11**	**5.84**	**2.15**	**0.37**	**63.2**	**298,100**	**109,800**	**18,800**	**10,400**

Notes:
1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at a net smelter return (NSR) cut-off value of $65/t.
3. Mineral Reserves are estimated using average consensus forecast long-term prices of US$1.21/lb zinc, US$1.00/lb lead, US$18.50/oz silver, FX: US$/C$0.80.
4. Numbers may not add due to rounding.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource or Mineral Reserve estimates.

CONCLUSIONS

Based on RPA's site visit, discussion with Caribou personnel, and review of the available documentation, RPA offers the following interpretation and conclusions.

GEOLOGY AND MINERAL RESOURCES

- The geology and mineralization is well understood by Caribou geology personnel.
- Drilling, sampling, quality assurance/quality control (QA/QC), and sample preparation and analyses were appropriate for the style of mineralization and adequate for Mineral Resource estimation.
- The assumptions, parameters, and methodology are appropriate for the style of mineralization.
- Mineral Resources were estimated consistent with Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions).
- Caribou Measured plus Indicated Mineral Resources total 8.89 Mt grading 6.11% Zn, 2.28% Pb, 0.38% Cu, and 68 g/t Ag containing approximately 543,400 t of zinc, 203,400 t of lead, 33,800 t of copper, and 19.4 million ounces of silver.
- Caribou Inferred Mineral Resources total 7.0 Mt grading 5.7% Zn, 2.1% Pb, 0.3% Cu, and 65 g/t Ag containing approximately 388,400 t of zinc, 148,100 t of lead, 21,000 t of copper, and 14.6 million ounces of silver.
- The 2017 Mineral Resource estimate completed in Leapfrog is reasonable. RPA, does, however, note that considerable work is still required in order to implement the new software that will replace the previously integrated geology/mine planning system at Caribou with the same robustness and operational flexibility.

EXPLORATION

- The extent of the orebody and mine has been generally defined by exploration drilling, however, the potential below and lateral to current orebodies is considered high and is being investigated.
- Geological interpretation utilizing wide spaced drilling, lithology, structures, grades, and existing knowledge of the Caribou geology, has been used to outline an exploration target of 3 Mt to 7 Mt grading 5% to 6% Zn, 1% to 3% Pb, 0% to 1% Cu, and 50 g/t to 100 g/t Ag. The potential quantity and grade is conceptual in nature, and there has been insufficient exploration to define a Mineral Resource. It is uncertain if further exploration will result in the target being delineated as a Mineral Resource.
- RPA concurs with Trevali's opinion that the Bathurst Mining Camp is a mature mining district that needs to be explored with new tools and approaches.

MINING AND MINERAL RESERVES

- The Mineral Reserve estimate was prepared using Mineable Stope Optimizer (MSO) in Deswik to determine potential mineable stope shapes per level based on a NSR cut-off value which captures the full cost of the mining operation including mining, processing, shipping, and smelting costs.
- The NSR cut-off values used for Mineral Reserve estimation are acceptable.
- Caribou Proven and Probable Mineral Reserves total 5.11 Mt grading 5.84% Zn, 2.15% Pb, and 63.2 g/t Ag containing 298,100 t of zinc, 109,800 t of lead, and 10.4 million ounces of silver.
- The Mineral Reserve estimate has been prepared utilizing acceptable estimation methodologies and the classifications of Proven and Probable Mineral Reserves conform to CIM (2014) definitions.

MINERAL PROCESSING

- The process plant includes crushing, screening, and grinding followed by lead/zinc flotation and filtering to produce separate lead and zinc concentrates.
- The zinc metallurgy is very consistent with respect to grade over the past two and a half years of operation. The recovery has continued to increase and is expected to continue improving as it approaches the 84% recovery forecast that has been achieved on several individual days of operation.
- The lead metallurgy has been very consistent on grade and recovery has seen significant improvements year on year.
- The silver recovery has steadily increased since the commissioning of the plant.
- The previous copper circuit design within a Preliminary Economic Assessment (PEA) prepared by SRK in 2015 is currently not considered feasible.

ENVIRONMENTAL, SOCIAL, COMMUNITY

- The Caribou mine has approval to operate the mine under COA I-10085.
- Trevali has a Limited Environmental Liability Agreement (LELA) with the province of New Brunswick, where the province accepted the environmental liability associated with historical operations.
- The construction of the proposed TMF may be delayed due to permitting timelines. To allow adequate permitting time, engineering and planning studies have been initiated by Trevali for the environmental infrastructure and proposed TMF design.
- No evidence of environmental issues that could materially impact the ability to extract the Mineral Resources or Mineral Reserves at the Caribou mine were observed. There are, however, environmental and social risks that need to be mitigated and managed.
- The Caribou mine supports and funds various projects within the community and has a 14% workforce of Mi'kmag First Nation at the mine.

RECOMMENDATIONS

RPA offers the following recommendations.

GEOLOGY AND MINERAL RESOURCES

- Formally document Standard Operating Procedures (SOPs) for all geological procedures including drill layout and core/sampling logging and QA/QC procedures.

- Whole core sampling for mine definition BQ core should be reinstated. The recent introduction of splitting the BQ sized core does allow for a representative sample when compared against the split exploration NQ sized core. In RPA's opinion, short holes less than 100 m in length should be whole core sampled and holes greater than 100 m in length should be whole core sampled or drilled NQ size.

- Additional effort should be undertaken to monitor QA/QC inputs and results.
    - Compare sample weights recorded during bulk density testing against laboratory received weights to check for sample mix-ups.
    - Review blank material source, preferably certified, as well as blank weight submitted. Blanks should be inserted after high grade intersections.
    - Do not use Certified Reference Materials that do not require an over-limit assay (<10,000 ppm) for Mineral Resource grade samples.

- Implement double manual keyed data entry and validation of the handwritten Caribou Lab Assay Results.

- The drill hole database should be added to the normal Caribou server daily backup with offsite backup.

- Review of the resource domains identified a number of minor snapping and nesting errors, and these should be addressed prior to the next resource update.

- Conduct a study to test density weighting the block grade estimate.

- As of the date of this report, no comparison has been made for 2017 production against the new Leapfrog model. RPA recommends that these reconciliation studies be completed on a monthly basis and summarized for year-end review and model validation.

EXPLORATION

- In-mine drilling should continue to explore for economic downdip potential.

- The 2018 New Brunswick exploration budget of approximately $4.0 million is warranted. The work on the Caribou deposit will include approximately 20,000 m of underground resource definition and exploration drilling, and approximately 1,500 m of surface exploration surface drilling along with mapping and sampling.

- Potential additional sources of feed to supplement Caribou production warrant advanced engineering studies and supplementary exploration, if required, at the regional targets of Restigouche, Heath Steele, and Murray Brook deposits.

MINING AND MINERAL RESERVES

- Complete additional reconciliation studies to confirm stope dilution and extraction assumptions.
- Complete additional delineation drilling and definition drilling in both mining limbs to upgrade Mineral Resources to Mineral Reserves.
- Complete a cemented rock fill (CRF) method trial to assess the potential of increasing mining recovery of sill pillars and at-risk stopes.
- Convert to fully using bulk emulsion powder in the future, in order to further control of hanging wall stability.
- Carry out diamond drilling at the formerly producing Restigouche mine in order to advance start-up and provide a potential additional source of feed for the Caribou mill.

MINERAL PROCESSING

- Utilize data generated from baselining to establish the next series of process optimizations.
- Evaluate the opportunity to recovery more liberated fines through size by size analysis.
- Continue work towards understanding the mechanism(s) of seasonal metallurgy.

ENVIRONMENTAL, SOCIAL, COMMUNITY

- To allow adequate permitting time, continue engineering and planning studies that have been initiated for the environmental infrastructure and proposed TMF design, as follows:
    - Site geotechnical investigation to assess TMF infrastructure foundations and borrow sources
    - Hydrogeological studies including water balance, surface, and groundwater models
    - Detailed testing of waste rock for acid generating potential
    - Environmental assessment
    - Alternatives assessment for the proposed TMF

ECONOMIC ANALYSIS

A Cash Flow Projection has been generated from the life of mine (LOM) Plan production schedule and capital and operating cost estimates for the Caribou mine, and is summarized in Table 1-3. The associated process recoveries, metal prices, operating costs, refining and transportation charges, royalties, and capital expenditures (sustaining) were also taken into account. All costs are based on fourth quarter of 2017 estimates and presented in US dollars. Metal prices, as provided by Trevali, are based on consensus, long term forecasts from banks, financial institutions, and other sources. Some of the key parameters and assumptions for the pre-tax cash flow are as follows:

Revenue

- 2,930 tpd
- LOM head grade: 5.8% Zn, 2.2% Pb, 63.2 g/t Ag
- Mill recovery averaging: 81.4% Zn, 64.4% Pb, and 54.7% Ag
- Metal prices based on consensus forecasts by year, averaging: US$1.21/lb Zn, US$1.00/lb Pb, and US$18.50/oz Ag at an exchange rate of US$/C$ 0.80
- Smelting and transport costs totalling $0.52 per pound payable zinc
- NSR: $97 per tonne milled.

Costs

- Mine life: 6 years
- Sustaining capital: $39.2 million
- Average operating cost over the mine life: $58.94/t milled
- Closure costs: $12.5 million
- Salvage costs: nil
- New Brunswick Mining Royalty: $26.3 million
- 10% Net Profits Interest (NPI): N/A
- Net cash cost (equivalent to C1 cost), including capital, of $0.70 per pound of payable zinc (net of by-product credits).

The after-tax NPV at an 8% discount rate is $88 million.

The Caribou mine cash flow projection is shown in Table 1-3.

TABLE 1-3 CASH FLOW SUMMARY
Trevali Mining Corporation - Caribou Mine

	INPUTS	UNITS	TOTAL	2018	2019	2020	2021	2022	2023	2024
MINING										
Caribou										
Operating Days		days	1,743	365	365	365	289	215	120	24
Tonnes milled per day		tonnes / day	2,930	2,757	3,002	3,002	2,936	2,936	2,991	2,936
Production		'000 tonnes	5,106	1,006	1,096	1,096	849	631	358	72
Au Grade		g/t	-	-	-	-	-	-	-	-
Ag Grade		g/t	63.2	65.8	62.6	63.7	66.3	56.6	59.8	68.5
Pb Grade		%	2.2%	2.2%	2.2%	2.2%	2.2%	2.0%	2.0%	2.2%
Zn Grade		%	5.8%	5.6%	6.0%	5.8%	6.0%	5.9%	5.7%	5.7%
PROCESSING										
Mill Feed		'000 tonnes	5,106	1,006	1,096	1,096	849	631	358	72
Au Grade		g/t	-	-	-	-	-	-	-	-
Ag Grade		g/t	63.2	65.8	62.6	63.7	66.3	56.6	59.8	68.5
Pb Grade		%	2.2%	2.2%	2.2%	2.2%	2.2%	2.0%	2.0%	2.2%
Zn Grade		%	5.8%	5.6%	6.0%	5.8%	6.0%	5.9%	5.7%	5.7%
Contained Au		oz	-	-	-	-	-	-	-	-
Contained Ag		oz	10,382,423	2,128,190	2,206,542	2,244,682	1,810,223	1,147,095	687,486	158,204
Contained Pb		tonnes	109,872	22,372	23,656	23,743	18,896	12,613	7,034	1,559
Contained Zn		tonnes	298,213	56,705	65,666	63,675	50,579	37,293	20,221	4,075
Recovery Grade										
Pb Concentrate	Recovery #1	%								
Au			0%	0%	0%	0%	0%	0%	0%	0%
Ag			37%	37%	37%	37%	37%	37%	37%	37%
Pb			64%	63%	64%	65%	65%	65%	65%	65%
Zn			0%	0%	0%	0%	0%	0%	0%	0%
Zn Concentrate	Recovery #2	%								
Au			0%	0%	0%	0%	0%	0%	0%	0%
Ag			17%	16%	17%	18%	18%	18%	18%	18%
Pb			0%	0%	0%	0%	0%	0%	0%	0%
Zn			81%	80%	81%	82%	82%	82%	82%	82%
Recovered Amount										
Pb Concentrate	Recovery #1									
Au		oz	12,103	2,449	2,631	2,611	2,078	1,387	774	171
Ag		oz	3,868,387	789,558	823,040	837,266	675,213	427,867	256,432	59,010
Pb		tonnes	70,732	14,093	15,140	15,433	12,282	8,198	4,572	1,013
Zn		tonnes	9,834	2,019	2,169	2,152	1,713	1,143	638	-
Zn Concentrate	Recovery #2									
Au		oz	14,924	2,824	3,311	3,183	2,528	1,864	1,011	204
Ag		oz	1,811,740	345,014	378,888	397,239	328,723	208,304	124,843	28,729
Pb		tonnes	15,094	2,896	3,395	3,263	2,592	1,911	1,036	-
Zn		tonnes	242,744	45,364	53,190	52,214	41,474	30,580	16,581	3,341
Grades in Concentrate										
Pb Concentrate		tonnes	188,216	38,090	40,919	40,613	32,322	21,574	12,032	2,666
Au grade in concentrate		g/t	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ag grade in concentrate		g/t	639.3	644.7	625.6	641.2	649.8	616.85	662.90	688.45
Cu grade in concentrate		%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
Pb grade in concentrate		%	37.6%	37.0%	37.0%	38.0%	38.0%	38%	38%	38%
Zn grade in concentrate		%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
Concentrate Moisture		%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%
Zn Concentrate		tonnes	510,086	96,519	113,169	108,778	86,405	63,709	34,545	6,961
Au grade in concentrate		g/t	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Ag grade in concentrate		g/t	110.5	111.2	104.1	113.6	118.3	101.70	112.41	128.37
Cu grade in concentrate		%	0.80%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Pb grade in concentrate		%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Zn grade in concentrate		%	47.6%	47.0%	47.0%	48.0%	48.0%	48%	48%	48%
Fe grade in concentrate		%	11.4%	11.4%	11.4%	11.4%	11.4%	11.4%	11.4%	11.4%
Concentrate Moisture		%	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%
Total Tonnes Concentrate		wmt	768,077	148,052	169,487	164,317	130,589	93,811	51,232	10,588
Total Recovered										
Ag		**oz**	**5,680,127**	**1,134,572**	**1,201,928**	**1,234,506**	**1,003,936**	**636,171**	**381,275**	**87,739**
Pb		**tonnes**	**70,732**	**14,093**	**15,140**	**15,433**	**12,282**	**8,198**	**4,572**	**1,013**
Zn		**tonnes**	**242,744**	**45,364**	**53,190**	**52,214**	**41,474**	**30,580**	**16,581**	**3,341**

	INPUTS	UNITS	TOTAL	2018	2019	2020	2021	2022	2023	2024
REVENUE										
Metal Prices		**Input Units**								
Au		US$/oz Au	$1,257.27	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,285.00	$1,285.00	$1,285.00
Ag		US$/oz Ag	$18.40	$18.50	$18.50	$18.50	$18.50	$18.00	$18.00	$18.00
Pb		US$/lb Pb	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00
Zn		US$/lb Zn	$1.20	$1.25	$1.20	$1.20	$1.20	$1.13	$1.13	$1.13
Exchange Rate		C$/US$	$0.80	$0.80	$0.80	$0.80	$0.80	$0.80	$0.80	$0.80
Concentrate Payable %										
Pb Concentrate Payable %										
Payable Au		%		53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%
Payable Ag		%		92.2%	92.0%	92.2%	92.3%	91.9%	92.5%	92.7%
Payable Pb		%		91.9%	91.9%	92.1%	92.1%	92.1%	92.1%	92.1%
Zn Concentrate Payable %										
Payable Au		%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Payable Ag		%		1.4%	0.0%	2.7%	5.2%	0.0%	2.0%	9.9%
Payable Zn		%		83.0%	83.0%	83.3%	83.3%	83.3%	83.3%	83.3%
Concentrate Payable										
Pb Concentrate Payable										
Payable Au		oz	6,456	1,307	1,404	1,393	1,109	740	413	91
Payable Ag		oz	3,565,925	728,348	757,284	772,002	623,271	393,197	237,097	54,726
Payable Pb		tonnes	65,085	12,951	13,912	14,214	11,313	7,551	4,211	933
Zn Concentrate Payable										
Payable Au		oz	-	-	-	-	-	-	-	-
Payable Ag		oz	37,910	4,679	-	10,735	17,099	-	2,559	2,838
Payable Zn		tonnes	201,937	37,642	44,136	43,511	34,562	25,484	13,818	2,784
Zn Eq. Lbs		Lbs	627,361,611	118,049,055	135,926,172	135,483,506	107,946,734	78,013,878	42,963,197	8,979,068
Gross Revenue										
Au Gross Revenue		US$ '000	$8,114	$1,633	$1,754	$1,741	$1,386	$951	$530	$118
Ag Gross Revenue		US$ '000	$66,326	$13,561	$14,010	$14,481	$11,847	$7,078	$4,314	$1,036
Pb Gross Revenue		US$ '000	$143,448	$28,543	$30,663	$31,329	$24,933	$16,642	$9,281	$2,057
Zn Gross Revenue		US$ '000	$532,215	$103,516	$116,961	$115,305	$91,589	$63,485	$34,423	$6,936
Total Gross Revenue		**US$ '000**	**$750,102**	**$147,253**	**$163,388**	**$162,856**	**$129,755**	**$88,156**	**$48,548**	**$10,146**
Total Charges										
Trucking to Port										
Pb Concentrate		US$ '000	$5,968	$1,147	$1,346	$1,294	$1,028	$686	$383	$85
Zn Concentrate		US$ '000	$2,275	$453	$487	$483	$384	$283	$154	$31
Ocean Transport										
Pb Concentrate		US$ '000	$28,319	$5,731	$6,157	$6,111	$4,863	$3,246	$1,810	$401
Zn Concentrate		US$ '000	$74,901	$14,173	$16,618	$15,973	$12,688	$9,355	$5,073	$1,022
Treatment										
Pb Concentrate		US$ '000	$23,470	$4,750	$5,103	$5,064	$4,031	$2,690	$1,500	$332
Zn Concentrate		US$ '000	$93,154	$15,926	$20,370	$20,450	$16,417	$12,105	$6,563	$1,323
Refining cost										
Au		US$ '000	$116	$24	$25	$25	$20	$13	$7	$2
Ag		US$ '000	$3,604	$733	$757	$783	$640	$393	$240	$58
Total Charges		**US$ '000**	**$230,186**	**$42,935**	**$50,863**	**$50,183**	**$40,071**	**$27,803**	$15,194	$3,137
Net Smelter Return		**US$ '000**	**$519,917**	**$104,318**	**$112,525**	**$112,673**	**$89,684**	**$60,353**	**$33,355**	**$7,009**
Royalty NSR		US$ '000	$26,300	$5,400	$6,900	$7,200	$4,900	$1,500	$400	$0
Net Revenue		**US$ '000**	**$493,617**	**$98,918**	**$105,625**	**$105,473**	**$84,784**	**$58,853**	**$32,955**	**$7,009**
Unit NSR		**US$/t milled**	**$96.67**	**$98.31**	**$96.40**	**$96.27**	**$99.90**	**$93.30**	**$92.17**	**$97.50**
OPERATING COST										
Mining (Underground)		US$/t milled	$23.83	$24.33	$21.95	$22.15	$24.17	$25.47	$28.17	$31.44
Processing		US$/t milled	$25.91	$24.59	$23.62	$23.84	$26.39	$28.94	$34.75	$34.77
Surface		US$/t milled	$4.22	$3.60	$3.17	$3.18	$4.15	$5.47	$9.34	$9.34
G&A		US$/t milled	$4.97	$4.00	$3.72	$3.74	$4.85	$6.53	$11.52	$11.52
Total Operating Cost		**US$/t milled**	**$58.94**	**$56.52**	**$52.46**	**$52.91**	**$59.56**	**$66.40**	**$83.78**	**$87.07**
Mining (Underground)		US$ '000	$121,704	$24,480	$24,051	$24,264	$20,510	$16,065	$10,073	$2,260
Processing		US$ '000	$132,321	$24,740	$25,881	$26,120	$22,399	$18,255	$12,426	$2,500
Surface		US$ '000	$21,571	$3,626	$3,477	$3,489	$3,521	$3,448	$3,339	$671
G&A		US$ '000	$25,377	$4,024	$4,072	$4,100	$4,118	$4,118	$4,118	$828
Total Operating Cost		**US$ '000**	**$300,973**	**$56,870**	**$57,481**	**$57,973**	**$50,549**	**$41,885**	**$29,956**	**$6,259**
Total Opex / Zn Equiv Payable		US$/lb pay Zn	$0.89	$0.89	$0.85	$0.85	$0.88	$0.92	$1.07	$1.06
C1 Cost		US$/lb pay Zn	$0.70	$0.68	$0.64	$0.63	$0.69	$0.80	$1.02	$1.01
Operating Cashflow		**US$ '000**	**$192,643**	**$42,048**	**$48,144**	**$47,500**	**$34,236**	**$16,968**	**$2,998**	**$750**

	INPUTS	UNITS	TOTAL	2018	2019	2020	2021	2022	2023	2024
CAPITAL COST										
Sustaining Capital Cost										
Underground Mine Infrastructure		US$ '000	$2,697	$2,417	$280	$0	$0	$0	$0	$0
Underground Mine Development		US$ '000	$10,595	$5,948	$4,423	$224	$0	$0	$0	$0
Diamond Drilling		US$ '000	$3,330	$990	$960	$480	$480	$240	$120	$60
Tailings and Other Ponds		US$ '000	$9,812	$1,664	$3,408	$2,740	$1,000	$1,000	$0	$0
Mill Infrastructure		US$ '000	$5,353	$3,383	$745	$386	$352	$232	$153	$101
Restigouche Water Management		US$ '000	$3,500	$500	$500	$500	$500	$500	$500	$500
Miscellaneous		US$ '000	$3,938	$0	$1,500	$1,500	$500	$250	$125	$63
Total Sustaining Cost		**US$ '000**	**$39,224**	**$14,903**	**$11,815**	**$5,830**	**$2,832**	**$2,222**	**$898**	**$724**
Other Costs										
Financial Equipment Leases		US$ '000	$10,269	$2,003	$2,544	$2,674	$3,047	$0	$0	$0
Interest on Financial Leases		US$ '000	$2,077	$801	$599	$417	$223	$38	$0	$0
Reclamation and closure		US$ '000	$12,480	$0	$0	$0	$0	$0	$0	$12,480
Total Capital Cost		**US$ '000**	**$64,050**	**$17,706**	**$14,959**	**$8,921**	**$6,102**	**$2,260**	**$898**	**$13,204**
PRE-TAX CASH FLOW										
Net Pre-Tax Cashflow		US$ '000	$128,593	$ 24,341	$ 33,185	$ 38,579	$ 28,133	$ 14,708	$ 2,100	$ (12,454)
Cumulative Pre-Tax Cashflow		US$ '000		$ 24,341	$ 57,526	$ 96,106	$ 124,239	$ 138,947	$ 141,047	$ 128,593
Taxes		US$ '000	$23,200	$ -	$ 6,900	$ 8,700	$ 6,000	$ 1,600	$ -	$ -
After-Tax Cashflow		US$ '000	$105,393	$ 24,341	$ 26,285	$ 29,879	$ 22,133	$ 13,108	$ 2,100	$ (12,454)
Cumulative After-Tax Cashflow		US$ '000		$ 24,341	$ 50,626	$ 80,506	$ 102,639	$ 115,747	$ 117,847	$ 105,393
PROJECT ECONOMICS										
Pre-Tax IRR		%	0.0%							
Pre-tax NPV at 5% discounting	5.0%	US$ '000	$113,994							
Pre-tax NPV at 8% discounting	8.0%	US$ '000	$106,360							
Pre-tax NPV at 10% discounting	10.0%	US$ '000	$101,682							
After-Tax IRR		%	0.0%							
After-Tax NPV at 5% discounting	5.0%	US$ '000	$94,030							
After-Tax NPV at 8% discounting	8.0%	US$ '000	$88,039							
After-tax NPV at 10% discounting	10.0%	US$ '000	$84,351							

SENSITIVITY ANALYSIS

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined through analysis of cash flow sensitivities:

- Head grade
- Zinc recovery
- Zinc price
- Operating costs
- Sustaining capital costs

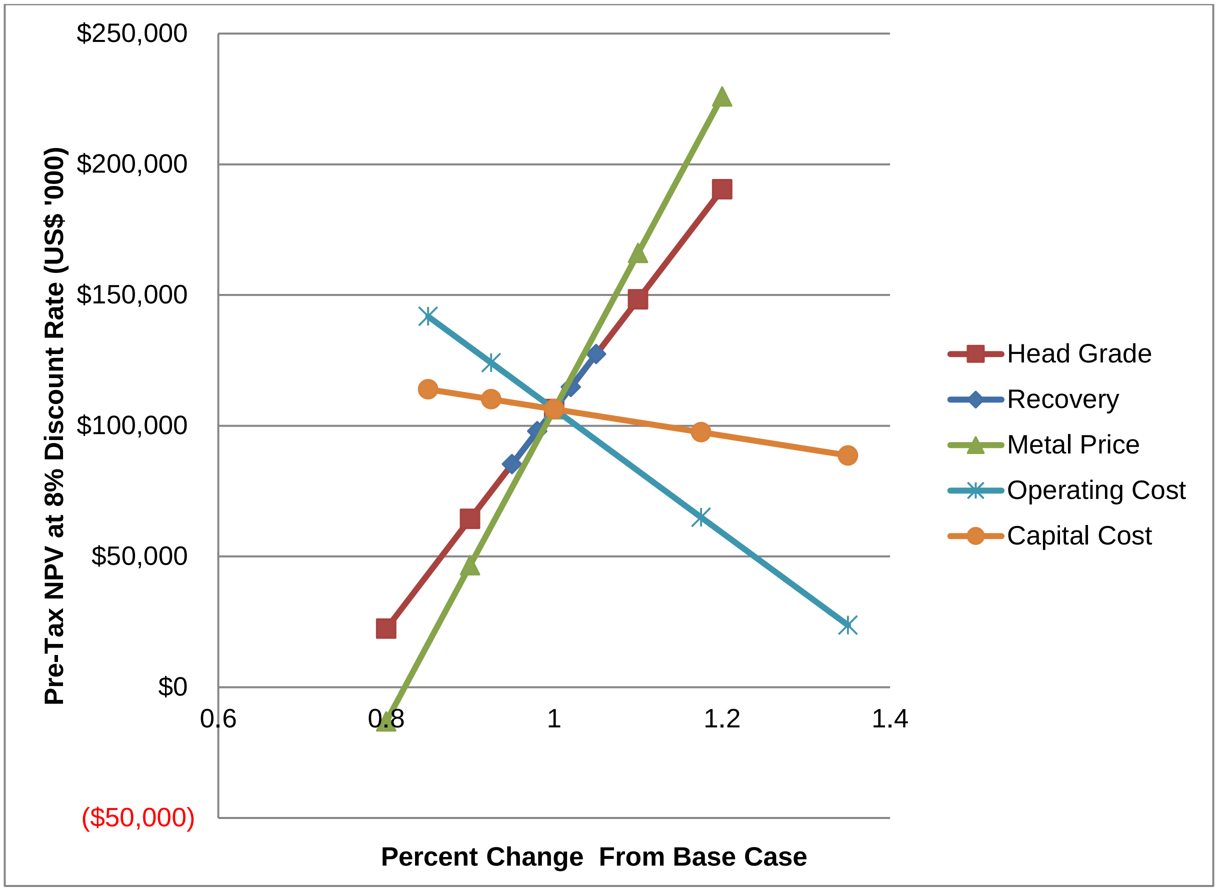
Pre-tax NPV at 8% discount sensitivities over the Base Case have been calculated per Table 1-4. The sensitivities are shown in Table 1-4 and Figure 1-1. The Project return is most sensitive to the product of changes in the head grade and zinc price followed by changes in the recovery, capital costs, and operating costs.

RPA is of the opinion that the study work on the Caribou mine is suitable for the declaration of Mineral Reserves.

TABLE 1-4 SENSITIVITY ANALYSIS
Trevali Mining Corporation – Caribou Mine

	Head Grade (% Zn)	NPV at 8% ($M)
0.80	4.7	22.3
0.90	5.3	64.3
1.00	**5.8**	**106.4**
1.10	6.4	148.4
1.20	7.0	190.4
	% Recovery	**NPV at 8% ($M)**
0.95	77.3	85.4
0.98	79.8	98.0
1.00	**81.4**	**106.4**
1.02	83.0	114.8
1.05	85.5	127.4
	Zinc Price ($/lb)	**NPV at 8% ($M)**
0.80	0.96	(13.2)
0.90	1.08	46.6
1.00	**1.20**	**106.4**
1.10	1.32	166.1
1.20	1.44	225.9
	Operating Costs ($M)	**NPV at 8% ($M)**
0.85	255.8	141.8
0.93	278.4	124.1
1.00	**301.0**	**106.4**
1.18	353.6	65.0
1.35	406.3	23.7
	Capital Costs ($M)	**NPV at 8% ($M)**
0.85	54.4	113.9
0.93	59.2	110.2
1.00	**64.1**	**106.4**
1.18	75.3	97.5
1.35	86.5	88.7

FIGURE 1-1 SENSITIVITY ANALYSIS - PRE-TAX NPV



TECHNICAL SUMMARY

PROPERTY DESCRIPTION AND LOCATION

The Caribou mine consists of a 3,000 tpd underground mine and mill located in Restigouche County in northeastern New Brunswick, 55 km west of Bathurst, New Brunswick. The Caribou property is accessible via Highway 180, which links Bathurst to Saint-Quentin in northern New Brunswick.

LAND TENURE

The Caribou property consists of Mining Lease (ML), ML-246, Mineral Claim 1773, Industrial Surface Lease No. SIML2271, and Freehold Lands known as PID 50072032. ML-246 covers 3,105.7 ha and has a 20-year term, and is set to expire on October 27, 2028. Mineral Claim 1773, also known as the Woodside Brook, covers a total area of approximately 825.8 ha. Annual assessment work is required to renew Mineral Claim 1773. Industrial Surface Lease No. SIML2271, covering approximately 90 ha which includes the tailings area, has a 20-year term and is set to expire on May 31, 2026. The Caribou property is owned 100% by Trevali and is held in the name of Trevali Mining (New Brunswick) Ltd.

ML-246 and Mineral Claim 1773 are subject to a LELA dated January 31, 2013. ML-246, Mineral Claim 1773, Industrial Surface Lease No. SIML2271, and the Freehold Lands are subject to a Debenture in favour of Computershare Trust Company of Canada filed with the Recorder of Mines under the Mining Act (New Brunswick) on May 29, 2014

The Caribou mine is subject to a 10% NPI in favour of the Fern Trust.

HISTORY

The Caribou property has been explored and developed by several companies since the 1950s.

- Caribou massive sulphide deposit discovered by Anaconda Canada Exploration Ltd. (Anaconda), in 1955.
- In 1965, extensive underground drifting, sampling, pilot plant testing, and diamond drilling were initiated and a small high-grade secondary copper cap was developed into an open pit mine-mill operation.
- Production was intermittent between 1971 and 1974, at which time the copper mineralization was exhausted.

- In 1980, a three-year program began and consisted of deep drilling, test stoping, mine planning, pilot plant testing, preliminary mill and tailings dam design, environmental impact studies, and marketing studies.

- In 1982, a silver/gold heap leach plant was constructed to process 60,000 tonnes of gossan material stripped from the open pit from 1971 to 1974.

- In 1986, the property was sold to East West Minerals NL (East West) through a subsidiary, East West Caribou Mining Limited (EWCM).

- East West developed a feasibility study of the project based on production of a bulk lead/zinc concentrate and, in 1988, a concentrator with a design capacity of 2,000 tpd was commissioned.

- In July 1989, operations were suspended pending the formulation of a new mining plan.

- In April 1990, the concentrator recommenced milling operations and operated until October 1990 and then placed on care and maintenance.

- Pursuant to a series of transactions during the summer and fall of 1990, EWCM became wholly-owned by Bathurst Base Metals Inc. (BBMI) and BBMI became wholly-owned by Breakwater Resources Ltd. (Breakwater).

- In late 1994, Breakwater initiated a metallurgical review of the Caribou underground mine mineralization with the objective of developing a process capable of producing separate saleable lead and zinc concentrates.

- In April 1995, a feasibility study was developed which included the development and mining of the Restigouche property in conjunction with the Caribou underground mine and an increase in concentrator throughput to 3,000 tpd.

- Breakwater purchased the Restigouche property from Marshall Minerals Corp (MMC) in October 1995.

- Construction and development commenced in October 1996. The Caribou underground mine and Restigouche open pit operated as expected. Although the mill commenced production in July 1997, mechanical deficiencies and design shortcomings prevented the operation from attaining commercial production.

- Throughout 1998, the metallurgical performance of the Caribou mill improved steadily but fell short of the levels anticipated by the feasibility study. As a result, and also because of declining metal prices, a decision was made to extend a planned maintenance shutdown that commenced in August 1998. The operation was placed on care and maintenance pending additional technical and economic studies.

- In August 2006, the property was acquired by Blue Note Metals Inc. (Blue Note) from CanZinco Ltd., a wholly-owned subsidiary of Breakwater. Between 2006 and 2007, Blue Note invested approximately $116 million in the completion of a major capital investment program.

- In August 2007, Blue Note made its first delivery of lead concentrate to Xstrata's lead smelter in Belledune, New Brunswick. As well, the first shipment of zinc concentrate production from the Belledune Port for delivery overseas was made in October 2007
- Effective January 1, 2008, the Caribou and Restigouche properties achieved commercial production. The concentrator processed 3,000 tpd from the underground and open pit mines with zinc and lead recoveries exceeding 83% and 70%, respectively.
- Low zinc and lead prices made the mine unprofitable and, in 2009, Blue Note declared bankruptcy after mining approximately 1.1 million tonnes. All underground equipment and services were pulled to surface and securely warehoused prior to mine shutdown.
- In 2009, Maple Minerals Corporation (Maple Minerals) acquired the Caribou property from bankruptcy, and in November 2012, Trevali acquired Maple Minerals and now controls the Caribou deposit.
- On May 1, 2013, Trevali received the Approval to Operate for the Caribou mine from the Province of New Brunswick.
- In June 2014, Trevali commenced both surface and underground construction and rehabilitation activities to facilitate mine and mill commissioning in the first half of 2015. Mine dewatering and rehabilitation was carried out by a mining contractor.
- During 2014 and 2015, as part of the mill rehabilitation, a new semi-autogenous grinding (SAG) mill was installed.
- During the first quarter of 2015, initial underground mineral production commenced with blasting of the first scheduled stope and transport of mineralized mill-feed to the surface stockpile.
- In May 2015, Trevali announced that commissioning of the Caribou mill had commenced. Trevali achieved initial production of zinc and lead concentrates and shipped and sold its first zinc concentrates in July 2015.
- Commercial production was declared on July 7, 2016.

GEOLOGY AND MINERALIZATION

The Bathurst Mining Camp (BMC) occupies a roughly circular area of approximately 70 km in diameter in the Miramichi Highlands of northern New Brunswick. The area includes 46 mineral deposits with defined tonnage, and approximately 100 other mineral occurrences, all hosted by Cambro-Ordovician rocks that were deposited in an ensialic back-arc basin.

The rocks in the BMC are divided into five groups—the Miramichi, Tetagouche, California Lake, Sheephouse Brook, and Fournier groups—that are largely in tectonic contact with one another. The lower part of each group is dominated by felsic volcanic rocks and the upper part by mafic volcanic rocks, which are overlain by carbonaceous shale and pelagic chert. The basalts are both tholeiitic and alkalic, and show a progression from enriched, fractionated continental tholeiites, to alkali basalts, to more primitive, mantle-derived, mid-ocean ridge, tholeiitic pillow basalts. Most massive sulphide deposits of the BMC are associated with felsic volcanic rocks in each group.

Mineralization within the Caribou deposit is composed of individual lenses that are zoned mineralogically and chemically from a copper-rich vent-proximal facies near the bottom and western part of each lens, to a lead-zinc-rich vent-distal facies near the top and eastern part of each lens. The Caribou deposit massive sulphide zones consist of 90% sulphides, mainly pyrite, sphalerite, galena, and chalcopyrite. The main gangue minerals are magnetite, siderite, stilpnomelane, quartz, and chlorite.

EXPLORATION STATUS

The Caribou property has been the site of numerous exploration programs by various companies including drilling by Blue Note in early 2009. Trevali has conducted exploration and drilling programs at Caribou since February 2014. The 2017 exploration program discovered additional zones including the North Limb Extension.

The Caribou deposit remains open at depth. Geological interpretation utilizing wide spaced drilling, lithology, structures, grades, and existing knowledge of the Caribou geology, has been used to outline an exploration target of 3 Mt to 7 Mt grading 5% to 6% Zn, 1% to 3% Pb, 0% to 1% Cu, and 50 g/t to 100 g/t Ag. The potential quantity and grade are conceptual in nature, and there has been insufficient exploration to define a Mineral Resource. It is uncertain if further exploration will result in the target being delineated as a Mineral Resource

Trevali's regional exploration program includes both advanced exploration projects as well as generative greenfields exploration projects.

MINERAL RESOURCES

Geological interpretation was completed by Caribou and Mineral Resource estimation, with an effective date of December 31, 2017, was completed by Glencore Zinc Technical Services (GZTS), which is a non-independent technical consultant to Trevali and reviewed by RPA. All domain modelling for Mineral Resource estimation was completed in Leapfrog GEO (version 4.2.3) and the Mineral Resource estimation was completed in Leapfrog Edge.

The Mineral Resources have been completed to a level that meets industry standards and are compliant with the CIM (2014) definitions as incorporated by reference in NI 43-101.

As of year-end 2017, total Measured and Indicated Mineral Resources are estimated to be 8.89 Mt grading 6.11% Zn, 2.28% Pb, 2.28% Pb, and 68 g/t Ag containing approximately 543,400 t of zinc, 203,400 t of lead, and 19.4 million ounces of silver. In addition, Inferred Mineral Resources are estimated to be 7.0 Mt grading 5.7% Zn, 2.1% Pb, and 65 g/t Ag containing approximately 388,400 t of zinc, 148,100 t of lead, and 14.6 million ounces of silver (Table 1-1).

MINERAL RESERVES

As at December 31, 2017, Proven and Probable Mineral Reserves total 5.11 Mt grading 5.84% Zn, 2.15% Pb, and 63.2 g/t Ag containing 298,100 t of zinc, 109,800 t of lead, and 10.4 million ounces of silver (Table 1-2). RPA is not aware of any mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

Mineral Reserves are estimated from the Measured and Indicated Mineral Resources. RPA has performed an independent verification of the block model tonnes and grade, and in RPA's opinion, the process has been carried out to industry standards.

MINING METHOD

Access to the underground mine is via a connected, dual-ramp system from existing portals in the upper 100 m of the mine, and a single-ramp system below. New ramps at depth are designed at an average gradient of -15%, with dimensions of 5.0 m wide by 5.0 m high.

Modified Avoca is the main mining method, supplemented by uphole retreat for partial sill pillar recovery. Modified Avoca stopes employ unconsolidated waste rock as backfill. With modified Avoca, no rib pillars are required, since wall support for the mined-out areas is provided by the backfill. Crown pillar recovery has not been considered due to lack of geotechnical information.

Stope sequencing generally follows a retreat along strike from lens extremities or strategic starting points, and retreats to ramp access points. The stopes are typically excavated 16 m along strike, and to a nominal height of 25 m floor-to-floor. Stope width is normally the same as the lens width. Blast holes are 16 m to 20 m downholes drilled at 76 mm diameter with a

2.0 m burden x 2.0 m ring spacing pattern. A standard stope will yield approximately 10,600 t of ore, including the development tonnes.

Run-of-mine (ROM) ore is hauled to surface by 40 t capacity trucks loaded by Load-Haul-Dump (LHD) vehicles. Ore is stored in remuck bays prior to truck haulage. Waste rock broken underground is loaded into trucks and hauled to remuck bays, where it is picked up by LHDs and dumped into empty stopes as backfill. LHDs fill empty stopes with waste rock from development, supplemented with waste rock back-hauled from existing surface waste rock stockpiles.

During sill pillar mining, upholes are drilled to a designed length to preserve a non-recoverable portion of the sill pillar, the thickness of which is based upon geotechnical data. Mining is on retreat, with remote mucking by LHDs.

Current ventilation capacity is 260 cubic metres per second (m^3/s) or 553,000 cubic feet per minute (ft^3/min) through two existing fresh air raises (FAR). Exhaust is via the 2460 Level and 2560 Level ramps, the shaft, and the main service raise in the upper mine.

An existing main sump located on the 2360 Level pumps clear water to surface through the main service raise. Secondary pump stations located on all main levels direct water to the main sump for pumping to surface.

An LOM production plan has been prepared based on a maximum mill feed rate of 1.096 Mtpa, or 3,000 tpd. The production period extends from January 2018 to Q1 2024. Planned LOM production is 5,106 kt, with metal grades of 5.8% Zn, 2.2% Pb, and 63.2 g/t Ag based on mining Proven and Probable Mineral Reserves.

MINERAL PROCESSING

The process plant includes crushing, screening, and grinding followed by lead/zinc flotation, and filtering to produce separate zinc and lead concentrates with silver as a by-product. Concentrates are shipped through the Port of Belledune, located 75 km from the Caribou mill site.

Since the recommencement of milling operations in August 2015, the process plant has produced a zinc concentrate in the range of 46.0% to 49.7% from head grades ranging from

5.3% Zn to 6.0% Zn. Recovery of zinc has been in the range of 62.9% in August 2015 to a maximum of 81.5% in September 2017. Lead concentrates have been in the range of 32.5% in August 2015 to 42.9% in June 2017 from head grades ranging from 2.0% Pb to 2.6% Pb. Recovery of lead has been in the range of 44.6% in August 2015 to a maximum of 66.9% in October 2017.

PROJECT INFRASTRUCTURE

The basic infrastructure for the mine is in place. The Caribou mine site comprises two formerly operated lead-zinc-silver open pits, namely the West and East Pits, and an underground lead-zinc-silver mine. A processing complex used to concentrate the ore is also located at the Caribou site. The Caribou site also has a large permitted tailings impoundment area. Other buildings on the site include:

- Administration office;
- Dry facility;
- Core shack;
- Assay laboratory;
- Warehouse;
- Maintenance shop;
- Hoist room;
- Head frame; and
- Mine water treatment plant.

Two portals for the underground ramps are used to access the mine; the shaft and conveyances are dormant and have not been refurbished. A power line connected to the New Brunswick power grid supplies the site with electricity.

NB Power supplies incoming power under a long-term contact.

MARKETS

Global zinc demand continues to rise by between 2% and 4% per annum (or 280,000 t to 560,000 t of zinc metal) driven by gross domestic product (GDP) growth, urbanization, and infrastructure development, and as a "mid-cycle" commodity with expanding markets for consumer goods (automobiles, appliances, etc.). Mine closures and production cuts over the past few years have constrained primary supply which has driven the zinc price to near-decade highs.

Zinc smelters are scaling back/curtailing refined zinc metal production due to concentrate shortages. Benchmark zinc smelter treatment charges (TCs) dropped to US$172/t in 2017, with no smelter price participation (0% escalators), a 10-year low. Forecast TCs for 2018, currently in negotiations, are anticipated to be even lower.

Consensus forecast is for continued strength in zinc prices in reaction to ongoing supply deficits. Wood Mackenzie, an independent global commodity forecast consultant, is predicting robust zinc commodity prices over the short term averaging US$1.71/lb in 2018, US$1.87/lb in 2019, and a long-term forecast price of US$1.23/lb.

In addition, lead, which is predominantly produced as by-product of zinc mining, is also expected to strengthen during this period.

ENVIRONMENTAL, PERMITTING AND SOCIAL CONSIDERATIONS

The Caribou Mine operates under an Environmental Management System (EMS). Trevali is in the process of implementing its Corporate Environmental and Social Management System (ESMS) and the Caribou site will align current practices to the ESMS in 2018. The ESMS is aligned with the principles of ISO 14001:2015 which is deemed best practice.

The Caribou mine makes use of the existing infrastructure on an already disturbed site. The site is fully permitted, and includes a water treatment plant and sludge ponds, and a TMF. The Caribou site has been previously operated by various companies, and the current operation of the mine does not represent a significant variance to previous operations.

On January 31, 2013, Trevali entered into a LELA with the province of New Brunswick, where the province accepted the environmental liability associated with historical operations.

At present, the monies being held in securities for the Caribou mine site are included in the assets that were acquired by Trevali Mining (New Brunswick) Ltd. (TMNBL). The current reclamation assets on file with the province totals $5,000,000. Also, as per Trevali's Approval to Operate I 10085 (Cond.15b), an additional $1,200,000 environmental protection bond has been posted with the New Brunswick Department of Environment and Local Government (NBDELG).

CAPITAL AND OPERATING COST ESTIMATES

Capital and operating costs are presented in US dollars as at the fourth quarter of 2017 (Q4 2017).

Caribou mine sustaining capital cost estimate is $39.2 million over the LOM.

Site operating costs averaging $58.94/t processed are estimated for the period from January 1, 2018, through to Q1 2024; this represents operating costs per tonne milled of $23.83/t for the mine, $25.91t for the mill, $4.22/t for environmental and surface, and $4.97/t for general and administration (G&A).

The Caribou mine is currently in production, and does not have plans for a material expansion of current production.

2 INTRODUCTION

Roscoe Postle Associates Inc. (RPA) was retained by Trevali Mining Corporation (Trevali) to prepare a Technical Report on the Caribou underground zinc-lead-silver mine, located 50 km west of Bathurst, New Brunswick, Canada. The purpose of this report is to support the disclosure of the Caribou mine Mineral Resource and Mineral Reserve estimates as at December 31, 2017, prepared by Trevali and reviewed by RPA. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects.

Trevali is a zinc focused, base metals mining company with four commercially producing operations. Trevali is actively producing zinc and lead-silver concentrates from its 2,000 tonne per day (tpd) Santander mine in Peru and its 2,000 tpd Rosh Pinah mine in Namibia. In addition, Trevali is producing zinc concentrates from its 2,000 tpd Perkoa mine in Burkina Faso.

Trevali wholly owns the Caribou mine and mill complex, consisting of an underground mine and a fully permitted 3,000 tpd processing mill, flotation recovery plant, metallurgical and geochemical laboratories, a water treatment plant (WTP), and a tailings management facility (TMF). The Caribou mine produces zinc and lead concentrates with silver as a by-product. Concentrates are shipped through the Port of Belledune, located 75 km from the Caribou mill site. The Caribou mine has been in commercial operation since July 1, 2016.

Considerable infrastructure is already in place as a result of several periods of historical mining in the mine area and Trevali's other properties in the vicinity. The mine is located in the Bathurst Mining Camp (BMC) of northern New Brunswick, and along provincial Highway 180. Local resources are sufficient to meet mine requirements.

Within the BMC, Trevali owns advanced regional exploration projects include the Restigouche, Halfmile, and Stratmat deposits in addition to an option on the Murray Brook deposit. The Restigouche project, a formerly producing zinc-lead-silver mine is located approximately 27 km west-southwest of the Caribou mine.

Generative regional exploration projects include the Heath Steele deposit as well as greenfields exploration within the regional land package and the northern BMC.

SOURCES OF INFORMATION

A site visit was carried out from February 20 to 22, 2018 by Mr. Torben Jensen, P.Eng., RPA Principal Mining Engineer, and Mr. Ian Blakley, P.Geo., RPA Principal Geologist. Ms. Tracey Jacquemin, Pr.Sci.Nat., Trevali Manager, HSEC carried out a site visit from November 29 to December 2, 2017.

Discussions were held with the following Caribou personnel:

- Ms. Barbara Rose, Principal Mine Engineer
- Mr. Jeremy Ouellette, Mine Operations/Technical Superintendent
- Mr. Tim Babin, P. Geo., Senior Geologist
- Mr. Bradford Ernst, Technical Lead
- Mr. Gordon Sheppard, Environmental Lead
- Mr. Brett Armstrong, Senior Resource Geologist
- Mr. Tim Kingsley, Exploration Geologist
- Mr. Brian Halsall, Laboratory Supervisor
- Mr. Shaun C. Woods, Mill Superintendent
- Mr. Mat Demore, Engineer In Training

Mr. Blakley reviewed the geology, sampling, assaying, and resource estimate work and is responsible for Sections 2 to 12, 14, and 23. Mr. Jensen reviewed the mining, reserve estimate, and economics and is responsible for Sections 15, 16, 18, 19, 21, and 22. Ms. Jacquemin reviewed the environmental, and permitting aspects and is responsible for Section 20. Mr. Shaun C. Woods, has been employed at the Caribou mine site since January 2013 and is responsible for Sections 13 and 17. The authors share responsibility for Sections 1, 24, 25, 26, and 27 of this Technical Report.

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References.

LIST OF ABBREVIATIONS

Units of measurement used in this report conform to the metric system. All currency in this report is US dollars (US$) unless otherwise noted.

a	annum
A	ampere
bbl	barrels
btu	British thermal units
°C	degree Celsius
C$	Canadian dollars
cal	calorie
cfm	cubic feet per minute
cm	centimetre
cm^2	square centimetre
d	day
dia	diameter
dmt	dry metric tonne
dwt	dead-weight ton
°F	degree Fahrenheit
ft	foot
ft^2	square foot
ft^3	cubic foot
ft/s	foot per second
g	gram
G	giga (billion)
Gal	Imperial gallon
g/L	gram per litre
Gpm	Imperial gallons per minute
g/t	gram per tonne
gr/ft^3	grain per cubic foot
gr/m^3	grain per cubic metre
ha	hectare
hp	horsepower
hr	hour
Hz	hertz
in.	inch
in^2	square inch
J	joule
k	kilo (thousand)
kcal	kilocalorie
kg	kilogram
km	kilometre
km^2	square kilometre
km/h	kilometre per hour
kPa	kilopascal
kVA	kilovolt-amperes
kW	kilowatt
kWh	kilowatt-hour
L	litre
lb	pound
L/s	litres per second
m	metre
M	mega (million); molar
m^2	square metre
m^3	cubic metre
µ	micron
MASL	metres above sea level
µg	microgram
m^3/h	cubic metres per hour
mi	mile
min	minute
µm	micrometre
mm	millimetre
mph	miles per hour
MVA	megavolt-amperes
MW	megawatt
MWh	megawatt-hour
oz	Troy ounce (31.1035g)
oz/st, opt	ounce per short ton
ppb	part per billion
ppm	part per million
psia	pound per square inch absolute
psig	pound per square inch gauge
RL	relative elevation
s	second
st	short ton
stpa	short ton per year
stpd	short ton per day
t	metric tonne
tpa	metric tonne per year
tpd	metric tonne per day
US$	United States dollar
USg	United States gallon
USgpm	US gallon per minute
V	volt
W	watt
wmt	wet metric tonne
wt%	weight percent
yd^3	cubic yard
yr	year

3 RELIANCE ON OTHER EXPERTS

This report has been prepared by RPA for Trevali. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to RPA at the time of preparation of this report,
- Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other information supplied by Trevali and other third party sources.

For the purpose of this report, RPA has relied on ownership information provided by Trevali. RPA has not researched property title or mineral rights for the Caribou mine and expresses no opinion as to the ownership status of the property.

RPA has relied on Trevali for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the Caribou mine.

Except for the purposes legislated under provincial securities laws, any use of this report by any third party is at that party's sole risk.

4 PROPERTY DESCRIPTION AND LOCATION

The Caribou mine consists of a 3,000 tpd underground mine and mill located in Restigouche County in northeastern New Brunswick, 55 km west of Bathurst, New Brunswick. Access is by way of Provincial Highway 180 to within four kilometres of the mine site and then by local mine road.

Concentrates are shipped through the Port of Belledune, located 75 km from the Caribou mill site. The locations of the mines and the port are shown in Figure 4-1. The geographic co-ordinates of the Caribou mine are 47° 33' 50" N and 66° 17' 23" W.

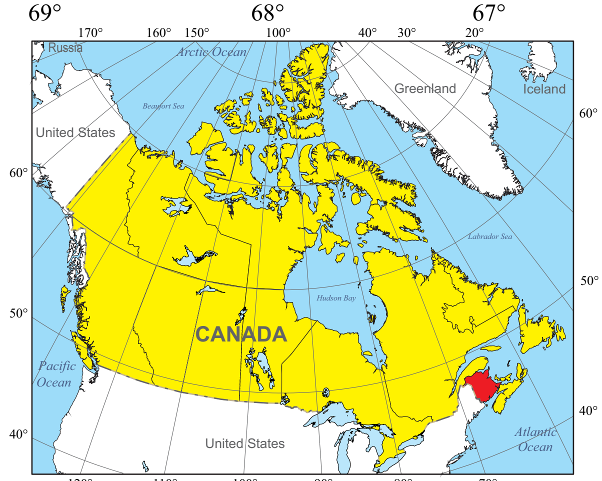


Figure 4-1

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Location Map

May 2018

LAND TENURE

The Caribou property consists of:

- Mining Lease No. ML-246
- Mineral Claim 1773
- Industrial Surface Lease No. SIML2271
- Freehold Lands known as PID 50072032

ML-246, covers 3,105.7 ha (Figure 4-2). The lease has a 20-year term, and is set to expire on October 27, 2028. The lease is 100% owned by Trevali and is held in the name of Trevali Mining (New Brunswick) Ltd. The lease is subject to a rental fee of $6.00 per hectare per annum.

Mineral Claim (Right Number) 1773, also known as the Woodside Brook, covers a total area of approximately 825.8 ha. The claim units included in Mineral Claim 1773 were originally ground staked mineral claims which have been converted to map staked claims. In order to keep the claims active, annual assessment work amounting to $30,400 must be performed before June 15, 2018 (Appendix 1). There are currently excess work credits available for renewal.

Industrial Surface Lease No. SIML2271 covers approximately 90 ha, which includes the tailings area. The lease has a 20-year term and is set to expire on May 31, 2026. The lease is 100% owned by Trevali and is held in the name of Trevali Mining (New Brunswick) Ltd.

ML-246 and Mineral Claim 1773 are subject to a Limited Environmental Liability Agreement (LELA) dated January 31, 2013. The LELA is described later in this section, under Environmental Considerations. ML-246, Mineral Claim 1773, Industrial Surface Lease No. SIML2271, and the Freehold Lands are subject to a Debenture in favour of Computershare Trust Company of Canada filed with the Recorder of Mines under the Mining Act (New Brunswick) on May 29, 2014.

The Caribou mine is subject to a 10% Net Profits Interest (NPI) in favour of the Fern Trust.

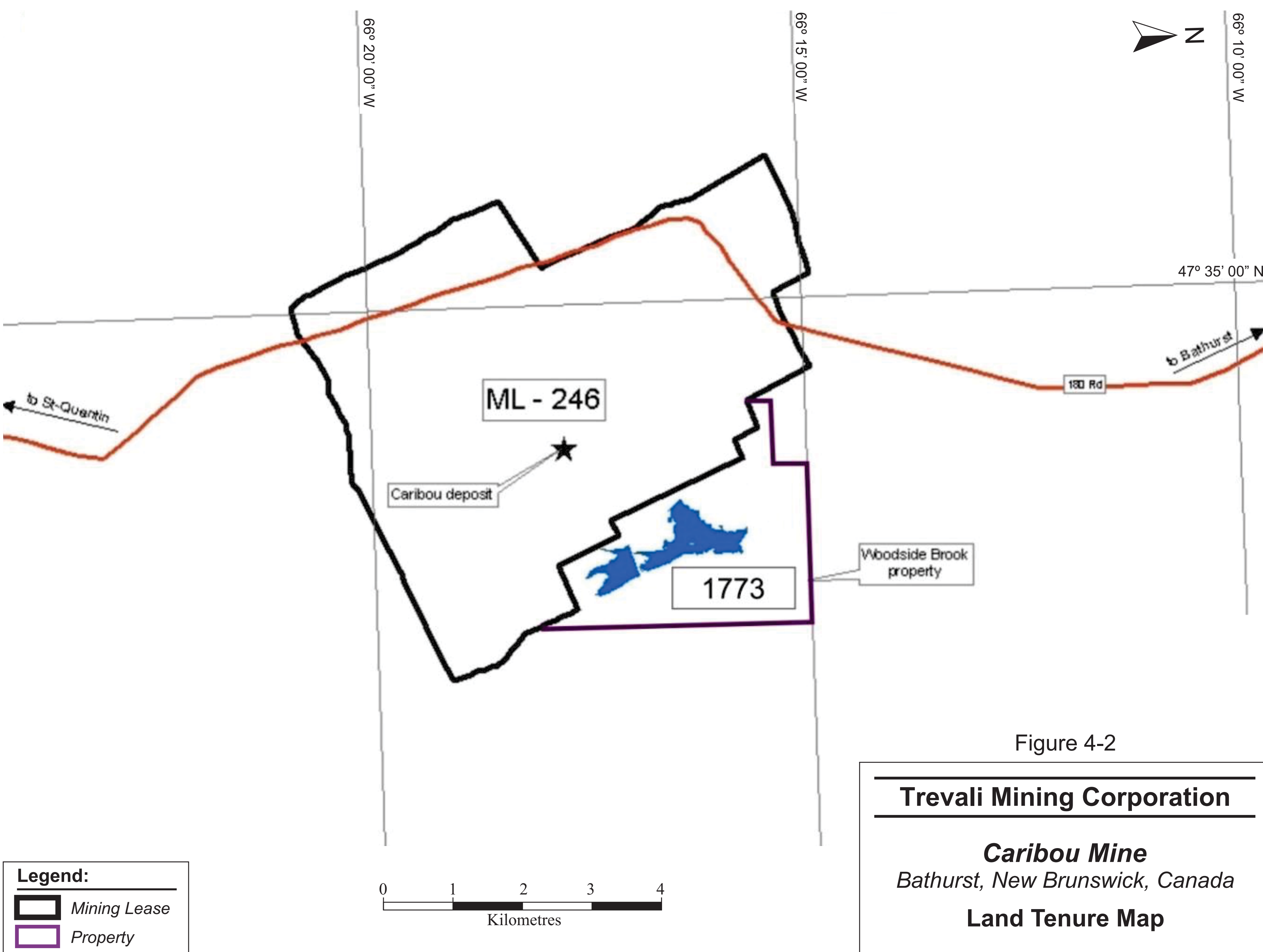


Figure 4-2

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Land Tenure Map

May 2018

Source: Peltier and Beausoleil, 2006, with modifications.

PERMITS AND AUTHORIZATIONS

Trevali currently holds an Approval to Operate for the Caribou mine (I-10085), which authorizes Trevali:

- To operate the Low Density Sludge (LDS) mine WTP, and to release the treated mine water to the South Tributary Tailings Pond (STTP) via the hydroxide sludge pond or the STTP hydroxide sludge cell subject to the discharge limits listed in Conditions 27 and 28 of the Approval to Operate I-10085;
- To carry out any activities necessary to maintain the mine;
- To construct new structures within the currently disturbed area of the mine site;
- To dewater the underground mine;
- To carry out equipment inspections, maintenance and/or replacement of the underground and/or concentrator plant equipment;
- To carry out all aspects of rehabilitation and stabilization of the underground mine, including establishing safe access by mucking out the ramp, shotcreting and scaling, etc.;
- To conduct exploratory drilling on the property and/or in the underground mine, subject to any further Terms and Conditions deemed necessary by the Department of Energy and Resource Development (DERD);
- To carry out any other activity that may be subsequently approved by the Industrial Processes Section, subject to any further Terms and Conditions deemed necessary by the Industrial Processes Section for the activity identified;
- To operate the underground mine and mill; and
- To operate a copper circuit.

A Certificate of Determination was issued to Trevali under the New Brunswick Environmental Impact Assessment Regulation File #4561-3-1403 on May 28, 2015, allowing Trevali to construct and operate a copper circuit at the Caribou mine. Commencement of this undertaking must occur within three years of the date of issuing of the determination (e.g., May 28, 2018).

The current Approval to Operate is valid until June 30, 2018 (Appendix 2).

ENVIRONMENTAL CONSIDERATIONS

The Caribou mine site has been previously operated by various companies, and the current operation of the mine does not represent a significant variance to previous operations. Trevali will continue to operate the property in accordance with all applicable provincial and federal regulations and permits described in Section 20.

On January 31, 2013, Trevali entered into a LELA with the province of New Brunswick, whereby the province would accept the environmental liability associated with Anaconda Canada Exploration Ltd. (Anaconda) historical liabilities, defined as:

> *"Anaconda Tailings Area," the "Open Pit," the "Waste Rock Storage Area" (as those terms are described in Section 5.6 of the Reclamation Plan and for those amounts estimated in Table 8.1 of the Reclamation Plan). Such environmental liability obligations of the Minister are hereinafter referred to as the "Historical Liabilities."*

Further details of the LELA are described in Section 20.

MINING RIGHTS IN NEW BRUNSWICK

As defined under the *Mining Act*, most minerals are owned by the Crown, however, some land grants reserved only specific minerals to the Crown and therefore other minerals were, in fact, transferred to the grantee. Prior to 1810, it was common for gold and silver, and a few other minerals to be reserved to the Crown. The *Mining Act* defines a mineral as any natural, solid, inorganic, or fossilized organic substance, and such other substances as are prescribed by regulation to be minerals, but does not include:

- Sand, gravel, ordinary stone, clay or soil unless it is to be used for its chemical or special physical properties, or both, or where it is taken for contained minerals;
- Ordinary stone used for building or construction;
- Peat or peat moss;
- Bituminous shale, oil shale, albertite, or intimately associated substances or products derived therefrom;
- Oil or natural gas; or
- Such other substances as are prescribed by regulation not to be minerals.

Crown-owned minerals are property separate from the soil; that is, a landowner owns the surface rights but does not own mineral rights, unless some minerals were granted with the land and each conveyance since the granting has preserved the ownership of those minerals. By means of the *Mining Act*, the province makes Crown-owned minerals available for exploration and development. Prospectors (persons or companies that hold prospecting licences), holders of claims, and holders of mining leases have the right to prospect, explore, mine, and produce those minerals, whether they are on Crown-owned or privately-owned lands. They also have the right of access to the minerals; however, they are liable for any damage they cause.

Claim acquisition in New Brunswick is an online process (NB e-CLAIMS) and can be completed by selecting claim units from an interactive map or by inputting claim units numbers in the application. For acquisition, the minimum size of a claim is 1 unit and the maximum number of units should not exceed 256 contiguous available units to fully benefit from all the options available via NB e-CLAIMS, holders of ground staked claims should convert their claims. Conversion of ground staked mineral claims to map staked claims is to be voluntarily completed until such time as the Recorder's office will control any outstanding conversions.

RPA DISCUSSION

RPA is not aware of any environmental liabilities on the property. Trevali has all required permits to conduct the proposed work on the property. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

ACCESSIBILITY

The Caribou property is accessible via Highway 180, which links Bathurst to Saint-Quentin in northern New Brunswick and intersects the northern part of the mining property. Approximately 55 km west of Bathurst, on Highway 180, a 4 km long gravel road leads to the main infrastructure at the Caribou mine site.

Bathurst is serviced by daily flights to Montreal.

CLIMATE

The mine site is located in the temperate zone of North America, and although the property is within 50 km of the ocean, climatic conditions are more continental, governed by the eastward flow of continental weather patterns. The average annual temperature is approximately 10˚C, with a summer maximum of 30˚C and a winter minimum of -30˚C. Winter conditions are prevalent at the mine site from late October or early November until mid to late April. Frost depth is 2.0 m. Annual precipitation is approximately 1,000 mm with 60% of this occurring as rain and the remainder as snow.

LOCAL RESOURCES

The city of Bathurst has a population of 12,000 people, and 40,000 people live in the immediate Bathurst area. It is an important centre for mining, forestry, fishing, and tourism in northern New Brunswick. The property has sufficient water, power, and surface rights to support mining.

INFRASTRUCTURE

The Caribou mine site comprises two former open pit lead-zinc-silver mines, namely the West and East Pits, and an underground lead-zinc-silver mine. A mill and processing complex used to concentrate the ore are also located at the Caribou mine site. Mine site services include a fresh water pumping and distribution system, fire protection and a 90 ha tailings impoundment pond located 1.5 km south of the concentrator. Mine water and mill tailings are treated with lime prior to discharge. Other buildings on the site include:

- Administration office;
- Dry facility;
- Core shack;
- Assay laboratory;
- Warehouse;
- Maintenance shop;
- Hoist room; and
- Headframe;
- Mine WTP.

Two portals for the underground ramps are used to access the mine; the shaft and conveyances are not used to transport personnel or materials. A power line connected to the New Brunswick power grid supplies the site with electricity (Figure 5-1).

NB Power supplies incoming power under a long-term contact.

PHYSIOGRAPHY

The Caribou mine is located within the northern part of the New Brunswick Highlands of the Appalachian Physiographic Region of Canada. The highlands are characterized by deep valleys and variable relief. Elevation on the property varies from 405 MASL to 540 MASL. In general, the topography of the land decreases in elevation from west to east, ending in gently undulating farm country on the east coast.

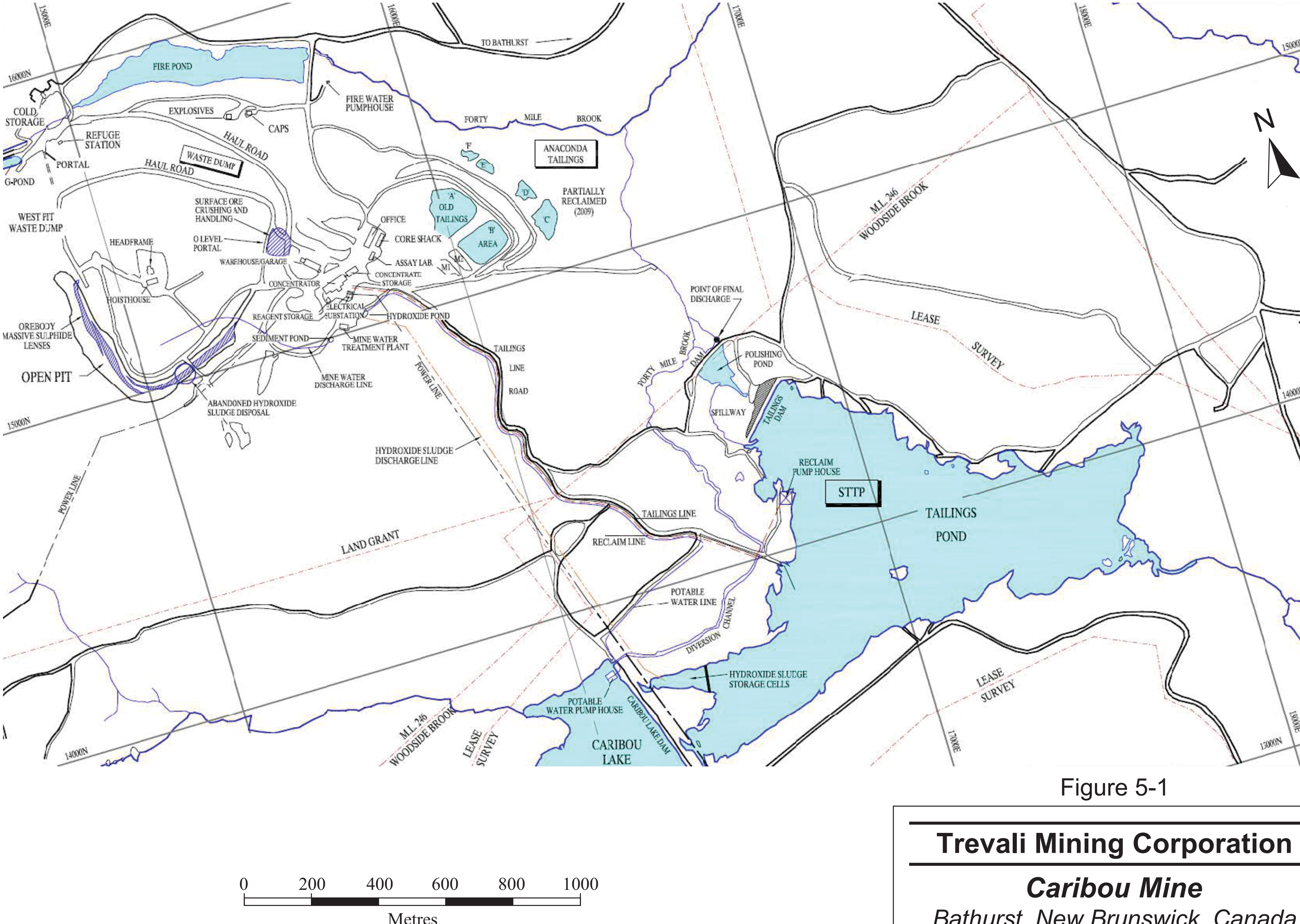


Figure 5-1

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Mine Infrastructure and Site Layout

May 2018

Source: Stantec, 2012.

6 HISTORY

EXPLORATION AND DEVELOPMENT HISTORY

The Caribou massive sulphide deposit was first discovered by Anaconda Canada Exploration Ltd. (Anaconda), in 1955. In 1965, extensive underground drifting, sampling, pilot plant testing, and diamond drilling were initiated and a small high-grade secondary copper cap was developed into an open pit mine-mill operation. Production was intermittent between 1971 and 1974, at which time the copper mineralization was exhausted.

The property was maintained on stand-by from 1974 until 1980 when interest in the deposit was renewed. In 1980, a three-year program began and consisted of deep drilling, test stoping, mine planning, pilot plant testing, preliminary mill and tailings dam design, environmental impact studies, and marketing studies.

In 1982, a silver/gold heap leach plant was constructed to process 60,000 tonnes of gossan material stripped from the open pit from 1971 to 1974. Between 1982 and 1983, 106,000 ounces of silver and 8,100 ounces of gold were produced.

In 1982, Anaconda prepared a feasibility study for a 2,000 tpd mine and mill complex that would concentrate on mining the higher grade portions of the deposit and utilize conventional flotation methods.

In December 1986, East West Minerals NL (East West), an Australian public company, purchased the mine from Anaconda through a subsidiary, East West Caribou Mining Limited (EWCM). A feasibility study of the project was developed based on production of a bulk lead/zinc concentrate, and in 1988 a concentrator with a design capacity of 2,000 tpd was commissioned and operated until July 1989 when operations were suspended pending the development of a new mining plan.

On April 9, 1990, the Caribou concentrator recommenced milling operations. Pursuant to a series of transactions during the summer and fall of 1990, EWCM became wholly-owned by Bathurst Base Metals Inc. (BBMI) and BBMI became wholly-owned by Breakwater Resources Ltd. (Breakwater). The mine and concentrator operated for seven months in 1990. On October 26, 1990, operations were suspended due to poor recoveries and falling metal prices. The mine/concentrator/tailings pond complex was placed on care and maintenance.

In late 1994, Breakwater initiated a metallurgical review of the Caribou underground mine mineralization with the objective of developing a process capable of producing separate saleable lead and zinc concentrates. Lakefield Research Limited (Lakefield Research) conducted tests on ore samples to determine the applicability of different flowsheet configurations and reagent schemes in an effort to determine if metallurgical improvements could be made. As a result of the positive results from the laboratory testwork, Lakefield Research performed a 220 tonne pilot plant test that confirmed the new treatment process, defined the overall metallurgical and operating parameters for future plant operation, and generated the engineering data required for modification of the existing Caribou mill.

In April 1995, Kilborn Inc. (Kilborn) was retained by Breakwater to complete a feasibility study for the re-opening of the Caribou mine, based on the Lakefield Research results. The feasibility study included the development and mining of the Restigouche deposit in conjunction with the Caribou underground mine and an increase in concentrator throughput to 3,000 tpd.

The Restigouche property was initially staked by Selco Exploration Ltd. in 1954 because of strong base-metal anomalies in streams in the area. In 1957, the property was optioned to New Jersey Zinc Company who discovered the deposit by drilling a significant soil geochemical anomaly. The property has since been optioned by Teck (1965 to 1970), Gowganda Silver Mines (1972), Placer Development (Canex Placer/Placer Dome, 1974 to 1976), Billiton Canada Ltd (1980 to 1982), Lincoln Resources, Southwind Resources, Marshall Minerals Corp. (1988 to 1995), and finally acquired by Breakwater in 1995 (475570, Caillé 2003, Gower and McCutcheon, 1997, Vaillancourt, 2003).

The Restigouche lead, zinc, and silver deposit is shallow and has high grades, but was too small to justify construction of its own processing plant. Several studies had been prepared by consultants, culminating in the feasibility study of October 1990 by Micon International Limited. This study recommended that the property be brought into production on the basis of contracted open pit mining and custom milling at the Caribou mill.

Marshall Minerals Corp (MMC) of Niagara Falls, Ontario, originally owned the Restigouche property. Breakwater completed the purchase of the Restigouche property from MMC in October 1995 through the issuance of 1,500,000 shares to MMC and subject to the payment of a mining royalty on each tonne of ore mined and hauled to the Caribou mill for processing.

The addition of the Restigouche open pit deposit to the mine plan facilitated the early start-up of the Caribou mine allowing sufficient time to develop the underground mine to reach its planned capacity and use a more efficient system of material transfer from underground to the mill.

Construction and development commenced in October 1996. Changes were made to the mill including expanding the existing grinding and flotation circuits, using high intensity conditioning and improving the reagent scheme. The lead flotation circuit was expanded in capacity by 200% and the zinc flotation circuit capacity was increased by approximately 60%. The addition of a second dewatering circuit was made to allow for separate dewatering of the lead and zinc concentrates and the general upgrading of the ore handling system.

Development of the Caribou underground mine was based on the Kilborn feasibility study. Bharti Engineering Associates (BEA) completed the mine planning under subcontract to Kilborn. Underground development included the deepening of the shaft, the addition of underground crushing and skip loading stations, extending the internal ramp, ventilation and backfill raising, and the excavation of ore passes.

In October 1996, stripping at the Restigouche open pit began. Construction of a wastewater treatment plant and waste storage pads was completed during the fall of 1996 and the summer of 1997. Pre-production stripping was completed in June 1997. During 2008, a total of 198,000 tonnes was produced at 5.34% Pb, 6.6% Zn, and 127 g/t Ag from the Restigouche open pit.

In 1997, EWCM changed its name to CanZinco Ltd. (CanZinco).

The Caribou underground mine and Restigouche open pit operated as expected. Although the mill commenced production in July 1997, mechanical deficiencies and design shortcomings prevented the operation from attaining commercial production. These were resolved by the end of 1997 allowing Breakwater to focus on achieving the metallurgical performance targets contained in the feasibility study.

Throughout 1998, the metallurgical performance of the Caribou mill improved steadily but fell short of the levels anticipated by the feasibility study. To August 1998, a total of 586,598 tonnes was milled grading 6.32% Zn and 2.93% Pb. As a result, and also because of declining metal prices, a decision was made to extend a planned maintenance shutdown that commenced in August 1998. The operation was placed on care and maintenance pending additional technical and economic studies.

From 1999 to 2000, Breakwater undertook several engineering studies to determine the feasibility of reopening the Caribou mine. Mineralogical and metallurgical studies were carried out at Lakefield Research; a preliminary engineering review of the modifications required to the concentrator as well as detailed engineering reviews of critical environmental projects were also carried out.

In August 2006, the property was acquired by Blue Note Metals Inc. (Blue Note) from CanZinco, a wholly-owned subsidiary of Breakwater. Between 2006 and 2007, Blue Note invested approximately $116 million in the completion of a major capital investment program that revived the former producer of zinc and lead concentrate. During this period, Blue Note completed a major overhaul and modernization of the processing plant and mine infrastructure (effectively new state-of-the-art milling and grinding circuits – Isa Mills and On-Stream analyzers to optimize recoveries). On February 7, 2007, Blue Note announced that the Caribou mine had been completely dewatered and the Restigouche open pit mine was in the process of being dewatered.

During the winter and spring of 2007, refurbishing and reconstruction of the concentrator was undertaken. This included the purchase and installation of a new surface crusher, refurbishing and reconstruction of the ore handling and storage facilities and the primary grinding circuits, complete reconstruction of the flotation area, installation of new ultrafine grinding equipment, and refurbishing and reconstruction of the dewatering equipment. As well, extensive work was completed on the site electrical systems, the mill service infrastructure, and the site buildings. Where possible and practical, existing equipment was rebuilt or used equipment was purchased. However, due to the tight market for used equipment, a considerable amount of new equipment was purchased and installed for these purposes.

Commissioning of the mill took place throughout the month of June 2007 when the crushing, grinding, flotation and dewatering circuits, and all ancillary mechanical installations were being prepared for production. On July 16, 2007, Blue Note announced that it had started processing ore at the Caribou mine, with the stockpiling of over 40,000 tonnes of ore at surface. On June 29, 2007, Blue Note transferred the Caribou and Restigouche properties to Blue Note Caribou (BNC), its wholly-owned subsidiary.

In August 2007, Blue Note made its first delivery of lead concentrate to Xstrata's lead smelter in Belledune, New Brunswick, and the first shipment of zinc concentrate production from the Belledune Port for delivery overseas was made in October 2007.

Effective January 1, 2008, the Caribou and Restigouche properties achieved commercial production, producing approximately 80 million pounds of zinc and 42 million pounds of lead in 2008.

Since commercial production was achieved in January 2008, operating performance had continuously improved with all of the original planned production targets being achieved or surpassed. The concentrator processed 3,000 tpd from the underground and open pit mines with zinc and lead recoveries exceeding 83% and 70%, respectively. Despite this operating performance, low zinc and lead prices made the mine unprofitable. In 2009, Blue Note declared bankruptcy after mining about 1.1 million tonnes. All underground equipment and services were pulled to surface and securely warehoused prior to mine shutdown.

In 2009, Maple Minerals Corporation (Maple Minerals) acquired the Caribou property from bankruptcy, and in November of 2012, Trevali acquired Maple Minerals and now controls the Caribou deposit.

On May 1, 2013, Trevali received the Approval to Operate for the Caribou mine from the Province of New Brunswick. The Approval to Operate authorized Trevali to operate the underground mine, surface mineralized material storage and crushing facility, the concentrator plant, mine WTP, and tailings impoundment. The permit also includes all land, buildings, processes, and activities associated with the operation of the Caribou mine and enabled Trevali to construct new structures within the currently disturbed area.

In June 2014, Trevali commenced both surface and underground construction and rehabilitation activities to facilitate mine and mill commissioning in the first half of 2015. Mine dewatering and rehabilitation was carried out by a mining contractor. During 2014 and 2015, as part of the mill rehabilitation, a new semi-autogenous grinding (SAG) mill was installed.

During the first quarter of 2015, initial underground mineral production commenced with blasting of the first scheduled stope and transport of mineralized mill-feed to the surface stockpile. In May 2015, Trevali announced that commissioning of the Caribou mill had commenced. Trevali achieved initial production of zinc and lead concentrates and shipped and sold its first zinc concentrates in July 2015. Commercial production was declared on July 7, 2016.

HISTORICAL MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

A number of Mineral Resource estimates, by various operators and independent consultants, have been prepared for the Caribou deposit. Table 6-1 summarizes the historical Mineral Resource estimates for the Caribou deposit. These estimates are considered to be historical in nature and should not be relied upon. A qualified person has not completed sufficient work to classify the historical estimates as current Mineral Resources or Mineral Reserves and Trevali is not treating the historical estimates as current Mineral Resources or Mineral Reserves. All previous Mineral Resource estimates prepared by Trevali are superseded by the current Mineral Resource estimate documented in Section 14 of this report.

TABLE 6-1 HISTORICAL MINERAL RESOURCE ESTIMATES FOR THE CARIBOU MINE
Trevali Mining Corporation – Caribou Mine

Author	Year	Kt	Class	Zn (%)	Pb (%)	Ag (g/t)	Cu (%)	Au (g/t)
Anaconda	1980	39,347	Not assigned	4.86	2.06	53	0.33	0.97
Breakwater	1991	2,989	Proven	8.31	3.68	ND	ND	ND
Breakwater	1991	777	Probable	8.17	3.29	ND	ND	ND
Breakwater	1991	945	Possible	7.48	3.63	ND	ND	ND
Breakwater	1991	8,302	Inferred	8.21	3.47	ND	ND	ND
Breakwater	1995	2,996	Proven	8.30	3.68	104	0.36	1.3
Breakwater	1995	772	Probable	8.17	3.29	97	0.41	1.6
Breakwater	1995	945	Possible	7.48	3.63	105	0.3	0.8
Breakwater	1995	8,302	Inferred	8.21	3.47	101	0.39	1.5
Breakwater	1996	2,770	Measured	8.34	3.74	ND	ND	ND
Breakwater	1996	1,962	Indicated	8.12	3.83	ND	ND	ND
Breakwater	1996	4,573	Inferred	8.2	3.65	ND	ND	ND
Breakwater	1997	1,935	Measured	8.02	3.80	101	ND	ND
Breakwater	1997	552	Indicated	8.38	3.48	99	ND	ND
Breakwater	1997	737	Inferred	7.79	3.78	107	ND	ND
Breakwater	1998	1,695	Measured	8.16	3.72	100	ND	ND
Breakwater	1998	522	Indicated	7.92	3.45	101	ND	ND
Breakwater	1998	737	Inferred	7.79	3.78	107	ND	ND
Breakwater (Internal)	1999	1,461	Measured	8.10	4.00	100	0.33	ND

Author	Year	Kt	Class	Zn (%)	Pb (%)	Ag (g/t)	Cu (%)	Au (g/t)
Breakwater (Internal)	1999	1,170	Indicated	7.70	4.10	98	0.31	ND
Breakwater (Internal)	1999	2,591	Inferred	7.80	4.10	100	0.31	ND
Breakwater (external)	1999	2,295	Measured	8.06	3.71	ND	ND	ND
Breakwater (external)	1999	522	Indicated	7.92	3.45	ND	ND	ND
Breakwater (external)	1999	4,102	Inferred	6.66	3.21	ND	ND	ND
Blue Note	2006	2,800	Measured	7.64	3.45	95	ND	ND
Blue Note	2006	1,010	Indicated	7.12	2.76	85	ND	ND
Blue Note	2006	3,944	Inferred	7.36	3.59	107	ND	ND
SRK	2015	5,610	Measured	6.91	2.93	84.64	0.46	0.84
SRK	2015	1,620	Indicated	7.28	2.94	83.68	0.34	1.06
SRK	2015	3,660	Inferred	6.95	2.81	78.31	0.32	1.23

Notes:
1. ND = no data.

PAST PRODUCTION

Table 6-2 summarizes the past mill production for the Caribou mine.

TABLE 6-2 PAST PRODUCTION RECORDS FOR THE CARIBOU MINE
Trevali Mining Corporation – Caribou Mine

Years	Owner	T Milled	Zn (%)	Pb (%)	Ag (g/t)
to 1989	Anaconda/East West	421,000	7.7	3.5	-
1989 to1990	Breakwater	728,400	7.2	3.5	-
1997	Breakwater	322,827	6.3	3.3	102
1998	Breakwater	494,449	6.3	3.8	105
2007	Blue Note	298,459	5.5	3.6	89
2008	Blue Note	819,452	5.9	3.6	81
2015	Trevali	369,006	5.3	2.0	59
2016	Trevali	823,646	6.0	2.6	79
2017	Trevali	945,436	5.9	2.6	75
Total		**5,222,675**	**6.2**	**3.1**	**-**
Caribou Underground		**4,426,874**	**6.1**	**2.8**	**-**
Restigouche Open Pit		**795,801**	**6.5**	**5.0**	**116**

Notes:
1. The Restigouche Open Pit is located outside of the Caribou property boundaries.

The 1997 and 1998 mill production included a total of 229,722 tonnes grading 5.4% Pb, 6.2% Zn, and 139 g/t Ag from the Restigouche open pit. The 2007 and 2008 mill production included a total of 566,079 tonnes grading 4.9% Pb, 6.6% Zn, and 107 g/t Ag from the Restigouche open pit.

7 GEOLOGICAL SETTING AND MINERALIZATION

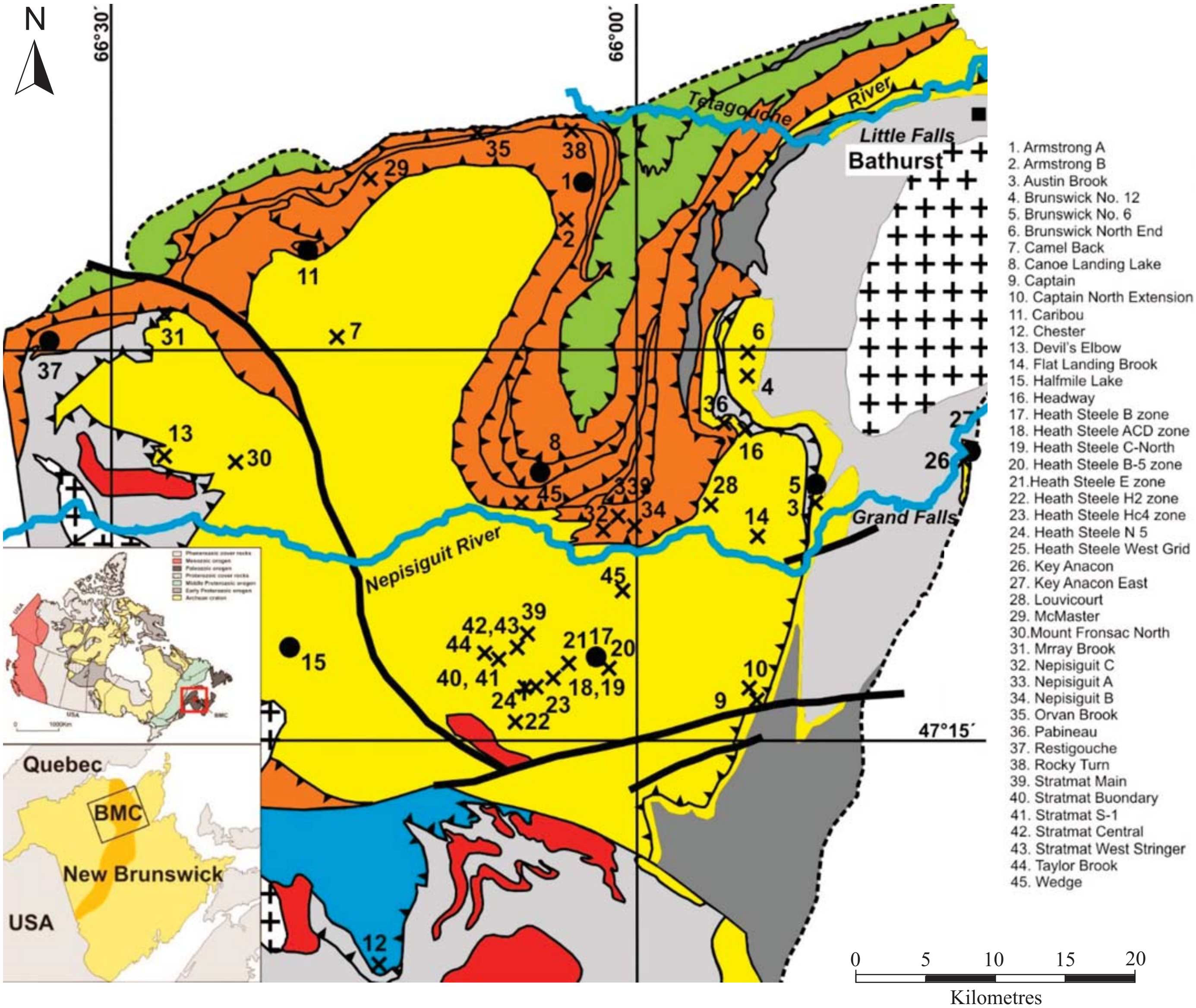
The following description is mostly taken from Peltier and Beausoleil (2006).

REGIONAL GEOLOGY

The BMC occupies a roughly circular area of approximately 70 km diameter in the Miramichi Highlands of northern New Brunswick. The area includes 46 mineral deposits with defined tonnage, and approximately 100 other mineral occurrences, all hosted by Cambro-Ordovician rocks that were deposited in an ensialic back-arc basin (Figure 7-1).

The rocks in the BMC are divided into five groups—the Miramichi, Tetagouche, California Lake, Sheephouse Brook, and Fournier groups—that are largely in tectonic contact with one another (Van Staal et al., 2003). The Cambro-Ordovician Miramichi Group represents a passive margin sequence that was deposited on the Avalonian platform. This passive margin became an active, Andean-type margin in the middle to late Arenig with the subduction of oceanic crust beneath the margin and the development of the ensialic Popelogan volcanic arc (Van Staal et al., 2003).

The Middle Ordovician California Lake, Tetagouche, and Sheephouse Brook groups represent the initial stages of back-arc rifting of ensialic crust. Radiometric dating shows that the California Lake, Tetagouche, and Sheephouse Brook groups are approximately coeval, and there are similarities in the internal stratigraphy of each group (Van Staal et al., 2003). The lower part of each group is dominated by felsic volcanic rocks and the upper part by mafic volcanic rocks that are overlain by carbonaceous shale and pelagic chert. This bimodal suite of rhyolites and basalts and cogenetic granites and gabbros were formed by partial melting of lower crustal rocks and the mantle, respectively, during progressive back-arc rifting of the Avalonian basement (Van Staal et al., 1991). The basalts are both tholeiitic and alkalic, and show a progression from enriched, fractionated continental tholeiites to alkali basalts to more primitive, mantle-derived, mid-ocean ridge, tholeiitic pillow basalts (Van Staal et al., 1991). Most massive sulphide deposits of the BMC are associated with felsic volcanic rocks in each group.



Silurian-Devonian

Late Ordovician-Early Silurian (?)

Tomogonops Group

Middle-Late Ordovician

Bathurst Sypergroup

Fournier Group

Sheephouse Brook Group

Tetagouche Group

California Lake Group

Late Cambrian-Early Ordovician

Miramichi Group

Intrusive rocks (undivided)

Intrusive rocks (undivided)

Cover Rocks

C-Carnoniferous

Si-Silurian

Geological contact

Unconformity

Fault

Thrust fault

Figure 7-1

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Regional Geology Setting

Source: Van Staal et al, 2003, Walker and McCutchen, 2011 with modifications

May 2018

The accretion of the Popelogan arc to the Laurentian margin in the Caradoc was followed by the closure of the back-arc basin by northwest-directed subduction beneath both the arc and Laurentia. All groups of the BMC were intensely deformed and tectonically assembled in the Brunswick subduction complex (Van Staal, 1994).

Rocks of the BMC have been subjected to complex polyphase deformation and associated greenschist and blueschist metamorphism (Helmstaedt, 1973; Van Staal et al., 1990). Five episodes of folding have been recognized in the BMC, but only the first two folding events account for the complex structural geometry (Van Staal and Williams, 1984).

The earliest deformation event (D1) is characterized by strong layering-parallel foliation (S1), asymmetrical intrafolial folds (F1), and a well-defined stretching lineation (L1). The D1 structures are concentrated in zones of high strain, are commonly associated with stratigraphic repetition, and are interpreted to have resulted from progressive deformation during imbrication in the northwest-dipping Brunswick subduction zone (Van Staal, 1994). The first phase of deformation has been interpreted by Van Staal et al. (1992) to have taken place in the Late Ordovician to Early Silurian.

The second deformational event (D2) is represented by tight, near-vertical isoclinal folds that are probably Early Silurian or older (McCutcheon et al., 1993) and occurred during continental collision. The plunges of the F2 folds are generally shallow, except near F1 fold closures. The cleavage associated with F2 folds is well developed, steeply dipping, and subparallel to S1 along the limbs of F2 folds. This deformation event is partly associated with the obduction of the accretionary wedge onto the basin margin.

Structures associated with D1 and D2 have been refolded by open to tight recumbent F3 folds (Van Staal and Fyffe, 1991). The S1 and S2 fabrics were reoriented to shallow-dipping attitudes where D3 was intense. Earlier structures have been refolded by large- and small-scale F4 and F5 folds, although the overprinting relationships are rarely preserved. Examples of later folds include the Nine Mile synform and the Tetagouche antiform (Van Staal and Williams, 1984). These F4 and F5 structures probably correspond to kink and parasitic folds documented by Davis (1972) in the area of the Caribou Deposit.

LOCAL AND PROPERTY GEOLOGY

The Caribou massive sulphide deposit is located in the northern part of the BMC, and occurs in the core of a synformal structure that plunges steeply (80° to 85°) to the north (Figure 7-2). The host felsic volcanic and sedimentary rocks are assigned to the Spruce Lake Formation that forms part of the California Lake Group. In the Caribou area, the Spruce Lake Formation is confined to one of three nappes that are named after the predominant volcanic unit in each nappe. All three nappes contain rocks that belong to the California Lake Group (Van Staal et al., 2003).

The Caribou deposit consists of the following units from the base upward:

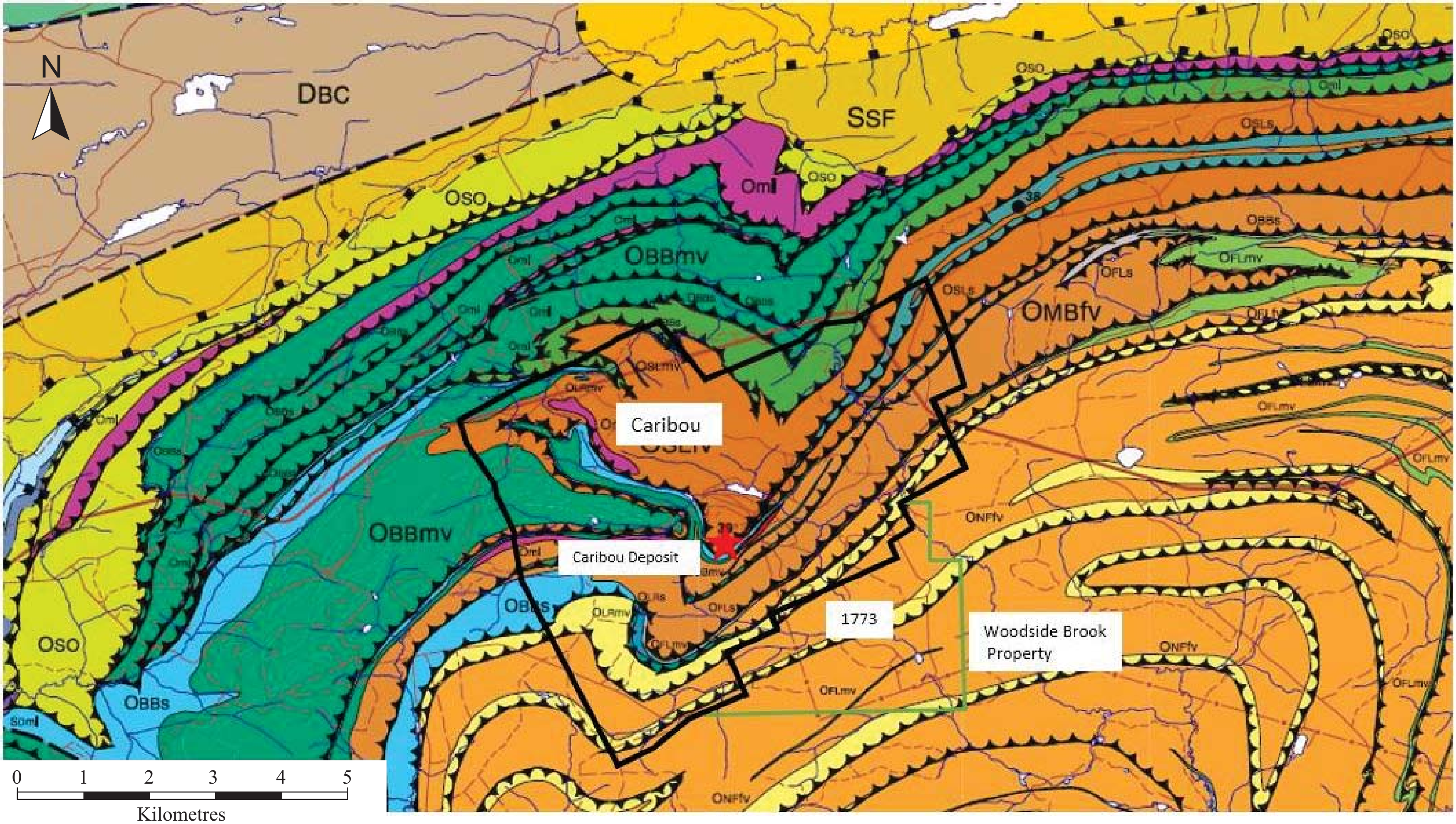
- Dark grey to black carbonaceous shale, pale grey phyllite, greywacke, and chloritic schist interbedded with hydrothermally-altered, pale green, felsic volcanic rocks (footwall of the deposit);
- Stringer sulphides cutting hydrothermally-altered sedimentary and felsic volcanic rocks;
- Massive sulphides comprising a vent complex and bedded sulphides;
- Chloritic schist at the contact between massive sulphides and overlying felsic volcanic rocks; and
- Interbedded felsic volcanic and sedimentary rocks.

PROPERTY STRUCTURE

The massive sulphides consist of seven en echelon lenses, numbered 1, 2, 3, 4, 6, 7, and 8 around the Caribou fold. Lenses 1, 2, 3, 7, and 8 occur on the north limb of the Caribou fold, while Lenses 4 and 6 are mostly on the eastern limb of the fold (Figure 7-3).

The western sulphide lenses on the north limb at Caribou are underlain by a sulphide stringer zone that is composed mostly of pyrite + quartz + siderite impregnations and veins with iron chlorite selvages cutting hydrothermally-altered, felsic, volcanic and sedimentary rocks. Because the rocks are highly strained, the sulphide stringer zone appears to be stratabound and individual sulphide veins occur subparallel to bedding.

The deposit is cut by two major faults called the NS fault and the EW fault, both of which have offsets of up to 3 m to 4 m. The locations are well known in older workings and cause some ground control issues when development is required to pass through them.



Legend:

CCF	sandstone, pebble conglomerate, and mudstone
DBC	greyish green to dark grey siltstone
SSF	red and greenish grey, pebble to cobble orthoconglomerate, sandstone, lithic greywacke, and siltstone
Oml	synvolcanic gabbro, minor diabase
OSO	mafic volcanic rocks
OBBmv	pillow basalt transitional from tholitic to alkalic, minor carbonate and chert
OBBs	dark grey to black shales, minor siltsotne, chert and limestone
OSLs	feldspar-phyric dacite to rhyolitic lava flows and cryptodomes; locally includes interlayered iron formation and massive sulphide
OSLmv	theoletic basalt
OMBfv	quartz and feldspar-phyric dacite to rhyolite lava tuff, minor basalt; locally includes massive sulphide
OLRmv	pillow basalt transitional from tholeiitic to alkalic
OLFmv	massive to pillowed tholetic basalt and pyroclastic breccia
OFLs	grey and red ferromanganiferous shale, minor jasper
ONFfv	quartz and feldspar phyric crystal tuff, minor felsic epiclastic sandstones, siltstone and shale, locally includes interlayered iron fomration and massive sulfide
ONFmv	tuffaceous, locally calcareous sandstone and siltstone, iron formation, minor pyritecfrous shale and conglomerate

May 2018

Source: Peltier and Beausoleil, 2006, with modifications.

Figure 7-2

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Local Geology Setting

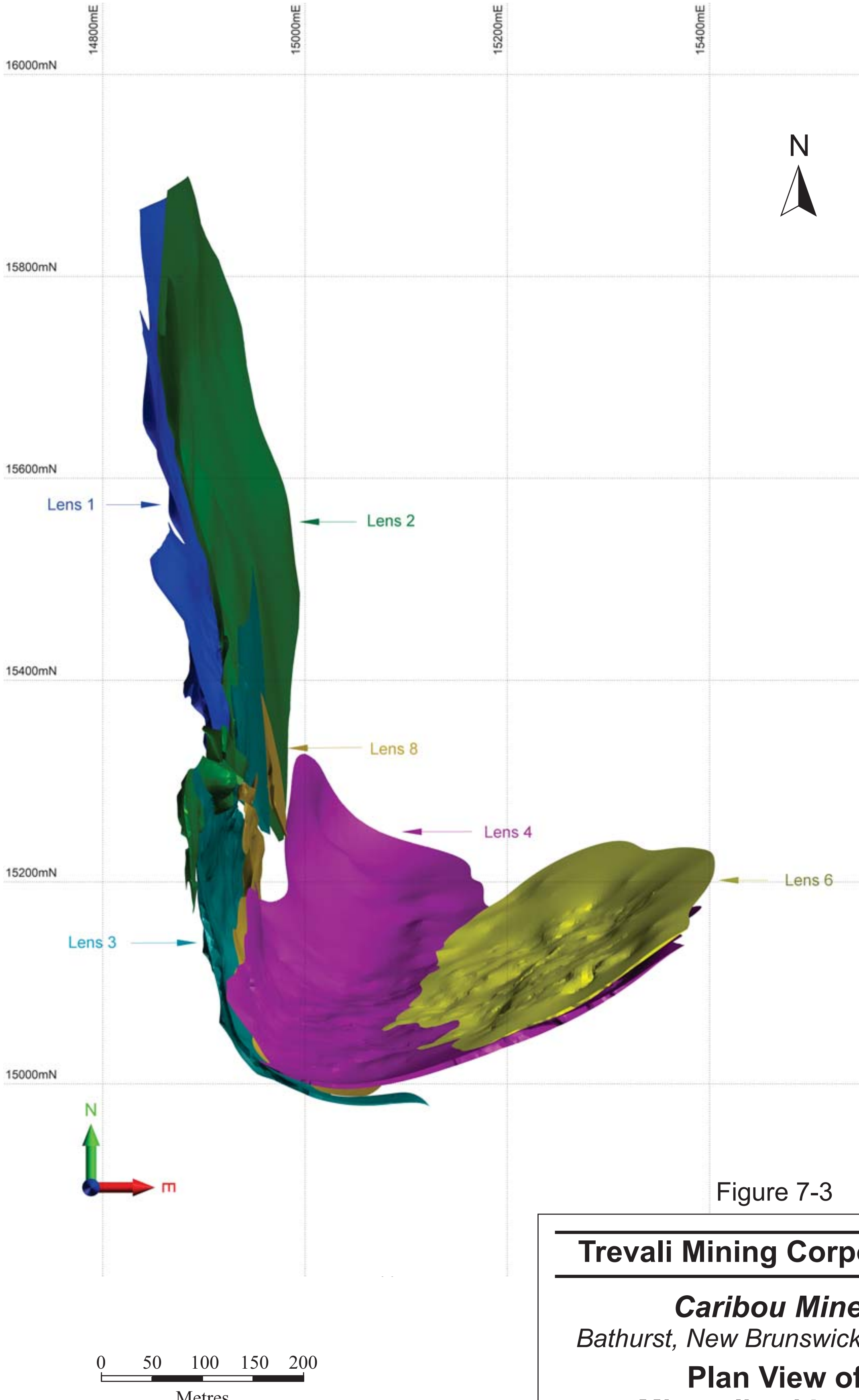


Figure 7-3

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Plan View of Mineralized Lenses

May 2018

Source: RPA, 2018.

There are also a series of several east-west trending subparallel faults (approximately 10 m spacing) on the north limb with offsets of approximately 8 m to 13 m. The faults have been modelled in Leapfrog GEO version 4.2.3 (Leapfrog) software and their position is used to plan development into these areas in the north limb. Many smaller faults are seen in the mine which do not appear to have any influence on the spatial location of the mineralized lenses.

MINERALIZATION

Mineralization within the Caribou deposit is composed of individual lenses that are zoned mineralogically and chemically from a copper-rich vent-proximal facies (vent complex) near the bottom and western part of each lens, to a lead-zinc-rich vent-distal facies (bedded sulphides) near the top and eastern part of each lens. Although it is impossible to rule out one large sulphide lens that was dismembered during deformation, the multiple vent sites at Caribou are consistent with the common clustering of similar modern and ancient deposits.

The vent complex consists predominantly of pyrite + pyrrhotite + chalcopyrite + magnetite, whereas the bedded sulphides are composed of pyrite + sphalerite + galena + arsenopyrite + tetrahedrite. The massive sulphides are zoned such that copper, bismuth, cobalt, europium/europium, and copper/(copper + lead + zinc) decrease, and zinc, lead, silver, tin, indium, arsenic, antimony, molybdenum, cadmium, mercury, and gallium increase, as one progresses from the vent complex to the bedded sulphide facies. Compared to bedded sulphides, the sphalerite, galena, and pyrite in the vent complex are also iron-, silver-, and arsenic-rich, respectively.

The Caribou deposit massive sulphide zones consist of 90% sulphides, mainly pyrite, sphalerite, galena, and chalcopyrite. The main gangue minerals are magnetite, siderite, stilpnomelane, quartz, and chlorite.

8 DEPOSIT TYPES

The Caribou deposit is a volcanogenic massive sulphide deposit (VMS) typical of the BMC. The BMC hosts 46 volcanic sediment-hosted massive sulphide deposits and about one hundred other mineral occurrences, including the Brunswick No. 12 (B-12) deposit. The BMC deposits formed in a sediment-covered back-arc continental rift during periods when the basin was stratified with a lower anoxic water column. The basin was subsequently intensely deformed and metamorphosed during multiple collisional events related to east-dipping subduction of the basin.

VMS deposits typically form lenses of polymetallic massive sulphide. Most deposits are zoned vertically and laterally from a high-temperature, vent-proximal, copper-cobalt-bismuth-rich, veined and brecciated core, to vent-distal, zinc-lead-silver-rich hydrothermal sediments. The vent complex is commonly underlain by a highly deformed sulphide stringer zone that extends hundreds of metres beneath deposits, and consists of veins and impregnations of sulphides, silicates, and carbonates that cut chloritized and sericitized volcanic and sedimentary rocks.

The Caribou massive sulphide deposit is sufficiently distinct from the Brunswick type to warrant a subtype designation (Caribou type) within the BMC. This deposit is second only in size to the B-12 deposit in the BMC (Cavalero, 1993). Unlike the B-12 deposit, which is hosted by the Tetagouche Group, the Caribou deposit occurs in the California Lake Group, near the base of a felsic volcanic rock sequence that comprises part of the Spruce Lake Formation (Figure 8-1).

The Spruce Lake Formation volcanic rocks are petrologically and geochemically distinct from those of the Tetagouche Group (Goodfellow, 2007). Furthermore, the Caribou deposit is not associated with the Algoma-type carbonate-oxide-silicate iron formation that overlies and is lateral to the B-12 and Heath Steele deposits (Peter and Goodfellow, 2003).

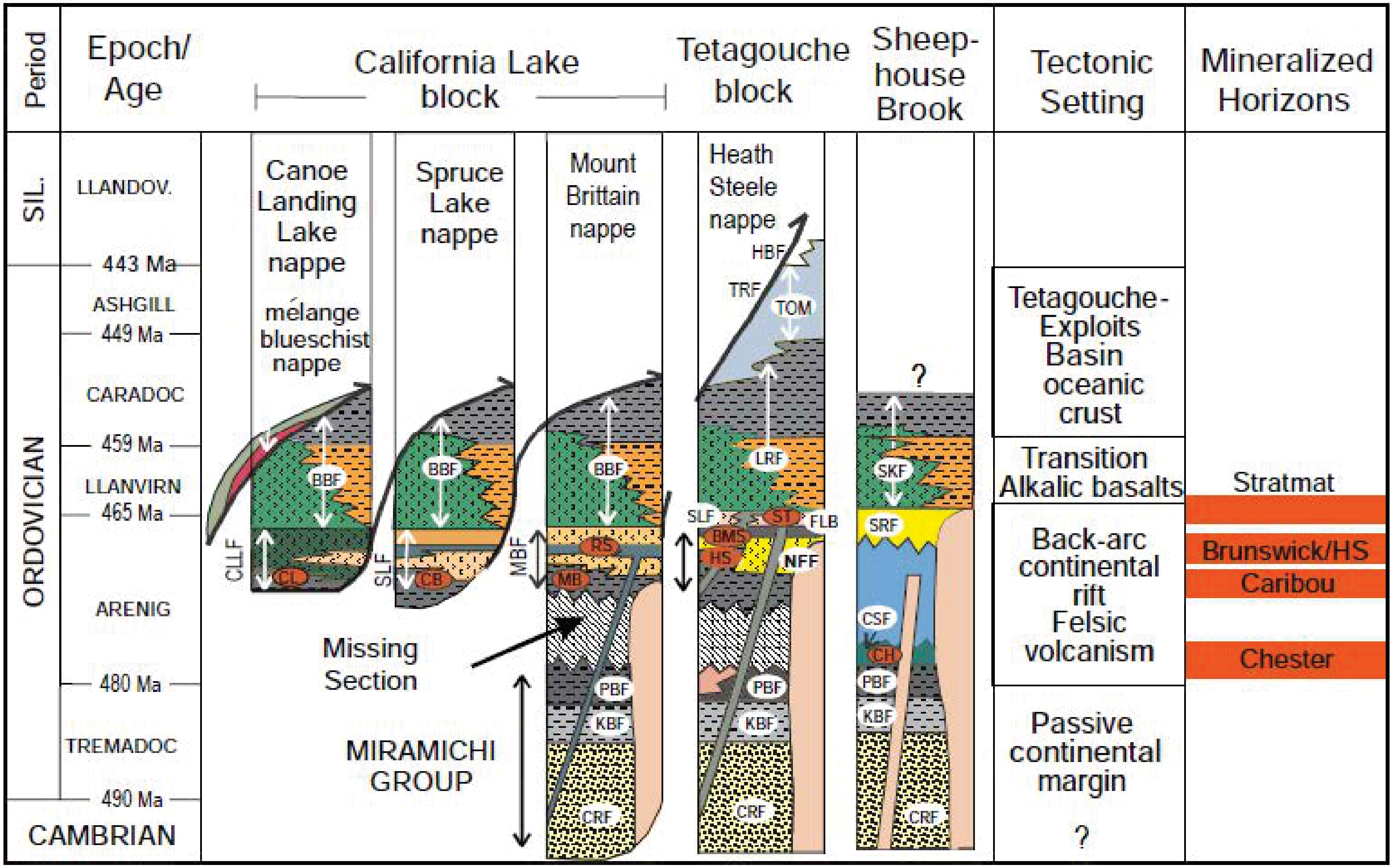


Figure 8-1

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Stratigraphic Location of Caribou Deposit

May 2018

Source: Goodfellow, 2007.

9 EXPLORATION

The Caribou property has been the site of numerous exploration programs, Mineral Resource estimates, and development and production programs by various companies (see Section 6, History).

EXPLORATION PROCESS AND TECHNIQUES

Trevali's corporate strategy is based on leveraging the current Caribou site infrastructure to extend the Life of Mill beyond the final Caribou deposit mine life in order to process potential feed from the five other VMS deposits Trevali controls or has options on in the BMC. These are Restigouche, Murray Brook, Halfmile, Stratmat, and the Heath Steele property – E-Zone. In addition, Trevali will continue to strategically acquire additional prospective ground in the under-explored northern portion of the BMC between the Caribou and Restigouche deposits.

Trevali uses an integrated exploration approach to screen targets and opportunities from a first principles basis using geology, geochemistry, and geophysics followed by drill testing. Trevali has a dedicated full time exploration team in the region with a typical annual program consisting of approximately 65% to 70% drilling.

2014 TO 2017 CARIBOU EXPLORATION ACTIVITIES

Between February and April 2014, four holes totalling 2,179 m were drilled to test different property-wide geophysical anomalies identified from a Titan 24 induced polarization (IP) survey in 2008 and for condemnation drilling for a planned tailings management facility expansion. A fifth drill hole, BR-1005 (1,095 m), was completed to test deep mineralization down plunge, below and to the west-northwest of the defined Caribou resource. BR-1005 successfully intersected massive sulphide mineralization approximately 450 m below the mineral resource defined at the time. A subsequent wedge borehole attempt encountered technical difficulties and the hole had to be abandoned.

In October 2014, Trevali commenced a 5,000 m surface exploration program to continue drill testing the "Caribou mineral horizon" as well as define additional near mine resource to help extend the life of the current underground operation. Drill hole BR-1014A was designed to test the northwest down-plunge extension of the horizon at intermediate depths outside the defined mineral resource at the time. BR-1014A intersected 50.9 m at a downhole depth of 607 m (vertical depth of approximately 550 m) grading 5.08% Zn, 1.76% Pb, 0.37% Cu, 59.66 g/t Ag, and 1.63 g/t Au, within which several higher-grade intervals occurred, including 5 m of 7.28% Zn, 2.41% Pb, 0.38% Cu, 82 g/t Ag, and 2.09 g/t Au. Immediately underlying this interval was a thin copper-rich lens grading 1.4% Cu, 0.8% Zn, 24.65 g/t Ag, and 0.2 g/t Au over 2.3 m, which may represent a local “feeder” source.

In August 2015, Trevali commenced a 10,000 m underground drilling program that was predominantly infill drilling and designed to provide additional detail for mine planning and to support the conversion of Inferred Mineral Resources to higher confidence categories.

Between November 2016 and November 2017, Trevali completed 18,106 m of surface drilling in 31 holes (including wedge holes), with the goal of proving continuity of mineralization encountered on the north limb of the “Caribou mineral horizon” in BR-1014A (discussed above). Directional drilling was used to help test tighter targets at depth, and provide adequate drill spacing in order to define an Inferred Mineral Resource. Notable intercepts included hole BR-1025 (35.39 m of massive sulphide at a downhole depth of 512.35 m grading 4.28% Zn, 1.41% Pb, 0.38% Cu, 53.06 g/t Ag, and 1.28 g/t Au), BR-1033 (11.98 m of sulphide mineralization at a downhole depth of 765 m grading 6.05% Zn, 2.23% Pb, 0.37% Cu, 80.91 g/t Ag, and 2.12 g/t Au), and BR-1036 (14.60 m of sulphide mineralization at a downhole depth of 718 m grading 5.81% An, 2.28% Pb, 0.46% Cu, 77.60 g/t Ag, and 2.21 g/t Au). As a result, the program successfully defined two continuous lenses of massive sulphide mineralization outside the currently defined resource, varying from 5 m to greater than 30 m thick and having a currently modelled strike length of 450 m and a dip length of approximately 700 m, within which higher-grade “Run-of-Mine” mineralization occurs (Figure 9-1).

Additional downhole geophysical surveys carried out in drill hole BR-1017, which tested the northern margin of these lenses (BR-1017), as well as in historic hole CX97-02, approximately 100 m outside the currently defined lenses, suggested a high potential to further extend mineralization to the north. Drill hole BR-1037 was drilled to test this horizon 200 m north of the defined mineralization, and successfully encountered 7.13 m of massive sulphide mineralization grading 11.09% Zn, 1.89% Pb, 0.60% Cu, 55.4 g/t Ag, and 0.39 g/t Au. To date, no additional follow up drilling has been completed around this intercept. Results will be incorporated into the 2018 Mineral Resource estimate.

The Caribou deposit remains open at depth. The 2017 exploration program (Figure 9-1) discovered additional zones including the North Limb Extension. Successful utilization of directional drilling to intersect tight targets presents an opportunity for further definition drilling from surface.

CARIBOU EXPLORATION POTENTIAL

Geological interpretation utilizing wide spaced drilling, lithology, structures, grades, and existing knowledge of the Caribou geology has been used to outline an exploration target (Figure 9-2) of 3 Mt to 7 Mt grading 5% to 6% Zn, 1% to 3% Pb, 0% to 1% Cu, and 50 g/t to 100 g/t Ag. The potential quantity and grade is conceptual in nature, there has been insufficient exploration to define a Mineral Resource, and it is uncertain if further exploration will result in the target being delineated as a Mineral Resource.

REGIONAL EXPLORATION

Trevali's regional exploration program (Figure 9-3) includes both advanced exploration projects as well as generative greenfields exploration projects. The following is a brief review of Trevali's regional exploration projects outside of the Caribou property boundaries.

ADVANCED EXPLORATION PROJECTS

Advanced regional exploration projects include the Restigouche, Murray Brook, Halfmile, and Stratmat deposits. Mineral Resource estimates for these projects have been prepared by others and have not been reviewed by RPA.

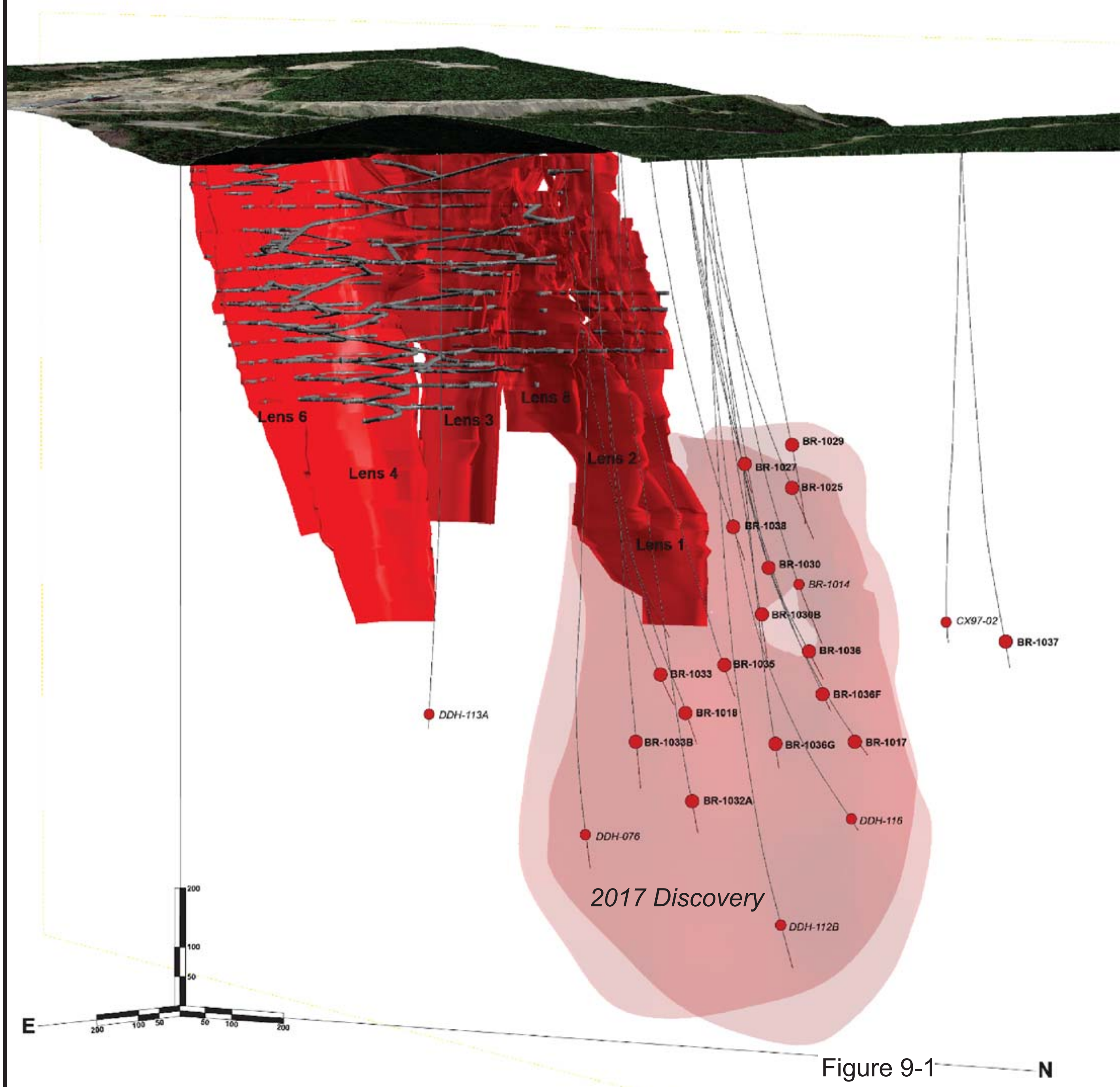


Figure 9-1

Looking South-West

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Caribou 2017
Exploration Drilling

May 2018

Source: Trevali, 2018.

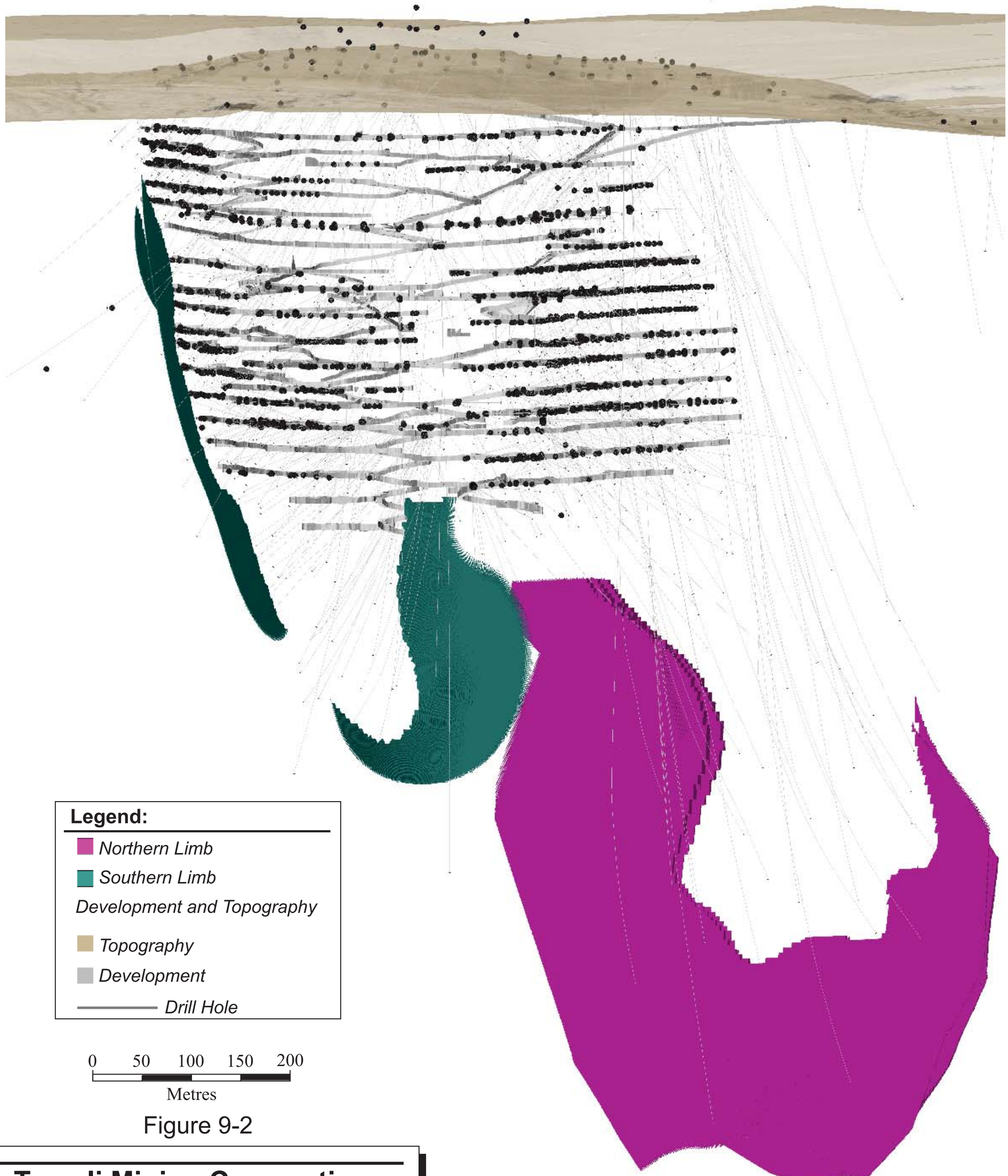


Figure 9-2

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Caribou Exploration Potential

May 2018

Source: Trevali, 2018.

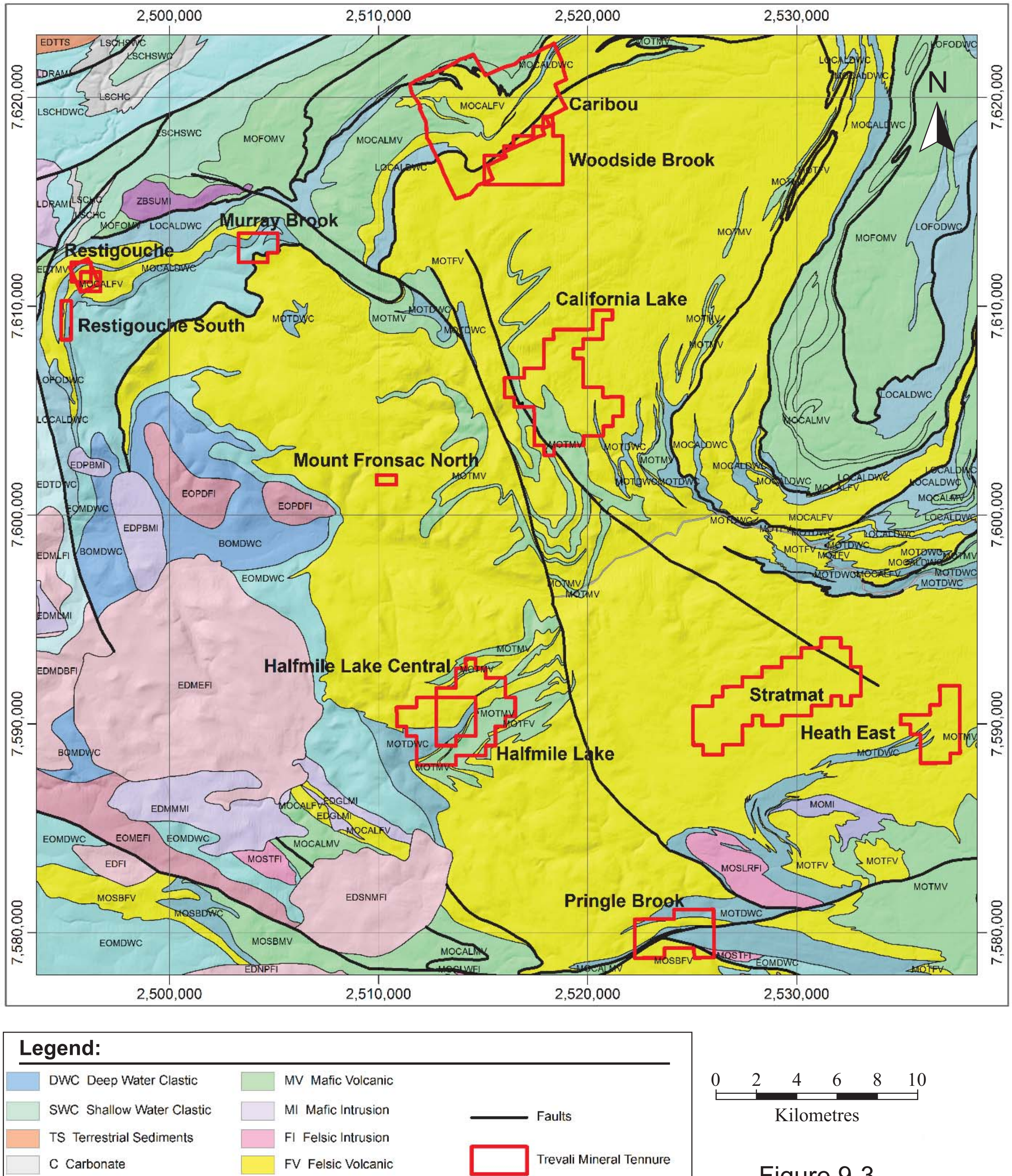


Figure 9-3

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Regional Exploration Properties

Source: New Brunswick Energy and Resource Department, 2018.

RESTIGOUCHE

The Restigouche project is a formerly producing zinc-lead-silver mine located approximately 27 km west-southwest of Trevali's Caribou mine in the BMC. Restigouche was intermittently mined using an open pit mining method by two different past operators, Breakwater and Blue Note, with the material being trucked to and processed at the Caribou mill. A total of approximately 796,000 tonnes were mined historically at 6.5% Zn, 5.0% Pb, and 116 g/t Ag. There is no current Mineral Resource for the Restigouche property.

High-grade sulphide mineralization outcrops at surface and dips gently to the north-northwest. The Restigouche sulphide body has a strike length of approximately 120 m and continues down dip for 460 m. Thickness varies between one metre and 30 m, with an average thickness of approximately 20 m. Trevali commenced evaluating the Restigouche property in 2017 with exploration drilling and several historic drill holes were also twinned.

HALFMILE

The Halfmile deposit is located in the BMC, approximately 60 km southwest of Bathurst and 40 km from the past producing B-12 mine. The Halfmile deposit contains four sulphide zones: Upper, Lower, Deep, and North. The deposit is structurally overlain by rhyolitic and dacitic rocks as well as disconformable quartz-wackes and pelites. Towards the footwall of the massive sulphide package are alkali basalts and thin bedded feldspathic wacke/shales which have been metamorphosed to the greenschist facies. The entire lithological package has been stratigraphically overturned.

STRATMAT

The Stratmat deposit is located in the BMC approximately 45 km southwest of Bathurst. The deposit is underlain by a magnetic northeast-southwest trending sequence of predominantly felsic volcanic rocks and lesser sedimentary rocks which are host to all massive sulphide deposits on the property. New Brunswick Provincial Government regional mapping projects have classified the rocks as belonging to the Flat Landing Brook Formation of the Middle Ordovician Tetagouche Group.

The sulphide minerals consist of disseminated and massive sphalerite-galena-pyrite and chalcopyrite. The sulphide minerals are fine to medium-grained, and are coarser than those typically found in deposits of the Bathurst-Newcastle district. Disseminated mineralization also occurs in the phyllitic sedimentary rocks as well as in the talc layers which locally grade into massive sulphide.

MURRAY BROOK

On March 2, 2018, Trevali announced that it had entered into a Letter of Intent (LOI) with Puma Exploration Inc. (Puma) for the acquisition of an option to acquire an interest in the Murray Brook deposit and to form a proposed Strategic Exploration Alliance (the Alliance) in the northern portion of the BMC.

The Murray Brook deposit is located approximately 10 km west of the Caribou mine along Provincial Highway 180 and covers an area of 484 ha under Mining Lease 252.

Geologically, the Murray Brook deposit consists of a large low to moderate grade massive sulphide body within which higher grade zones occur. The system is divided into two distinct domains. The Zn-Pb rich West Zone is approximately 200 m wide, extending from surface to approximately 300 m depth, with a true thickness varying from 75 m to 100 m. The Cu-Au rich East Zone is approximately 100 m wide, also extending from surface to approximately 300 m depth.

GENERATIVE EXPLORATION PROJECTS

Generative regional exploration projects include the Heath Steele deposit as well as greenfields exploration within the regional land package and the northern BMC.

HEATH STEELE PROJECT

The Health Steel project is a formerly producing zinc-lead-silver-copper-gold mine located adjacent to Trevali's Stratmat Deposit and approximately 35 km south-southeast of the Caribou mine. Mining operations at Heath Steele were carried out by a variety of companies (including Noranda) discontinuously between 1957 and 1999. Over Heath Steele's long mine life, zinc, lead, copper, silver, and gold were extracted from several zones on the property with historic production totalling approximately 24 Mt at 5.21% Zn, 1.81% Pb, 0.93% Cu, and 67 g/t Ag. There is no current Mineral Resource for the Heath Steel property.

The current target on the project, the E-Zone, has VMS mineralization exposed at surface and has been previously tested and defined by more than 150 historic drill holes. Based on the available historic drill hole data, the E-Zone appears to consist of two stacked sulphide lenses each approximately 150 m in length and with thicknesses ranging from 5 m to 30 m. The lenses merge towards surface and have a vertical continuity of approximately 200 m.

In March 2017, Trevali drilled seven holes on the E-Zone totalling 1,272 m, with the goal of validating historic data and collecting material for metallurgical test work. Results generally confirmed the historic model in terms of both grade and thickness.

REGIONAL LAND PACKAGE

In addition to the aforementioned projects, Trevali is actively carrying out exploration on its greenfields exploration properties which include Pringle Brook, California Lake, Restigouche South, Heath Steele East, and Mount Fronsac North.

NORTHERN BMC

As a part of Trevali's overall regional exploration strategy, Trevali is actively seeking opportunities to increase its foothold in the BMC, with a particular emphasis on the northern part of the camp, which is largely believed to be under-explored compared to the southern region.

2018 PLANNED EXPLORATION

In 2018, a $4.0 million exploration program is proposed for various projects in New Brunswick. Exploration work will include:

- Caribou: Underground resource definition and exploration drilling campaign of approximately 20,000 m. Primary goal will be to add Inferred and Indicated Mineral Resource tonnes below the east limb and hinge zone (Figure 9-4).
- Caribou: Surface exploration including approximately 1,500 m of drilling along with mapping and sampling.
- Restigouche: Surface resource definition, exploration, and geotechnical drill program of approximately 5,000 m.
- Heath Steele: Approximately 2,000 m of drilling at Heath Steele to test initial exploration targets.
- Murray Brook: Exploration drilling and geophysics on the Murray Brook and Murray Brook East properties as part of the newly formed Exploration Alliance with Puma.

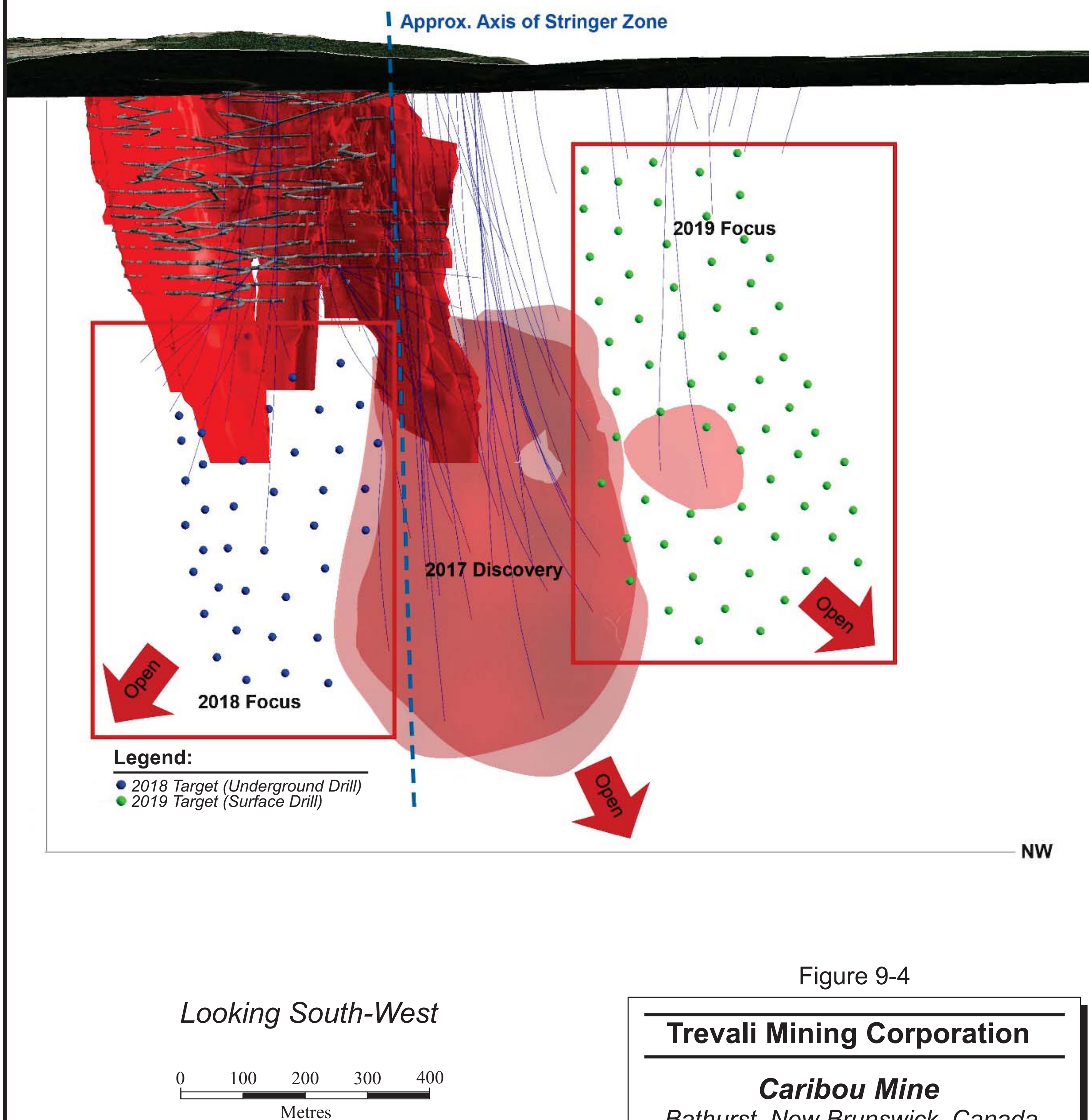


Figure 9-4

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Caribou 2018 Planned Exploration Drill Targeting

May 2018

Source: Trevali, 2018.

10 DRILLING

INTRODUCTION

The Caribou drill hole database (Table 10-1) contains 2,158 holes, totalling 135,426 m, of surface and underground diamond core drilling (DDH) and an additional 4,081 m of underground chip and muck samples interpreted as pseudo drill holes. Figure 10-1 presents a schematic plan view of the Caribou deposit illustrating drill traces. The location of the Caribou syncline is evident from the drill hole collar locations.

TABLE 10-1 DRILL HOLE DATABASE AS OF DECEMBER 31, 2017
Trevali Mining Corporation – Caribou Mine

Code	Type	No. of Holes	Metres
Caribou B	DDH	1,251	92,671.30
Exploration	DDH	82	42,754.75
Traverse A	Chip & Muck Samples	555	2,669.21
Traverse B	Chip & Muck Samples	270	1,411.64
	Total	**2,158**	**139,506.90**

Notes:

1. Traverse chip samples plotted as pseudo drill holes.
2. Traverse A are pre-Trevali chip samples.
3. Traverse B are chip samples collected by Trevali.

UNDERGROUND DEFINITION DRILLING

Approximately 65% of targeted mineralization is in the Measured and Indicated Mineral Resource categories, and will require less definition drilling, however, a detailed diamond drilling plan for 2018 has been prepared. On average, diamond drilling programs have been planned for approximately 14,000 m of drilling per year, with variable costs per metre. The average cost of underground definition diamond drilling over the past three years was approximately $74/m.

In-mine underground definition drilling is BQ core size (36.4 mm diameter), with hole lengths from 15 m to 150 m, and generally based on the following drill pattern:

- Measured: 20 m by 20 m hole spacings.
- Indicated: 50 m by 50 m hole spacings.

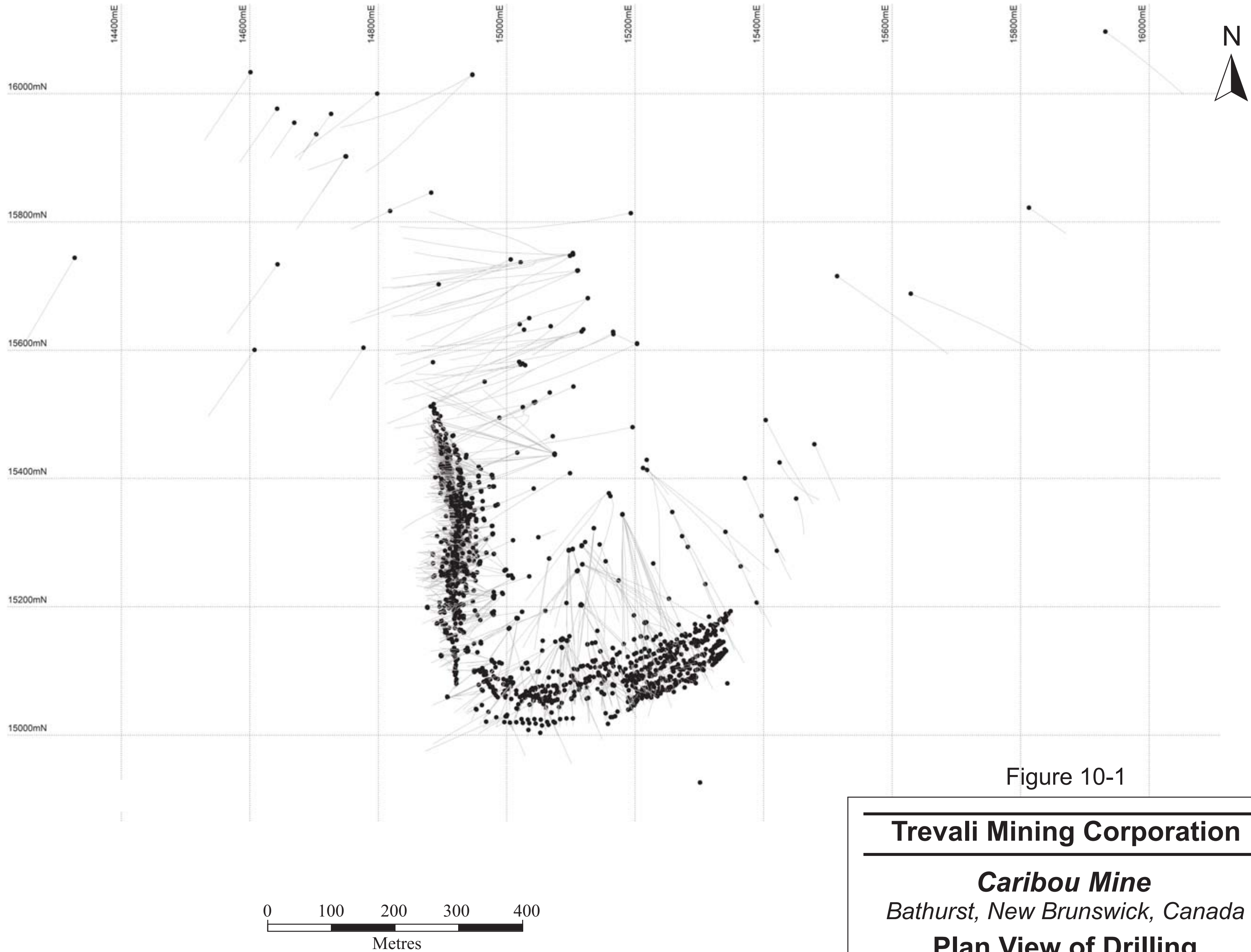


Figure 10-1

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Plan View of Drilling on the Caribou Property

May 2018

Source: Trevali, 2018.

SURFACE AND UNDERGROUND EXPLORATION DRILLING

Exploration drilling in 2017 targeted the lower parts of the mine in order to upgrade Inferred Mineral Resources to Indicated, and/or define new Inferred Mineral Resources. Exploration holes are drilled NQ size (47.6 mm diameter). Hole lengths are generally in the order of 600 m to 900 m from surface with drill spacings of up to 80 m for Inferred classification. Exploration drilling protocols are listed in the document Trevali_SOP_Ver3.1_2017 (Trevali, 2017).

SURVEY GRIDS

Caribou utilizes a mine grid with a -2° rotation compared with UTM coordinates. The local magnetic declination is -17.8° grid correction.

DRILL PLANNING AND SITE PREPARATION

UNDERGROUND

Diamond drill holes are currently planned in Flairbase Inc.'s Amine software (Amine) with transition to Leapfrog and Deswik by mid-2018.

Prior to issuance of the Drill Layout, a geologist visits the proposed drill site and fills out a Pre-Drilling Site Visit form.

The drill layouts include plan (upper and lower horizon) and section views as well as a Safety Information sheet outlining procedures for potential safety items (e.g., water ingress, gas intersections). Drill layouts include considerations for drift or other infrastructure intersections.

The drill layouts are signed off by the Geotech, Mine Captain/General Foreman, Mine Engineer, Mine Surveyor, and Senior Geologist.

SURFACE

All planned drill hole locations must be surveyed by a geologist designated by the site geologist or surveyor and should be clearly marked with the drill hole ID, UTM northing, UTM easting, elevation, dip, and azimuth. Following correctly identifying the site, site clearing, if necessary, will be carried out by a third party. Site clearing will maintain government regulations and adhere to standard industry practices.

Prior to any drilling activity and post-drill site clearing, a mandatory drill site check list including a photo is to be completed by either a geologist or by one of the geological support staff. Prior to commencement of drilling, a geologist will ensure that the hole orientation matches the planned orientation using either a compass or a differential global positioning system (DGPS).

COLLAR SURVEYS

UNDERGROUND

Mine surveyors lay out drill hole foresight and backsight prior to drilling. If a hole is expected to intersect underground development, then the collar elevation is specified. For longer holes with more defined targets the mine surveyors are also used to line up the rig using their survey instrument.

Upon completion of drilling, the collars are surveyed for location and a collar apparatus is utilized to confirm the collar azimuth and dip.

SURFACE

The collar locations of drill holes are spotted and surveyed by DGPS using the UTM Zone 19N NAD83 reference datum. Drill hole names are typically project-specific with the first two to three letters corresponding to the project followed by a three or four digit number in sequence. The hole number is sequential for the entire specific project and the sequence does not vary. Some projects include a two digit year after the project code.

DOWNHOLE SURVEYING

UNDERGROUND

A Reflex digital multi-shot instrument is rented and operated by the drilling company. Testing intervals are dependent upon the length of hole: less than 100 m length holes are tested at end of hole and every 9 m uphole, and greater than 100 m hole lengths are tested during drilling (on 25 m, 50 m, or 100 m intervals), followed by an uphole full multi-shot measurement every 9 m (i.e., length of a rod). The drillers have been trained to review data quality prior to moving off of the collar.

The digital survey data is delivered to the Geology department which checks for dog leg severity and magnetic field strength to ensure that the data being collected is suitable. Once the collar is validated, the downhole data is either revised or ignored based on geological confidence. Notes are provided in the survey table to give reasons for poor data not being used.

Total correction for magnetic declination from true north for downhole testing is -17.8° in azimuth. An additional -2° correction is applied to correct for the difference between mine grid and UTM grid

SURFACE

Initial alignment of the drill hole is determined by taking the first azimuth/dip survey reading 10 m past the end-depth of casing with a second reading taken at 20 m past end-depth of casing. If the azimuth or dip is off by more than ±2°, the drillers are required to make necessary adjustments to correct the orientation, which may include pulling the casing and realigning the drill. The trajectory of all drill holes is determined during drilling with a Reflex instrument in single point mode, which measures the dip and azimuth at 30 m intervals. This frequency may be increased as required. After completion, all holes at the Caribou mine are surveyed via Reflex instrument in multi-shot mode which measures the dip and azimuth downhole at 3 m intervals. The downhole surveys are completed by the drilling crews.

Upon completion, all holes within the property are cemented to at least 20 m unless otherwise determined by the site geologist. Reasons for not immediately cementing a hole include, but are not limited to, future hole extensions, downhole geophysical surveys, etc.

The metal casing is left in the ground with no less than 40 cm of this casing protruding above ground to form the collar. Drill holes in solid rock have at least 2 m of metal casing left in the hole. Holes completed in unstable ground have enough casing left in to ensure that at least 2 m of casing is anchored into solid bedrock. A metal casing cap with a metal flag displaying the drill hole number is attached.

CORE HANDLING

At each drill site, core is removed from the core tube by the drill contractors, cleaned, and placed directly into four row BQ wooden core boxes or three row NQ wooden core boxes. The wooden boxes are wrapped with reusable tire tubes and placed on pallets. The hole number and interval length are marked on the core box. The boxes are delivered to the surface core shed at the end of each shift. The core boxes are sorted in numerical order and then laid out on the logging bench and the tags and depth markers are checked to ensure that everything is in the proper order. The core is then carefully reconstructed, washed, geotechnically logged for lithologies, alteration, structures, and mineralization, photographed (wet and dry), and marked for sampling.

Core recovery is generally very good, allowing for representative samples to be taken and accurate analyses to be performed. Average core recovery of all new drilling carried out by Trevali is 97% with higher recovery in mineralized sections which are harder with high compressive strengths compared to hanging wall (HW) and footwall (FW) units.

GEOTECHNICAL LOGGING

MINE DRILLING

The core technician measures the distances and determines the recovery for every 3 m run. Structural measurements, including core angles and faults, are marked on the core in white marker.

The only geotechnical logging for mine core is rock quality designation (RQD).

EXPLORATION DRILLING

Trevali exploration drilling protocols require that prior to geologic logging, the geologist or technician log the core geotechnically on a run by run basis including the number of naturally occurring fractures, magnetic susceptibility, total core recovery (TCR), and RQD, using a yellow china marker to easily analyze each run of core and to differentiate between a natural joint and a mechanical joint. Cemented joints are veins that cut all the way through the core and have a width greater than one millimetre. Intervals such as Broken Zone (BZ) and/or Fault (BFLT) need to be measured and logged as a separate geotechnical structure. The rule to be followed is that there are five natural joints within every 10 cm of BZ or BFLT.

Detailed geotechnical logging begins 50 m above the mineralized zone and ends 30 m below the mineralized zone. All boreholes extend 30 m into the footwall in order to assess potential ground conditions for mining services. When applicable, oriented holes are used to maximize geological and geotechnical information. Detailed oriented core logging is performed starting at 20 m above the mineralized zone and extending to 30 m below the mineralized zone.

GEOLOGICAL LOGGING

Logging and sampling information is entered by pen tablet directly into Flairbase Inc.'s Corelog software SQL database.

The geologist begins logging by marking up the sample contacts. The Corelog software then generates the Sample Number which is also written on the core using a red marker. Waste intersections greater than 6.0 m in width are not sampled. Shoulder samples on the HW and FW contacts generally consist of one 1.5 m sample for visually barren material or six 1.5 m samples for disseminated mineralization (typically stockwork/stringer mineralization in the FW).

The core is then photographed dry and wet using a photo rack along with a board listing the hole information.

The Corelog SQL drill hole database is updated routinely with the recent geology and geotechnical information captured during the core logging process. The database is updated as soon as new analytical results are available from the laboratory. Drill hole Reflex survey tests and surveyed drill hole coordinates are entered in the database.

HISTORICAL SAMPLING

For diamond drill holes, the sampling was typically carried out in lengths varying from 0.3 m to 1.5 m, with the bulk of the samples being less than 1.0 m long. While some of the earlier boreholes were sampled with a core splitter, most of the drill cores were sampled with a saw. The remaining cores were stored in core racks inside the core shack on the Caribou property and remained in good condition for further examination. Most of the surface drilling utilized N-sized core. Earlier underground diamond drilling was typically AX-sized, though some BX-sized core drilling was also completed. Underground drilling completed since 1987 by previous operators is BQ core size.

Previous operators at Caribou carried out extensive underground chip sampling of faces in drifts and stopes, however, no documentation on the sampling methodologies is available.

CURRENT DIAMOND CORE SAMPLING

Trevali's underground drilling utilizes BQ size core. From 2015 to March 2017, whole samples 0.3 m to 2.0 m long were collected within the sulphide mineralization, respecting visual grade and lithology contacts. Since June 2017, the BQ mine core has been split by diamond saw. Exploration drilling utilizes NQ size core.

The core boxes for sampling are transported to the cutting shack (a converted sea container). The push type diamond saw utilizes fresh water for cutting, with the effluent sent to the WTP.

On-site sample preparation consists of core splitting by geological technicians under the supervision of geologists. The core is split using a diamond saw with an attached rail guide to ensure that core halves are equal. Current practice is that the top half (which is where all data is written) of the core is retained and the lower half is sampled. This serves the purpose of allowing the sampler, geologist, and any other interested party to check that no sampling bias was introduced by preferential selection of mineralized features. If a field duplicate sample is taken, the portion of core to be sampled would be cut in half again so that a quarter of the core goes into each sample bag and the remaining half of the core is returned to the core box.

All samples taken should honour lithological contacts, i.e., sample intervals should always be stopped and/or started at a lithological contact and never overlap the contacts, except in the case of narrow mineralization. Marginally mineralized intervals can be sampled at the discretion of the logging geologist.

Waste intersections greater than 6 m in width are not sampled. Shoulder samples on the HW and FW contacts consist generally of one 1.5 m sample for visually barren material or six 1.5 m samples for disseminated mineralization (typically stockwork/stringer mineralization in the footwall).

Upon the cutting of any high-grade samples, as deemed by the logging geologist, the cutter runs the blade once through the provided silica sharpening stone which will eliminate any potential cross-contamination from high-grade samples to the subsequent samples.

BULK DENSITY

Trevali initiated bulk density testing on all drill core recovered in 2015. Historical bulk density values in the drill hole database are assigned values. The cores are measured using the Archimedean principles of measuring the sample in air and suspended in water. The 2016 results indicated that the massive sulphides are denser than previously thought, ranging from 4.5 t/m^3 to 4.6 t/m^3. Anecdotal supporting evidence was also provided by 2016 underground truck weightometer readings.

Before shipping, each sample is weighed by the core handler, and only core that is large enough not to be washed away during the water measurement is used in the analysis.

Four measurements are taken to determine the specific gravity of a sample and recorded in the following order:

1. b_{air} = Weight of Tray in air (kg).
2. Sb_{air} = Weight of Sample and Tray in air (kg).
3. Sb_{water} = Weight of Sample and Tray in water (kg).
4. b_{water} = Weight of Tray in water (kg).

$$\frac{(Sb_{air} - b_{air})}{(Sb_{air} - b_{air}) - (Sb_{water} - b_{water})} = \textbf{Specific Gravity}$$

Prior to measuring specific gravity, calibration measurements are conducted at the beginning of each measurement batch. Additional calibration tests can be performed at the discretion of the technician. Calibration is performed using the calibration standard which is a solid metal bar 4.5 cm in diameter and 30 cm long, weighs 3.820 kg, and has a specific gravity of 7.662.

Trevali has conducted a total of 8,197 specific gravity tests. The Caribou Senior Geologist reviews and validates the results via the Core Shed Sample Inventory spreadsheet.

SAMPLE PACKAGING AND SHIPPING

Trevali sampling protocols indicate that sample shipments are the responsibility of the geologist. If the physical bundling/packaging of the samples and insertion of quality assurance and quality control (QA/QC) samples are undertaken by someone else, the geologist must ensure that that person has an updated sample list and is adequately trained to ensure the task is completed properly.

All samples sent to the laboratory at the same time will share a common Batch Number. The Batch Number consists of the three letter project code, the four digit year, and the three digit shipment number. All shipment data is entered into a sample tracking spreadsheet to keep track of batches shipped and received. The following data is routinely recorded:

- Date dispatched.
- Batch number.
- Sample numbers in batch.
- Weight of rock samples.
- Date samples were received by the laboratory.
- Date results were received from the laboratory.

Digital requisitions are completed for each batch. A printout of the requisition goes in the first bag of the shipment, a second printout is filed, and a digital copy is emailed to the laboratory and database manager upon shipping.

Drill core samples are bagged and tags are placed into the bag. The bag is stapled, the tag number is written on it, and the bag is delivered to the sample preparation room located in the on-site assay laboratory, where crushing, pulverization, and analysis take place. Remaining core is stored and the remaining waste rock intervals are disposed of, apart from several holes retained for geotechnical analysis. All rejects are returned to the core shack, and pulps retained at the assay laboratory.

The remaining core is stored at site. A representative section of the HW stratigraphy, all the half core samples, and generally all the FW core (as this is generally where the bad ground is) are retained.

CHIP SAMPLING

Chip sampling of development headings is carried out to assist with the planning of development, especially in areas of low diamond drill density, or areas where mineralization transitions to lower grade material. The face is marked up to indicate the visual lithological and grade contact information, measured, and sampled from left to right across the development face at approximately 1.3 m above the drift floor.

The chips are delivered to the mine assay laboratory. Once the data is received, the assay results are compiled into a traverse so that the data can be represented as a channel sample (pseudo diamond drill hole). The chips are also assigned a lithology code so that they can be utilized for geological modelling. The chip sampling data is used to make production decisions to control development in areas where the massive sulphides have dropped below mineable width or grade.

RPA notes that the chip sampling data is used to guide wireframe construction, however, it is not used for grade interpolation for Mineral Resource estimation.

THIN SECTION SAMPLING

Trevali protocols state that samples of drill core to be used for thin section are to be taken using the following procedure:

1. Cut drill core into quarters.
2. Use one quarter core for the section billet and mark very clearly with permanent marker where the laboratory is to cut the billet and which face is intended to be sectioned.
3. Thin section samples to be named as follows: Drill hole ID – Depth, e.g., BR-1001-94.5. If more than one section is to be cut from the same billet/depth, then a sequential letter is added to the end of each sample name, e.g., BR-1001-94.5a.
4. Prior to sending samples to be thin sectioned, each sample is described in detail and is accompanied with the description of the sample and a photograph.

DISCUSSION

In RPA's opinion, the drilling procedures employed by Trevali conform to industry best practice and the resultant drilling pattern is sufficient to interpret the geometry and boundaries of the mineralization. All drilling sampling was conducted under the direct supervision of appropriately qualified geologists. There are no drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results.

RPA does, however, recommend that Caribou formally document Standard Operating Procedures (SOPs) for all geological procedures including drill layout and core/sampling logging and QA/QC procedures.

RPA also recommends that whole core sampling for mine definition BQ core is reinstated. The recent introduction of splitting the BQ sized core does allow for a representative sample when compared against the split exploration NQ sized core. In RPA's opinion, short holes less than 100 m in length should be whole core sampled and holes greater than 100 m in length should be whole core sampled or drilled NQ size.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

HISTORICAL SAMPLE PREPARATION AND ANALYSIS

No information is available on the sample preparation for the historical data collected by previous owners of the property. Some descriptions of sample preparation, analyses, and security are available in historical reports (Luff, 1998; Gow, 1999; SRK, 2015). Prior to 1987, sample preparation and analysis was generally completed at a contract laboratory located in Bathurst, with assay checks completed at Lakefield Research and at an in-house Anaconda laboratory located in Butte, Montana. After 1987, assays were completed on site, with check assays being carried out in Bathurst, by either a commercial laboratory or by Noranda.

CURRENT SAMPLE PREPARATION PROCEDURES

Since start-up, Trevali has used the existing uncertified onsite Caribou mine laboratory (CML) for all its analytical services, except gold analysis, which has been completed by offsite laboratories for mine drilling samples, and Bureau Veritas Mineral Laboratories in Vancouver, B.C. (BVML) for exploration drilling samples and mine check samples. BVML (previously known as AcmeLabs) is ISO 9001:2008 accredited, as well as the Standards Council of Canada Accredited Laboratory No. 720, and conforms to requirements of CAN-P-1579 , CAN-P-4E (ISO/IEC 17025:2005).

RPA notes that high grade mill samples and underground chip samples are also prepared and assayed in the CML facility. CML has protocols in place to ensure that no contamination occurs between the core/chip samples and the mill samples. The protocols include preparing the samples at different times of the day, as well as using separate pans and utensils. The mill samples are prepared in the morning, followed by underground chip samples and then the diamond drill core samples. CML protocols are listed in the SOP entitled Sample Preparation for Geological Samples & Mill Products (Trevali, 2014).

CARIBOU MINE LABORATORY DIAMOND DRILL CORE SAMPLES

The drill core samples are hand delivered from the cutting shack to the sample preparation room in the CML by a geological technician (Figure 11-1).

Figure 11-1

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Caribou Property Mine Laboratory Sample Preparation Room

Source: Trevali, 2018.

To reduce the risk of sample contamination and provide a healthier work environment, the sample room is equipped with dust control systems in which crushing and grinding equipment is virtually completely enclosed. One CML technician is assigned to the sample preparation and the housekeeping.

Drill core sampling procedures include the following:

- The plastic sample bags containing the core samples are laid out to verify sample identification.

- Samples are transferred into a drying pan and placed in a drying oven at a consistent temperature of approximately 65°C (150°F) for a period of two hours (dependent on the moisture content of the sample).

- Crushing:
  - Between 2 kg and 10 kg of sample is poured from the pan into the crusher hopper, and the crusher is run until the entire sample is crushed.
  - The crushed sample is poured out of the crusher pan.
  - Both compressed air and a vinyl brush are used to clean the crusher pan.
  - Both compressed air and wire brush are used to clean the crusher jaws.

- Splitting:
  - The sample is moved to the splitting area where a riffle splitter is utilized to reduce or split a representative sample from 2 kg to 100 g.
  - The 100 g sample is placed into a small paper "envelope" bag marked with the appropriate sample number.
  - The paper bags are then left opened in the oven and covered with pan to avoid dust contamination for at least two hours.
  - The remaining approximately 1.9 kg of crushed material is placed back into the original sample bag.

- Pulverizing:
  - The sample is removed from the drying oven and placed on the sample preparation table.
  - A dried sample is uniformly tipped in a grinding bowl.
  - The grinding bowl is covered and placed into the pulverizer. The grinding bowl is tightened, and the pulverizer cover is closed. The pulverizer is run for approximately 105 s (grinding times may vary depending on the type of rock).
  - The grinding bowl is removed and taken to the pulverized sample portion of the table preparation.
  - The sample is rolled about 30 to 40 times on new Kraft paper.
  - Approximately 50 g to 100 g of pulverized sample is transferred into a numbered sample envelope. The remainder of the sample is placed in the original sample bag with the used sample.
  - The numbered sample envelope is placed into a covered container; to be later taken as a batch into the analytical room for analysis.
  - The grinding bowl is cleaned with a rag. To minimize contamination during sequential sample preparation, the pulverizer is cleaned with a high-pressure air hose after each sample.

- To minimize contamination between each sample, silica sand is added into the grinding bowl and pulverized for approximately 30 seconds.

CARIBOU MINE LABORATORY MILL SAMPLES

At midnight, a total of 13 mill run samples equal to approximately one kilogram are taken from the mill on stream analyzer filtration unit and hand delivered to the sample room by a mill technician. Each sample is identified with a stream number and recorded in a logbook.

Samples are transferred into a drying pan and placed in a drying oven at a consistent 65°C (150°F) from two to seven hours depending on the moisture content of the sample. The samples are screened through a sieve of 45 mesh, and then are transferred to previously labelled pulp bag and sent for analysis. During the crushing and pulverizing of the samples, a strict procedure is followed including cleaning of crushing and pulverizing equipment with brushes, compressed air, and silica sand.

BUREAU VERITAS MINERAL LABORATORIES SAMPLE PREPARATION PROCEDURES

As per BVML protocol PRP70-250, received core samples are entered into the Laboratory Information Management System (LIMS), weighed, dried then crushed to ensure that greater than 70% pass a 2 mm sieve. A wash with barren material is conducted during the crushing stage to prevent/reduce carryover from one sample to another.

A 250 g split of the crushed material is then pulverized to greater than 85% passing a 75 µm sieve. Additional splits of the pulp or reject may be taken to prepare internal QC preparation duplicates.

Samples requiring pulverizing only (PUL85) are dried at 60°C and pulverized to 85% passing 200 mesh (75 µm), using a mild-steel pulverizer.

During the pulverizing process, there is an additional wash with silica sand between samples in order to prevent/reduce carryover from one sample to the other. The pulps are then labelled, sorted, and boxed. Rejects are returned to the Caribou mine.

At random intervals and at the start of each shift, QC testing is completed on both crushed and pulverized material to ensure that the above specifications are met.

CURRENT ANALYTICAL PROCEDURES

CARIBOU MINE LABORATORY

The diamond drill and mill product samples are assayed for the following elements: Pb, Zn, Cu, Ag, and Fe. The analytical procedures are standard in sulphide minerals.

Procedures for sample digestion includes:

- Transfer a portion of 0.2 g of sample, accurately weighed, to 200 mL Volumetric Flasks. Weigh 0.2 g of CDN-FCM-2 Certified Reference Materials for the QA/QC protocol.
- Add 20 mL of hydrochloric acid directly into the 200 mL Volumetric Flask and boil for three minutes.
- Add 20 mL of nitric acid and boil for three minutes.
- Add 25 mL of hydrochloric acid and boil for approximately 10 to 15 minutes.
- Cool for approximately 20 minutes.
- Fill with distilled water and mix well with caps on the Volumetric Flask.
- Transfer to a new single use test tube.

All the samples are analyzed for Pb, Zn, Cu, and Ag by flame atomic absorption spectroscopy (FAAS), and Fe by titrimetric method. For those samples that exceed the upper calibration limits, the titrimetric method is used, as outlined below. These ISO procedures are recognized and standard in base metal industries:

- Pb >10%, Pb determined by EDTA titration (ISO Method 11441);
- Zn >10%, Zn determined by EDTA titration (ISO Method TC 183N 489E); and
- Cu >10%, Cu determined by short iodide titration (ISO Method 1025).

BUREAU VERITAS MINERAL LABORATORIES ANALYTICAL PROCEDURES

LOW GRADE GEOCHEMICAL FOUR ACID DIGESTION (MA300)

Lower grade samples are assayed by geochemical four acid digestion (MA300). Procedures include:

- The prepared sample is digested to complete dryness with an acid solution of (2:2:1:1) H_2O-HF- $HClO_4$-HNO_3.
- 50% HCl is added to the residue and heated using a mixing hot block.
- After cooling, the solutions are transferred to test-tubes and brought to volume using dilute HCl.
- Sample splits of 0.25 g are analyzed.

Table 11-1 presents the detection limits for MA300.

TABLE 11-1 DETECTION LIMITS FOR BVML PROCEDURE MA300
Trevali Mining Corporation – Caribou Mine

Element	Unit	Lower Limit	Upper Limit
Ag	ppm	0.5	200
Al	%	0.01	20
As	ppm	5	10,000
Ba	ppm	1	10,000
Be	ppm	1	1,000
Bi	ppm	5	4,000
Ca	%	0.01	40
Cd	ppm	0.4	4,000
Co	ppm	2	4,000
Cr	ppm	2	10,000
Cu	ppm	2	10,000
Fe	%	0.01	60
K	%	0.01	10
La	ppm	2	2,000
Mg	%	0.01	30
Mn	ppm	5	10,000
Mo	ppm	2	4,000
Na	%	0.01	10
Nb	ppm	2	2,000
Ni	ppm	2	10,000
P	%	0.002	5
Pb	ppm	5	10,000
S	%	0.1	10
Sb	ppm	5	4,000
Sc	ppm	1	200
Sn	ppm	2	2,000
Sr	ppm	2	10,000
Th	ppm	2	4,000
Ti	%	0.1	10
U	ppm	20	4,000
V	ppm	2	10,000
W	ppm	4	200
Y	ppm	2	2,000
Zn	ppm	2	10,000
Zr	ppm	2	2,000

ORE GRADE MULTI ACID DIGESTION (MA370)

Procedures for ore grade sample multi acid digestion (MA370) include:

- A 0.5 g sample split is digested to complete dryness acid solution of H_2O-HF-$HClO_4$-HNO_3.
- 50% HCl is added to the residue and heated using a mixing hot block.
- After cooling, the solutions are made up to volume with dilute HCl in class A volumetric flasks.
- Samples are run by ICP-ES to determine analyte concentrations.

Table 11-2 presents the detection limits for MA370.

TABLE 11-2 DETECTION LIMITS FOR BVML PROCEDURE MA370
Trevali Mining Corporation – Caribou Mine

Element	Unit	Lower Limit	Upper Limit
Ag	g/t	2	1,500
Cu	%	0.001	10
Pb	%	0.02	10
Zn	%	0.01	40

AQUA REGIA DIGESTION (AR404)

The moderate to high grade samples are assayed by aqua regia digestion (0.5 g per 200 mL) with atomic absorption spectroscopy (AA) analysis (AR404).

A prepared sample is digested with standard 3:1 aqua regia solution. Solutions are brought to a final volume with hydrochloric acid and distilled water. Sample splits of 0.5 g are analyzed.

Table 11-3 presents the detection limits for AR404.

TABLE 11-3 DETECTION LIMITS FOR BVML PROCEDURE AR404
Trevali Mining Corporation – Caribou Mine

Element	Unit	Lower Limit	Upper Limit
Ag	ppm	2	1,000
Cu	%	0.001	10
Zn	%	0.01	10
Pb	%	0.01	10

PRECIOUS METAL BY LEAD COLLECTION FIRE ASSAY (FA330 AND FA530)

Procedures for precious metal by lead collection fire assay analysis includes:

- 30 g of prepared sample is custom-blended with fire-assay fluxes, PbO litharge, and a silver inquart.
- Firing the charge at 1,050ºC liberates Ag, Au, and platinum group elements (PGE) that report to the molten Pb-metal phase.
- After cooling the Pb button is recovered, placed in a cupel, and fired at 950ºC to render a Ag, Au, and PGEs doré bead.
- The bead is then either digested with nitric and hydrochloric acids for instrumentation determination or weighed and parted with nitric acid to dissolve Ag leaving Au which is weighed directly (FA330-Au).
- Ag is determined by difference of the bead from the Au in gravimetric analysis (F530).

Table 11-4 presents the detection limits for FA330 and FS530.

TABLE 11-4 DETECTION LIMITS FOR BVML PROCEDURES FA330 AND FA530
Trevali Mining Corporation – Caribou Mine

Method Code	Element	Lower Limit	Upper Limit
FA330-ICP-ES	Au	2 ppb	10 ppm
FA530-Gravimetric	Au	0.9 ppm	

QUALITY ASSURANCE AND QUALITY CONTROL PROGRAMS

QA/QC programs validate the accuracy of analytical results and are essential for reliable estimates of Mineral Resources. There are no historical QA/QC data in the Caribou database, however, it is evident from historical records that QA/QC samples were collected in the past, and that protocols for collecting such samples were in place.

The discussion below is based upon the 2017 Caribou Mine and Exploration QA/QC Report (Trevali, 2017). Trevali's QA/QC program includes:

- Blank samples – Screen cross-contamination between samples during preparation and analyses
- Certified reference materials (CRM) – Determination of accuracy
- Duplicate samples – Determination of precision/repeatability

Insertion of blanks, standards, and duplicates has been a standard procedure for underground definition drilling at Caribou since only June 2017 but has been in place for surface exploration since the beginning of Trevali's programs. The geologist decides when to insert blanks, duplicates, and standards at a regular interval. The Corelog program automatically creates the entry into the Corelog database and generates the necessary sample tag to match the blank/CRM/duplicate insertion locations.

Results from the QA/QC samples are continually tracked by Trevali geologists as certificates for each sample batch are received. If QA/QC samples of a sample batch pass within acceptable limits, the results of the sample batch are imported into the master database.

The Caribou mine drilling has included blind quality control samples in the sample batches submitted to the CML. Of the 2,306 samples (CBU-409 to CBU-553) submitted, there are a total of 251 quality control samples including 87 blank samples, 89 standard samples, and 74 field duplicate samples.

As a check for the CML, 335 check pulps covering all Trevali Mining CBU Series drilling (CBU-006 to CBU 548) were submitted to the BMVL in early 2018, along with additional 16 standards and 15 pulp blanks.

Exploration "BR" Series drill holes from 2014 to 2017 totalled 1,179 assays in 19 batches from 68 Exploration BR Series drill holes that were submitted to the BVML Timmins preparation laboratory with analysis at the Vancouver laboratory. In addition to the regular 1,030 samples, 149 quality control samples were submitted, including 34 blank samples; 63 standard samples; and 52 field duplicate samples.

LABORATORY QA/QC

CARIBOU MINE LABORATORY

An overview of the QA/QC procedures being followed at the CML is provided below.

- Before a sample can be analyzed and an accurate result obtained, the instrument is prepared for analysis. This includes inspecting daily and cleaning the combustion system O-ring, performing a system leak check, selecting or creating a method, performing a blank calibration and performing a standard calibration. Certified reference material CDN FCM-2 from CDN Resource Laboratories is run with each batch of samples. Other CRMs used include CPB-1, KC-1A, MP-1B, and CDN-ME14.

- Before each batch of 24 samples, the AA unit is calibrated. All calibration results are graphed for quality assurance. One duplicate is included with each batch of 24 samples. During analysis, the operators will re-run any sample which falls outside the normal limits and/or metal ratios for the Caribou deposit.

- FAAS units are serviced every two years.

BUREAU VERITAS MINERAL LABORATORIES

BVML has an internal QA/QC system to review data for inconsistences. CRMs, duplicates, and blanks are inserted into randomly assigned positions within each rack as generated by BVML proprietary LIMS system so that they are analyzed with the Caribou solutions. The purpose is to provide a final verification of the entire sample handling process.

QC validation includes analyzing client samples to validate each run and confirm that each run has been performed correctly. BVML's QC samples are typically inserted immediately before and immediately after client samples.

The instrument is calibrated to establish the factors required to convert raw instrument data into concentration values.

BLANKS

The regular submission of blank material is used to assess contamination during sample preparation and to identify sample numbering errors. The Caribou blanks are generally inserted at a frequency of one in 40 samples. Blanks are generally inserted at the start of a batch as well as between mineralized samples or at the end of a mineralized intersection.

Trevali has selected a level of five times the background for a blank to be a failure. This is considered acceptable for a level of contamination for samples used for mineral resource estimates, where high-grade samples have the potential to contaminate subsequent samples during the preparation process. Trevali is considering using a failure level of five times the method detection limit for exploration sampling where anomalous samples are of principal interest.

RPA recommends that Trevali investigate the use of certified blank material, improve the cleaning protocols during the sample preparation, and ensure that all samples are processed in numerical order so that potential contamination issues can be investigated.

CARIBOU MINE LABORATORY

The uncertified Caribou mine blanks (BLNK_TV_MINE) are sourced from crushed -2 in. size Landscaping Marble obtained from Canadian Tire. The sample weight is approximately one kilogram. The blanks are generally inserted at a frequency of one in 20 samples and generally at the start of the hole. RPA recommends that blanks should be inserted after high grade intersections. The site geologist used smaller weight samples for the inserted blanks.

The results for Zn, Pb, and Cu were within three times of the lower detection limit; however, four Ag blanks were above the detection limit as shown in Figures 11-2 to 11-5.

FIGURE 11-2 BLANK: BLNK_TV_MINE ZN PPM

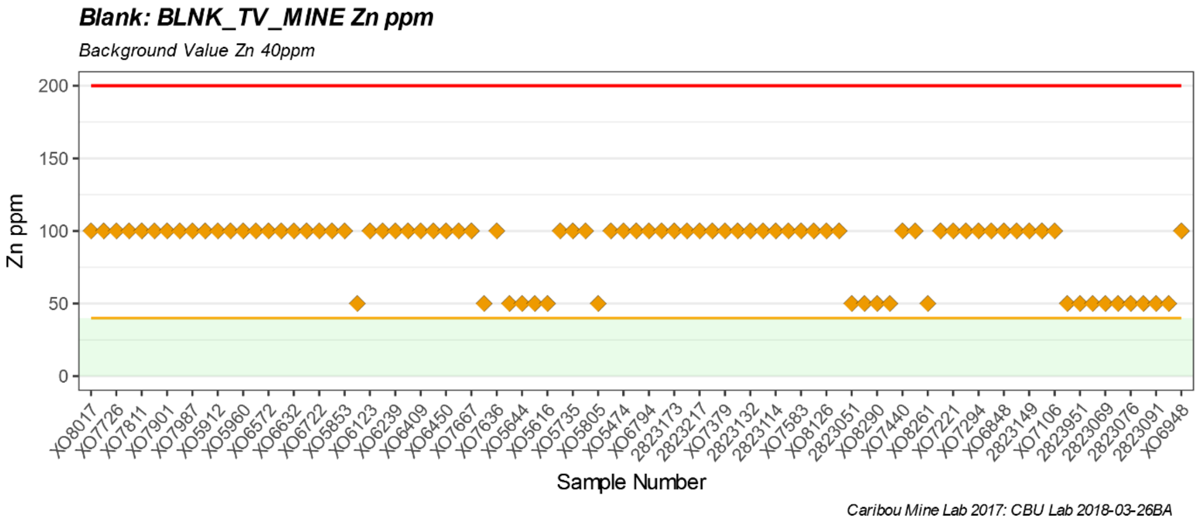


FIGURE 11-3 BLANK: BLNK_TV_MINE PB PPM

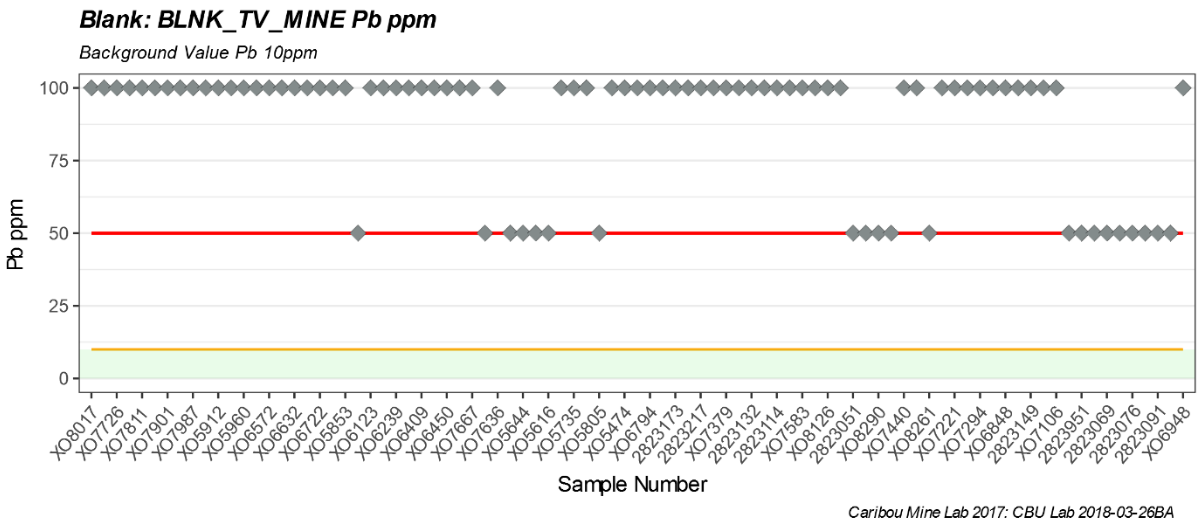


FIGURE 11-4 BLANK: BLNK_TV_MINE CU PPM

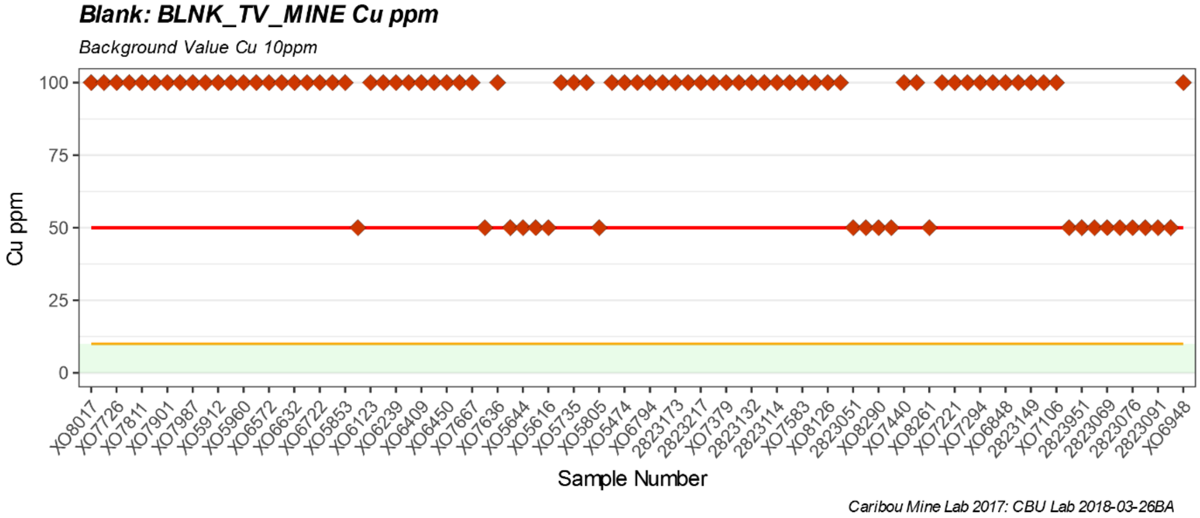
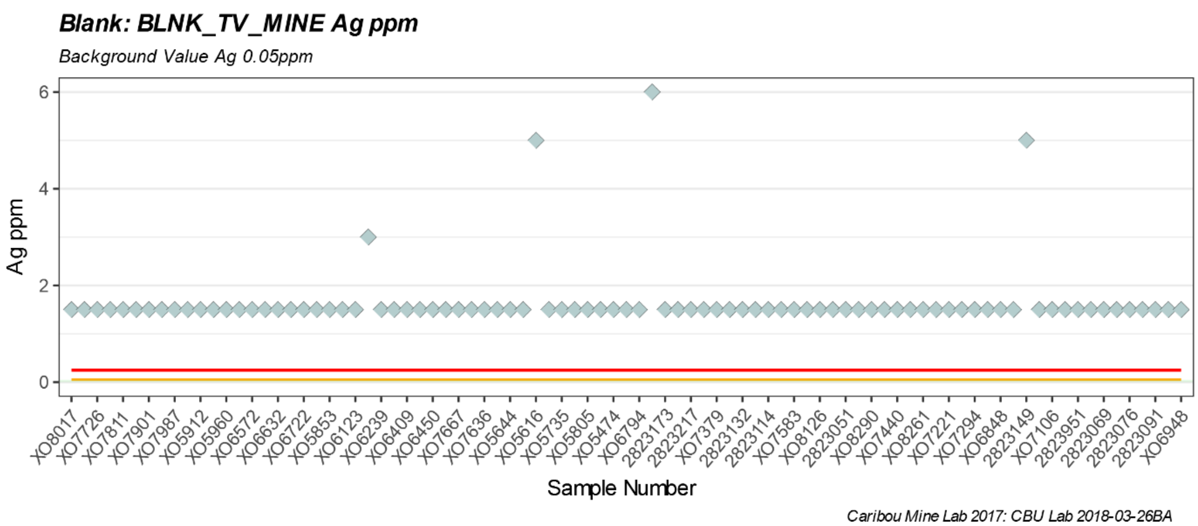


FIGURE 11-5 BLANK: BLNK_TV_MINE AG PPM



BUREAU VERITAS MINERAL LABORATORY

As part of the umpire study, Trevali submitted blanks from five different sources to the BVML to obtain uniform low background material. The results indicated that the material used by the site to date shows the best performance. It was determined that the Zn, Pb, and Ag sample failures were likely due to much smaller weight of the blanks than the weight of the preceding samples in the batch.

CERTIFIED REFERENCE MATERIALS (STANDARDS)

Results of the regular submission of CRMs are used to monitor analytical accuracy and to identify potential issues with specific batches. The Caribou standards are generally inserted at a frequency of one in 20 samples (sample numbers are pre-determined as 10, 30, 50, 70, 90). The type of standard (CRM) inserted must be at appropriate levels that the geologist determines will bracket the expected values to be encountered in the sample. Specific pass/fail criteria are determined from the standard deviation (SD) provided for each CRM. The conventional approach for setting standard acceptance limits is to use the mean assay ± two SD as a warning limit and ± three SD as a failure limit. Results falling outside of the ± three SD failure limit must be investigated to determine the source of the erratic result, either analytical or clerical. Caribou uses greater than two SD for failure criteria.

In 2018, Caribou will be utilizing Matrix Matched samples prepared by CDN Labs Vancouver collected by Caribou Geology from development rounds; one at cut-off grade, one low, one at average mine grade, and one high grade.

CARIBOU MINE LABORATORY

A total of 89 CRMs from Canadian Resource Labs (CRL) were used by the CML (Table 11-5). From the five samples considered as failure (greater than 3SD), two were the result of typing errors. The failed standards were re-run by the CML, and results replaced the previous samples in the database.

TABLE 11-5 SUMMARY OF CML CRM RESULTS
Trevali Mining Corporation – Caribou Mine

CRM	Expected Value	2 SD	2 2SD Failures	Single 3SD Failure
CDN-ME-1204 (13 samples)				
Zn (%)	2.36	0.12	0	0
Pb (%)	0.443	0.024	0	1
Cu (%)	0.519	0.022	0	0
Ag (g/t)	58	6	0	0
CDN-ME-1301 (17 samples)				
Zn (%)	0.797	0.038	3	1
Pb (%)	0.188	0.01	3	11
Cu (%)	0.299	0.016	7	2
Ag (g/t)	26.1	2.2	2	0
CDN-ME-1402 (39 samples)				
Zn (%)	15.23	2.48	0	0
Pb (%)	2.48	0.11	0	0
Cu (%)	2.9	0.16	0	0
Ag (g/t)	131	7	0	0

CRM	Expected Value	2 SD	2 2SD Failures	Single 3SD Failure
CDN-ME-17 (20 samples)				
Zn (%)	7.34	0.37	0	1
Pb (%)	0.676	0.054	0	0
Cu (%)	1.36	0.1	0	0
Ag (g/t)	38.2	3.3	0	0

BUREAU VERITAS MINERAL LABORATORIES – CERTIFIED REFERENCE MATERIAL

As the check for the CML, 63 CRM samples were submitted to BVML from seven CRMs obtained from CRL:

- CDN-ME-1204 – 10 samples,
- CDN-ME-1301 – 10 samples,
- CDN-ME-17– 10 samples,
- CDN-ME-1201 – 3 samples,
- CDN-ME-1306 – 3 samples,
- CDN-ME-14 – 1 sample, and,
- CDN-ME-1402 – 2 samples.

Multiple failures were noted in CRMs CDN-ME-1204 and CDN-ME-1301 which could be a result of BVML using the inductively coupled plasma (ICP) method to analyze the samples. The 2SD limits for these CRMs are very narrow and the ICP method may not have the required precision for analysis within these limits. Trevali has recommended that low-grade CRMs (<10,000 ppm) that do not trigger an over-limit AA assay result no longer be used.

BUREAU VERITAS MINERAL LABORATORIES – PULP CERTIFIED REFERENCE MATERIAL

Check pulp samples, representing approximately 5% of the submitted samples, as well as 16 CRMs, were submitted to BVML for check analysis. Standards included eight samples from CDN-ME-17, four samples from CDN-ME-1402, and four samples from CDN-ME-1204. The method used by BVML for the check samples was ore grade AR404, which is generally comparable to the CML AA; the difference is the weight of the sample (0.5 g BVML vs. 0.2 g CML).

CDN-ME-1204 has one failure for Cu and Au, and all four Zn results were sequential failures. CDN-ME-17 has two failures for Zn. The 2017 QA/QC report concludes that the CML CRM results are closer to the certified values than the BVML check pulp results, making the CML the more accurate of the two laboratories.

DUPLICATES

Duplicate samples are used to test for contamination in the laboratory and for overall consistency in performance. These duplicates can be made of the original sample material (termed field duplicates), the crushed reject material (reject), or the pulverized sample material (pulp). Each type of duplicate tests for inaccuracy at different stages in the sample preparation and assay procedure.

Field duplicates are inserted at a frequency of one in 20 samples (sample numbers are pre-determined as 01/02, 21/22, 41/42, etc.). Caribou field duplicates consist of quarter core of the previous sample in the sample stream. The duplicate can be based on any grade. Up until 2016, preparation duplicates were inserted at a frequency of one in 40 samples.

The logging geologist submits an empty bag with a ticket number to the preparation laboratory, indicating that a duplicate needs to be prepared from the previous sample. If quarter assay values are 10% to 15% above or below the duplicate sample, the sample is considered a failure. Upon failure of a crushed duplicate, the batch is re-run from coarse reject to eliminate any possible contamination or improper preparation work by the laboratory. Post 2016, the BVML internal coarse reject duplicate samples have been reviewed and monitored by Trevali.

CARIBOU MINE LABORATORY

The CML 74 field duplicate samples compare well to the original assay results with a few pairs varying by more than 10%.

BUREAU VERITAS MINERAL LABORATORIES

Out of 54 field duplicates analyzed in the BVML, the majority of the results were within 10%. In 2017, 367 check pulp samples, previously prepared and analyzed at the CML, were sent to the BVML for check analysis. The results are plotted in sorted quantile-quantile plots to compare the two laboratories over the grade range of the analysis and to easily visualize any differences. To ascertain which laboratory is more accurate, QC CRM standards were also included in the check samples. The method selected at the BVML was AR404 which is an AA method similar to that used at the CML.

The results for Pb, Cu, and Ag from the uncertified CML are very similar to the results from the certified BVML. For Zn, BVML systematically reported slightly lower results than the CML. This was also seen in the CRM standard results submitted to BVML for inclusion with the pulp checks. On reviewing the CRMs, the CML was determined to be more accurate and correct.

The Zn check results will be reviewed again for the next check samples analyzed by BVML with the AR404 method.

SECURITY

No information is currently available on security for the historical data collected by previous owners of the property.

The Caribou core shacks and core cutting building are locked when not in use.

After cutting and inclusion of QA/QC samples, the diamond drill core is hand delivered to the CML or couriered to BVML. Assay results are received electronically and inserted into the Drill Hole Database by a Senior Geologist.

All drilling and geological data is stored on the Caribou Mine Server. The drill hole database is backed up only once per week onto hard drives which are kept offsite. RPA recommends that the drill hole database be added to the normal Caribou server daily backup with offsite backup.

DISCUSSION

In RPA's opinion, the sample preparation, analysis, and security procedures at the Caribou mine are adequate for use in the estimation of Mineral Resources.

In RPA's opinion, the QA/QC program, as designed and implemented by Trevali, is adequate and the assay results within the database are suitable for use in a Mineral Resource estimate.

The CML appears to be well run with experienced personnel. One issue that Caribou experiences is the delay in receiving and reviewing QA/QC data. As most of the production drilling is just-in-time, by the time the Geology department reconciles a QA/QC issue the material has already been mined and processed.

The following recommendations are based on RPA's site visit and Trevali's 2017 QA/QC report:

- Compare sample weights recorded during bulk density testing against laboratory received weights to check for sample mix-ups. There would be a requirement for CML to implement sample weighing upon receipt of core samples.

- Review blank material source, preferably certified, as well as blank weight submitted.

- Do not use CRMs that do not require an over-limit assay (<10,000 ppm) for Mineral Resource grade samples, those in stock should be used for exploration anomalous samples.

- Implement double manual keyed data entry and validation of the handwritten CML assay results.

- Add the drill hole database to the normal Caribou server daily backup with offsite backup.

12 DATA VERIFICATION

RPA SITE VISIT

During the February 2018 site visit, RPA toured the underground operations to review geology and mineralization types in a number of exposures. RPA also observed the core logging, sampling, QA/QC, and database management procedures conducted by the Mine Geology and Exploration departments. Discussions were also held with the CML staff during a tour of the laboratory facility.

RPA reviewed the 2017 Leapfrog shells in both plan and section and compared these against the assay results, noting no material differences.

RPA is of the opinion that database verification procedures for the Caribou mine comply with industry standards and are adequate for the purposes of Mineral Resource estimation.

CARIBOU DATABASE VERIFICATION PROCEDURES

Since start-up, QA/QC programs have been in place at Caribou to ensure that drill core samples are logged and collected accurately. The Corelog software being used has built-in data verification that does not allow lithological or assay sample interval overlaps or total depth of hole errors. All of these items are flagged during the logging process, at which time the geologist must make a correction. The assay tags are printed directly from the software to a label printer, which avoids any human error. All cores are photographed with the sample intervals and assay tag number written on the core for any back analysis that may be required.

The core shed technician visually compares the tags that are printed with the sample number written on the core to ensure that there are no errors made in the collection of the material. Once the assay data is received from the laboratory, the data is digitally imported into the Corelog software. At no time is re-entry of sample numbers or intervals required.

DRILL HOLE DATABASE VALIDATION

HISTORICAL VALIDATION

Historical data has been verified several times in the past by various QPs that have been involved with the project, and nothing of concern has been reported (Luff, 1998; Gow, 1999; Peltier and Beausoleil, 2006).

2015

During the preparation of the 2015 PEA (SRK, 2015), SRK checked the digital database provided by Trevali against historical drill logs found at the mine site during the site visit. A total of 140 historical drill holes were checked for coordinate and downhole survey records. Several small, non-material rounding errors were noted in drill hole collar locations. Two drill holes, TH212-16 and UGX-07-02, were found to have their easting and northing coordinates reversed. These errors were corrected in the database prior to modelling. An additional 13 drill holes were found to have different coordinates on the paper logs than those entered in the database. Investigating further, with visual inspections, SRK decided that the log coordinates had been incorrectly entered.

Only minor errors were noted in the survey table; none were considered material.

A check of the assay table indicated that one drill hole had silver ounces entered in the grams per tonne field; this was corrected prior to modelling. SRK also noted that some assays that were entered as being less than the detection limit on the paper logs (DDH TH4E3-17) had been entered as 0.33% Cu and Pb in the database. These assays were not from the mineralized intervals, and therefore were not used in the estimate, but were still corrected prior to modelling.

2016

The 2016 database was verified by the Caribou geological staff with a few minor non-material errors found and corrected. Drill collar locations that did not align with actual underground workings or did not coincide with the location of drift walls based on mine surveys were corrected. The collar of DDH2-33 was moved to match an old drawing that showed the original location of the drill hole. The Z value of L2-22 was adjusted as the drill hole was located where no actual mine workings exist. The drill hole collars of a series of test holes drilled by Blue

Note in 2007 and 2008 were adjusted to match updated location of the drift walls based on current mine surveys conducted by Trevali in 2015 and 2016.

2017

In 2017, Trevali recompiled the Caribou drill hole database with the assistance of an external database consultant. The complete dataset was then used for geological modelling in Leapfrog software and intervals validated separately with Geovia GEMS were utilized for data compilation and validation to identify and correct any drill hole interval discrepancies.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

There are two primary sources of information with respect to Caribou metallurgy: historical plant results and laboratory testwork performed by Trevali, which are detailed in the following sections.

To the extent known, there are no processing factors or deleterious elements that could have a significant effect on economic extraction.

CARIBOU PLANT FEED PROCESSED IN CARIBOU CONCENTRATOR

The Caribou concentrator has been operational since May 2015, with the first month solely dedicated to wet commissioning and ensuring all the pumping systems were functional. Table 13-1 illustrates the past performance of the Caribou concentrator under Trevali operation.

TABLE 13-1 CARIBOU METALLURGICAL PERFORMANCE (TREVALI)
Trevali Mining Corporation – Caribou Mine

	Grades							Recoveries (%)				
	Wt (%)	Pb (%)	Zn (%)	Cu (%)	Fe (%)	Ag (g/t)	Au (g/t)	Pb	Zn	Cu	Ag	Au
2015 Performance												
Feed	100	1.98	5.30	0.35	32.31	59	N/A	100	100	100	100	N/A
Pb Concentrate	2.57	37.83	5.17	0.68	20.01	578	N/A	48.9	2.5	5.0	25	N/A
Zn Concentrate	7.34	2.47	47.99	1.04	11.52	141	N/A	9.1	66.4	21.8	17.4	N/A
Tailings	90.09	0.92	1.83	0.28	34.35	38	N/A	42.0	31.1	73.2	57.6	N/A
2016 Performance												
Feed	100	2.65	5.97	0.31	30.25	78	N/A	100	100	100	100	N/A
Pb Concentrate	3.85	39.75	5.44	1.04	19.96	711	N/A	57.8	3.5	13.0	35.1	N/A
Zn Concentrate	9.56	3.17	47.16	0.71	11.59	149	N/A	11.4	75.6	22.1	18.3	N/A
Tailings	86.59	0.94	1.44	0.23	32.77	42	N/A	30.7	20.9	64.9	46.6	N/A
2017 Performance												
Feed	100	2.55	5.94	0.34	31.41	77	N/A	100	100	100	100	N/A
Pb Concentrate	4.09	39.30	5.29	1.06	20.28	736	N/A	63.0	3.6	12.7	39.2	N/A
Zn Concentrate	9.58	2.55	48.02	0.81	11.67	131	N/A	9.6	77.4	22.5	16.3	N/A
Tailings	86.33	0.81	1.30	0.26	34.12	40	N/A	27.4	18.9	64.8	44.4	N/A

ZINC

The zinc metallurgy is very consistent with respect to grade over the past two and a half years of operation. The recovery has continued to increase each period, as illustrated in Table 13-1, and is expected to continue improving as it approaches the 84% recovery forecast that has been achieved on several individual days of operation. Currently, the majority of the zinc losses are in liberated fines, suggesting that grinding capacity is not the issue. Projects to maximize fines recoveries are currently underway at Caribou to minimize these losses, starting with a baseline survey and size-by-size analysis of all streams. Additionally, there is a seasonal effect at Caribou, where zinc is significantly more selective and stable in the summer months than in the winter months.

LEAD

The lead metallurgy has been very consistent on grade and recovery has seen significant improvements year on year. Similar to the zinc circuit, there are seasonal shifts in lead performance, where superior results are achieved during the winter months, with reduced stability in the summer months. According to size-by-size analysis of the lead tailings streams, there appears to be a little room for finer grinding on the rougher circuit, however, the losses through the cleaning circuit are largely liberated fines. It is expected that the lead performance will continue to increase towards its recovery entitlement as the mechanism of seasonal effects is understood through current testwork and fines recovery is improved. A grinding circuit survey will be completed in early 2018, and the upgrade of the primary cyclones will be evaluated with the data. In addition to this, there is capital identified in the 2018 budget to install a particle size analyzer in advance of lead flotation.

SILVER AND GOLD METALLURGY

The silver recovery has steadily increased since the commissioning of the plant. This correlates with increases in both silver head grades and copper recovered to the lead concentrate. There has been a significant initiative in the plant to reduce the consumption of sodium cyanide or replace it completely with an alternative pyrite depressant in the lead circuit. The reduction of sodium cyanide in the lead circuit should result in less soluble silver and gold leaving the plant in solution.

COPPER

The previous copper circuit design prepared by SRK for the 2015 PEA (SRK, 2015) is currently not considered feasible. This is due to lower than anticipated copper grade in the lead cleaner tails, which is anticipated to feed the new copper circuit. Over the previous two and a half years, copper head grades have remained very consistent at approximately 0.3% Cu.

However, the copper circuit is still a possibility at Caribou with a modification to the initially proposed flowsheet in the PEA and further laboratory test work. No copper revenues were included in the LOM and should only be viewed as potential upside.

FORECAST METALLURGY

Based on historical results, current mineralogy, and size-by-size analysis, along with ongoing plant initiatives, the anticipated plant metallurgy is provided in Table 13-2.

The 2018 forecast is based on the most recent metallurgical performance and ongoing short-term projects designed to reduce variability. The 2019 forward metallurgy is based upon future initiatives to close the gap between average results and entitlement. This will require reducing the effect of seasonal swings in metallurgy.

TABLE 13-2 PREDICTIVE METALLURGY BASED ON HISTORICAL RESULTS
Trevali Mining Corporation – Caribou Mine

	Grades							Recoveries (%)				
	Wt (%)	Pb (%)	Zn (%)	Cu (%)	Fe (%)	Ag (g/t)	Au (g/t)	Pb	Zn	Cu	Ag	Au
2020 Forward Metallurgy												
Feed	100.00	2.21	5.88	0.31	30.00	70	0.53	100.0	100.0	100.0	100.0	100.0
Pb Conc	3.78	38.00	5.00	1.22	20.27	691	1.20	65.0	3.2	14.9	37.3	8.6
Zn Conc	10.05	3.00	48.00	0.60	11.00	150	0.36	13.6	82.0	19.4	21.5	6.7
Tailings	86.18	0.55	1.01	0.24	32.64	33	0.52	21.4	14.8	65.5	40.6	84.6
2019 Metallurgy												
Feed	100.00	2.21	5.88	0.31	30.00	70	0.53	100.0	100.0	100.0	100.0	100.0
Pb Conc	3.82	37.00	5.52	1.22	21.40	720	1.27	64.0	3.4	14.2	37.1	8.6
Zn Conc	10.13	3.40	47.00	0.66	12.00	145	0.36	15.0	81.0	21.3	20.7	6.7
Tailings	86.05	0.59	1.13	0.23	32.64	34	0.51	20.9	15.6	64.1	42.0	83.1

	Grades							Recoveries (%)				
	Wt (%)	Pb (%)	Zn (%)	Cu (%)	Fe (%)	Ag (g/t)	Au (g/t)	Pb	Zn	Cu	Ag	Au
2018 Metallurgy												
Feed	100.00	2.21	5.88	0.31	30.00	70	0.53	100.0	100.0	100.0	100.0	100.0
Pb Conc	3.61	37.00	5.52	1.22	21.40	720	1.27	63.0	3.4	14.2	37.1	8.6
Zn Conc	10.01	3.40	47.00	0.66	12.00	145	0.36	15.4	80.0	21.3	20.7	6.7
Tailings	86.39	0.59	1.13	0.23	32.64	34	0.51	22.9	16.6	64.1	42.0	83.1

14 MINERAL RESOURCE ESTIMATE

SUMMARY

The geological interpretation was completed by Caribou, and Mineral Resource estimation, with an effective date of December 31, 2017, was completed by Glencore Zinc Technical Services (GZTS, 2018), which is a non-independent technical consultant to Trevali. The methods and results of both were reviewed and accepted by RPA. The Mineral Resources have been completed to a level that meets industry standards and are compliant with the terms and definitions provided in the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions) as adopted by NI 43-101.

Caribou Mineral Resources, estimated as of December 31, 2017, are summarized in Table 14-1.

TABLE 14-1 MINERAL RESOURCE SUMMARY – AS AT DECEMBER 31, 2017
Trevali Mining Corporation – Caribou Mine

Classification	Tonnes (M)	Grade				Contained Metal			
		Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	Zn (Tonnes)	Pb (Tonnes)	Cu (Tonnes)	Ag (000 oz)
Measured	5.87	6.11	2.27	0.37	67	358,400	133,100	21,700	12,600
Indicated	3.03	6.11	2.32	0.39	70	185,000	70,300	11,800	6,800
Measured and Indicated	**8.89**	**6.11**	**2.28**	**0.38**	**68**	**543,400**	**203,400**	**33,800**	**19,400**
Inferred	7.0	5.7	2.1	0.3	65	388,000	148,000	21,000	14,600

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources are estimated at a 5% zinc equivalent cut-off grade with metal prices of: US$1.21/lb zinc, US$1.00/lb lead, US$18.50/oz silver, FX: US$/CAD$0.80.
4. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
5. Numbers may not add due to rounding.

The wireframes and block grades estimations were generated in Leapfrog Geo and EDGE, as opposed to Amine used for the previous Caribou Mineral Resource estimate. Caribou Mineral Resources are presented as a series of discrete mineralized domain wireframes. The dimensions of the envelope containing the currently defined mineralized lenses is approximately 850 m long from north to south, 550 m wide from east to west, and 925 m deep.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

RESOURCE DATABASE

The complete Caribou mine drill hole database was re-compiled and validated by Trevali in 2017.

The drill hole database within the resource area consists of 2,158 drill holes, including traverse chip samples plotted as pseudo drill holes. Of the 1,305 validated drill holes, 1,281 were used in the Mineral Resource estimation. Caribou did not include any traverse chip samples or invalid data in the estimation. Table 14-2 provides a summary of the database used for the Caribou mine resource estimation.

TABLE 14-2 DIAMOND DRILL HOLE DATA WITHIN THE RESOURCE AREA
Trevali Mining Corporation – Caribou Mine

Type	Number of Drill Holes	Number of Samples
Validated DDH	1,281	12,740
Validated DDH Ignored	24	198
Invalid DDH + Point Samples + Traverse Chip Samples[1]	853	13,459
Total	**2,158**	**26,397**

Note:
1. Traverse chip samples plotted as pseudo drill holes.

Some of the ignored data were geotechnical drill holes. Other holes were ignored where the underground mapping and recent drill holes showed that longer holes typically drilled from surface by previous operators did not match new data, in some cases by tens of metres. Poor quality downhole survey data, and/or possible collar survey errors from past operators appear to be the source of the large discrepancies. As more recent underground mapping and drilling data become available, holes drilled at poor angles to the strike of the deposit due to lack of diamond drill stations are replaced with newly acquired information.

GEOLOGICAL MODEL

METHODOLOGY

All domain modelling for Mineral Resource estimation was completed in Leapfrog GEO (version 4.2.3) by Caribou geologists. The wireframing is kept up to date by the Geology department resource modelling team. Detailed internal documents describing the domain modelling procedure are available.

The massive sulphides consist of seven en echelon lenses, numbered 1, 2, 3, 4, 6, 7, and 8, around the Caribou fold. Lenses 1, 2, 3, 7, and 8 occur on the north limb of the Caribou fold, while Lenses 4 and 6 are mostly on the eastern limb of the fold as illustrated in Figure 7-3.

The cut-off grade used for modelling the resource lenses is 4.0% Zn + Pb. The Zn : Pb ratio at the Caribou mine is generally 2.7:1. The low-grade pyrite sulphide lenses contain up to 4% Zn, 2% Pb, and locally above 1% Cu. Faults are modelled, however, the chloritic and sericitic waste rock units are not modelled.

Caribou's Leapfrog geological modelling process consists of the following steps:

1. Import of 3D wireframes of the pre-existing and planned underground development. Geological mapping of pre-existing development, which includes both lithological and structural information, is draped over the development wireframes.

2. Validated drill holes are loaded into Leapfrog and sulphide shells, based on geology (grade shell based on grades) and drill hole intervals, are coded, as per the lens name.

3. Traverse chip samples represented as pseudo drill holes and point sample are also used in the interpretation. RPA notes that these samples were not used to estimate block grades. These were also coded as per lens type.

4. 3D polylines are then created from the draped geological modelling and coded as per lens type.

5. A 3D wireframe (shell) is then created in Leapfrog. For the initial wireframing, the meshes were exported into Geovia GEMS for repair and validation and then imported back into Leapfrog. Going forward, all wireframing will be validated in Leapfrog Geo and Leapfrog Edge.

6. Completed wireframes are reviewed in plan and section and compared against the drilling and the geological mapping.

RESOURCE SHELLS

As part of Leapfrog modelling in 2017, a revision of the modelled domains was undertaken which has improved the interpretation.

RPA's review of the resource domains identified a number of minor snapping and nesting errors and RPA recommends that these be addressed prior to the next resource update.

The 2017 modelled domains include:

- **Lens 1**: Split into Lens 1 and Lens 1B (which is a smaller lens closer to the FW in the north end of Lens 1).
- **Lens 2:** Split into Lens 2 North, Lens 2 Mid, and Lens 2 South – fault controlled.
- **Lens 3:** HW lens split into Lens 3 North, Lens 3 Mid, and Lens 3 South – fault controlled.
- **Lens 4:** East Limb Lens.
- **Lens 6:** East Limb Lens.
- **Lens 7:** A Cu zone within the north limb massive sulphide.
- **Lens 8:** A narrow, discontinuous lens on the HW of Lenses 2 and 3 split into Lens 8 North, Lens 8 North Fault Block 1, Lens 8 Mid, and Lens 8 South – fault controlled.

Aside from the distinction between resource and sulphide shells, additional subdomains were also generated in the L4 and L8S domains, to both segregate Pb metal zonation and to resolve the change in orientation of the mineralization around the fold nose. Both L4 and L8S were each subdivided in two subdomains for variography and estimation.

Table 14-3 presents the assigned resource domain codes.

TABLE 14-3 RESOURCE DOMAIN CODES
Trevali Mining Corporation – Caribou Mine

Domain Code	Location	Lens No.	Domain Name
110	North Limb North	1	L1_ORE_TK
111	North Limb North	1	L1N_ORE_B
120	North Limb Mid	2	LENS2MID
121	North Limb North	2	L2N_ORE_TK
122	North Limb North	2	L2S_ORE
130	North Limb Mid	3	L3MID
131	North Limb North	3	L3N
132	North Limb South	3	L3S_ORE
140	East Limb Sulphides	4	L4_ORE_TK
160	East Limb Sulphides	6	L6_ORE_TK
180	North Limb Mid	8	L8MID
181	North Limb North	8	L8N
182	North Limb North	8	L8N_FB1
183	North Limb South	8	L8S_ORE

Figure 14-1 illustrates the discrete mineralized domain wireframes.

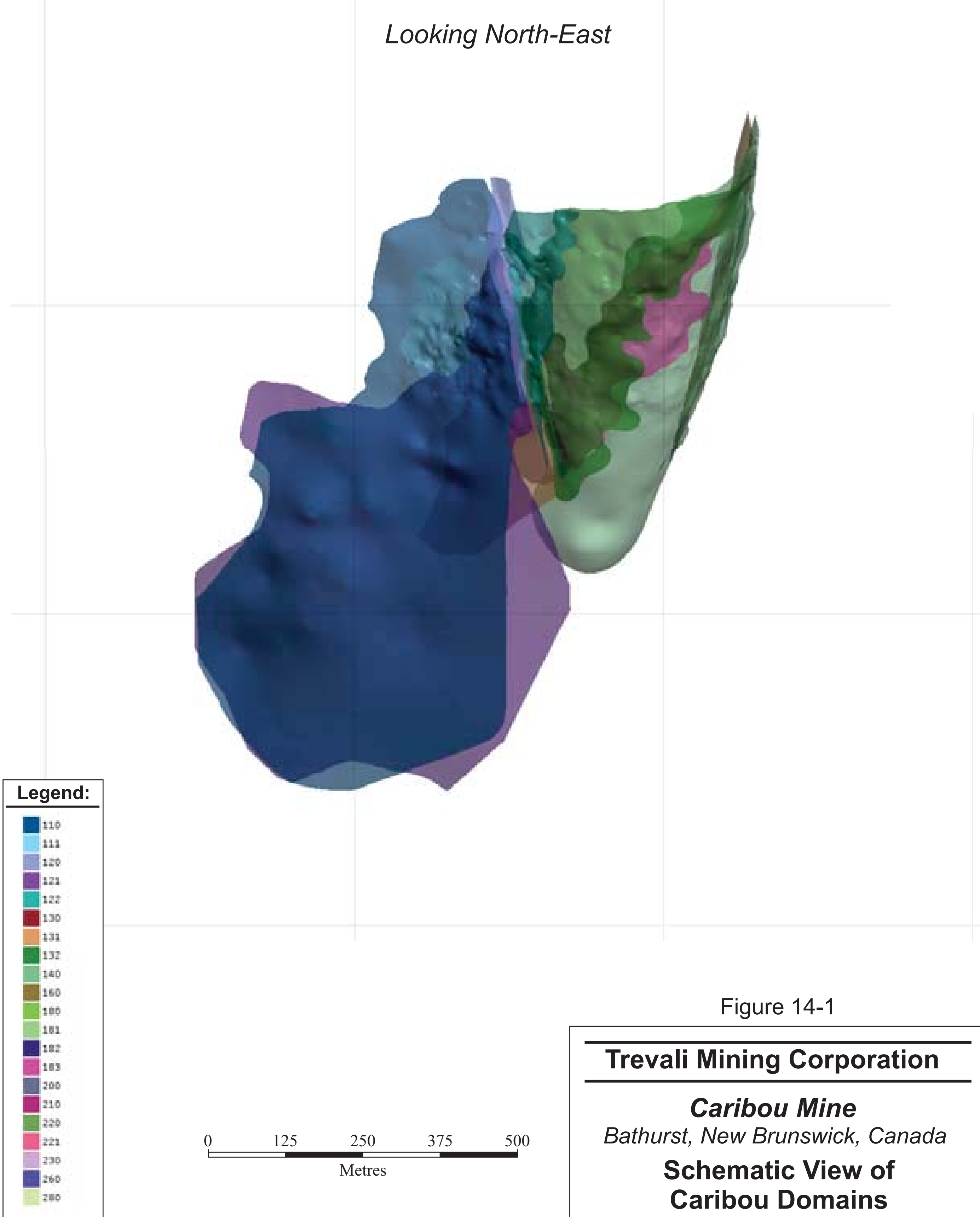


Figure 14-1

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Schematic View of Caribou Domains

May 2018

Source: Trevali, 2018.

SULPHIDE SHELLS

Due to the occasional narrow nature of the resource shells, sulphide shells were modelled in order to create dilution envelopes around the sulphide domains. The shells include all sulphide mineralization from hanging wall to footwall and are not based on cut-off grades. Geological mapping was also used to guide the sulphide shell construction. These shells were used for block modelling planned dilution in the Mineral Reserve estimation process.

Table 14-4 presents the assigned sulphide domain codes.

TABLE 14-4 SULPHIDE DOMAIN CODES
Trevali Mining Corporation – Caribou Mine

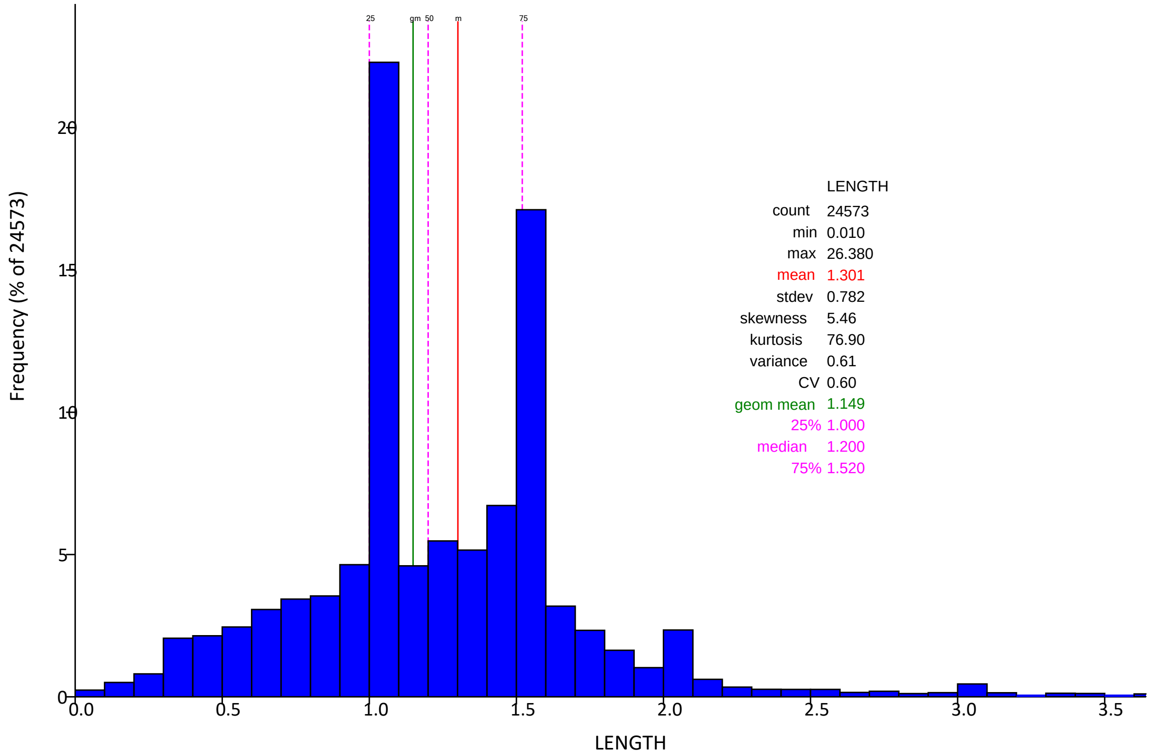
Domain Code	Location	Lens No.	Domain Name	Buffer Offset (m)
200	East Limb	4	L4S	0.40
210	North	1	L1N	0.35
220	North Limb South	2	L2S	0.25
221	North Limb North	2	L2N	0.35
230	North Limb South	3	L3S	0.25
260	East Limb	6	L6	0.30
280	North Limb South	8	L8S	0.00

Since the sulphide shell contacts were often very close to, or the same as, the resource shells, valid volumes could not be automatically generated for block model construction. Instead, a distance buffer was generated from the sulphide shell encompassing the smallest outward offset possible (0.00 m to 0.40 m). This had the undesired effect of encompassing a minor volume and narrow intervals of low grade or waste material below the sulphide zone cut-off zone. The minimal overall effect, however, is not considered material and does not impact the resource. RPA noted, however, that in some instances the resource domains are not fully enclosed inside the sulphide shells.

COMPOSITING

Most of the samples inside the mineralized estimation domains were collected at intervals between 1.0 m and 1.5 m (Figure 14-2). For resource estimation, all assays were composited to 1.0 m lengths within the resource domains to respect the narrow nature of the wireframes. Sulphide domains were composited using 1.5 m regularized domains. Boundary analysis was performed on the composites to verify the nature of the contacts. Hard boundaries are used in all cases (except for the aforementioned subdomaining).

FIGURE 14-2 HISTOGRAM OF SAMPLE LENGTHS



Most of the sample lengths in the assay database range from 0.5 m to 2.0 m. Caribou composited the assays at 1.0 m, equal in length to approximately 50% of the total sample set within the resource wireframes. The effect of the chosen composite length was an increase of the total population, caused in part by splitting of 2.0 m samples into two.

TREATMENT OF HIGH GRADES (CAPPING)

Capping analysis was performed for each metal, by domain, using histograms generated by Leapfrog's Edge Cumulative Distribution Function (CDF). A grade cap was then applied to the composites to avoid the use of anomalous data leading to local overestimation of the grade. A summary of the capping grades, by domain and metal, is presented in Table 14-5.

TABLE 14-5 GRADE CAPPING SUMMARY
Trevali Mining Corporation – Caribou Mine

Domain	Code	Zn (%)		Pb (%)		Ag (g/t)		Cu (%)		Au (g/t)	
		Max	Cap	Max	Cap	Max	Cap	Max	Cap	Max	Cap
Resource	110	38.00	22.00	9.73	8.00	302.00	250.00	5.50	3.00	7.51	5.00
	111	18.25	None	12.90	10.00	123.00	None	3.73	3.00	Not Estimated	
	120	21.20	18.00	9.76	7.00	174.11	None	10.80	8.50	3.43	3.00
	121	20.47	None	9.79	None	566.00	240.00	1.83	1.50	4.97	4.20
	122	20.00	17.00	14.40	9.00	247.00	180.00	7.12	4.60	4.91	none
	130-131	21.70	20.00	8.87	None	244.30	None	0.84	None	Not Estimated	
	132	28.70	20.00	19.50	11.00	446.00	210.00	4.95	4.00	Not Estimated	
	140	16.50	15.00	12.10	10.00	604.00	350.00	1.83	1.20	10.28	5.00
	160	21.10	20.00	None	none	297.84	None	None	None	3.42	3.20
	180-181	23.62	16.00	8.42	None	228.00	190.00	0.49	None	Not Estimated	
	182	12.10	None	7.42	None	359.00	350.00	1.10	1.00	Not Estimated	
	183N	19.80	14.00	6.77	None	269.00	225.00	1.21	None	Not Estimated	
	183S	19.80	14.00	9.80	None	269.00	225.00	1.21	None	Not Estimated	
Sulphide	200	8.77	None	4.17	None	182.00	100.00	2.44	1.20	2.68	2.00
	210	13.30	10.50	6.05	None	132.00	100.00	9.75	6.00	8.58	5.40
	220	15.10	14.00	5.36	None	118.00	80.00	4.62	3.20	5.34	3.50
	221	17.10	11.00	5.70	None	180.00	100.00	9.47	5.00	3.43	None
	230	12.70	8.00	3.89	None	217.00	115.00	8.04	5.00	4.10	3.00
	260	10.40	None	3.70	None	177.00	115.00	9.42	5.00	6.52	3.00

In RPA's opinion, the grade caps are reasonable. RPA recommends, however, that grade capping should be applied to the raw assays prior to compositing.

BLOCK MODEL

The block model is rotated at an azimuth of 340°, with a parent block size of 5 m by 5 m by 5 m, which is then sub-blocked down to a minimum size of 0.5 m at domain boundaries in the X and Y directions, with a variable height (Z) set to a minimum of 0.25 m (Table 14-6).

TABLE 14-6 BLOCK MODEL DESCRIPTION
Trevali Mining Corporation – Caribou Mine

Type (Mine Grid)	Y	X	Z
Minimum Coordinates (m)	14,950.0	14,915.0	1,364.0
Maximum Coordinates (m)	15,130.8	15,997.1	2,534.0
Parent Block Size (m)	5.0	5.0	5.0
Sub-block Size (m)	0.5	0.5	0.25
Rotation (°)		340	

The block model contains the key fields as listed in Table 14-7.

TABLE 14-7 BLOCK MODEL FIELDS
Trevali Mining Corporation – Caribou Mine

Model Field	Description
Zn	Zinc Grade (%)
Pb	Lead Grade (%)
Ag	Silver Grade (g/t)
Cu	Copper Grade (%)
Au	Gold Grade (g/t)
SG	Specific Gravity
Fe	Iron Grade (%)
DOMAIN	Wireframe Domains (Identifying the Mineralization Lenses)
RESCAT	Resource Category (1 = Measured, 2 = Indicated, 3= Inferred, 4 = Potential, 99 = Dilution Halo)
SG	Specific Gravity
MINE_VOID	Mined Out identifier (1= Mined, 0 = Not Mined)
ZNEQ	Zinc Equivalent
NSR	Net Smelter Return (Long term Cost Assumptions)

SPATIAL ANALYSIS (VARIOGRAPHY) AND BLOCK MODEL INTERPOLATION

Three separate estimation methods were used for each element and domain: Ordinary Kriging (OK), Nearest Neighbour (NN), and Inverse Distance to the Power of 2 (ID^2). Variograms were calculated and modelled in Leapfrog Edge. Table 14-8 presents the search ellipse ranges and anisotropies.

TABLE 14-8 VARIOGRAM PARAMETERS
Trevali Mining Corporation – Caribou Mine

Pass No.	Distance (m)		
	Major	Intermediate	Minor
Pass 1	25	20	10
Pass 2	50	40	20
Pass 3	80	65	30
Pass 4	150	120	45

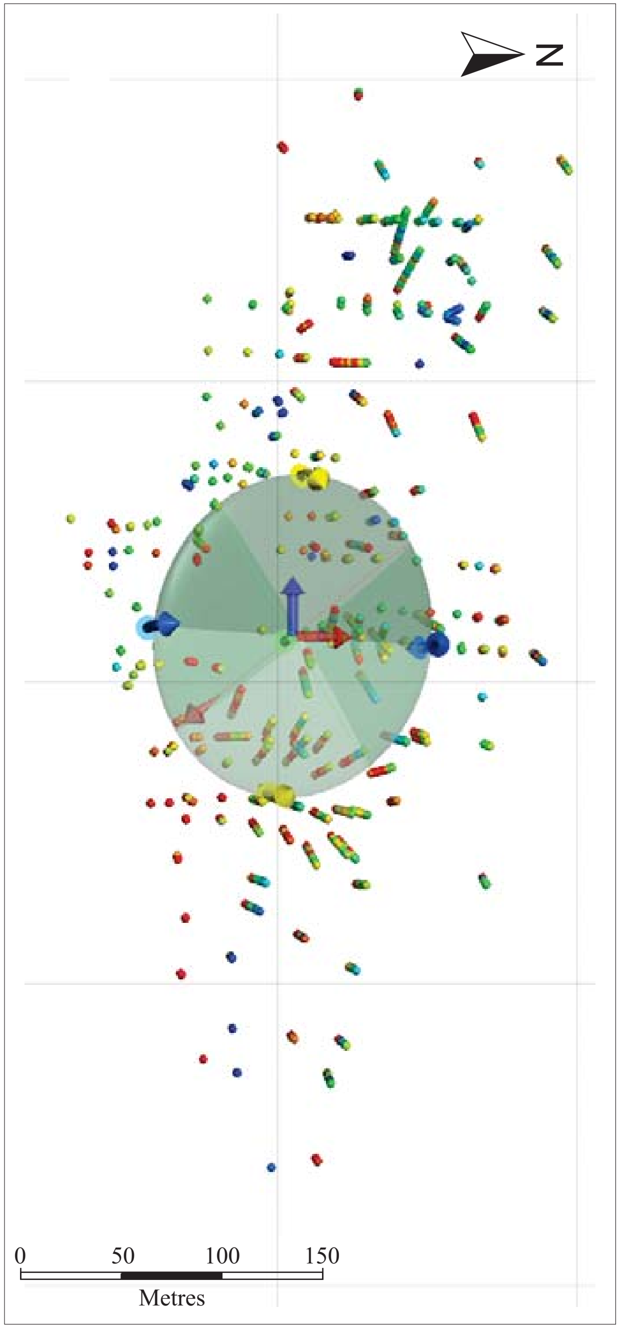
Table 14-9 summarizes search strategy for the block grade estimates.

TABLE 14-9 SEARCH STRATEGY FOR BLOCK GRADE ESTIMATION
Trevali Mining Corporation – Caribou Mine

Domain	Min No. Samples	Max No. Samples	Max Sample per Hole	Min No. of Holes	Max Samples per Octant	Max Empty Octants
PASS 1	12	32	4	3	6	4
PASS 2	12	32	4	3	6	4
PASS 3	8	20	4	2	6	6
PASS 4	4	20	4	1	No Octants	
ID	12	32	4	3	6	5
NN	1	1	1	1	No Octants	

Figure 14-3 presents Leapfrog Edge Pb variogram and search ellipse for Lens 6 Domain 160.

In RPA's opinion, the number of composites used in the block estimation is excessive and adds to the smoothing produced by the OK estimation method. RPA tested the sensitivity of the estimation to the interpolation parameters by reducing the minimum and maximum number of composites used in the three estimation passes by half. The resulting grades and tonnages were slightly higher than Caribou's model.



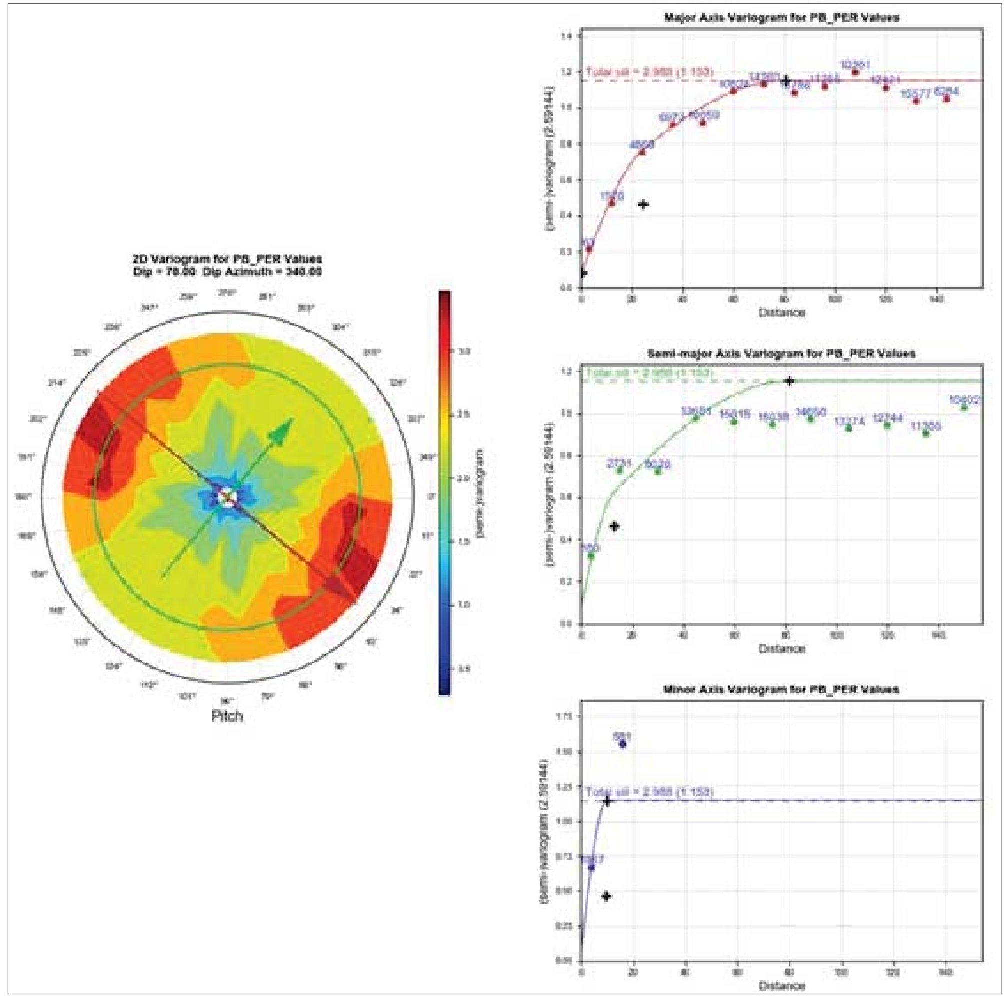


Figure 14-3

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Leapfrog Edge Pb Variogram and Search Ellipse for Lens 6 Domain 160

May 2018

Source: Trevali, 2018.

Three separate estimation methods were used for each element and domain including OK, NN, and ID^2. In most cases, OK grades were taken as the final value used in reporting, however, in domains where data was insufficient for variography, ID^2 estimates were used. No estimates were generated for domains 180+181 and 280. Table 14-10 presents a summary of the estimation method by domain.

TABLE 14-10 KRIGING PLAN AND SEARCH CRITERIA
Trevali Mining Corporation – Caribou Mine

Domain	Zn	Pb	Ag	Cu	Au	Fe	SG
110	OK	OK	OK	OK	OK	OK	OK
111	OK	OK	OK	OK	OK	None	OK
120	OK	OK	OK	OK	OK	None	OK
121	OK	OK	OK	OK	OK	None	OK
122	OK	OK	OK	OK	OK	OK	OK
130+131	OK	OK	OK	OK	OK	OK	OK
132	OK	OK	OK	OK	OK	OK	OK
140	OK	OK	OK	OK	OK	ID^2	OK
160	OK	OK	OK	OK	OK	None	OK
180+181				Not Estimated			
182	ID^2	ID^2	ID^2	ID^2	ID^2	ID^2	ID^2
183-NORTH	OK	OK	OK	OK	OK	OK	OK
183-EAST	OK	OK	OK	OK	OK	OK	OK
200	OK	OK	OK	OK	OK	OK	OK
210	OK	OK	OK	OK	OK	OK	OK
220	OK	OK	OK	OK	OK	OK	OK
221	OK	OK	OK	OK	OK	OK	OK
230	OK	OK	OK	OK	OK	OK	OK
260	OK	OK	OK	OK	OK	OK	OK
280				Not Estimated			

De-clustering was used to assign weights in the ID^2 estimation, using a standard 16 m by 16 m by 16 m spherical ellipse, equivalent to three times the parent block size. Figure 14-4 presents an example of de-clustering weights for Lens 2 Domain 121.

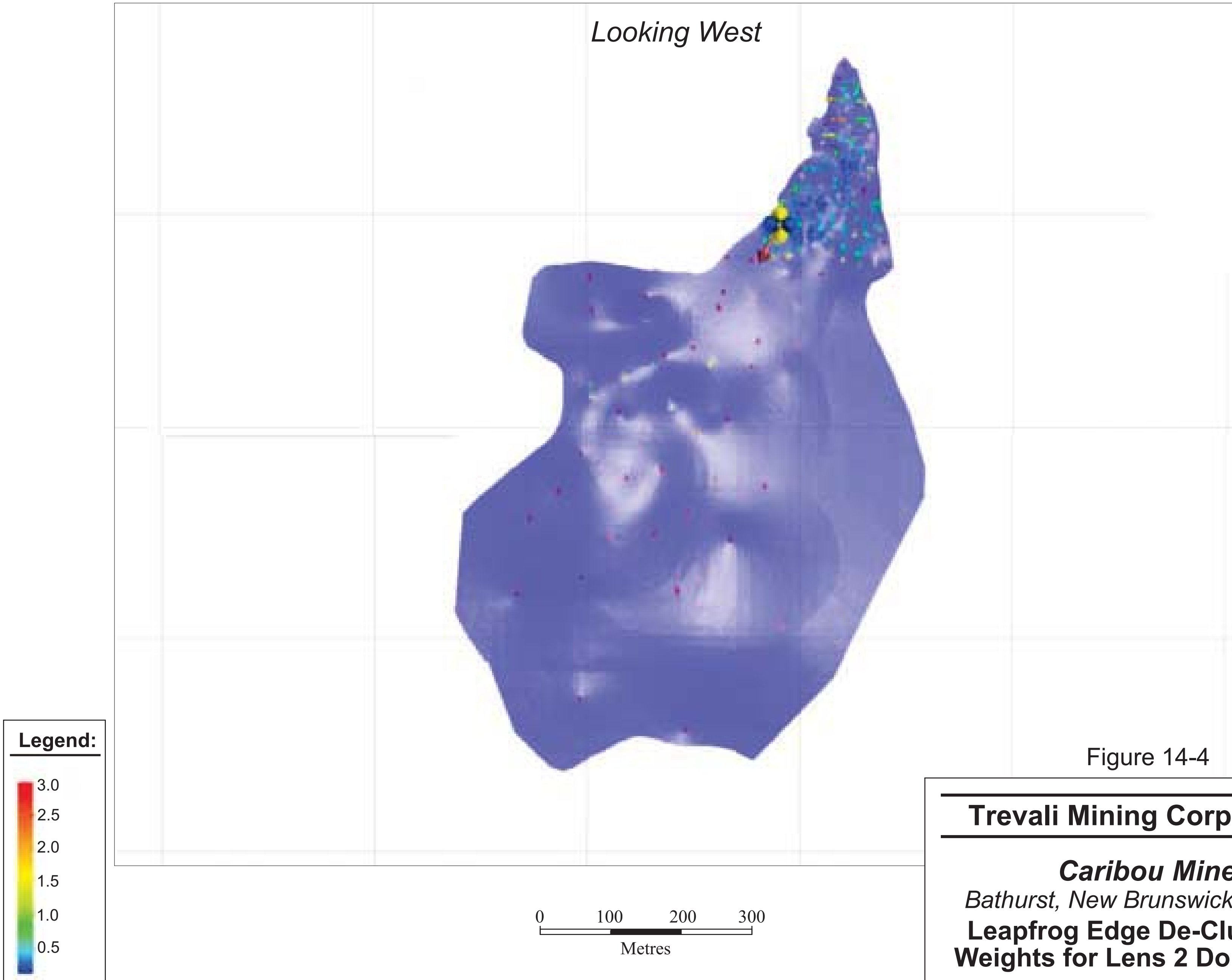


Figure 14-4

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Leapfrog Edge De-Clustering Weights for Lens 2 Domain 121

May 2018

Source: Trevali, 2018.

BLOCK MODEL VALIDATION

GZTS validated the sub-blocked model using a number of statistical and visual methods including: volume checks, visual comparison of block versus composites, swath plots, and basic statistical comparisons.

WIREFRAME VERSUS BLOCK VOLUMES

Table 14-11 presents the results of a reconciliation between the wireframe and block model volumes. Only minor discrepancies are noted. Note that sulphide shell volumes are quoted as final outputs with inner resource shell removed for comparison with block volume.

SWATH PLOTS

Swath plots of composited grades, ID^2, NN, and OK block estimates were reviewed and a good grade correlation was observed between the estimated blocks and composites (Table 14-11).

TABLE 14-11 WIREFRAME TO BLOCK VOLUME RECONCILIATION
Trevali Mining Corporation – Caribou Mine

Domain	Code	Location	Name	Wireframe Volume (m^3)	% of Total	No. of Blocks	Block Volume (m^3)	Delta (Block to Wireframe)
RESOURCE	110	North Limb North	L1_ORE_TK	1,602,000	22.5%	1,282,505	1,602,059	0.0%
	111	North Limb North	L1N_ORE_B	38,517	0.5%	41,151	38,506	0.0%
	120	North Limb Mid	LENS2MID	131,760	1.8%	71,076	131,751	0.0%
	121	North Limb North	L2N_ORE_TK	1,751,600	24.6%	1,370,950	1,751,651	0.0%
	122	North Limb South	L2S_ORE	218,220	3.1%	147,872	218,235	0.0%
	130	North Limb Mid	L3MID	16,161	0.2%	-	-	-
	131	North Limb North	L3N	307,290	4.3%	-	-	-
	Subtotal 130+131			323,451	-	259,537	323,434	0.0%
	132	North Limb South	L3S_ORE	472,330	6.6%	397,791	472,250	0.0%
	140	East Limb Sulphides	L4_ORE_TK	1,540,600	21.6%	1,232,624	1,540,582	0.0%
	160	East Limb Sulphides	L6_ORE_TK	857,430	12.0%	650,646	857,035	0.0%
	180	North Limb Mid	L8MID	13,927	0.2%	-	-	-
	181	North Limb North	L8N	4,118	0.1%	-	-	-
	Subtotal 180+181			18,045	-	16,949	17,982	-0.3%
	182	North Limb North	L8N_FB1	41,262	0.6%	38,403	41,241	-0.1%
	183	North Limb South	L8S_ORE	133,250	1.9%	147,768	133,273	0.0%
		Total		**7,128,465**		**5,657,272**	**7,128,000**	**0.0%**

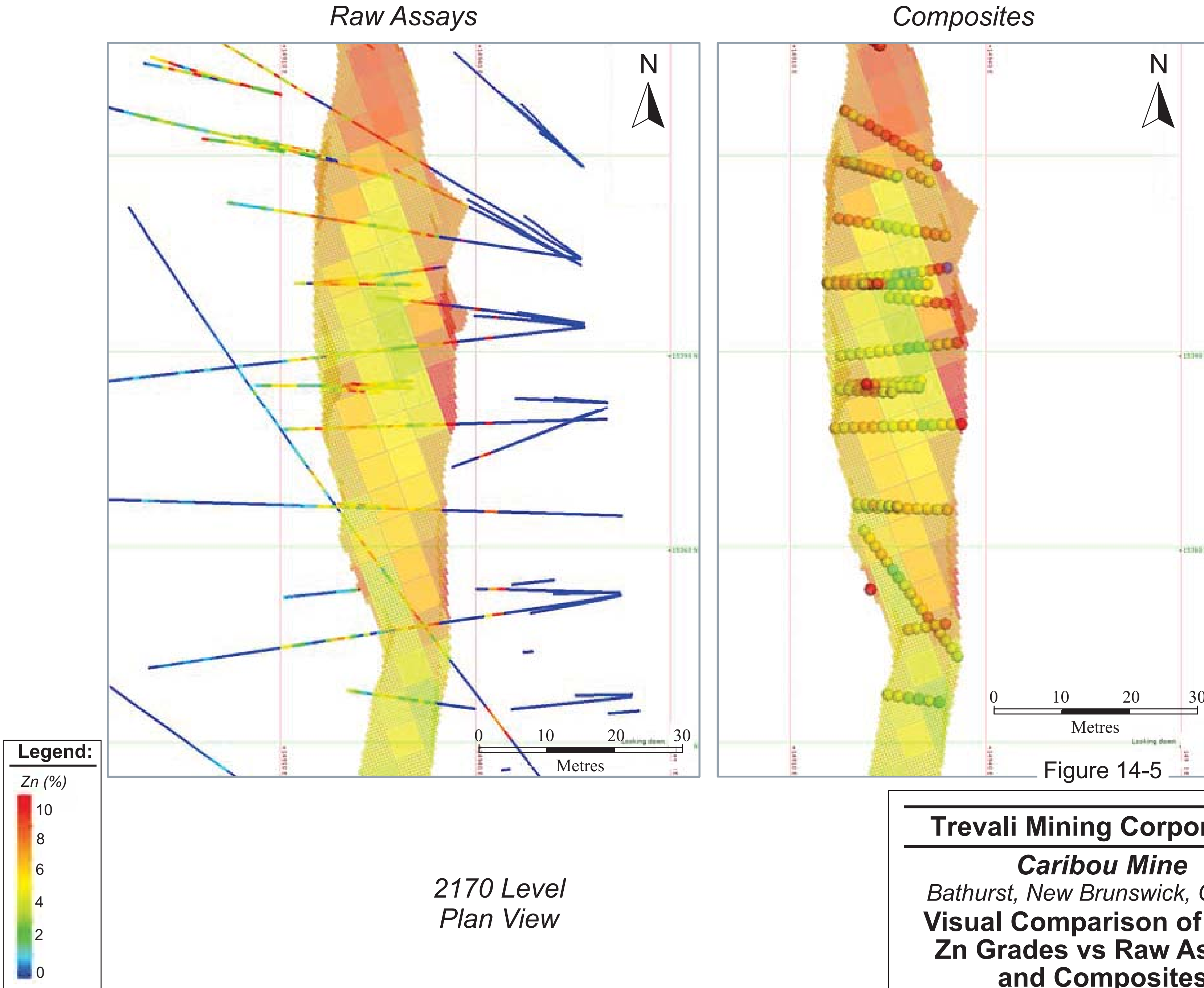
Domain	Code	Location	Name	Wireframe Volume (m^3)	% of Total	No. of Blocks	Block Volume (m^3)	Delta (Block to Wireframe)
SULPHIDE	200	East Limb	L4S	572,740	10.9%	955,871	572,577	0.0%
	210	North	L1N	1,815,200	34.5%	1,666,275	1,815,005	0.0%
	220	North Limb South	L2S	226,590	4.3%	170,146	226,546	0.0%
	221	North Limb North	L2N	1,967,400	37.3%	1,833,747	1,955,215	-0.6%
	230	North Limb South	L3S	190,370	3.6%	279,299	190,238	-0.1%
	260	East Limb	L6	279,270	5.3%	457,562	279,148	0.0%
	280	North Limb South	L8S	217,490	4.1%	-	-	-
		Total		**5,269,060**		**5,362,900**	**5,038,728**	**-0.3%**

Notes:

1. Sulphide shell volumes are quoted as final outputs with inner resource shell removed for comparison with block volume.
2. Total Delta of Block to Wireframe does not include uninterpolated domains 180+181 or 280.

VISUAL COMPARISONS

Visual comparisons were made between the drill hole data and interpolated data. Figure 14-5 presents a comparison of block Zn grades versus raw assays and composites for Lens 2 Domain 121, Level 2170.



May 2018

Source: Trevali, 2018.

Figure 14-5

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Visual Comparison of Block Zn Grades vs Raw Assays and Composites

GLOBAL MEANS

Global mean grades for NN estimates were compared versus interpolated blocks for the Measured category (Table 14-12). Total grade variances for domains 110, 121, 132, 140, and 160, which account for 83% of the total Measured + Indicated Mineral Resources, were generally less than 3%, except for Cu and Au, which showed a greater underestimation, in the order of 7% to 10%. Copper and gold are not reported in the Caribou Mineral Resource statement.

TABLE 14-12 GLOBAL MEAN GRADES FOR NN ESTIMATE VS. OK/ID² MEASURED BLOCKS
Trevali Mining Corporation – Caribou Mine

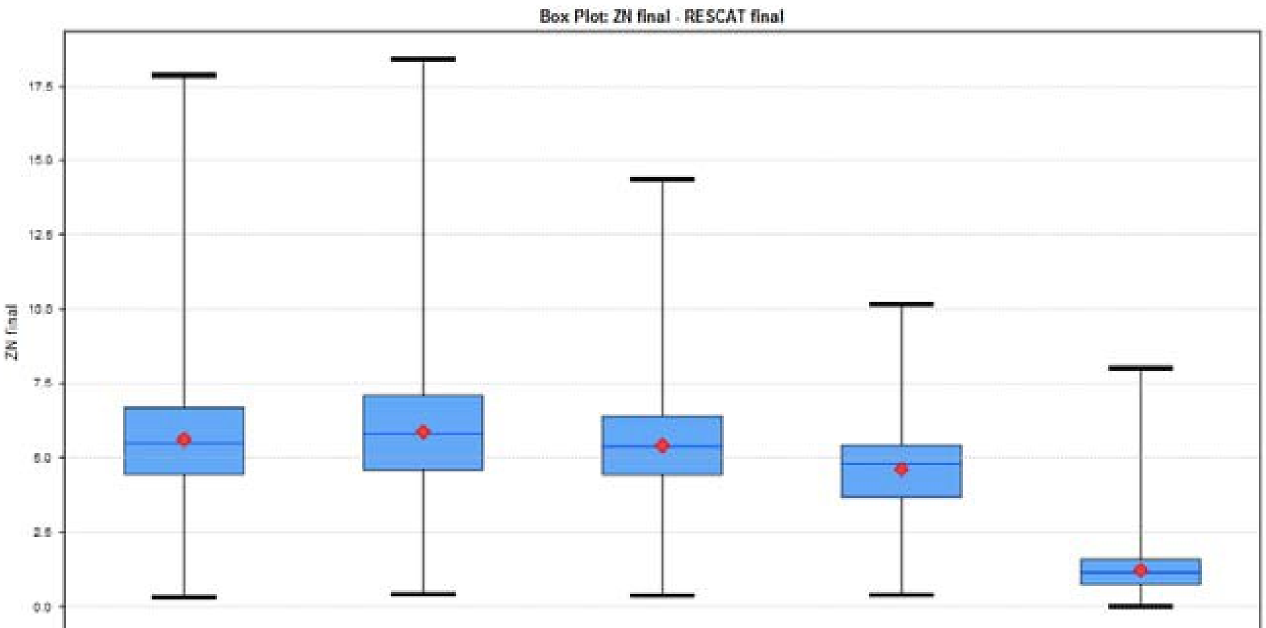
Domain	Zn (%)			Pb (%)			Ag (g/t)		
	NN	OK or ID²	*Variance*	NN	OK or ID²	*Variance*	NN	OK or ID²	*Variance*
110	5.88	6.07	*3.2%*	1.81	1.87	*3.3%*	60.9	59.9	*-1.6%*
111	4.86	4.85	*-0.2%*	1.50	1.47	*-2.0%*	49.6	50.1	*1.1%*
120	2.66	3.00	*12.8%*	0.64	0.74	*15.6%*	28.0	28.2	*0.8%*
121	6.01	5.85	*-2.7%*	2.05	1.96	*-4.4%*	60.5	57.8	*-4.4%*
122	5.23	5.41	*3.4%*	1.62	1.75	*8.0%*	49.6	51.6	*4.0%*
131	8.19	8.34	*1.8%*	3.26	3.28	*0.6%*	105.1	107.1	*1.9%*
132	6.37	6.03	*-5.3%*	2.19	2.06	*-5.9%*	75.4	71.2	*-5.6%*
140	5.22	5.10	*-2.3%*	3.41	3.17	*-7.0%*	67.8	69.7	*2.8%*
160	5.18	5.48	*5.8%*	2.44	2.44	*0.0%*	73.1	72.5	*-0.8%*
181	6.80	6.70	*-1.5%*	3.26	3.41	*4.6%*	90.3	86.2	*-4.6%*
183-N	5.92	6.00	*1.4%*	2.42	2.34	*-3.3%*	59.9	65.2	*8.8%*
183-S	5.41	5.57	*3.0%*	2.67	2.6	*-2.6%*	111.5	111.6	*0.1%*

Domain	Cu (%)			Au (g/t)			SG (t/m³)		
	NN	OK or ID²	*Variance*	NN	OK/ID²	*Variance*	NN	OK or ID²	*Variance*
110	0.50	0.49	*-2.0%*	0.16	0.16	*0.0%*	4.46	4.48	*0.4%*
111	0.64	0.64	*0.0%*	none	-	-	4.40	4.45	*1.1%*
120	0.80	0.77	*-3.8%*	0.08	0.09	*12.5%*	4.05	4.07	*0.5%*
121	0.29	0.29	*0.0%*	1.63	1.85	*13.5%*	4.47	4.49	*0.4%*
122	0.47	0.44	*-6.4%*	1.26	1.12	*-11.1%*	4.22	4.22	*0.0%*
131	0.33	0.35	*6.1%*	none	-	-	4.39	4.45	*1.4%*
132	0.47	0.47	*0.4%*	none	-	-	4.19	4.39	*4.8%*
140	0.28	0.28	*-0.8%*	0.686	0.74	*7.9%*	4.06	3.97	*-2.2%*
160	0.26	0.26	*-1.6%*	0.70	0.47	*-32.9%*	4.02	4.07	*1.2%*
181	0.20	0.21	*5.0%*	none	-	-	3.84	3.85	*0.3%*
183-N	0.24	0.25	*4.2%*	none	-	-	4.13	4.11	*-0.5%*
183-S	0.23	0.25	*8.7%*	none	-	-	3.78	3.58	*-5.3%*

VARIANCES BETWEEN RESOURCE CATEGORIES

Figures 14-6 through 14-8 present Box and Whisper plots for Zn, Ag, and Cu which examine grade variances between the various resource categories. No material discrepancies are noted between the data.

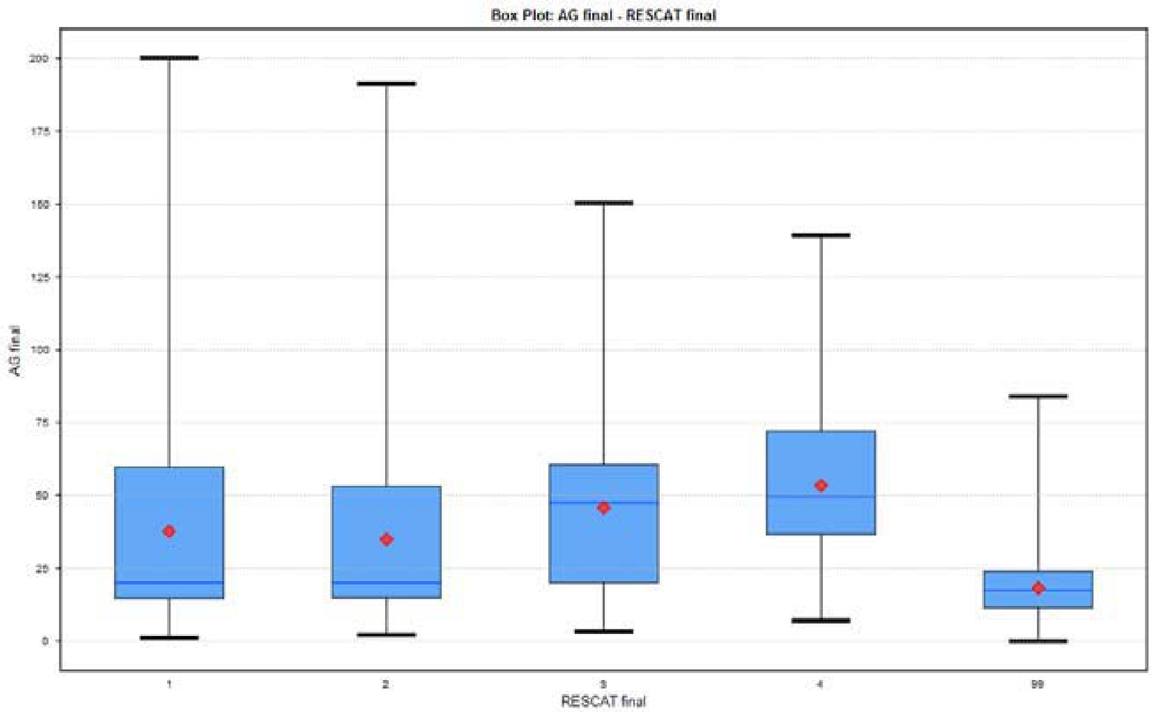
FIGURE 14-6 ZN GRADE BY CLASSIFICATION, ALL DOMAINS



	1	2	3	4	99
Min	0.30832	0.40899	0.37322	0.38858	1.9324e-05
Q1	4.4211	4.599	4.4128	3.6648	0.74761
Median	5.4947	5.8019	5.3868	4.8054	1.1422
Q3	6.6892	7.0841	6.4035	5.417	1.5762
Max	17.862	18.399	14.355	10.155	8.0181
Mean	5.6112	5.8691	5.4101	4.6162	1.2167
SD	1.7945	1.8584	1.481	1.3317	0.66847
N	1597764	905226	1685620	1227387	4862475

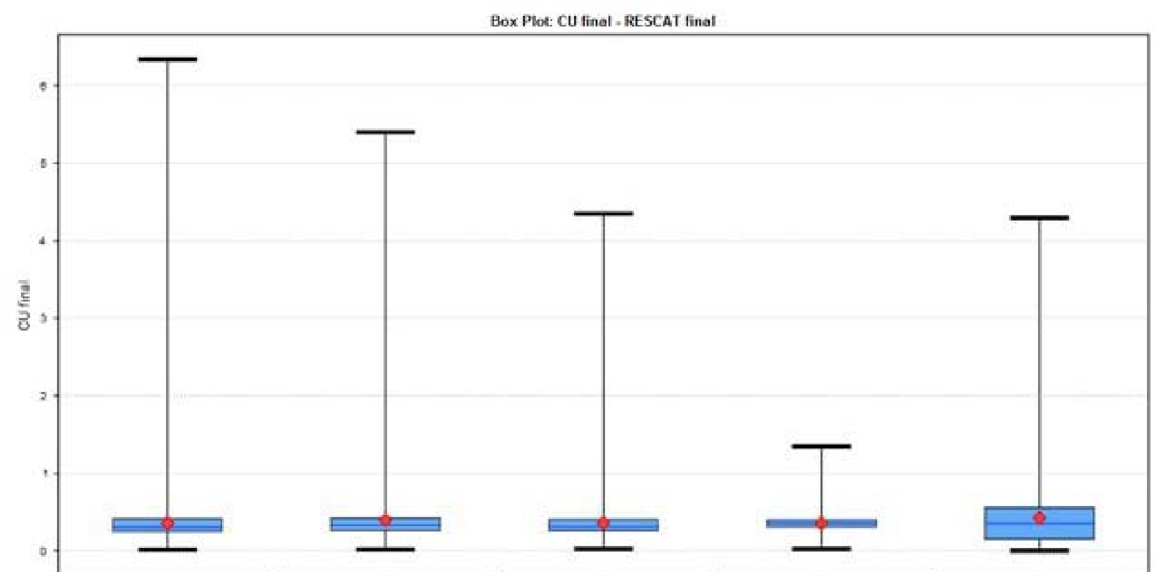
Note: 1 = Measured, 2 = Indicated, 3 = Inferred, 4 = Exploration Potential, 99 = Waste

FIGURE 14-7 AG GRADE BY RESCAT, ALL DOMAINS



Note: 1 = Measured, 2 = Indicated, 3 = Inferred, 4 = Exploration Potential, 99 = Waste

FIGURE 14-8 CU GRADE BY RESCAT, ALL DOMAINS



	1	2	3	4	99
Min	0.012566	0.016259	0.024855	0.02472	1.879e-06
Q1	0.24786	0.26679	0.25969	0.31174	0.15315
Median	0.30973	0.33242	0.31479	0.35812	0.35585
Q3	0.41052	0.4228	0.40286	0.39723	0.55806
Max	6.3367	5.399	4.3491	1.3488	4.294
Mean	0.35664	0.39697	0.36062	0.35487	0.42547
SD	0.21719	0.27523	0.2434	0.085719	0.38647
N	1596576	888720	1326229	813034	4850555

Note: 1 = Measured, 2 = Indicated, 3 = Inferred, 4 = Exploration Potential, 99 = Waste

BULK DENSITY

Prior to 2017, all Trevali models used standard fixed bulk densities for the massive sulphides (4.27 t/m^3), semi-massive sulphides (3.85 t/m^3), and the surrounding country rock (2.69 t/m^3). The values were derived from past reports and production data. In this estimate update, Caribou used measured bulk density for new drilling and maintained averages previously assigned for the earlier drill holes.

Table 14-13 presents the interpolated mean bulk density by domain.

TABLE 14-13 INTERPOLATED MEAN BULK DENSITY BY DOMAIN
Trevali Mining Corporation – Caribou Mine

Domain Type	Code	Domain Name	Mean Bulk Density (t/m^3)
Resource	110	L1_ORE_TK	4.17
	111	L1N_ORE_B	4.39
	120	LENS2MID	4.02
	121	L2N_ORE_TK	4.31
	122	L2S_ORE	4.22
	131	L3N	4.43
	132	L3S_ORE	4.18
	140	L4_ORE_TK	4.13
	160	L6_ORE_TK	3.93
	181	L8N	3.83
Sulphide	200	L4S	3.15
	210	L1N	3.77
	220	L2S	3.69
	221	L2N	3.71
	230	L3S	3.14
	260	L6	3.30

RPA reviewed the relationship between Zn+Pb grade to measured density and notes a relatively good correlation. RPA therefore recommends that Trevali test density weighting the block grade estimate.

CUT-OFF GRADE

The Mineral Resource cut-off grade for the Caribou mine is a 5% Zn equivalent (ZnEq) based upon the approximate cost of milling and transport of ore to surface. Copper and gold are currently not considered economic or recoverable and are therefore not included in the ZnEq calculation. The ZnEq formula used for the 2017 Mineral Resource estimate is presented below:

ZnEq = Zn (%) + 0.666*Pb (%) + 0.515*Ag (oz/ton)

MINERAL RESOURCE CLASSIFICATION

Definitions for resource categories used in this report are consistent with CIM (2014) definitions as incorporated by reference into NI 43-101.

Mineral Resources were classified using the four pass search ellipse system and the data requirements assigned during the interpolation as a guide. Passes 1 to 3 represent Measured, Indicated, and Inferred Mineral Resources, respectively. Pass 4 is not considered part of the Mineral Resource and was only populated to fill the block volumes. Material in the sulphide shells was assigned a code of 99. As the search ellipse passes produce a patchy distribution of blocks in various resource categories, the classification was assigned using hand digitized shapes (Figure 14-9).

In RPA's opinion the classification criteria are reasonable given that the substantial smoothing of the classification is a result of additional confidence gathered from geological development mapping and channel sampling.

MINING DEPLETION

Following estimation and classification, the block model was depleted using wireframe shapes representing the actual development and stoping void solids from survey pick-ups and cavity monitoring surveys (CMS) (Figure 14-10).

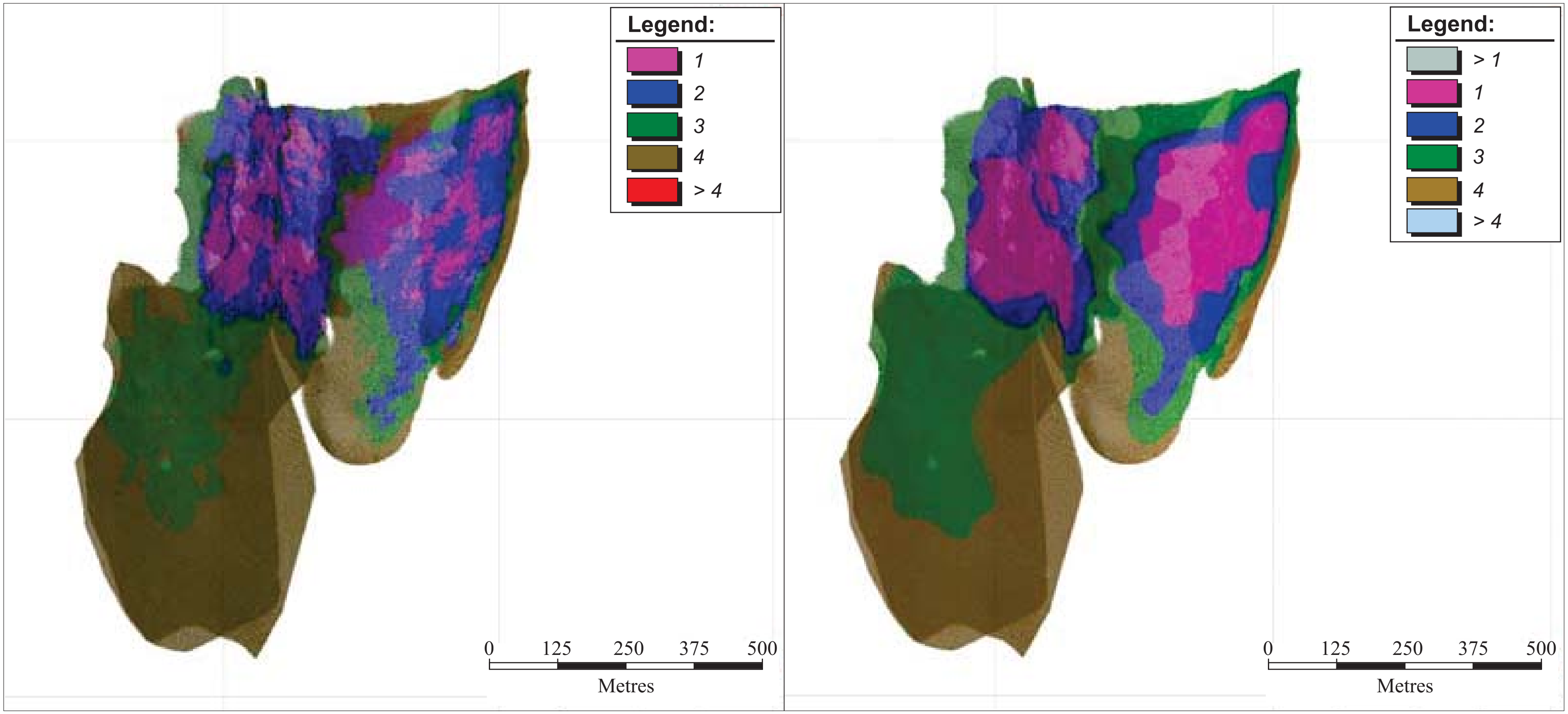
Void shapes were received from the site in Deswik format and converted to a DXF. A separate Leapfrog Geological Model was then generated from the voids and the information was tagged to the model.

All the attributes of the affected blocks were then reset to default values.

One copy of the non-voided block model is also saved for past-production reconciliation purpose.

Original RESCAT

Edited RESCAT



Looking North-East

Figure 14-9

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Original vs Edited RESCAT Results

May 2018

Source: Trevali, 2018.

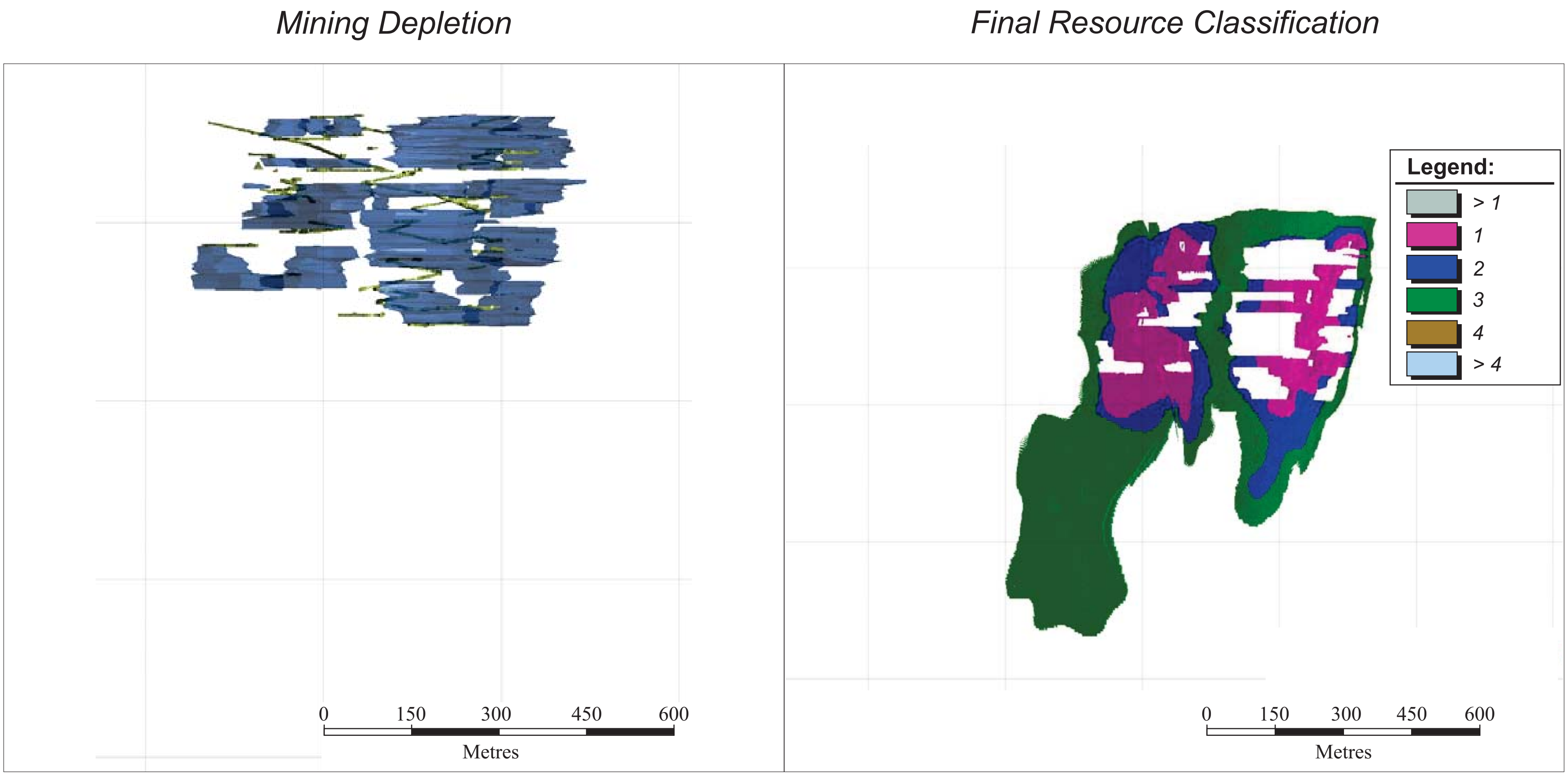


Figure 14-10

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Mining Depletion and Final Mineral Resource Classification

Looking North-East

May 2018

Source: Trevali, 2018.

MINERAL RESOURCE STATEMENT

Table 14-14 lists the Mineral Resources individually for each lens and Mineral Resource category. No Mineral Resources have been reported for Domain 182 since the domain has poor data coverage.

TABLE 14-14 MINERAL RESOURCES BY CLASSIFICATION AND DOMAIN – AS AT DECEMBER 31, 2017
Trevali Mining Corporation – Caribou Mine

Class	Domain	Tonnes	Grade					
			ZnEq (%)	Zn (%)	Pb (%)	Ag (g/t)	Cu (%)	Au (g/t)
Measured	110	1,227,000	8.62	6.28	1.98	62	0.47	0.18
	111	103,000	7.21	5.20	1.66	54	0.66	-
	120	33,000	7.56	5.84	1.45	46	0.56	0.17
	121	1,125,000	8.52	6.11	2.09	61	0.29	1.43
	122	397,000	8.18	5.96	1.93	57	0.43	1.23
	131	270,000	12.27	8.32	3.26	107	0.34	-
	132	661,000	9.08	6.36	2.22	75	0.49	1.83
	140	1,315,000	8.16	5.61	2.34	59	0.30	0.41
	160	605,000	9.16	5.78	2.88	88	0.27	0.64
	181	39,000	10.61	6.89	3.48	85	0.21	-
	182	-	-	-	-	-	-	-
	183	89,000	8.87	6.19	2.36	67	0.24	-
Total Measured		**5,865,000**	**8.73**	**6.11**	**2.27**	**67**	**0.37**	**0.76**
Indicated	110	508,000	7.72	5.61	1.78	56	0.50	0.72
	111	13,000	6.81	4.81	1.59	57	0.80	-
	120	153,000	7.71	5.71	1.74	51	0.44	0.32
	121	265,000	7.44	5.27	1.86	56	0.32	1.42
	122	167,000	8.13	5.91	1.91	57	0.46	1.32
	131	131,000	11.36	7.61	3.01	105	0.38	-
	132	346,000	8.79	6.13	2.18	73	0.56	1.67
	140	895,000	9.68	6.54	2.75	80	0.33	0.48
	160	402,000	9.50	6.37	2.76	78	0.30	0.66
	181	14,000	8.58	5.80	2.60	63	0.19	-
	182	-	-	-	-	-	-	-
	183	134,00	7.73	5.49	2.00	55	0.24	-
Total Indicated		**3,028,000**	**8.82**	**6.11**	**2.32**	**70**	**0.39**	**0.75**

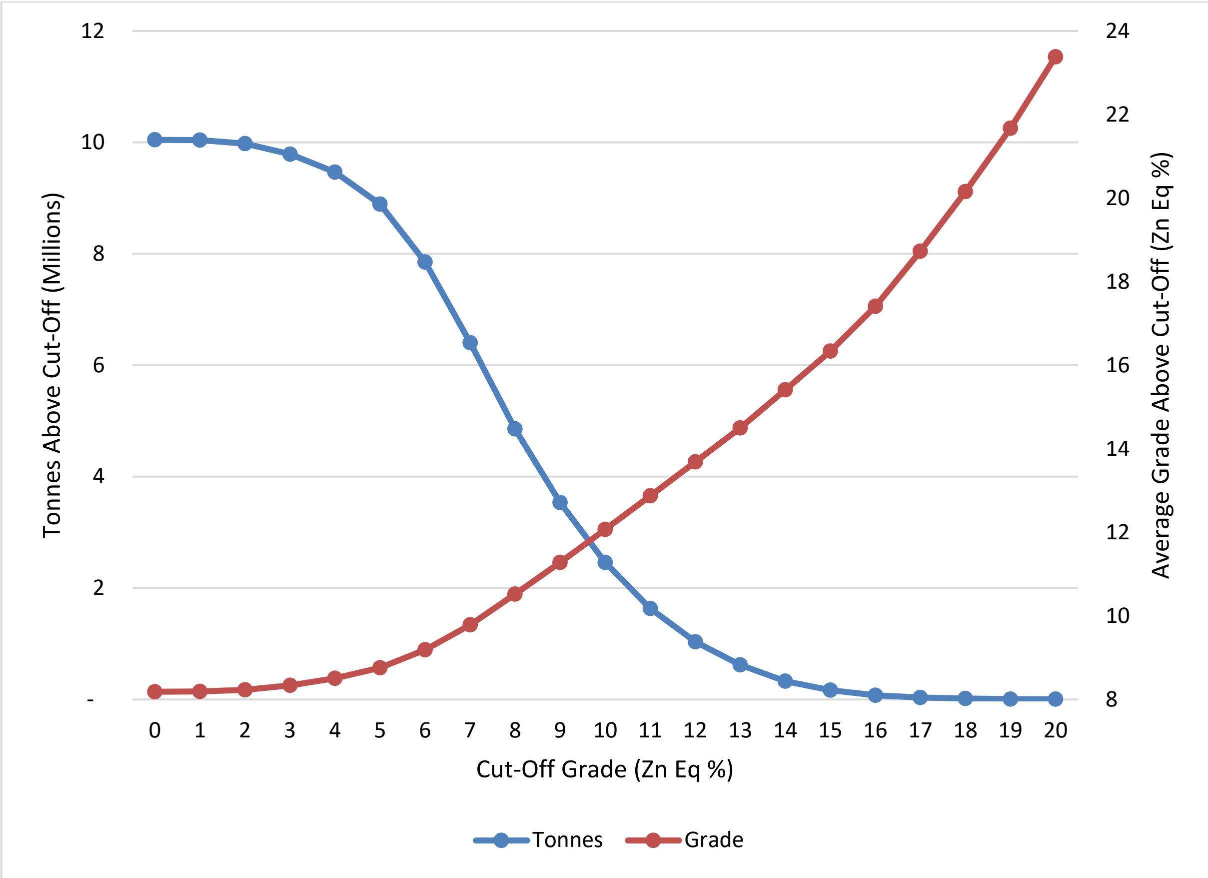
Class	Domain	Tonnes	Grade					
			ZnEq (%)	Zn (%)	Pb (%)	Ag (g/t)	Cu (%)	Au (g/t)
Total M+ I	110	1,735,000	8.36	6.08	1.92	60	0.48	0.34
	111	116,000	7.17	5.16	1.65	55	0.67	-
	120	186,00	7.69	5.73	1.69	50	0.46	0.29
	121	1,390,000	8.31	5.95	2.05	60	0.30	1.42
	122	564,000	8.16	5.94	1.92	57	0.44	1.25
	131	402,000	11.97	8.09	3.18	107	0.35	0.00
	132	1,008,000	8.98	6.28	2.21	74	0.52	1.77
	140	2,210,000	8.77	5.99	2.51	68	0.31	0.44
	160	1,007,000	9.29	6.01	2.83	84	0.28	0.65
	181	53,000	10.08	6.60	3.25	79	0.20	-
	182	-	-	-	-	-	-	-
	183	223,000	8.19	5.77	2.14	60	0.24	-
Total M + I		**8,893,000**	**8.76**	**6.11**	**2.28**	**68**	**0.38**	**0.76**
Inferred	110	1,987,000	8.2	5.9	2.0	57	0.2	1.1
	111	-	-	-	-	-	-	-
	120	8,000	6.0	4.4	1.3	41	0.9	0.7
	121	2,719,000	7.3	5.2	1.8	54	0.3	1.7
	122	5,000	6.2	4.6	1.4	40	1.4	1.6
	131	291,000	9.9	6.7	2.6	90	0.4	-
	132	342,000	8.9	6.2	2.3	71	0.4	1.9
	140	911,000	9.3	5.9	2.7	93	0.3	0.8
	160	677,000	8.9	5.8	2.7	81	0.3	0.8
	181	3,000	9.0	6.3	2.6	64	0.2	-
	182	-	-	-	-	-	-	-
	183	41,000	8.7	6.1	2.3	66	0.3	-
Total Inferred		**6,985,000**	**8.1**	**5.7**	**2.1**	**65**	**0.3**	**1.3**

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources are estimated at a 5% zinc equivalent cut-off grade with metal prices of: US$1.21/lb zinc, US$1.00/lb lead, US$18.50/oz silver, FX: US$/CAD$0.80.
4. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
5. Numbers may not add due to rounding.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

The Mineral Resources of the Caribou mine are sensitive to the selection of the reporting cut-off grade. To illustrate this sensitivity, the Measured and Indicated quantities and grade estimates are presented as a ZnEq grade tonnage curve in Figure 14-11.

FIGURE 14-11 MEASURED + INDICATED (MI) RESOURCE GRADE (ZNEQ) TONNAGE CURVES



TREVALI RECONCILIATION – AMINE BLOCK MODEL VS. ACTUAL MINE PRODUCTION

The final QA check on the block model is the month end Mill/Mine reconciliation performed by the Caribou Geology department. Since start-up, the reconciliation has been very close, as can be seen in Table 14-15, which presents a comparison of Amine mine block model mine production versus the mill production since Trevali commenced mining and milling. RPA notes that this comparison is based on adjustments to the mining shapes within Amine.

TABLE 14-15 TREVALI RECONCILIATION – AMINE BLOCK MODEL VS. MILL PRODUCTION
Trevali Mining Corporation – Caribou Mine

Item	Tonnes	Zn (%)	Pb (%)	Ag (g/t)
Amine Mine Block Model	2,166,759	6.00	2.54	70.33
Mill Production	2,138,086	5.87	2.49	74.28
Ratio Mill/Mine	1.01	1.02	1.02	0.95

In order to verify the validity and the accuracy of the mine's grade block model for monthly mine planning and resource/reserve estimations, a reconciliation is conducted at the end of each month. This exercise consists of comparing the actual mill head tonnes and grade for the month to the actual adjusted mine tonnes and the associated grade estimated from the block model. The final drill and blast layouts and the CMS are used. The adjusted mine tonnes may also include a visually estimated dilution tonnage, consisting of low-grade pyritic sulphides and waste rock. On a monthly basis, there are some variations, which are mainly due to the effect of the ore stockpiling on surface. The broken ore can remain in the surface stockpile for several months, complicating the monthly reconciliation. However, on a yearly basis, the comparison is very good between the mill head weighted tonnage and assayed grade and the mine estimated tonnage and estimated grade.

As of the date of this report, no comparison has been made for 2017 production against the new Leapfrog model. A very preliminary comparison between the Amine Model and the Leapfrog model indicates that the tonnages are similar, however, the Leapfrog model grades may be overestimated by approximately 5% to 7%. RPA strongly recommends that these reconciliation studies be completed on a monthly basis and summarized for year-end review and model validation/calibration.

COMPARISON TO PREVIOUS ESTIMATE

The previous Mineral Resource estimate for Caribou was prepared by SRK in 2014 (SRK, 2014). Table 14-16 presents a comparison between the 2014 and 2017 estimates.

TABLE 14-16 COMPARISON TO PREVIOUS ESTIMATE
Trevali Mining Corporation – Caribou Mine

2014 Mineral Resources (SRK)

Category		Grade					Contained Metal				
	Quantity (Mt)	Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)	Cu (%)	Au (M oz)	Ag (M oz)	Pb (M lbs)	Zn (M lbs)	Cu (M lbs)
Measured	5.61	0.84	84.64	2.93	6.91	0.46	0.15	15.28	362.69	855.36	56.94
Indicated	1.62	1.06	83.68	2.94	7.28	0.34	0.06	4.36	104.95	259.87	12.14
Measured and Indicated	**7.23**	**0.89**	**84.43**	**2.93**	**6.99**	**0.43**	**0.21**	**19.64**	**467.64**	**1,115.23**	**69.08**
Inferred	3.7	1.2	78.3	2.8	6.9	0.3	0.14	9.21	226.6	560.44	25.8

2017 Mineral Resources (RPA)

Category		Grade					Contained Metal				
	Quantity (Mt)	Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)	Cu (%)	Au (M oz)	Ag (M oz)	Pb (M lbs)	Zn (M lbs)	Cu (M lbs)
Measured	5.87	0.76	67	2.27	6.11	0.37	0.14	12.65	293.81	790.84	47.89
Indicated	3.03	0.75	70	2.32	6.11	0.39	0.07	6.82	154.90	407.95	26.04
Measured and Indicated	**8.89**	**0.76**	**68**	**2.28**	**6.11**	**0.38**	**0.22**	**19.44**	**446.94**	**1197.71**	**74.49**
Inferred	7.0	1.3	65	2.1	5.7	0.3	0.28	14.59	326.29	869.59	43.09

Comparison

Category		Grade					Contained Metal				
	Quantity (Mt)	Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)	Cu (%)	Au (M oz)	Ag (M oz)	Pb (M lbs)	Zn (M lbs)	Cu (M lbs)
Measured	5%	-10%	-21%	-23%	-12%	-20%	-4%	-17%	-19%	-8%	-16%
Indicated	87%	-29%	-16%	-21%	-16%	15%	22%	56%	48%	57%	114%
Measured and Indicated	**23%**	**-15%**	**-19%**	**-22%**	**-13%**	**-12%**	**3%**	**-1%**	**-4%**	**7%**	**8%**
Inferred	91%	2%	-17%	-25%	-19%	-13%	100%	58%	44%	55%	67%

The difference in the tonnage and grades could be explained by the following:

- Metal price variance.
- Significant mine depletion of 2.2 Mt at 6.09% Zn, 2.54% Pb, 0.31% Cu, and 70.32 g/t Ag.
- Additional drilling totalling 51,912 m including 26,234 m of in-mine drilling to upgrade Inferred to Indicated and Measured as well as exploration drilling at depth on the north limb.
- More robust software for modelling and estimation (Leapfrog vs. Amine).
- Variance in cut-off grades for domain wireframing and reporting.

- o Caribou 2014 domains were based on a 7% Pb+Zn cut-off grade whereas Caribou 2017 modelling uses a 4% Zn+Pb cut-off grade. Lowering of the cut-off grade results in the increase of tonnage and decrease in grade

RPA VALIDATION

RPA reviewed the Caribou Mineral Resource interpolation inputs and methodology. Data was loaded into Micromine v.16.5 geological software. RPA also reviewed the Leapfrog models created by GZTS and tested sensitivity of the estimate to selection of the interpolation parameters by estimating zinc grades in one of the resource domains.

The block model was validated by completing a series of visual inspections against wireframes and drill holes. The checks showed good agreement between drill hole composite values along sections and plans.

RPA's overall compiled Mineral Resource estimate showed no material differences to that reported.

RPA COMMENTS ON SOFTWARE MIGRATION

In 2017, Trevali began moving from the Amine mine design and planning software to Leapfrog and Deswik. All domain modelling for the 2017 Mineral Resource estimation was completed in Leapfrog Geo by Caribou geologists and the interpolation was completed by GZTS in Leapfrog Edge.

In RPA's opinion, the 2017 Mineral Resource estimate completed in Leapfrog is reasonable. RPA, does, however, note that considerable work is still required in order to implement new software that will replace the previously integrated geology/mine planning system at Caribou with the same robustness and operational flexibility.

15 MINERAL RESERVE ESTIMATE

As at December 31, 2017, Proven and Probable Mineral Reserves at Caribou, as reviewed by RPA, total 5.11 Mt grading 5.84% Zn, 2.15% Pb, and 63.2 g/t Ag containing 298,100 t of zinc, 109,800 t of lead, and 10.4 million ounces of silver (Table 15-1). RPA is not aware of any mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

TABLE 15-1 MINERAL RESERVE SUMMARY – AS AT DECEMBER 31, 2017
Trevali Mining Corporation – Caribou Mine

Classification	Tonnes (M)	Grade Zn (%)	Grade Pb (%)	Grade Cu (%)	Grade Ag (g/t)	Contained Metal Zn (Tonnes)	Contained Metal Pb (Tonnes)	Contained Metal Cu (Tonnes)	Contained Metal Ag (000 oz)
Proven	2.62	5.82	2.14	0.35	64.3	152,900	56,000	9,200	5,400
Probable	2.48	5.85	2.17	0.39	62.1	145,200	53,800	9,600	5,000
Proven and Probable	**5.11**	**5.84**	**2.15**	**0.37**	**63.2**	**298,100**	**109,800**	**18,800**	**10,400**

Notes:
1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at an NSR cut-off value of $65/t.
3. Mineral Reserves are estimated using average consensus forecast long-term prices of US$1.21/lb zinc, US$1.00/lb lead, US$18.50/oz silver, FX: US$/C$0.80.
4. Numbers may not add due to rounding.

Mineral Reserves are estimated from the Measured and Indicated Mineral Resources. Mineral Reserve stope blocks have generally the same shape as the Mineral Resource stope blocks. Based on past and forecasted operating performance, dilution and mining recovery factors are applied. After positive economic analysis, the Measured Resource blocks are converted to Proven Reserve stope blocks and the Indicated Resource blocks are converted to Probable Reserve stope blocks. Designed stopes are classified based on the most dominant resource category(s) within the stope shape. If there are greater than 50% Measured Mineral Resources within the stope block, then the block is given a Measured classification, however, if the stope block contains less than 50% Measured Mineral Resources and greater than 50% Measured + Indicated Mineral Resources, then it is given an Indicated classification. Reserve stopes are normally optimized through further engineering and occasionally with some additional delineation drilling.

In RPA's opinion, the process is consistent with industry standards.

MINING MODIFYING FACTORS

NET SMELTER RETURN CALCULATION

Revenue of any given parcel of material is calculated using an NSR equation. NSR is the net revenue received by the mine from the sale of the zinc, lead, and silver metal less the transportation and processing costs. Table 15-2 shows the assumptions and parameters used in the NSR calculation that were incorporated into the resource block model for mine design.

In order to estimate Mineral Reserves, Trevali used an NSR value ($/t) to determine whether a mining shape/stope meets the economic cut-off criteria for inclusion into the mining plan.

TABLE 15-2 PARAMETERS USED IN NET SMELTER RETURN CALCULATION
Trevali Mining Corporation – Caribou Mine

Item	Unit	Metal Price US$	Mill Recovery (%)
Zn	$/lb	1.21	82
Pb	$/lb	1.00	64
Cu	$/lb	3.00	-
Ag	$/oz	18.50	35
Au	$/oz	1,250	3
Exchange Rate	C$/US$	1.25	-

The NSR equation takes all the latest financial and recovery information to generate a single revenue dollar figure for any particular grade combination found in the mine. The calculation uses assumptions for metal prices, current concentrator recoveries, and budgeted downstream transport and realization costs.

The NSR value for the various metals are:

- $12.05/% Zn
- $8.02/% Pb
- $0.20/g Ag

The equation is applied throughout the geological model to populate an NSR field for each individual block.

NSR CUT-OFF VALUE

Costs used for the calculation of the NSR cut-off value have been extracted from the actual 2017 operating costs (Table 15-3).

The costs include:

- Mining, milling, general and administration (G&A), and environmental costs based on actual Trevali-Owner operated Caribou costs;
- Royalties based on current royalty agreements for Caribou operation;
- Offsite trucking costs based on actual costs;
- Total site capital costs based on projected capital costs over the LOM; and
- Interest on Capital Lease based on actual costs.

TABLE 15-3 NET SMELTER RETURN CUT-OFF VALUE ESTIMATION
Trevali Mining Corporation – Caribou Mine

Item	Unit	NSR Cut-Off Value
Underground Production Rate Estimate	tpd	3,000
Mining Operating Cost	$/t	23.74
Milling Operating Cost	$/t	24.13
G&A Cost	$/t	3.44
Environmental Cost	$/t	3.82
Site Total Operating Cost / Tonne Milled	$/t	**55.13**
Royalty	$/t	1.58
Offsite Trucking	$/t	1.66
Total Site Capital Costs	$/t	6.29
Interest on Capital Lease	$/t	0.76
Total Cost	**$/t**	**65.42**

Note: NSR cut-off value rounded to $65/t

DILUTION

Dilution has been applied by adding an additional 0.3 m to the FW and 0.3 m to the HW of each stope in Deswik which uses the block model grades to determine the dilution grade. This distance of overbreak is an average over the area of the stope FW and HW and is based on the theory of equivalent linear overbreak/slough (ELOS) (Stewart and Trueman).

Due to the extreme variation in characteristics between ore and waste, the LHD operators have historically been able to separate a large portion of dilution from the ore material at the stope drawpoints.

Internal dilution is the combined waste sulphides and waste rock mined with the Mineral Reserve from inside defined mining lines. Mining lines are established for each stope or mining block to account for dilution and recoveries. Mining lines are generally determined by the width of the lens, with a minimum width of 3.5 m.

MINING RECOVERY

Based on historical records Trevali has defined the anticipated mining recovery of stopes by mining zone.

Mining recovery for the majority of the stopes using the modified Avoca mining method has averaged 94%. This varies by zone and is detailed in Table 15-4. The mining recovery for the remaining minority of stopes has averaged 81% as detailed in Table 15-5, however, the 94% recovery was applied to all zones, except for sill pillars where a mining recovery of 78.5% was applied.

TABLE 15-4 HISTORICAL RECOVERY OF STOPE TONNES (MAJORITY)
Trevali Mining Corporation – Caribou Mine

Zone	Number of Stopes	Total Tonnes	Stopes Recovery (%)
1	21	180,145	94
5	6	45,019	91
6	2	22,744	81
8	31	310,429	95
10	6	41,964	97
11	18	230,513	91
14	19	121,413	99
Total	**103**	**952,227**	**94**

TABLE 15-5 HISTORICAL RECOVERY OF STOPE TONNES (MINORITY)
Trevali Mining Corporation – Caribou Mine

Zone	Number of Stopes	Total Tonnes	Stopes Recovery (%)
2	9	76,602	87
4	1	7,820	59
7	15	138,673	81
9	5	25,071	77
12	14	112,249	81
13	1	11,859	76
Total	**45**	**372,274**	**81**

RPA recommends that additional reconciliation studies be completed to confirm stope dilution and extraction assumptions.

STOPE DESIGN

Trevali selected the Caribou stope designs using design guidelines that included an NSR cut-off value, as discussed in the previous section, and a minimum mining width of 3.5 m. The stope design process followed these steps:

- Regional contacts were defined by Trevali geologists to generate mineralized shells.
- Mining level spacing and elevations, including sill pillar locations, were defined based on operational experience and overall mine stability, generally following Caribou PEA design locations.
- Potential mining shapes were generated based on the above two items and stope dimension guidelines.
- Mining shapes were evaluated to meet the $65/t NSR cut-off value.
- The Caribou current active block model was used to report in situ tonnes, NSR, and metal grades inside the mining shapes.
- External dilution was added by including an additional 0.3 m on the FW and 0.3 m on the HW.
- Mining recoveries were applied based on current performance.

Mining shapes were automatically designed by slicing the mineralized shells using Mineable Stope Optimizer (MSO) in Deswik.

Figure 15-1 shows an isometric view of the north limb of the orebody. Figure 15-2 shows an isometric view of the east limb of the orebody. The entire development infrastructure is on the horseshoe centre of the HW side. Figure 15-3 shows the 2060 elevation (2060 Level Sub-5) plan view.

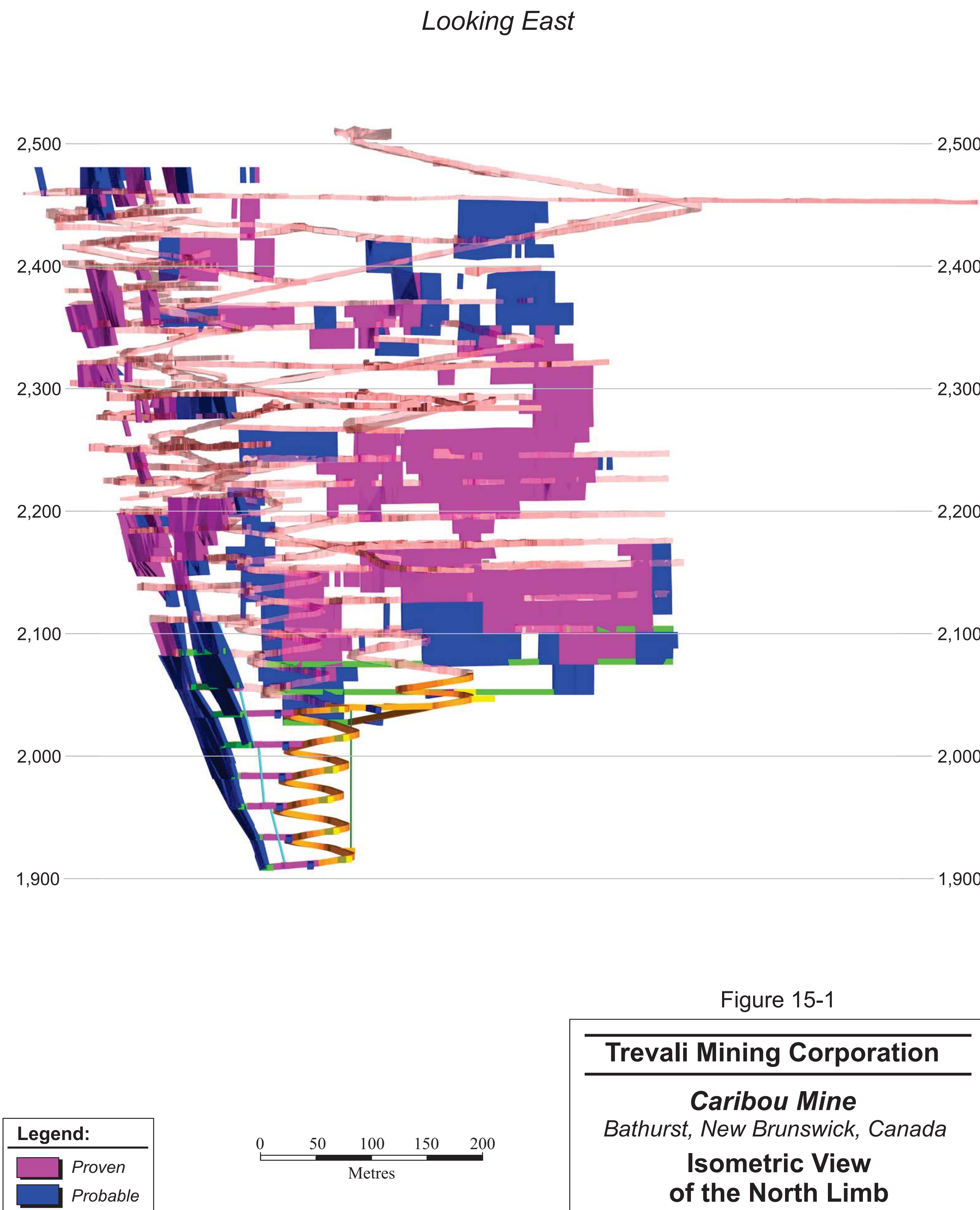


Figure 15-1

Trevali Mining Corporation

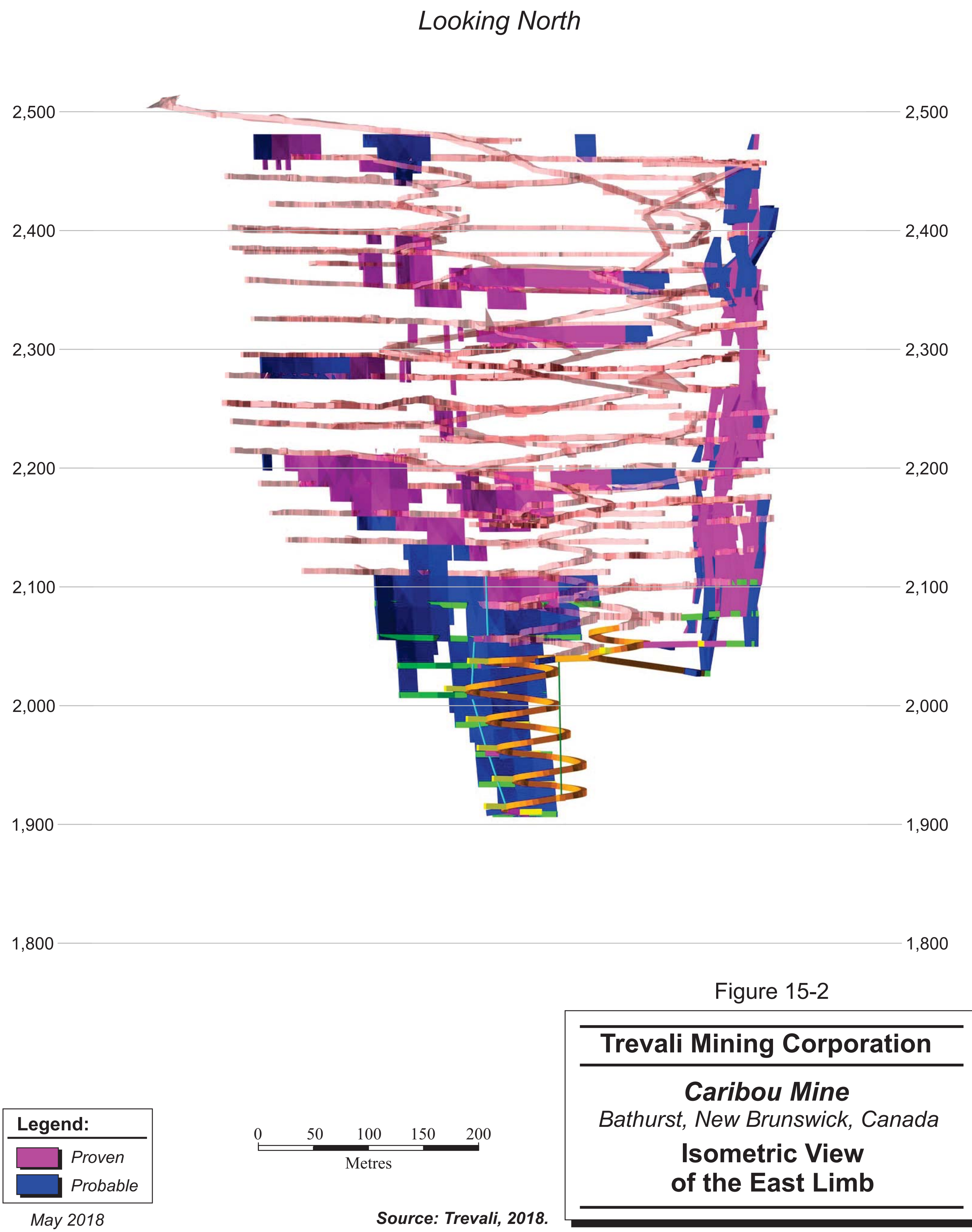
Caribou Mine

Bathurst, New Brunswick, Canada

Isometric View of the North Limb

May 2018

Source: Trevali, 2018.



Source: Trevali, 2018.

Figure 15-2

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Isometric View of the East Limb

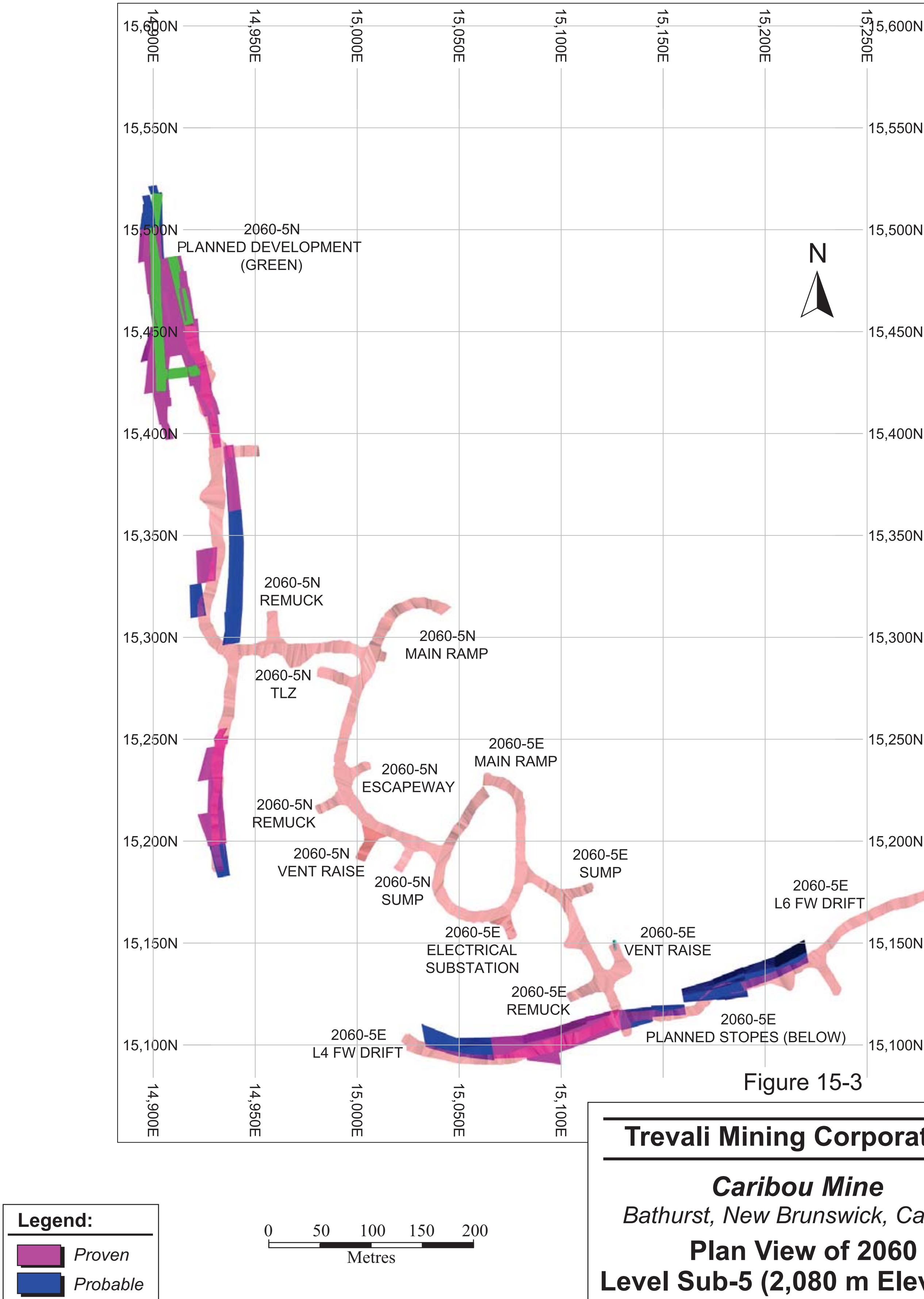


Figure 15-3

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Plan View of 2060 Level Sub-5 (2,080 m Elevation)

May 2018

Source: Trevali, 2018.

16 MINING METHODS

INTRODUCTION

Access to the underground mine is via a connected, dual-ramp system, with an existing Main 2460 Portal located on the north side of the deposit, and an existing 2560 Portal located on the east side near the crusher pad, which connects to the main ramp near the top of the 2360 Level (Figure 16-1).

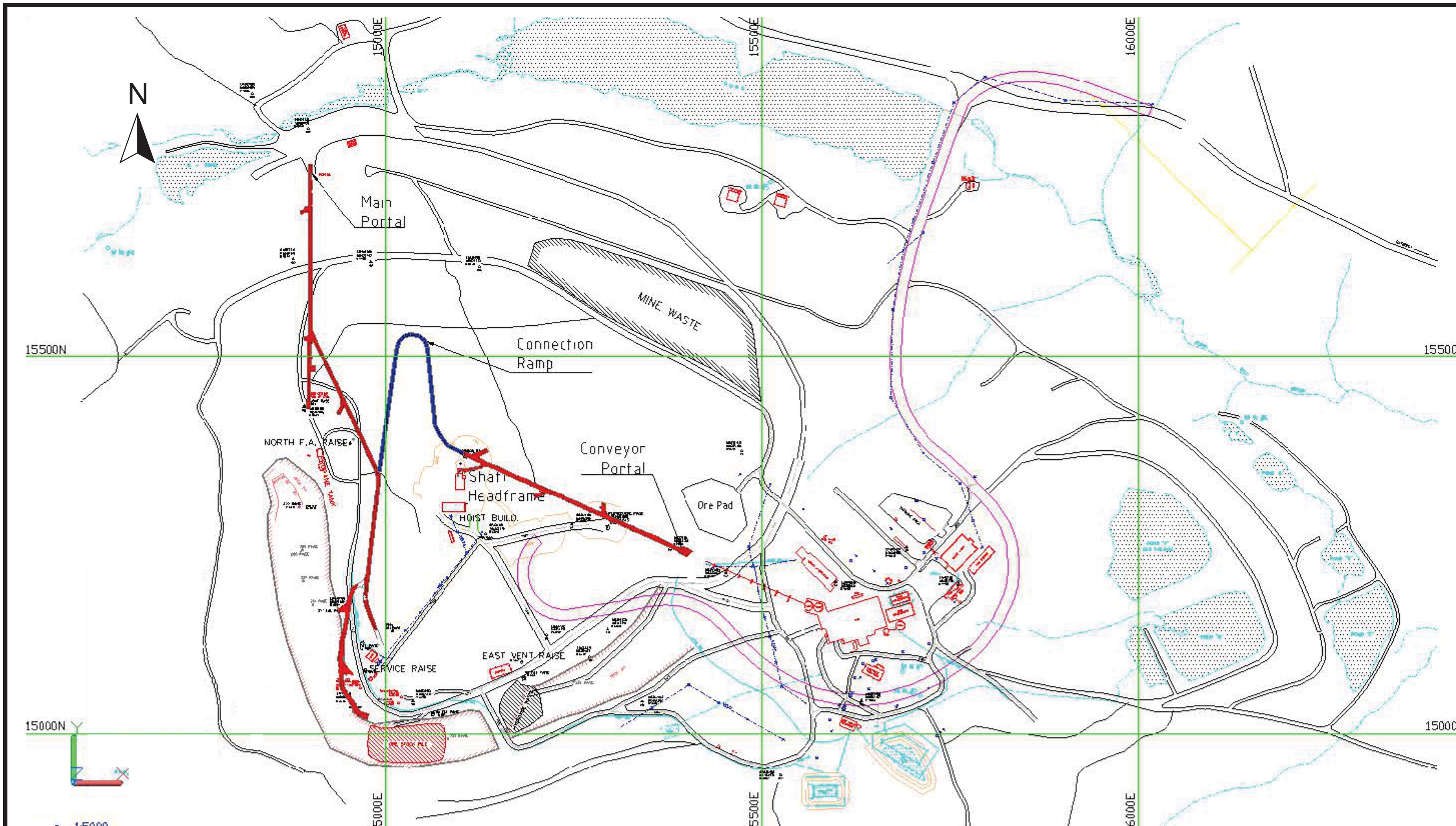
During past operations ore was skipped to surface using an existing shaft and then conveyed through a conveyor gallery to the Fine Mill-Feed Bins. Trevali decided to use truck haulage over shaft hoisting based on the following considerations:

- Reduced capital expenditure;
- Utilization of the existing declines; and
- Operations reliability.

During 2015, the construction of an underground ramp connection to the existing conveyor portal (approximately 400 m of development) was completed which allowed operational efficiencies by reducing the underground haul distance to a stockpile within approximately 100 m of the Fine Mill-Feed Bins versus the previous approximately 1.5 km surface haul route. This stockpile is the primary feed to the concentrator, and has a capacity of 50,000 tonnes.

As the mine had been placed on care and maintenance in 2009, pre-development mine dewatering and rehabilitation was carried out which commenced in May 2014 and was completed in July 2016. Mine water was pumped from the mine through a series of stages and the main service raise to surface, where it flowed into the site WTP. All mine water was treated in the site WTP with sludge and water deposited into the existing sludge cell at the STTP.

During the restart of the Caribou mine, extensive underground mine rehabilitation was completed, including slashing/widening of existing development headings, installing new and updated ground support, and installing new services and infrastructure. Although the required rehabilitation has been completed, rehabilitation crews are maintained on site for additional support or to repair support damaged by mining activities.



Legend:

- Gravel Road
- Road / Trail
- River / Stream
- Pond
- Building / Structure
- Fence
- Culvert
- Electrical Cable
- Water Line
- Control Station
- Monitoring Well

Figure 16-1

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Mine Major Surface Infrastructure and Major Underground Infrastructure Surface Projection View

May 2018

Source: Trevali, 2014.

All new ramps are designed at a maximum gradient of -15%, with dimensions of 5.0 m wide by 5.0 m high.

Each main ventilation raise in the north and east limbs will continue to be extended to the mine bottom as development to the mine bottom continues.

MINING METHOD

Modified Avoca is the main mining method, supplemented by uphole retreat for partial sill pillar recovery. This method uses development waste and surface-stockpiled waste (historical open pit and underground development waste) as backfill (Figure 16-2).

The characteristics of the Caribou deposit relevant to the mining method selection are provided below:

- It is a steeply dipping (85° to 90°) VMS polymetallic deposit.
- The massive sulphides consist of seven lenses striking parallel to the Caribou fold, forming a horseshoe shape in plan view.
- Lenses 1, 2, 3, 7, and 8 occur on the north limb of the Caribou fold, while Lenses 4 and 6 are mostly on the east limb of the fold; see Figure 7-3.
- The rocks are highly strained; the sulphide stringer zone appears to be stratabound, and individual sulphide lenses occur subparallel to bedding.
- The lenses have an average in situ thickness of 6.0 m, ranging from 2.0 m to 20 m (splay junction).
- The continuity of each lens is relatively good at a target of $65/t NSR value.

Modified Avoca is a longitudinal retreat mining method. Stope sequencing generally follows a retreat along strike from lens extremities or strategic starting points, and retreats to ramp access points, as shown in Figure 16-2. Based on local ground conditions and stability of the stope hanging wall and footwall, stope strike length can be easily adjusted to facilitate dilution control by varying the total number of rings blasted in stope. With modified Avoca, no rib pillars are required, since wall support for the mined-out areas is provided by the backfill.

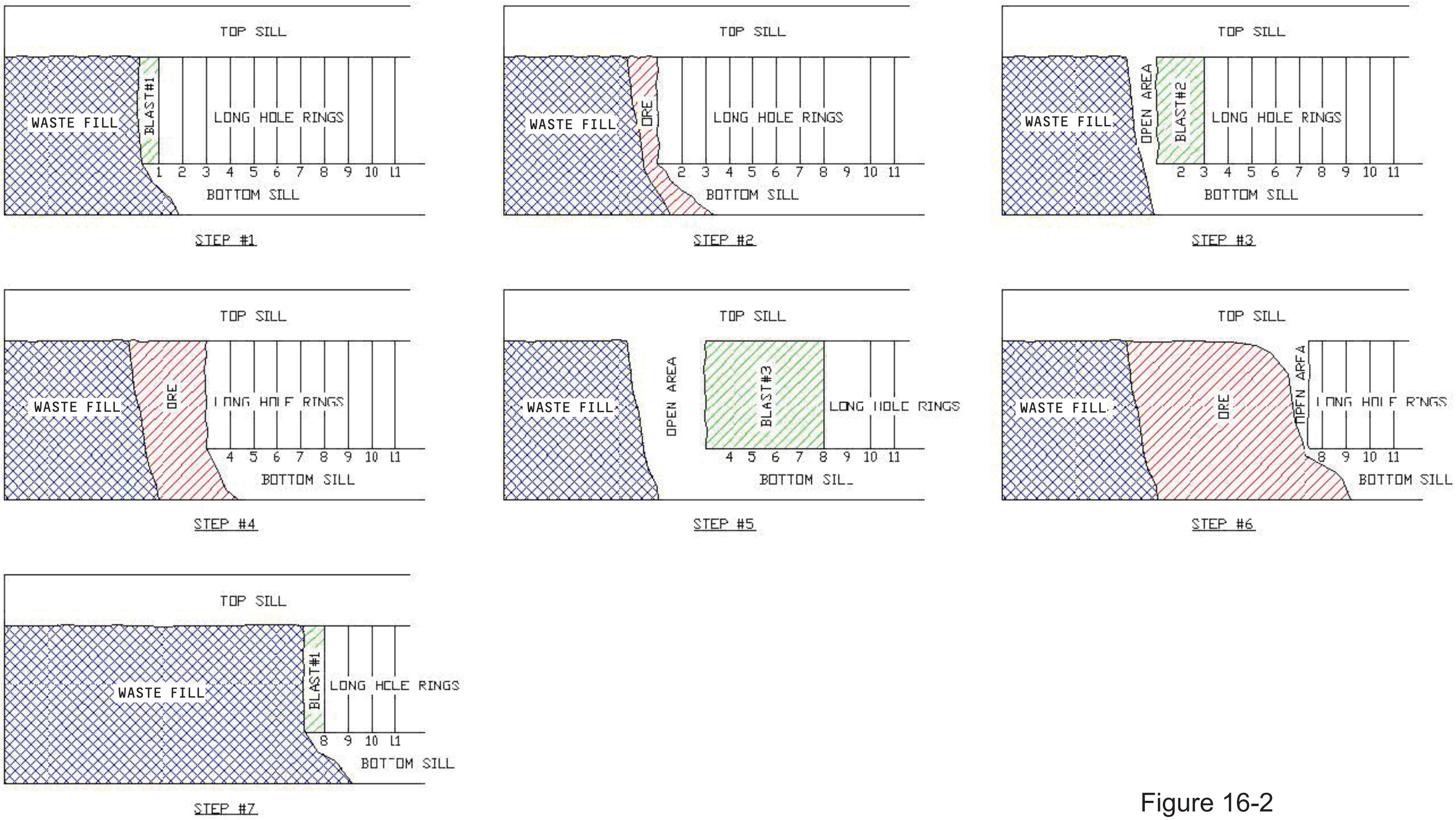


Figure 16-2

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Modified Tight-Fill Avoca Mining Method and Blasting Sequence

May 2018

Source: Trevali, 2014.

The stopes are typically excavated 16 m along strike, and to a nominal height of 25 m floor-to-floor. Stope width is normally the same as the lens width. A standard stope will yield approximately 10,600 tonnes of ore, including the development tonnes.

Blast holes are 16 m to 20 m downholes drilled at 76 mm diameter with a 2.0 m burden x 2.0 m spacing pattern. Some drill holes are fanned out where lens width exceeds 5.0 m. On average, the drill factor is 11.0 ore tonnes per metre of drilling.

Blast holes are loaded with either emulsion or ammonium nitrate/fuel oil (ANFO), depending on local water conditions, to an average powder factor of 0.45 kg/t. Slots are opened by drop raising on only the first stope of each retreat mining front. On average, one slot raise will suffice for four stopes. Trevali is planning to convert to use 1.1 m diameter raisebore holes for slots in all stopes.

Production mucking is undertaken by 14 t capacity Load-Haul-Dump (LHD) mobile equipment. Ore mucked from drawpoints is trammed to remuck bays located on each level close to the main ramp, then loaded into 40 t capacity haul trucks. Loaded trucks then travel up the ramp and dump material on the surface crusher pad located adjacent to the mill CV001 (Main Feed) conveyor.

When stope mucking is completed, the mined-out stope is tightly filled with waste rock; no cement is used for the backfill material. The practice of using unconsolidated fill has been demonstrated successfully at the Caribou mine during operating periods by Breakwater (1997-1998) and Blue Note (2007-2008), as well as throughout the Trevali operation of the site (2015 to present).

Under current practice, when the backfilling cycle is completed, the first ring in the next section/stope is blasted against the waste fill (Step #1). This action compacts the waste fill that remains near vertical when the blasted ore material is mucked. After the first ring is blasted, the ore is mucked out (Step #2) and the remainder of the stope is blasted as needed. Some variances to final stope blasts are used in different areas of the mine. These varying techniques are applied to ensure the smallest open hydraulic radius until the final blast for that stope is completed. During Q1 2018, this methodology is being changed to raisebore slots.

Within each stoping block, mining retreats in echelon along strike and up dip from the starting elevations of the block to ramp access drifts. Sill pillars between mining blocks are then recovered as the last stopes in the sequence. During sill pillar mining, upholes are drilled to a designed length to preserve a non-recoverable portion of the sill pillar, the thickness of which is based upon geotechnical data. Mining is on retreat, with remote mucking by LHDs. Since backfill is resting on the sill pillars while they are being extracted, the mining recovery of the sill pillars is lower than expected from typical stope blocks.

The goal of the mine plan is to recover portions of the planned sill pillars based on a geotechnical review by Andrieux & Associates Geomechanics Consulting Inc. The sill pillar mining method is an uphole retreat method.

The crown pillar will remain intact, and is not considered for recovery due to a lack of local geotechnical information to support mine planning.

MINE GEOTECHNICAL ASPECTS

During Trevali's operations of the Caribou mine, four external geotechnical reviews and resulting memorandums have been completed. The focus of the reviews has largely been on improving the stope shapes and extraction sequences, dimensions of development excavations, support standards, sill pillar extraction analysis, along with longer-term geotechnical considerations.

SUMMARY OF THE GEOLOGY

The Caribou deposit is composed of seven high-grade massive sulphide lenses within a pyrite-rich envelope, all folded about a steep northeast plunging fold axis, with one limb striking north–south and the other striking east–west. Both limbs plunge towards the north-northeast with a dip angle of 80° to 90°. Five lenses are located in the north limb (Lenses 1, 2, 3, 7, and 8) and have a higher lead and zinc content. Lenses 4 and 6 form the east limb.

MAIN LITHOLOGICAL UNITS

Massive Sulphides: mostly pyrite, sphalerite, galena, and chalcopyrite, with minor amounts of magnetite, pyrrhotite, and siderite.

Graphitic schist: dark schist with various amounts of quartz, muscovite, and graphite. It is a relatively weak, crumbling material.

Chlorite schist: various amounts of quartz, muscovite, and chlorite. It is more competent than the graphitic schist.

Phyllite (also referred to in some documents as sericitic schist): a thin-bedded metapelite, with variable amounts of quartz, muscovite, and graphite, and minor chlorite.

Hanging wall volcanic units: these units are mainly composed of a schist of volcanic origin. The shaft, main access drifts, and ramps are primarily located within these units.

FOOTWALL CONTACT

The FW contact is composed of phyllite for all ore lenses, with the exception of the southern part of Lens 2, where chloritic schist is dominant. The thickness of the contact zone ranges from 5 m to 20 m. Beyond the FW contact, the rock is composed of a mixture of graphitic and chloritic schist.

HANGING WALL CONTACT

For all massive sulphide lenses, a sharp HW contact exists, composed of an approximately 3 m to 20 m thick sedimentary phyllite band. The rest of the hanging wall is mostly composed of volcanic units.

MAJOR FAULTS

Two major fault systems intersect the lenses: a north–south trending fault, and an east–west trending fault. The north–south fault dips approximately 55° to the east. The east–west fault dips approximately 60° to the south. The north–south fault appears to be a single fault, whereas the east–west fault is accompanied by a system of subparallel secondary faults. The north–south fault intersects the main ramp and levels in several areas, as well as the north ventilation raise.

ROCK MASS CLASSIFICATION

A limited amount of information on rock mass quality was found in an internal memorandum dated 1998. The rock mass parameters available to date are summarized in Table 16-1.

TABLE 16-1 ROCK MASS PARAMETERS FOR THE MAIN LITHOLOGICAL UNITS
Trevali Mining Corporation – Caribou Mine

	RQD (%)	Q'	RMR	UCS (MPa)
Ore (massive sulphides)	75[1]	18.3[1]	67-70[1]	100[1]
Sericite Schist (phyllite)	25[1]	2.7[1]	48-53[1]	35[1]
Contact zone (2 m to 5 m)	-	-	18[1]	-
Estimated from site visit in February 2007. (in volcanics, away from faults)	70-90[2]	1.4[2] min 10 max 4 avg.	47-65[2]	70[2]

Notes:
1. MacRory, 1998.
2. Estimated from visual observations.
3. avg. = average; max = maximum; min = minimum; % = percent; RMR = Rock Mass Rating; UCS = Unconfined Compressive Strength; MPa = megapascal; Q' = Quality Index; RQD = Rock Quality Designation.

The rock mass quality expressed in Table 16-1 is based on two universally recognized classification systems: the Rock Mass Rating (RMR) and the Modified Rock Tunneling Quality Index (Q'). According to both classification systems, the data provided by the mine indicated that the massive sulphide ore zones can be classified as fair to good quality.

The phyllite that composes both footwall and the hanging wall close to the mineralization can be estimated to be of poor quality. No direct observation of these units has been made, however, the information provided in the historical records is in line with reports of rock mass behaviour and dilution reports during mining in 1998.

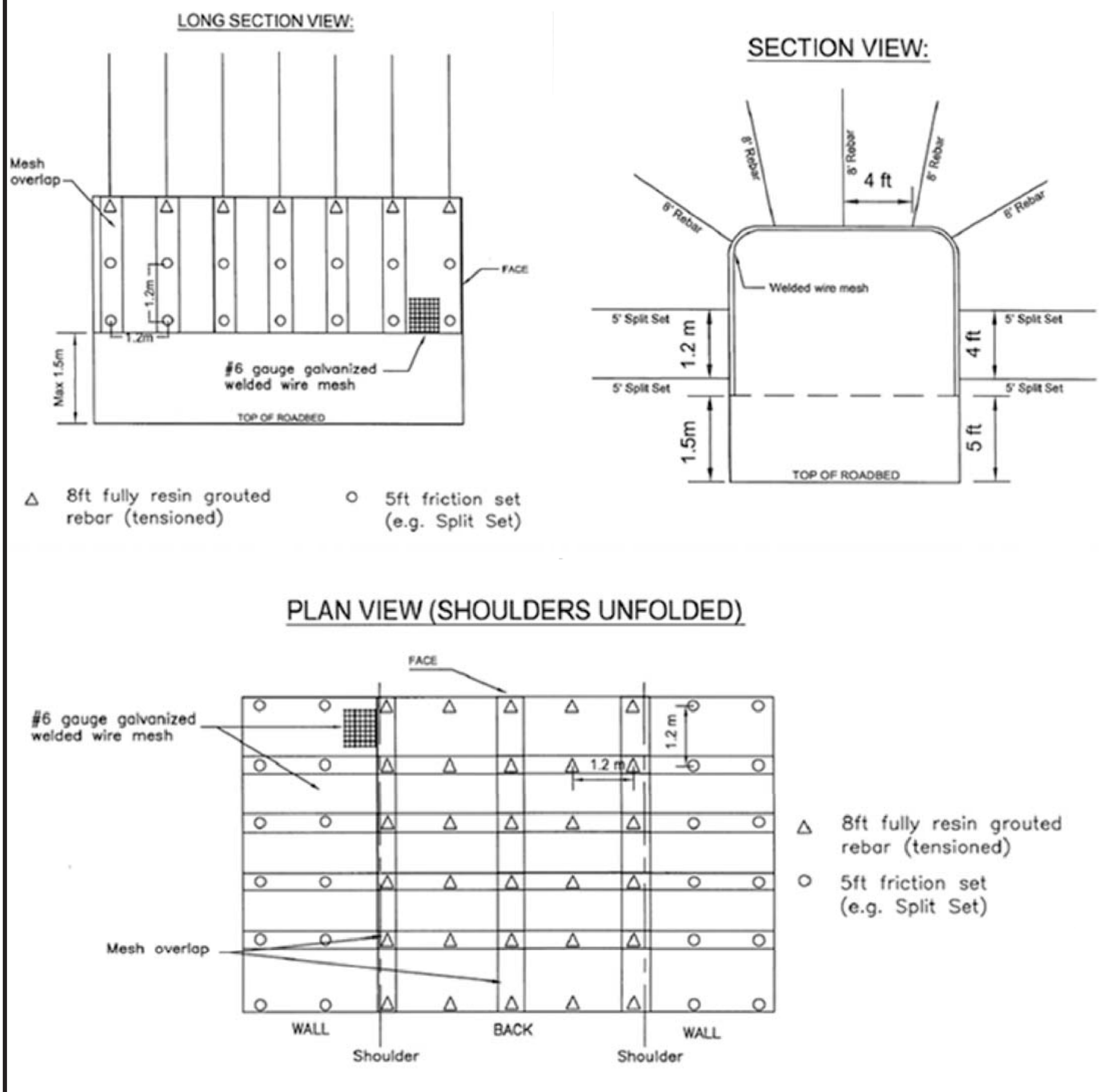
Since moving ahead with operations at Caribou, Trevali has retained Dr. Patrick Andrieux of Andrieux & Associates Geomechanics Consulting Inc. to review the ground conditions and ground support methodology. Through Mr. Andrieux's guidance, Trevali was able to advance stope and development optimization regarding stability.

STOPE DESIGN AND DILUTION CONTROL

Waste rock dilution represents an additional cost and causes production delays. Efforts are typically made to minimize dilution while ensuring maximum recovery of the lenses. The mining method selected by the Caribou mine, the Modified Avoca method, was introduced to the mining industry in the 1970s, and has been adopted by several mining operations since. The operational parameters and stope dimensions were refined in the first year of operations at Caribou mine. The stope heights vary between 15 m and 27 m from floor to floor. The stope length is controlled by the operators, and has been adjusted during the past two years to maximize stope stability. Initial mining started with a typical stope length of 20 m. The stope length has since been modified based on operational experience, with the typical design stope length being 16 m.

GROUND SUPPORT

Standard drifts are systematically bolted and screened. Current practice is to screen the back and walls down to within 1.5 m from the sill, as per Figure 16-3.



GROUND SUPPORT SPECIFICATIONS
THIS DRAWING DETAILS THE STANDARD GROUND SUPPORT SPECIFICATIONS FOR SPANS OF UP TO 6.5M WIDE.
ADDITIONAL GROUND SUPPORT MAY BE INSTALLED AS REQUIRED OR AS SPECIFIED.
ALL REBAR AND SETS TO BE INSTALLED WITH MINIMUM 4" SQUARE FACEPLATES ON A MAXIMUM 1.2m x 1.2m SQUARE PATTERN WITH A MINIMUM OF 6 REBAR OR SETS PER SCREEN (2 x 3 PATTERN).
ALL MATERIALS SHALL BE USED AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

ROOF SUPPORT
1) 8FT LONG, 3/4" (20MM) FULLY RESIN GROUTED REBAR SHALL BE USED IN THE BACK AND SHOULDERS.
2) ALL REBAR SHALL BE TENSIONED TO A MINIMUM OF 68Nm.

WALL SUPPORT
1) 5FT LONG FRICTION SETS SHALL BE USED IN WALL UNLESS DIRECTED OTHERWISE.
2) LOWEST ROW OF FRICTIONS SETS SHALL BE A MAXIMUM OF 1.8m FROM ROADBED.

SCREENING
1) #6 GAUGE GALVANIZED WELDED WIRE MESH SHALL COVER WALLS AND BACK EXTENDING DOWN THE WALLS TO A MINIMUM OF 1.5m FROM THE ROADBED.
2) MESH SHALL BE OVERLAPPED BY A MINIMUM OF 8" LATERALLY.
3) MESH SHALL EXTEND DOWN THE FACE, WHERE THE FACE IS THE END OF A DEVELOPMENT.

Figure 16-3

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Typical Ground Support for Standard Development

May 2018

Source: Trevali, 2018.

If any factors outside of standard parameters are identified, the matrix shown in Figure 16-4 is used to evaluate the ground support requirements using a rating system. This matrix has been developed using inputs and guidance from Dr. Andrieux. The matrix is an active document that is continuously updated based on new data and experience from continued operations at Caribou.

FIGURE 16-4 EXAMPLE USE OF CURRENT GROUND SUPPORT MATRIX CARIBOU MINE

INSIDE STOPES	Wide fault	Actual expected span			Dev. direction vs weak foliation		Rock mass quality			Depth	Situation in the sequence			Presence of water	Intersection		Within how many stope spans of that mined stope?		Intended life span		Total score
	(> 1m)	< = 6.5m	6.5-10m	10-12m	At angle	Parallel	Massive	Blocky	Wedges	> 350m	1st lifts	Last	Sill	Yes	3-way	4-way	> 1	< 1	< 18 mths	> 18 mths	
Points		0	22	45			0	3	20	*TBD*	0	19	32		18	21	0	4	0	0	
Selection				x					x		x				x		x				
Score				45					20		0				18		0				**83**

Criteria:	Between	0	and	21	points:	Primary support: resined 8 ft 20 mm rebar bolts + 6 gauge welded wiremesh screen + 5 ft Splitset friction bolts in walls to no more than 5 ft from the floor
	Between	22	and	44	points:	Primary support, plus 12 ft resined Spin cablebolts
	Between	45	and	73	points:	Primary support, plus 20 ft grouted cablebolts
	Between	74	and	87	points:	Primary support, plus straps between cablebolts and/or shotcrete posts - Try to avoid this situation
			Above	88	points:	Not supportable

SILL PILLAR EXTRACTION

Since Trevali has continued operation of the Caribou mine, there has been significant consideration put into both the design and operations of sill pillar extraction.

DESIGN

Sill pillar extraction is achieved by drilling 76 mm diameter longholes with similar spacing as standard downhole stope drilling. With current design, these holes are drilled to within 5 m of breakthrough to the fill above. Standard rings are dumped to 70° from horizontal. Drill rings that neighbour the previous stope are further offset and dumped at shallower angles so as to ensure that mine personnel are able to remain away from the open brow of the previous stope while drilling and loading the stope.

OPERATIONS

With a new mining method applied, a full review of the process and sequence was evaluated to ensure that the operators were able to achieve the plan in a safe manner. In order to keep drilling activities fully away from the adjacent open brow, a series of safety rings are pre-drilled.

SILL PILLAR RECOVERY

To date, Trevali has fully recovered three complete stopes using the sill pillar extraction method described above. Recovery of the stope was planned at 75% of ore tonnes. Actual ore recovery from the stope was slightly higher, approximately 80%. Using the planned recovery as a baseline, and reducing overall recovery by accommodating vertical rib pillars, the average planned recovery of sill pillars is 78.5%. This recovery was applied to all sill pillars in the mine planning stages. Pending results of an ongoing paste backfill study, the overall sill pillar recovery has the potential to achieve 80%.

MINE INFRASTRUCTURE

MINE DEWATERING

Dewatering activities consist of sump stations located on all of the main levels (1960 Level, 2060 Level, 2160 Level, 2260 Level, and 2360 Level) with enough pump capacity to move water up to the next main level, approximately 100 vertical metres. Interim sumps are located on all sublevels (at 20 m intervals between main levels), with all effluent flowing to the main level sump station below it, and consequently being pumped up to the main sump station on 2360 Level, to be pumped out of the mine via the main service raise.

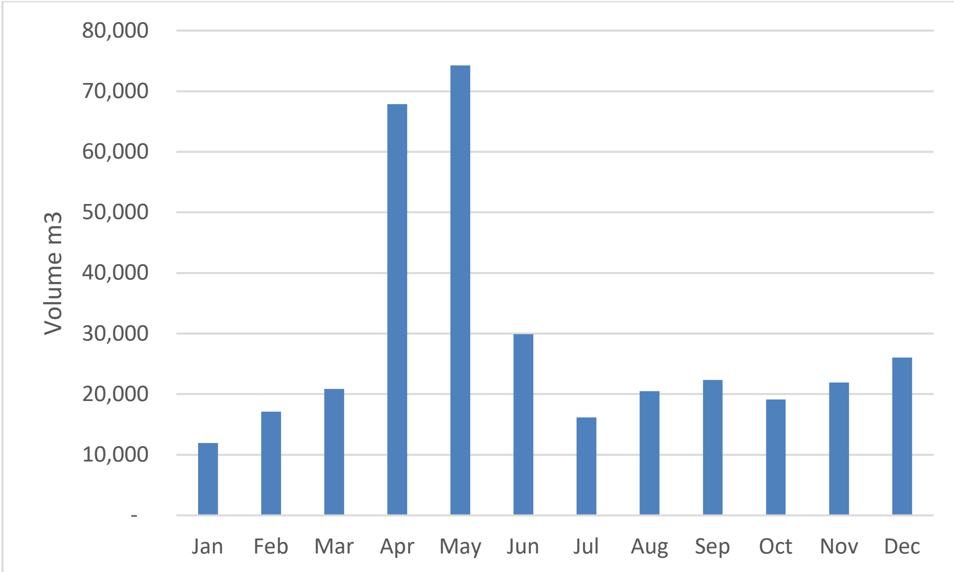
Auxiliary dewatering activities take place during mining activities to keep mining faces free from water, in the form of low horsepower electric pumps or pneumatic pumps.

Since restarting the Caribou mine, Trevali has taken daily measurements of water inflows through its WTP to evaluate the volume of water discharged from the mine through its pumping facilities. Figure 16-5 is a summary of the 2017 mine dewatering records by month. It should be noted that the majority of the mine dewatering occurs between the months of April and June.

To mitigate risks involved with significant water inflows during peak runoff periods, Trevali has increased the underground dewatering capacity and the capacity of the WTP. In addition, Trevali has established a series of safe and reliable storage locations underground (sumps and historical development no longer required for production), which are used to hold water inflows in excess of the dewatering capacity. Water collected is stored until the mine dewatering system is able to pump to surface for treatment.

From the information shown in Figure 16-5, it can be concluded that peak pumping periods are caused by surface water draining into the historical Anaconda Pit and the G Pond during the freshet (April to June). Over the remaining nine months of the year, the mine dewaters at an average rate of 33.1 m^3/h (146 US gpm).

FIGURE 16-5 2017 MINE DEWATERING MONTHLY SUMMARY



MINE VENTILATION

The Caribou mine is ventilated by two 447 kW (600 hp) Joy axial vane fans. The fans are located at the north and east limbs of the mine. The north limb fresh air raise (FAR) delivers 135 m^3/s (287,200 ft^3/min) and the east limb FAR delivers 125 m^3/s (266,600 ft^3/min). Each fan is equipped with a propane burner to supply heated air during the winter.

Currently, the east limb FAR delivers air to the 2060 Level Sub-5 via four individual raises in series, and the north limb FAR delivers air to the 2360 Level, and then through a bypass raise to the 2060 Level Sub-5. Exhaust is via the 2460 Level and 2560 Level ramps, the shaft, the main service raise in the upper mine, and various historical rock passes throughout the mine (Figure 16-6).

Looking South-West

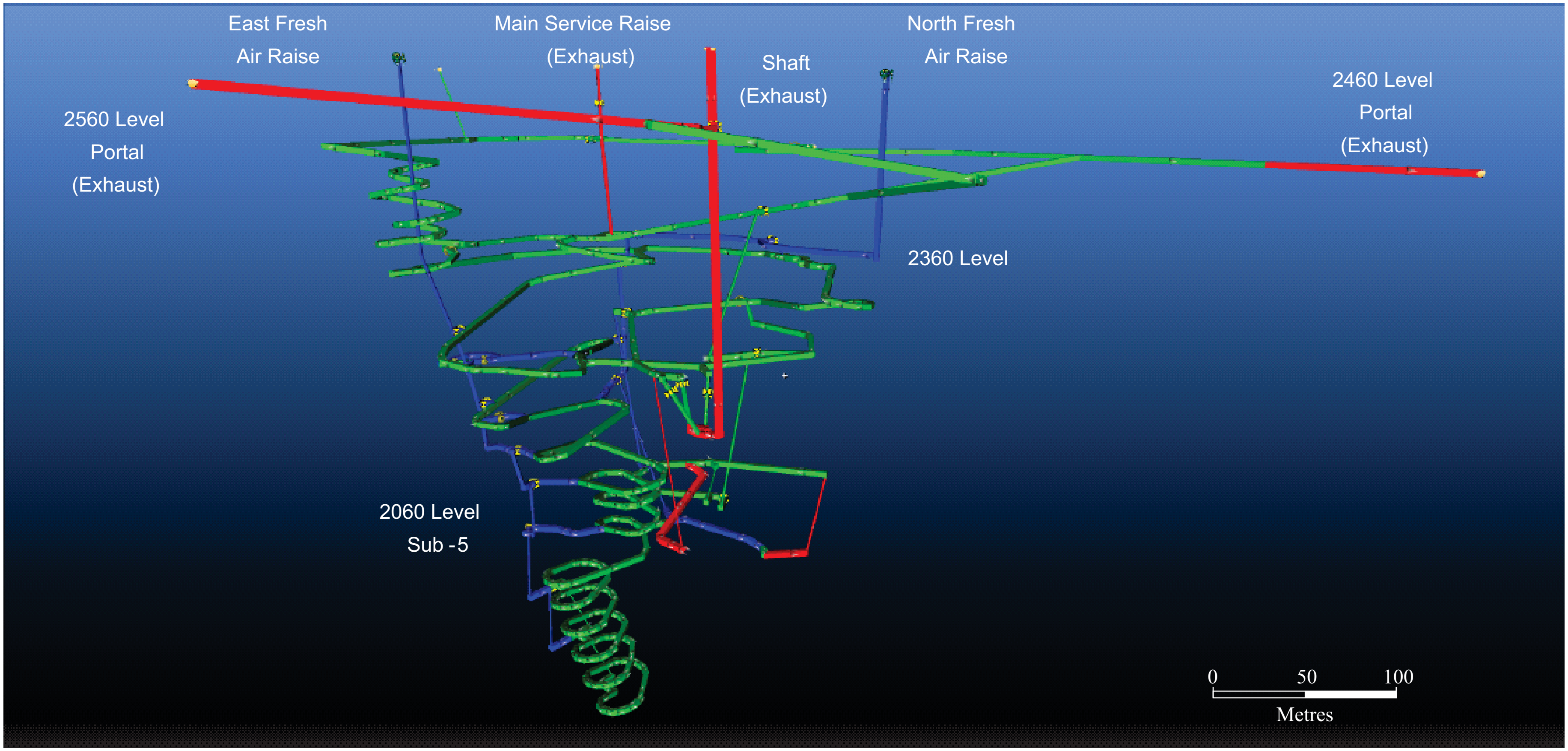


Figure 16-6

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Underground Ventilation Schematic

May 2018

Source: Trevali, 2018.

MAINTENANCE FACILITIES (SURFACE/UNDERGROUND)

Maintenance facilities for the mine mobile fleet consist of a surface repair shop and an underground central lube station. These locations are managed by equipment Original Equipment Manufacturer (OEM) as the mobile maintenance leads.

The surface shop is a 45 m by 20 m steel-frame building, with partial height, concrete block walls. The building contains four double-length equipment bays with electrically operated steel doors. A 10 tonne overhead bridge crane services the equipment bays. A 16 m by 16 m steel Quonset hut, housing an oil storage and hose repair area, adjoins the shop. Attached to the maintenance shop is a 13 m by 18 m heated warehouse.

The existing underground central lube station is located on the 2260 Level. Maintenance activities taking place in this location are typically restricted to equipment washing and lube activities. Most major maintenance activities take place in the surface shop.

UNDERGROUND POWER

At the service raise substation, 4160 V electrical power is delivered to underground substations, where the power is stepped down to 600 V for mine equipment.

Table 16-2 shows the existing underground electrical substations in use at the Caribou mine.

TABLE 16-2 EXISTING UNDERGROUND ELECTRICAL SUBSTATIONS
Trevali Mining Corporation – Caribou Mine

Item	Quantity	Transform	Power (kVA)
Substation – 2360-0	1	4160 - >600	500
Substation – 2360-2	1	4160 - >600	1,000
Substation – 2160-4/5	1	4160 - >600	500
Substation – 2160-1	1	4160 - >600	1,000
Substation – 2060-5N	1	4160 - >600	750
Substation – 2060-5 (temp)	1	4160 - >600	750
Total	**6**		4,500

COMPRESSED AIR SUPPLY

There are four Sullair model LS-25 200LAC 470 l/s (1,000 ft^3/min) compressors, each driven by a 149 kW (200 hp) motor, as well as a Sullair TS20CH/200/A installed at the compressor house near the shaft headframe with a total capacity of 2,242 l/s (4,750 ft^3/min).

HOIST ROOM AND HEADFRAME

The hoist room is a 17 m by 12 m, insulated, steel, heated building, and houses a Nordberg double drum 3.0 m by 1.8 m (120 in. by 72 in.) hoist, powered by two 336 kW (450 hp) AC motors. This hoist is not presently operated by Trevali.

LIFE OF MINE PRODUCTION SCHEDULE

The production rate used in the LOM schedule is based on actual Trevali-operated production rates by zone, to a maximum of 1,000 tpd by mining zone.

In Q1 2018, an average production rate of 2,800 tpd is planned, which is 93% of the designed underground mine capacity. The maximum mill feed rate is set at 1.096 Mtpa, or 3,000 tpd. The production period extends from January 2018 to Q1 2024.

Planned LOM production is 5,106 kt, with metal grades of 5.8% Zn, 2.2% Pb, and 63.2 g/t Ag.

Table 16-3 presents the LOM production plan based on mining Proven and Probable Mineral Reserves. Table 16-3 shows the LOM waste rock handlings and backfill material balance.

TABLE 16-3 LIFE OF MINE PRODUCTION PLAN
Trevali Mining Corporation – Caribou Mine

ROM Production	Units	2018	2019	2020	2021	2022	2023	2024	Total
Stope	kt	**909**	**1,077**	**1,096**	**849**	**631**	**358**	**72**	**4,990**
Zn	%	5.6	6.0	5.8	6.0	5.9	5.7	5.7	5.8
Pb	%	2.2	2.2	2.2	2.2	2.0	2.0	2.2	2.2
Ag	g/t	65.8	62.6	63.7	66.3	56.6	59.8	68.5	63.2
Development	kt	**97**	**19**	**0**	**0**	**0**	**0**	**0**	**116**
Zn	%	5.6	6.0	0.0	0.0	0.0	0.0	0.0	5.7
Pb	%	2.2	2.2	0.0	0.0	0.0	0.0	0.0	2.2
Ag	g/t	66	63	0	0	0	0	0	65.3
Total	kt	**1,006**	**1,096**	**1,096**	**849**	**631**	**358**	**72**	**5,106**
Zn	%	5.6	6.0	5.8	6.0	5.9	5.7	5.7	5.8
Pb	%	2.2	2.2	2.2	2.2	2.0	2.0	2.2	2.2
Ag	g/t	65.8	62.6	63.7	66.3	56.6	59.8	68.5	63.2
Average Production	tpd	2,757	3,002	3,002	2,936	2,936	2,991	2,936	2,930

Unconsolidated rock backfill (RF) is used to fill the majority of mining voids. A total of 2,084 kt of waste rock for backfill will be sourced from underground development waste (207 kt) and surface waste stockpiles (1,877 kt); see Table 16-4.

TABLE 16-4 LIFE OF MINE WASTE ROCK HANDLING AND BACKFILL MATERIAL BALANCE
Trevali Mining Corporation – Caribou Mine

Item	Unit	2018	2019	2020	2021	2022	2023	2024	Total
Backfill Required	kt	555	398	482	289	214	122	24	**2,084**
Waste Produced	kt	113	93	-	-	-	-	-	**207**
Makeup Waste Required	kt	441	305	482	289	214	122	24	**1,877**

Table 16-5 is a summary of the LOM lateral development requirements. Underground development advance rates were scheduled at an average of 16 m/d, with multiple headings planned. Current lateral development advance for a single jumbo is 360 m/month. Full mine development and rehabilitation for the LOM plan is completed by 2020.

TABLE 16-5 SUMMARY OF LIFE OF MINE LATERAL DEVELOPMENT REQUIREMENTS
Trevali Mining Corporation – Caribou Mine

Development	Units	2018	2019	2020	2021	2022	2023	2024	Total
Ore Development	metres	1,026	205	-	-	-	-	-	**1,231**
Waste Development	metres	1,540	1,303	-	-	-	-	-	**2,844**
Rehabilitation	metres	475	219	241	-	-	-	-	**935**
Total	metres	3,041	1,727	241	-	-	-	-	**5,010**
Blast/Day		2.2	1.2	0.2	-	-	-	-	**-**

Table 16-6 is a summary of LOM raising requirements. A total of 512 m of raise development is required to achieve the LOM development and production goals; 88% of the vertical development is associated with ventilation.

TABLE 16-6 SUMMARY OF LIFE OF MINE RAISE DEVELOPMENT REQUIREMENTS
Trevali Mining Corporation – Caribou Mine

Heading	Type	Length (m)	Diameter (m)
North Fresh Air Raise	Waste	240	2.13
East Fresh Air Raise	Waste	212	2.13
Waste Pass	Waste	60	2.13
Total Equivalent Metres	Waste	**512**	

EQUIPMENT AND LABOUR FORCE

Previously, all mining was completed by contractor with contractor supplied equipment. In Q2 2017, Trevali completed its planned transition to owner-operated production. This includes all mining activities, except for specialized activities, including diamond drilling.

MINE EQUIPMENT

Table 16-7 shows the planned mining fleet to support the mine plan.

Major underground equipment requirements will vary with time, especially for haul trucks and LHDs.

TABLE 16-7 LIFE OF MINE PLANNED MINING EQUIPMENT
Trevali Mining Corporation – Caribou Mine

Underground Equipment	Make	Peak Unit
8-yard Underground Scoop	Sandvik	5
40-tonne Underground Truck	Sandvik	7
Grader	Cat	1
Jumbo	Sandvik	2
Production Drill	Sandvik	1
Auto-Cabler	Sandvik	1
Boom Truck (Crane Truck)	Getman	1
Services Loader/Manlift	Cat	1
Services Telescoping Boom Lift	Cat	1
Toyota Man Carriers (Crews)	Toyota	4
Toyota Truck (Technical)	Toyota	4
Toyota Truck (Captain)	Toyota	2
Toyota Truck (Shifters)	Toyota	1
Electrician Tractor	Getman	1
Shotcrete Boom	CSI	1
Block Holer	Marcotte	1
Fuel/Lube Truck	Marcotte	1
No. of Units in Fleet		**36**

MINE LABOUR FORCE

During Q2 2017, the mine transitioned from contractor-operated production to owner-operated in all but the most specialized activities. Table 16-8 shows the composition of the Caribou mine workforce on the owner's payroll during the full production period, with the exception of mobile maintenance labour force, which will be under OEM. Labour costs associated with maintenance are included in equipment rates.

TABLE 16-8 MINE LABOUR FORCE – FULL PRODUCTION PERIOD
Trevali Mining Corporation – Caribou Mine

Discipline	Number of Employees
Engineering	10
Engineering Technicians	4
Geology	7
Mine Operations	101
Mine Electrical	8
Total	**130**

17 RECOVERY METHODS

SUMMARY

The process plant includes crushing, screening, and grinding followed by lead/zinc flotation, and filtering to produce separate zinc and lead concentrates with silver as a by-product. Concentrates are shipped through the Port of Belledune, located 75 km from the Caribou mill site.

The process plant is a rehabilitated concentrator that is currently operating as a stand-alone plant. The mill building is a multi-level structure occupying an area of approximately 4,000 m^2. The building is steel construction on concrete foundations, and includes overhead service cranes with capabilities ranging from three tonnes to ten tonnes. The building is a combination of an older structure, which holds the primary grinding, zinc regrinding, and zinc flotation equipment, and a newer (1996) structure that holds the lead regrinding, lead flotation, and lead dewatering equipment. Both sections of the mill building are clad with matching dark brown siding. Mill offices are located outside the mill complex.

Two 2,000 t coarse ore bins are located adjacent to the mill and supply plant feed to the SAG mill. Adjacent to the mill are two concentrate storage sheds. The zinc storage shed has a storage capacity of 2,500 t. The lead concentrate storage shed has a storage capacity of 1,200 t. Both sheds are connected by a breezeway, where concentrate transport trucks are loaded. All of the concentrate storage and load-out buildings are of steel construction with metal cladding. The concentrate storage buildings have three metre high concrete side walls.

PLANT FLOWSHEET AND PROCESS DESCRIPTION

A generalized flowsheet of the rehabilitated plant is shown in Figure 17-1 with details of the equipment provided in the subsequent sections.

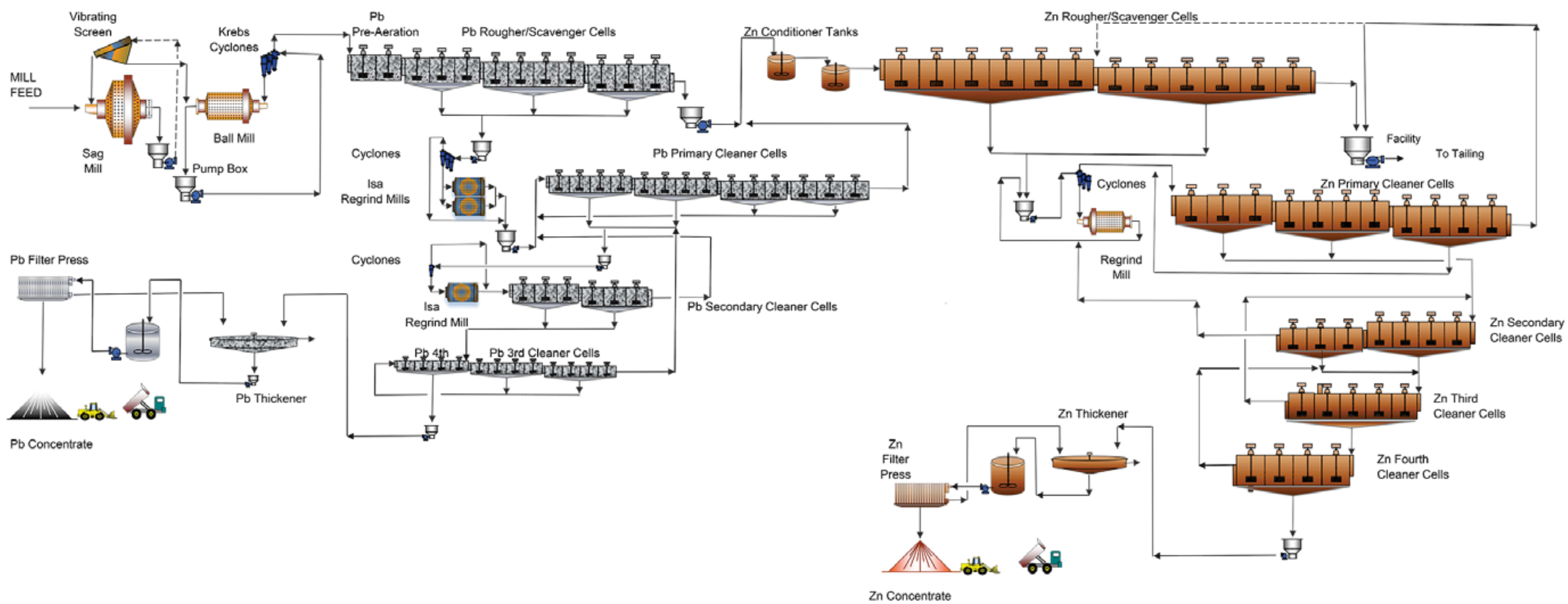


Figure 17-1

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Generalized Plant Flowsheet

May 2018

Source: Trevali, 2018.

GRINDING

The plant feed is delivered as primary crushed ore at nominally 119 mm (4.5 in.) top size by inclined conveyor from the mine to two 2,000 tonne storage bins at the concentrator. Belt feeders discharge each bin individually, controlled by a variable frequency drive (VFD) located on each bin's discharge conveyor.

The plant feed is delivered to the 6.7 m (22 ft) diameter by 2.1 m (7 ft) long Hardinge primary SAG mill, equipped with a 1,491 kW (2,000 hp) drive motor. A maximum ball charge of 15% is allowed in the mill to reduce the feed material to nominal 650 µm as feed to the secondary ball mill. The discharge from the SAG mill is pumped to a Derrick vibratory screen, with 3.2 mm (0.13 in.) apertures, to classify the mill discharge and recycle the oversize particles back to the SAG mill feed. Derrick screen undersize gravitates to the secondary ball mill cyclone feed pump for secondary classification in a battery of 508 mm (20 in.) diameter Krebs cyclones.

Overflow, at 80% passing nominal 30 µm to 35 µm, reports directly to flotation while the cyclone underflow will recycle to the 4.3 m (14 ft) diameter by 6.7 m (22 ft) long Nordberg secondary ball mill, equipped with a 1,864 kW (2,500 hp) drive motor, for further grinding.

Secondary ball mill discharge combines with the SAG mill product in the cyclone feed pump. Soda ash and sodium cyanide are added to the grinding circuit as pyrite and sphalerite depressants.

LEAD CIRCUIT

Product from the grinding circuit, at nominal 35% solids by weight and pH 8.2, gravitates to the pre-aeration circuit for depression of the pyrite.

PRE-AERATION

The first two cells in the lead rougher bank are DR500 units which are used to pre-aerate the slurry and tarnish the iron minerals to aid in their depression. There is no flotation in this circuit, as the cells are simply to provide aeration of the pulp.

LEAD ROUGHER-SCAVENGER

Discharge from the pre-aerators passes directly to the lead rougher bank, which consists of five Outokumpu 16 m^3 (565 ft^3) units and three additional DR500 units for recovery of the lead mineralization. The collector (3418A) is used to recover the lead mineralization selectively from the zinc, with Methyl Isobutyl Carbinol (MIBC) being used as the frother. Rougher tailings flows by gravity directly to the scavenger bank, which consists of two banks, three DR500 units and two Outokumpu 16 m^3 units. The combined rougher and scavenger concentrate is sent for regrinding, while the scavenger tailings forms the majority of the feed to the zinc circuit.

LEAD REGRIND

The combined rougher-scavenger concentrate passes to the lead regrind circuit, where it is classified in a battery of 152 mm (6 in.) cyclones to divert the plus 12 µm to 15 µm mineralization to an M1000 Isa regrind mill rated at 500 kW (670 hp). Previous operations required two M1000s in parallel owing to higher head grades. Current conditions have allowed Trevali to utilize the additional ISA mill as a spare.

Isa mill discharge combines with the cyclone overflow at nominal 12 µm to 15 µm as feed to the primary cleaning.

The primary cleaner concentrate undergoes secondary regrind in an additional M1000 Isa mill using 100 mm (4 in.) diameter cyclones as classifiers. Product, at nominal 8 µm to -10 µm, passes to secondary cleaning.

LEAD CLEANING

The primary cleaner consists of an eight cell rougher and a six cell scavenger, with all cells being DR300 units. The rougher concentrate passes to secondary regrind, while the scavenger concentrate is recycled back to the head of the primary cleaner. Primary cleaner tailings report directly to the primary cleaner scavenger via gravity.

The lead secondary cleaner consists of six DR300 cells, with total secondary concentrate passing to tertiary cleaning. Secondary cleaner tailings combine with the rougher concentrate as feed to the regrind cyclone ahead of the primary cleaner.

Second cleaner concentrate passes to the combined third and fourth cleaner, consisting of 24 DR100 cells, for final cleaning of the lead, and depression of the contaminant iron and zinc mineralization. The quaternary cleaner concentrate forms the final lead concentrate and is pumped to dewatering while the tertiary cleaner tailings report to the cyclone feed sump prior to the secondary cleaner. The quaternary cleaner tailings report directly to the tertiary cleaner.

The cleaner scavenger tailings join with the rougher scavenger tailings to make up the feed to the zinc circuit.

LEAD DEWATERING

The final lead concentrate from the fourth cleaner is pumped to a 4.6 m (15 ft) diameter conventional thickener for recovery of the excess water. The underflow, at approximately 60% solids, is pumped to a holding stock tank ahead of the Vertical Plate Pressure (VPA) 1515-33 plate and frame filter.

Filtrate is recycled to the lead thickener. Thickener overflow is pumped to the tailings pond.

ZINC CIRCUIT

Combined lead rougher scavenger and cleaner scavenger tailings will combine as feed to the zinc circuit.

CONDITIONING

A single conditioner is utilized as a reagent addition stage to allow activation and promotion of the zinc mineralization, and to adjust the pH for pyrite depression.

ZINC ROUGHER-SCAVENGER

Overflow from the conditioners gravitates to a combined zinc rougher-scavenger circuit of eighteen cells, with the rougher being a bank of twelve DR300 cells, and the scavenger a bank of six DR500 units.

ZINC REGRIND

The combined rougher and scavenger concentrate is pumped to a single-stage, 3.0 m (10 ft) diameter by 6.7 m (22 ft) long regrind ball mill, equipped with a 746 kW (1,000 hp) drive motor. All mill feed reports to the cyclone feed box for classification in a battery of 254 mm (10 in.) diameter Krebs cyclones, with a product of nominal 80% passing 14 µm. The cyclone underflow recycles to the regrind mill, maintaining the regrind in closed circuit. The cyclone overflow passes by gravity to the cleaner circuit for upgrading to final concentrate specification.

ZINC CLEANERS

The cleaner circuit consists of a four-stage cleaning plant, with the final three stages of cleaning operating in closed circuit, with the tailings of each cleaning stage reporting to the feed of the previous stage. The primary cleaner operates in open circuit, with the tailings passing directly to the cleaner scavenger feed.

The primary cleaner consists of a single bank of eleven DR500 cells, with total primary cleaner concentrate product passing directly to the secondary cleaner bank of seven DR300 cells. Tailings from the secondary cleaner recycles to the regrind mill, while the total secondary concentrate passes to the tertiary cleaner, a bank of five DR300 cells operating in open circuit. Tailings report to the second cleaner feed pump, while the third cleaner concentrate is delivered to the fourth cleaner of four DR300 cells, operating as the final cleaner bank. Tailings recycle to the third cleaner feed pump, while the product, as final concentrate, will be delivered to the dewatering section.

ZINC DEWATERING

The final zinc concentrate from the fourth cleaner is pumped to a 12 m (40 ft) diameter conventional thickener for recovery of the excess water. The underflow, at approximately 60% solids, is pumped to a holding stock tank ahead of the VPA 1515-33 plate and frame filter. Filtrate from the filter operation is recycled to the zinc thickener. Thickener overflow is pumped to the tailings pond.

TAILINGS DISPOSAL

Tailings are pumped from the mill to the STTP and deposited subaqueously via floating pipeline. Reclaim water is pumped back from the STTP to feed the mill from an area close to the dam.

HISTORICAL PLANT PERFORMANCE

Table 17-1 shows the historical plant performance since Trevali recommenced milling in August 2015.

TABLE 17-1 HISTORICAL PLANT PERFORMANCE
Trevali Mining Corporation – Caribou Mine

Month	Milled tonnes	Pb Conc Grade (%)	Pb Recovery (%)	Ag Recovery in Pb Conc. (%)	Zn Conc Grade (%)	Zn Recovery (%)
Aug-15	77,149	32.50	44.6	23.1	49.49	62.9
Sep-15	74,195	37.84	52.7	25.2	47.09	75.1
Oct-15	53,492	39.73	56.3	29.6	48.43	69.3
Nov-15	61,487	39.00	57.7	27.2	46.82	75.8
Dec-15	50,626	40.90	57.6	32.3	47.66	68.7
Jan-16	69,833	36.31	56.3	31.0	47.82	70.2
Feb-16	64,134	41.15	60.0	45.7	47.97	71.0
Mar-16	65,786	40.44	59.0	37.7	47.64	72.1
Apr-16	60,032	39.63	57.4	31.7	46.41	73.5
May-16	53,038	40.20	57.7	31.2	47.22	78.1
Jun-16	73,176	42.88	54.8	30.4	46.86	79.2
Jul-16	67,938	38.67	56.4	35.0	47.93	79.8
Aug-16	47,289	40.86	58.2	35.7	48.95	77.3
Sep-16	70,261	38.81	54.7	35.9	47.30	78.4
Oct-16	81,252	39.82	62.3	39.6	46.86	78.2
Nov-16	79,986	40.04	58.8	35.3	46.38	76.0
Dec-16	90,004	39.02	58.2	33.4	45.95	73.6
Jan-17	72,541	38.88	65.5	38.3	47.35	72.2
Feb-17	71,225	37.59	62.6	36.8	46.97	74.3
Mar-17	89,114	38.61	63.3	37.7	48.02	77.4
Apr-17	64,982	39.12	60.6	36.8	46.93	76.5
May-17	78,648	39.37	61.2	39.2	48.46	78.1
Jun-17	82,062	38.70	60.9	39.4	49.29	79.7
Jul-17	79,944	37.86	53.6	33.5	49.40	78.8
Aug-17	69,357	39.78	64.5	48.3	49.73	76.7
Sep-17	84,706	40.32	63.7	40.8	48.44	81.5
Oct-17	84,930	40.53	66.9	39.8	48.11	80.4
Nov-17	81,746	40.53	66.4	41.7	46.93	77.5
Dec-17	86,181	38.89	63.8	37.2	46.69	75.3

Since the recommencement of milling operations in August 2015, the process plant has produced a zinc concentrate in the range of 46.0% to 49.7% from head grades ranging from 5.3% Zn to 6.0% Zn. Recovery of zinc has been in the range of 62.9% in August 2015 to a maximum of 81.5% in September 2017. Lead concentrates have been in the range of 32.5% in August 2015 to 42.9% in June 2017 from head grades ranging from 2.0% Pb to 2.6% Pb. Recovery of lead has been in the range of 44.6% in August 2015 to a maximum of 66.9% in October 2017.

LIFE OF MINE PRODUCTION SCHEDULE

The LOM process plant production schedule, based on Proven and Probable Mineral Reserves, is shown in Table 17-2.

TABLE 17-2 LIFE OF MINE PLANT PRODUCTION SCHEDULE
Trevali Mining Corporation – Caribou Mine

ROM Production		2018	2019	2020	2021	2022	2023	2024	Total
Milled	000 t	1,006	1,096	1,096	849	631	358	72	**5,106**
Zn Grade	%	5.6	6.0	5.8	6.0	5.9	5.7	5.7	**5.8**
Pb Grade	%	2.2	2.2	2.2	2.2	2.0	2.0	2.2	**2.2**
Ag Grade	g/t	65.8	62.6	63.7	66.3	56.6	59.8	68.5	**63.2**
Au Grade	g/t	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Zinc Concentrate	000 t	96.5	113.2	108.8	86.4	63.7	34.5	7.0	**510.1**
Zn Grade	%	47.0	47.0	48.0	48.0	48.0	48.0	48.0	**47.6**
Zn Recovery	%	80.0	81.0	82.0	82.0	82.0	82.0	82.0	**81.4**
Lead Concentrate	000 t	38.1	40.9	40.6	32.3	21.6	12.0	2.7	**188.2**
Pb Grade	%	37.0	37.0	38.0	38.0	38.0	38.0	38.0	**37.6**
Ag Grade	g/t	645	626	641	650	617	663	688	**639.3**
Au Grade	g/t	2.0	2.0	2.0	2.0	2.0	2.0	2.0	**2.0**
Pb Recovery	%	63.0	64.0	65.0	65.0	65.0	65.0	65.0	**64.4**
Ag Recovery	%	37.1	37.3	37.3	37.3	37.3	37.3	37.3	**37.3**
Au Recovery	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Payable Zinc	000 t	37.6	44.1	43.5	34.6	25.5	13.8	2.8	**201.9**
Payable Lead	000 t	13.0	13.9	14.2	11.3	7.6	4.2	0.9	**65.1**
Payable Silver	000 oz	733.0	757.3	782.7	640.4	393.2	239.7	57.6	**3,603.8**
Payable Gold	ounces	1,307	1,404	1,393	1,109	740	413	91	**6,456.1**

LIFE OF MINE MAJOR CONSUMABLES

Table 17-3 lists the LOM major consumables and energy requirements. All consumables are readily available. The Caribou mine has ample water supply to handle all activities.

TABLE 17-3 LIFE OF MINE MAJOR CONSUMABLES
Trevali Mining Corporation – Caribou Mine

Mill Consumables	Units	Usage	Total/Year (000 kg)
Soda Ash	kg/t	2.19	2,394
Copper Sulphate	kg/t	1.41	1,545
Areophine 3418A Promoter	kg/t	0.09	103
Ceramic Beads (2mm)	kg/t	0.20	219
Carbon Grinding Ball (4”)	kg/t	0.75	822
Carbon Grinding Ball (0.75”)	kg/t	1.20	1,315
Hydrated Lime	kg/t	1.70	1,863
Energy			**MW/Year**
Mine	kW/t	17.1	18,000
Mill	kW/t	63.3	66,626
Surface	kW/t	5.4	5,738
Total/year	**kW/t**	**85.8**	**90,364**

18 PROJECT INFRASTRUCTURE

The Caribou mine site comprises two formerly operated lead-zinc-silver open pits, namely the West and East Pits, and an underground lead-zinc-silver mine. A processing complex used to concentrate the ore is also located at the Caribou site. The Caribou site also has a large permitted tailings impoundment area.

Two portals for the underground ramps are used to access the mine; the shaft and conveyances are dormant and have not been refurbished. A power line connected to the New Brunswick power grid supplies the site with electricity.

The mine's footprint includes a concentrator, office buildings, a WTP, a shop/warehouse, a hoist room, a shaft, a compressor room, an electrical substation and several pump stations. The site also includes several historical tailings storage areas known as the Anaconda tailings (Ponds A, B, C, D, E, and F). The current tailings area is located 1.5 km southeast of the concentrator. The site also has a fire water retention pond (the "Fire Pond") that supplements the mill with process water.

Minor repairs and rehabilitation were completed in 2014 and 2015 to support the restart of operations. Underground mine dewatering was completed in 2016; underground rehabilitation and development progressed with dewatering.

The process plant is a multi-level structure occupying an area of approximately 4,000 m^2. Primary plant feed crushing is contracted out. Grinding, a lead flotation circuit, and a zinc flotation circuit are in place, along with a new SAG mill.

Figure 18-1 is an aerial view of the Caribou site infrastructure and Figure 18-2 shows the location of the surface facilities at the Caribou site. Figure 18-2 shows the major access road (provincial Highway 180) to the Caribou mine as well as the site infrastructure layout.

FIGURE 18-1 AERIAL VIEW OF CARIBOU SITE INFRASTRUCTURE

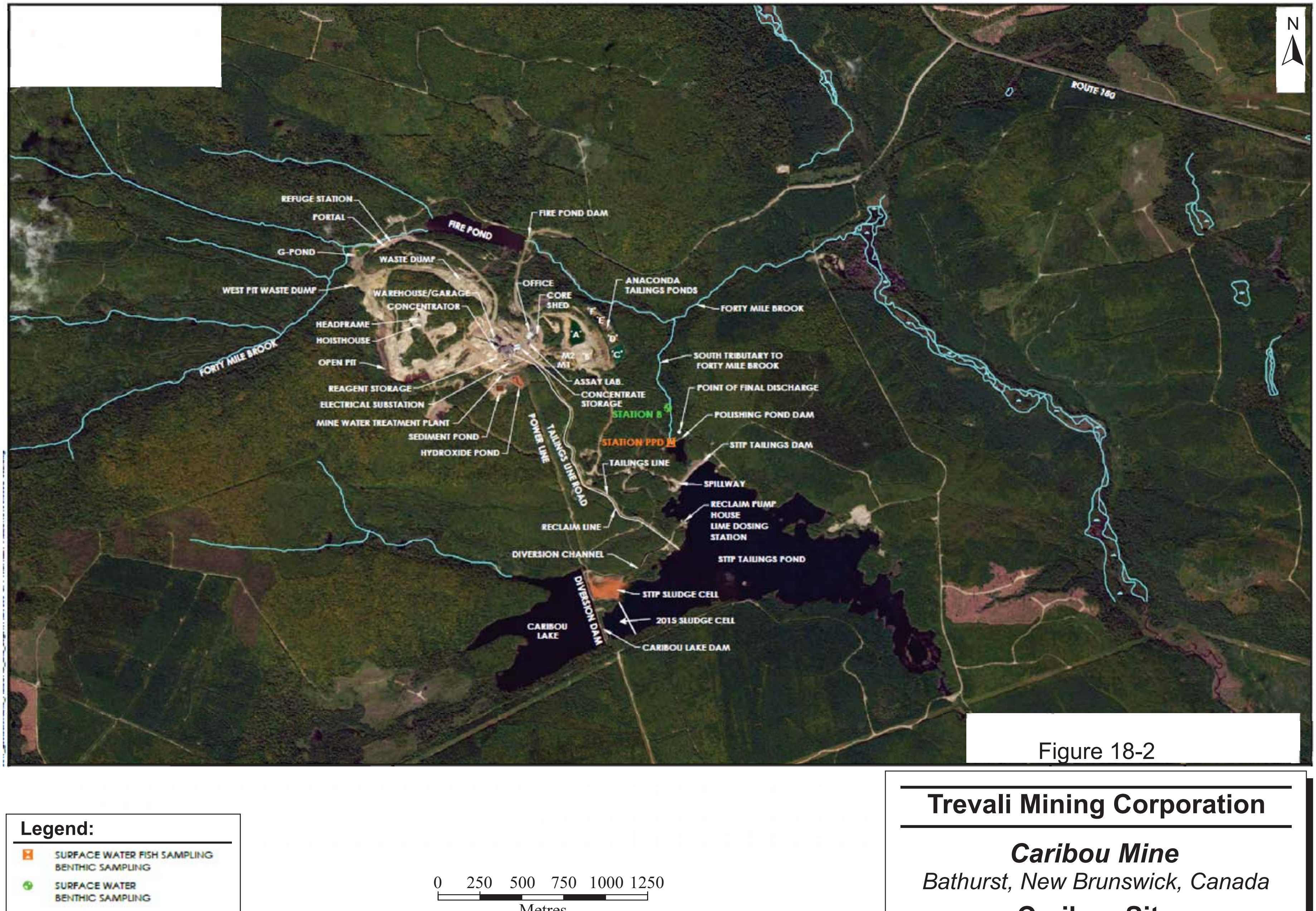


Figure 18-2

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

Caribou Site Infrastructure Layout

May 2018

Source: Stantec, 2012.

The key Caribou mine facilities include:

- Administration building that houses administration, security, engineering, mine offices, and mine dry
- Core shack which includes a drill core sampling and preparation area and office space
- Mill plant including an emergency firefighting and sprinkler system
- Assay laboratory including sample preparation facility
- Hoist room and headframe (not currently in use)
- Mine WTP
- TMF
- Tailings pond lime addition plant
- Mobile equipment shop and warehouse
- Fire pond pumphouse including a standby generator for use in the event of power interruption
- Compressor building that houses four Sullair model LS 25 200LAC, 0.47 m^3/s (1,000 ft^3/min) compressors
- Information services (IS) hardware and software providing the operations with a modern, fully integrated IS system

ELECTRICAL POWER

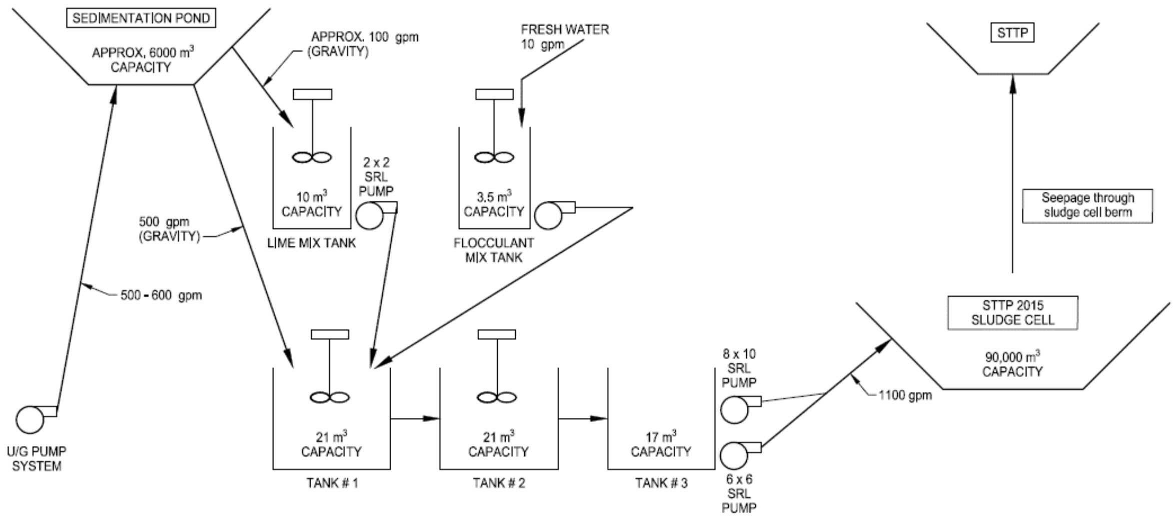
NB Power supplies incoming power under a long-term contact. Supply voltage is 138 kV, and is converted to 4,160 V through a 15 MVA fan-cooled transformer. The mine owns the transformer and associated switchgear. A 910 kW diesel generator is in place as a standby generator.

MINE WATER MANAGEMENT INFRASTRUCTURE

CARIBOU MINE WATER TREATMENT PLANT

The Caribou WTP is located 200 m southeast of the milling complex. The WTP building is a metal-clad building housing a lime-based treatment facility. Next to the building is a 40 t hydrated lime silo. The facility is currently designed to treat a maximum of 250 m^3/h (1,100 gpm). The facility includes three reactor tanks, a lime slurry mixing tank, a flocculation mix tank, and associated pumps. The basic flow diagram of the plant is shown in Figure 18-3.

FIGURE 18-3 CARIBOU WATER TREATMENT PLANT LAYOUT



Untreated mine effluent is pumped from the central pumping station on the 2360-0 Level via the main service raise to the sedimentation pond, located directly behind the WTP, then gravity fed to the plant for treatment.

Mine effluent is gravity fed into Tank #1, where the pH is adjusted to approximately 8.5, then is gravity fed to Tank #2, where a flocculent is added and the pH is adjusted to 9.5, and finally proceeds into Tank #3. From Tank #3 the water is pumped directly into the new sludge cell located within the STTP via a dedicated high-density polyethylene (HDPE) pipeline. The hydroxide sludge settles and remains in the sludge cell, while the water-permeable perimeter barriers slowly release the treated effluent into the STTP.

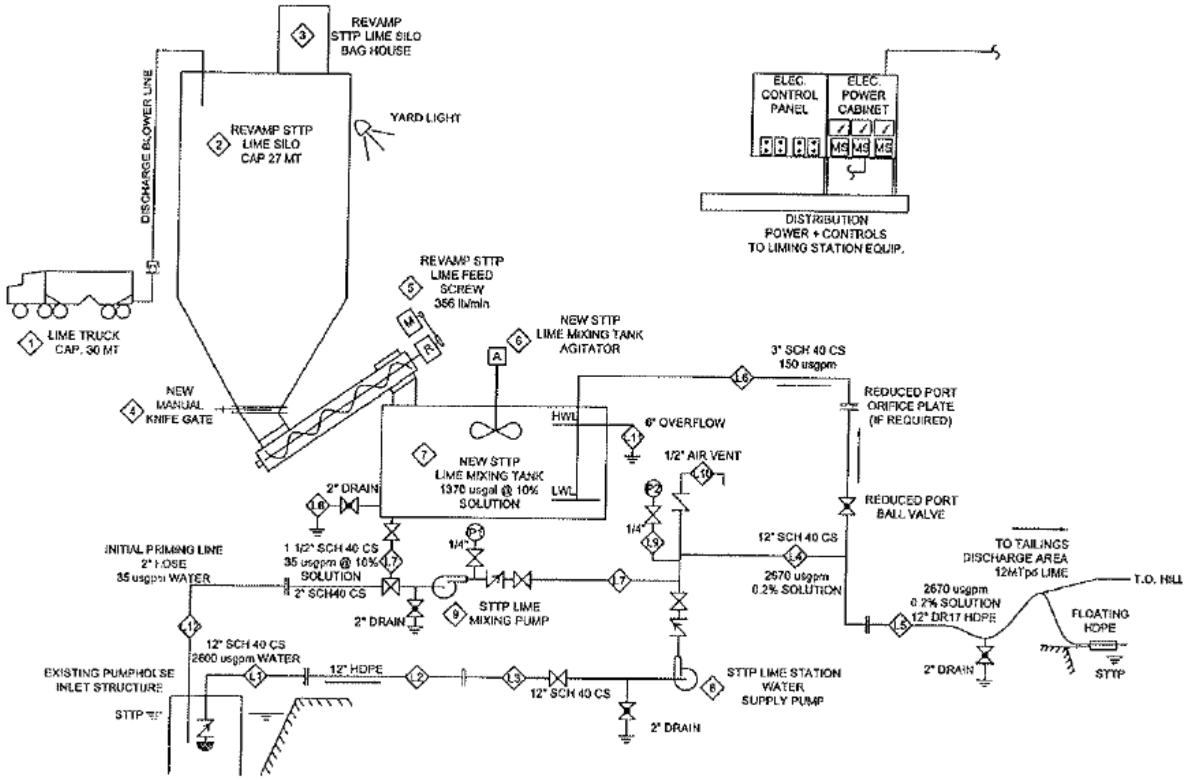
In 2016, a second sludge cell was constructed within the STTP with a storage capacity of 90,000 m^3, providing 10 years of storage at the current sludge disposal rate.

SOUTH TRIBUTARY TAILINGS POND LIME ADDITION SYSTEM

As part of the past owner's Certificate of Approval (COA), a lime addition system was installed at the STTP for additional pH control.

The system is constructed on a concrete slab and is open to the environment. It consists of a 27 t capacity hydrated lime silo, a lime slurry-mixing tank and agitator, transfer pump, discharge pump, and a semi-automated lime addition system. The lime slurry addition system is currently designed to deliver approximately 21 m^3/h (92 gpm) of slurry to the STTP via a floating discharge line. Refurbishment of this lime addition plant was completed in 2015 to add the ability to dose lime slurry directly into the STTP. The basic layout of the plant is shown in Figure 18-4.

FIGURE 18-4 SOUTH TRIBUTARY TAILINGS POND LIME ADDITION PLANT LAYOUT



SEPTIC FACILITY

The existing system consists of a septic tank located to the south of the office/assay laboratory area. The effluent is piped underneath the roadway to a conventional septic field. In 2015, two new tanks were added to the existing septic system. The total volume of the three tanks is 24,605 L (6,500 US gal.).

The entire septic field system has been upgraded to meet the New Brunswick provincial health department guidelines. It measures approximately 44.1 m x 18.4 m by 1.0 m deep, and is located three metres to the south of the toe of slope of the existing roadway. The septic wastewater system was designed to meet the demands of 300 people.

CARIBOU DAMS

Five dams are found on the Caribou property:

1. Caribou Lake dam (formerly diversion dam);
2. STTP dam, formerly tailings dam (main dam);
3. Polishing pond dam;
4. STTP saddle dam(s); and
5. Fire pond dam.

As per Condition 19 of the COA I-10085, a Dam Safety Review (DSR) following the Canadian Dam Association's (CDA) – Dam Safety Guidelines 2007 (2013 Edition) was completed for the dams noted above at the Caribou mine site in 2015.

In 2016 and 2017, the annual DSR was completed at the Caribou mine site. The dam inspections were completed as part of ongoing operation, maintenance, and surveillance of dams on site, as per CDA guidelines. The infrastructure inspected was mainly associated with the tailings disposal facilities and wastewater treatment facilities at the Caribou mine site.

TAILINGS MANAGEMENT FACILITY

The TMF comprises three ponds: the polishing pond, the STTP, and Caribou Lake. Each of the ponds has an associated dam across the south branch tributary of Forty Mile Brook; in addition, there is a diversion channel that routes freshwater from Caribou Lake around the tailings impoundment. Flow from each of the ponds is by gravity. The relationship of these ponds is shown in Figure 18-5.

The polishing pond was created below the dam of the tailings pond to provide a buffering pool for any seepage through the tailings dam, and to provide time for settling of metal hydroxides if lime treatment of the tailings effluent were required. This pond has a surface area of approximately 1.7 ha and a volume of 30,000 m^3. Discharge is by means of a concrete flume/spillway near the east end of the dam. An emergency spillway is also present along the dam.

The tailings pond is situated immediately downstream of Caribou Lake and covers an area of 90 ha. In 2008, a 2.1 m lift was added to the STTP dam to provide adequate storage capacity as part of the thiosalt management program required under the previous owner's provincial

COA. The STTP flow to the polishing pond is regulated by a hydraulic control structure and a spillway. In addition to the raise, a saddle dam along the south shore of the STTP was also built to avoid potential tailings effluent seepage into the adjacent watershed. All tailings stored in the pond are required to be under a minimum of one metre of water cover to maintain adequate pH in the pond. During operations, tailings are discharged into the pond via a 406 mm (16 in.) floating HDPE pipeline. The pipeline originates in the mill building and follows a two kilometre roadway to a location in the southeast corner of the pond. Reclaim water from the tailings pond is pumped back to the mill through a 457 mm (18 in.) HDPE pipe via a pumphouse located approximately 160 m south of the tailings dam.

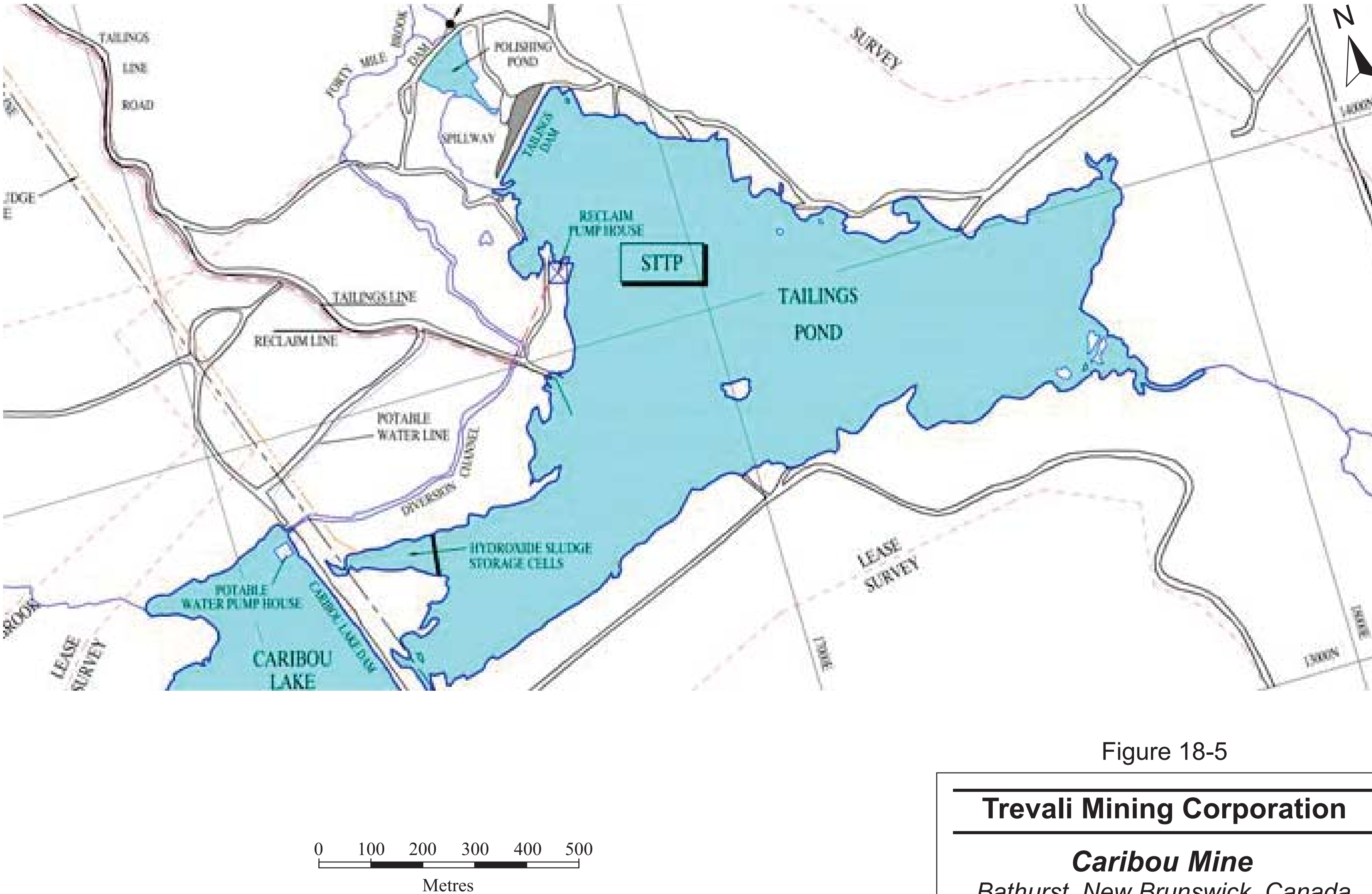


Figure 18-5

Trevali Mining Corporation

Caribou Mine

Bathurst, New Brunswick, Canada

General Layout of South Tributary Tailings Pond

May 2018

Source: Stantec, 2012.

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Effluent discharged from the TMF is regulated under COA I-10085 and the Metal Mining Effluent Regulation (MMER). Water quality parameters as specified under Condition 28 of the COA and under Schedule 4 of the MMER are summarized in Table 18-1.

TABLE 18-1 WATER QUALITY PARAMETERS
Trevali Mining Corporation – Caribou Mine

Parameter	COA	MMER	Max. Monthly Mean Concentration	Max. Concentration in a Composite Sample	Max. Concentration in a Grab Sample
Arsenic (As)		x	0.50 mg/L	0.75 mg/L	1.00 mg/L
Copper (Cu)	x	x	0.30 mg/L	0.45 mg/L	0.60 mg/L
Cyanide (Cn)		x	1.00 mg/L	1.50 mg/L	2.00 mg/L
Lead (Pb)	x	x	0.20 mg/L	0.30 mg/L	0.40 mg/L
Nickel (Ni)		x	0.50 mg/L	0.75 mg/L	1.00 mg/L
Zinc (Zn)	x	x	0.50 mg/L	0.75 mg/L	1.00 mg/L
Total Suspended Solids	x	x	15.00 mg/L	22.50 mg/L	30.00 mg/L
Radium 226 (Ra-226)		x	0.37 Bq/L	0.74 Bq/L	1.11 Bq/L
pH		x	≥6.0 - ≤9.5 units	≥6.0 - ≤9.5 units	≥6.0 - ≤9.5 units
pH	x		≥6.5 - ≤9.0 units	≥6.5 - ≤9.0 units	≥6.5 - ≤9.0 units
Acute Lethality	x	x	Non-acutely lethal	Non-acutely lethal	Non-acutely lethal

Notes: COA = Certificate of Approval, MMER = Metal Mining Effluent Regulation; mg/L = milligram per litre; Bq/L = Becquerel per litre.

Caribou Lake is the uppermost pond and is a naturalized man-made lake created to impound water and make up for loss of habitat resulting from the downstream construction of the tailings and polishing ponds. Caribou Lake covers approximately 12 ha and is contained by an earthen dam with an inverted filter construction on the downstream face. Water level in the pond is controlled by a spillway to the diversion channel and an emergency overflow spillway near the centre of the dam, which is typically active for a few days during spring flood conditions.

The diversion channel drains the upper watershed and Caribou Lake to the south branch tributary at a location downstream of the polishing pond. The channel was designed for a maximum flow of 0.6 m^3/s (9,500 gpm). During the operating period in 2007 and 2008, the diversion channel was upgraded. This upgrade included an increase in berm bank height and a widening and realignment of the channel watercourse. The overall channel run (approximately 1,800 m long) was flattened, and the entire channel was upgraded to facilitate fish passage and fish habitat features, as per Department of Fisheries and Oceans (DFO) requirements.

In a recent dam safety review conducted in 2015, it was recommended that the Caribou dam crest elevation be raised a minimum of 600 mm, and that the riprap wave run-up area along the upstream face of the dam be repaired and raised to match the new crest grade (Stantec, 2015). As part of the TMF capacity review process, the proposed Caribou dam lift will be examined in 2018.

In late 2015, as part of the new hydroxide sludge storage cell (90,000 m^3) construction, areas of seepage found on the downstream face of the Caribou Lake dam were repaired using geotextile and rockfill. In addition, an access road leading to the new hydroxide sludge cell was constructed downstream of the dam, which also serves as a toe berm.

SOUTH TRIBUTARY TAILINGS POND

Mill tailings were produced during the last four operating periods of the mine: 1988 to 1989, 1990, 1997 to 1998, and 2007 to 2008. These tailings are stored in the STTP, which is located approximately 1.5 km south of the mine site. The tailings contain iron sulphides and would be classified as potential acid producers (AP) if exposed to the atmosphere. The tailings pond is designed to maintain a minimum one metre water cover over the tailings.

The STTP dam was upgraded in 2008 as part of the process to implement a thiosalt contingency plan, as required by the regulatory authorities and the COA as issued from the Province of New Brunswick at that time.

Currently, treated mine water is pumped into the STTP via the sludge storage cell, and tailings from mill processing is discharged into the STTP. The STTP water level is maintained by surface drainage from the surrounding topography and periodic emergency overflow/discharge from Caribou Lake, located immediately west and up-gradient of the main TMF.

Water from the STTP currently exits from three 610 mm (24 in.) diameter pipes controlled by valve structures installed above the intake block. An emergency spillway located at the northern end of the pond may also serve as a discharge location if the STTP discharge surpasses the intake block capacity, and/or if the intake block valves are closed. Prior to final discharge to the environment, the TMF effluent is retained in a 1.7 ha polishing pond. The polishing pond permits additional retention time for the tailings water discharge.

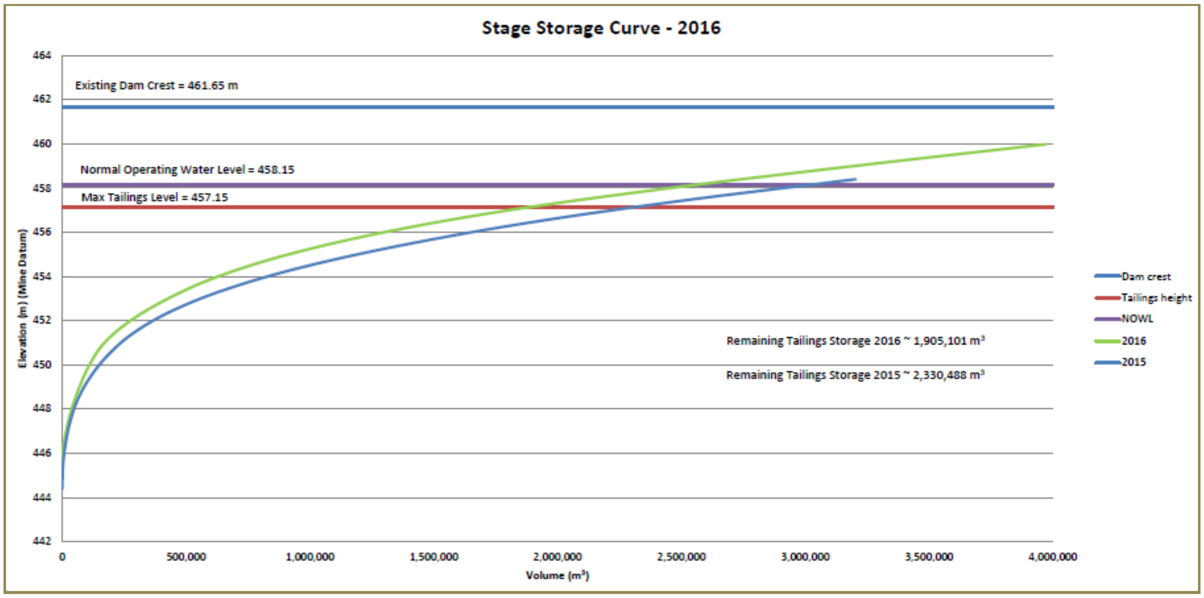
While maintaining the normal operating water level (NOWL) of 458.15 m (level for thiosalt contingency planning), a total available volume of approximately 1.9 Mm^3 of storage is available, based on bathymetry survey completed in June 2016. This corresponds to 3.0 to 3.5 years of tailings storage at the current production rate, tailings properties, and STTP configuration. The stage storage curve for the STTP is presented in Figure 18-6.

Based on the current Mineral Reserve estimate of 5.11 Mt, an additional 305,000 m^3 of tailings storage will be required outside of the current TMF. A starter dam at Forty Mile Brook, with a crest elevation of 378 m (geodetic) is proposed. This starter dam will contain the estimated required tailings storage, including a one metre water cover over the tailings and a 2.1 m lift for thiosalt management. A preliminary study on the Forty Mile dam was completed in 2014. This dam will act as a starter dam for the Forty Mile dam, which is proposed as an option in the reclamation plan.

The dams will consist of a glacial till central core, with free draining waste rock shell. The starter dam will be constructed first, followed by downstream raise(s) to the final elevation. The starter dam is estimated to cost $3.4 million.

A tailings deposition plan has been developed to optimize tailings placement and ensure that the minimum specified 1.0 m of water cover is maintained over the tailings to prevent Acid Rock Drainage (ARD) generation.

FIGURE 18-6 STAGE STORAGE CURVE – 2016



Note: Stage storage based on bathymetric survey completed by Natech Environmental Services Inc. in June 2016.

G POND

The G Pond is an HDPE-lined pond that collects the underground flow from the mine workings and surface runoff from the ARD piles located at the western end of the pond. The pond was partially upgraded in 2007-2008 with the placement of a new HDPE liner. Ongoing operational maintenance is required due to sediment buildup in the pond.

DIVERSION CHANNEL

The diversion channel was originally constructed in 1989, and functions as a clean water bypass for flow from Caribou Lake around the tailings pond and polishing pond and returning flow into Forty Mile Brook. Due to channel instability, erosion, and low-quality fish habitat, the channel was upgraded in 2007, and in 2015, new bridge crossings were constructed as part of a commitment to the DFO. The upgraded channel also serves to reduce the flow over the Caribou dam emergency spillway during high flow events (Whitford, 2007).

19 MARKET STUDIES AND CONTRACTS

MARKETS

Global zinc demand continues to rise by between 2% to 4% per annum (or 280,000 t to 560,000 t of zinc metal) driven by gross domestic product (GDP) growth, urbanization, and infrastructure development, and as a "mid-cycle" commodity with expanding markets for consumer goods (automobiles, appliances, etc.). Mine closures and production cuts over the past few years have constrained primary supply which has driven the zinc price to near-decade highs.

Zinc smelters are scaling back/curtailing refined zinc metal production due to concentrate shortages. Benchmark zinc smelter treatment charges (TCs) dropped to US$172/tonne in 2017, with no smelter price participation (0% escalators). Forecast TCs for 2018 recently settled at US$147/tonne with no smelter price participation, a 12-year low.

Consensus forecast for zinc is for continued strength in zinc prices in reaction to ongoing supply deficits. Wood Mackenzie, an independent global commodity forecast consultant, is predicting robust zinc commodity prices over the short-term; averaging US$1.71/lb in 2018, US$1.87/lb in 2019, and a long-term forecast price of US$1.23/lb.

In addition lead, which is predominantly produced as by-product of zinc mining, is also expected to strengthen during this period.

CONTRACTS

The following contracts are currently part of the operation of the Caribou mine:

- Zinc and lead concentrate offtake agreements are in place with Glencore AG, a large, diversified, resource conglomerate and commodity trader, for LOM feed at International Benchmark terms, as defined by average respective commodity price on the London Metal Exchange for the relative shipping period.

- Production drilling assistance is provided by a well-established mining contractor (Major Drilling Group International Inc.).

- Primary crushing of the plant feed on surface is contracted out to a local contractor (Elmtree Resources Ltd.).

- Concentrate trucking from site to Belledune, New Brunswick, is contracted to Pabineau First Nations Trucking.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

The Caribou Mine operates under an Environmental Management System (EMS). Trevali is in the process of implementing its Corporate Environmental and Social Management System (ESMS) and the Caribou site will align current practices to the ESMS in 2018. The ESMS is aligned with the principles of ISO 14001:2015 which is deemed best practice.

The Caribou property is located in northern New Brunswick in Restigouche County, 45 km west of the City of Bathurst, and covers an area of 2,105.7 ha. The mine's footprint includes a concentrator, office buildings, a WTP, a shop, a warehouse, a hoist room, a shaft, a compressor room, an electrical substation, and several pump stations. The site also includes several historical tailings storage areas known as the Anaconda tailings (Ponds A, B, C, D, E, and F). The current tailings area is located 1.5 km southeast of the concentrator. The site is also characterized by a fire water retention pond called the Fire Pond which supplements the mill with process water and provides process water to underground.

The Caribou mine has approval to operate the mine under COA I-10085 valid until June 30, 2018, which authorizes Trevali:

- To operate the mine WTP, and to release the treated mine water to the STTP via the hydroxide sludge pond or the STTP hydroxide sludge cell subject to the discharge limits listed in Conditions 27 and 28 of the licence;
- To carry out any activities necessary to maintain the Caribou mine;
- To construct new structures within the currently disturbed area of the mine site;
- To dewater the underground mine;
- To carry out equipment inspections, maintenance and/or replacement of the underground and/or concentrator plant equipment;
- To carry out all aspects of rehabilitation and stabilization of the underground mine, including establishing safe access by mucking out the ramp, shotcreting and scaling;
- To conduct exploratory drilling on the property and/or in the underground mine, subject to any further Terms and Conditions deemed necessary by the Department of Energy and Resource Development (DERD);

- To carry out any other activity that may be subsequently approved by the Industrial Processes Section, subject to any further Terms and Conditions deemed necessary by the Industrial Processes Section for the activity identified;
- To operate the underground mine and mill; and
- To operate a copper circuit.

Water quality monitoring at the Caribou mine site has been on-going for several years. The mine is subject to conditions for effluent discharged from the TMF regulated under COA I-10085 and the MMER. Water quality parameters are specified under Condition 28 of the COA and under Schedule 4 of the MMER. The mine has one designated final discharge location called the Polishing Pond Discharge (PPD). This location is sampled five days per week for metals including zinc, copper, and lead, as well as for pH and Total Suspended Solids (TSS). In addition, toxicity testing for rainbow trout and Daphnia Magna are conducted once per month as part of the MMER while sublethal testing is conducted twice yearly at PPD, control and near field stations.

Historical mining activities at the site have severely affected portions of North and South Branch Forty Mile Brook. Well and surface monitoring data show a direct correlation between the historical Anaconda tailings and elevated metal concentrations and low pH values found in Forty Mile Brook. Responsibilities and cost sharing details related to several historical legacies identified at Caribou are detailed in the LELA.

PROJECT PERMITTING

Provincial environmental requirements to develop and operate the Caribou mine are specified in the New Brunswick Mining Act (Chapter M-14.1), Clean Environment Act (Chapter C-6), and the Clean Water Act (Chapter C-6.1). The Mining Act is administered by the New Brunswick Department of Energy and Resource Development (NBDERD), while the Clean Environment Act and the Clean Water Act are administered by NBDELG.

Authorization to operate is controlled under the following main regulations:

- Under the General Regulation 86-98 - Mining Act, a requirement exists for the submission and approval of a “Program for Protection, Reclamation and Rehabilitation of the Environment”;

- Under the Environmental Impact Assessment Regulation 87-83 – Clean Environment Act, all “undertakings” must be registered under the regulation to determine if an environmental impact assessment (EIA) is required; and
- Various other regulations under the New Brunswick Clean Environment Act, Clean Water Act, and Clean Air Act.

The Caribou mine is subject to the New Brunswick Environmental Impact Assessment Regulation – Clean Environment Act (referred to as the EIA Regulation). The EIA Regulation requires that the proposed construction, operation, modification, extension, abandonment, demolition, or rehabilitation of certain projects or activities, called “undertakings” and described in Schedule A of the Regulation, must be registered. Schedule A includes 24 categories of projects or activities, one of which is “(a) all commercial extraction or processing of a mineral as defined in the Mining Act”. On February 20, 1996, determination review of the Caribou mine was completed and approved. On May 28, 2015, Certificate of Determination was approved to construct and operate a copper circuit at the Caribou mine.

The current mining activities at Caribou do not trigger a project registration, although the proposed addition of a new dam as described in the reclamation plan will require registration under the EIA Regulation. Following a review of the EIA registration documentation and the subsequent provision of information or response to questions arising from its review, the Minister of the NBDELG will decide if the Project can proceed directly subject to conditions (“Determination Review”) or whether a more comprehensive EIA is required (“Comprehensive Review”).

Due to the larger scope of constructing a proposed new dam, a Comprehensive Review will likely be required. The proposed strategy to minimize the chances that a Comprehensive Review is required is to provide an enhanced EIA registration package that anticipates the likely questions and concerns of the Technical Review Committee (TRC), supplemented by field work in the appropriate biological windows to confirm the EIA registration findings. The Minister’s determination is made in view of the magnitude of the project and the associated environmental impacts, and there is no way to determine which outcome will result. At present, Stantec is preparing a proposal to initiate the registration and permitting process including discussions with the various pertinent federal and provincial agencies and other stakeholders such as the local First Nations representatives.

Should a Comprehensive Review be required, the Minister would issue draft guidelines which establish the scope of the EIA, which are finalized following public input. Terms of Reference (ToR) are developed by the proponent to outline the work plans that will be carried out to meet the final guideline requirements. Following finalization of the ToR, baseline and environmental studies are carried out to characterize existing conditions and provide predictions on environmental effects to inform the EIA. The EIA Report is prepared following the completion of baseline and any predictive environmental studies, and submitted to the NBDELG for review. Following response to questions and comments by the government reviewers, the EIA Report is finalized and released to the public for comment prior to a formal public meeting regarding the EIA. The Lieutenant-Governor-in-Council then either approves the EIA and the project can proceed or rejects the EIA until further information is provided.

The project as currently conceived is neither a new mine or mill, nor an expansion to the mine or mill. As such, it is not a designated activity under CEAA 2012, so a federal environmental assessment (EA) is not anticipated to be required. As is the case with any project, the federal Minister may require a federal EA for a project that is not included in the Regulations Designating Physical Activities if the Minister is of the opinion that an EA is warranted, given its potential environmental impacts or public concerns, though this is not anticipated for the Caribou mine.

Using a natural water body frequented by fish for mine waste disposal (such as tailings) requires an amendment to the MMER to specifically list the proposed TMF on Schedule 2 of the MMER. The regulatory amendment requires an application to be submitted to Environment and Climate Change Canada (ECCC) as well as an alternatives assessment report that justifies the nature and location of the proposed TMF as being environmentally favourable compared to other options explored. The amendment process requires approval of the federal Treasury Board and requires publication in the Canada Gazette Part I and Part II in addition to considerable public and First Nations consultation prior to approval. The timeline for completion of the regulatory amendment process is approximately 16 months or more from the time ECCC approves the alternatives assessment report.

Pursuant to the Water Quality Regulation (Regulation 82-126) under the Clean Environment Act and the Air Quality Regulation (Regulation 97-133) under the Clean Air Act, a COA to operate is required from the NBDELG. Currently, the Caribou mine site is operating under COA I-10085 conditions issued on April 5, 2013 to Trevali Mining New Brunswick Ltd (TMNBL).

COA I-10085 allows for the operation of the underground mine, the surface concentrator plant, the mine WTP, and the tailings impoundment. The COA is issued pursuant to paragraph 8(1) of the New Brunswick Water Quality Regulation - Clean Environment Act (Chapter C-6). As COA I-10085 expires on June 30, 2018, a draft of the replacement document is soon expected from NBDELG as requested by TMNBL. This document was not available at the time of the writing of this report. The document is not anticipated to be delayed or to impact the operation.

Pursuant to the Petroleum Product Storage and Handling regulations (Regulation 87-97) under the Clean Environment Act, a licence which applies to the storage, handling, and use of petroleum products for any facility capable of holding capacity of 2,000 L or more of petroleum products is required. Currently, TMNBL holds a petroleum licence (lic#7313) which is valid until September 30, 2018. TMNBL also holds a Purchaser's Permit (Mining/Quarrying) allowing the purchase of fuels under the Gasoline and Motive Fuel Tax Act; the permit expires June 23, 2018. There is no requirement for an Air Quality COA for the operation at Caribou, as there are few emission sources associated with this operation.

Federal environmental requirements to operate the Caribou mine site are specified in the Canadian Environmental Assessment Act, 2012 (c. 19, s. 52), the federal Fisheries Act (c. F-14), and the Canadian Environmental Protection Act (c. 33). In the event that production and milling capacities at Caribou would exceed the EA triggers, the federal Minister of Environment would, in their discretion, require a federal EA to be completed if there are real or perceived concerns about significant environmental effects, or in the face of extreme public pressure. In addition to potential requirements for federal EA, the Fisheries Act, as amended in 2012, applies to the Caribou mine. For mines, the requirements of Section 36 of the Fisheries Act are further defined and regulated by the MMER. The specific requirements would require confirmation with regulatory agencies in parallel with the provincial and/or federal EAs. Also pursuant to the MMER, all mines and recognized closed mines are required to conduct acute lethality testing, effluent characterization, and Environmental Effects Monitoring (EEM). The Caribou Mine became subject to this regulation in November 2007, and TMNBL continues to adhere to MMER requirements. TMNBL has submitted its Phase 1 Environmental Effects Monitoring report in 2015 and is scheduled to submit a Phase 2 EEM report in 2018 – this work is being undertaken by Stantec. As per the MMER requirement, an Emergency Response Plan (ERP) for the Caribou mine was developed and is on file with ECCC.

Pursuant to the Environmental Emergency Regulations (SOR/2003-307) under the Canadian Environmental Protection Act, a list of 174 substances are required to be reported to federal authorities and an environmental emergency plan including prevention of, preparedness for, response to, and recovery from an environmental emergency with respect of a substance is required. The Caribou mine submits annual reports under the Federal National Pollutant Release Inventory (NPRI) as directed by the Canadian Environmental Protection Act. Additionally, an Environment Emergency Plan under the E2 regulations may be required for some of the substances found at the Caribou mine. Substances are currently being reviewed as part of operations and will be added to the plan accordingly.

Pursuant to section 24 of the Nuclear Safety and Control Act, all nuclear substances, sealed sources, and radiation devices require licensing and certification. Several nuclear devices are installed in the Caribou milling complex and are subject to the Nuclear Safety and Control Act. Annual compliance reporting is also required under this act. TMNBL currently holds a Nuclear Substances and Radiation Devices Licence (14806-1-15.0) which is valid until April 30, 2020.

SOCIAL OR COMMUNITY REQUIREMENTS

The Caribou mine supports and funds various projects within the community and has a fourteen percent workforce of Mi'kmag First Nation at the Mine. Trevali is in the process of implementing the Corporate ESMS and the Caribou mine will develop site specific procedures during 2018. The ESMS will assist in the formalizing of the corporate social investment programs and initiatives undertaken at the Caribou mine. The Caribou mine drives the empowerment of women in mining and has eight percent of its workforce as females.

MINE CLOSURE REQUIREMENTS

In accordance with the New Brunswick Regulation 86-98-General Regulation of the Mining Act, the Caribou mine requires an approved Program for the Protection, Reclamation, and Rehabilitation of the Environment. A Reclamation Plan was submitted under Maple Minerals Corporation's name on June 4, 2012 to the New Brunswick Department of Energy and Mines and subsequently approved by the Minister on January 11, 2013.

At present, the monies being held in securities for the Caribou mine site are included in the assets that were acquired by TMNBL. The current reclamation assets on file with NBDERD total $5,000,000, which covers the total amount required based on the current reclamation plan. Additionally, as per Trevali's Approval to Operate I-10085 (Cond.15b), an additional $1,200,000 environmental protection bond has been posted with NBDELG.

The above mentioned financial securities are separate from the assets described below. On January 31, 2013 Trevali entered into a LELA with the province of New Brunswick, where the province would accept the environmental liability associated with historic liabilities. The historic liabilities are defined as the "Anaconda Tailings Area", the "Open Pit", and the "Waste Rock Storage Area". There is some uncertainty related to the final total cost for mine closure. Trevali will be responsible for posting an annuity for water treatment in perpetuity totalling $10,266,666, or as an alternative to water treatment in perpetuity, constructing a closure dam to flood the portal and historic liabilities (under this agreement the province has agreed to contribute 50% of the construction cost up to $12 million). The Caribou mine requires an update to the financial closure liability to ensure that the uncertainty in the total final cost for closure is understood. In addition, a high-level costing for the proposed TMF has been started to determine if the 50% of construction cost up to $12 million by the province of New Brunswick will be adequate.

DISCUSSION

Based on the review of available reports and documents as well as discussions held with management, no evidence of environmental issues that could materially impact the ability to extract the Mineral Resources or Mineral Reserves at the Caribou mine were observed. There are, however, environmental and social risks that need to be mitigated and managed, as detailed above.

The construction of the proposed TMF may be delayed due to permitting timelines. Regulatory decisions, outcomes, or timelines associated with the completion of the permitting processes are not in the control of the proponent. To allow adequate permitting time, the following engineering and planning studies have been initiated for the environmental infrastructure and proposed TMF design:

- Continue site geotechnical investigation initiated in 2014 to assess TMF infrastructure foundations and borrow sources
- Hydrogeological studies including water balance, surface, and groundwater models
- Detailed testing of waste rock for acid generating potential

- Environmental assessment
- Alternatives assessment for the proposed TMF

21 CAPITAL AND OPERATING COSTS

CAPITAL COSTS

Sustaining capital is mainly for underground mine infrastructure, mine development, infill diamond drilling, tailings pond expansion, mill infrastructure, Restigouche water management, and miscellaneous.

Table 21-1 presents a summary of LOM estimated project sustaining capital costs and other costs.

TABLE 21-1 SUMMARY OF LIFE-OF-MINE SUSTAINING CAPITAL AND OTHER COSTS

Trevali Mining Corporation – Caribou Mine

Items	Units	2018	2019	2020	2021	2022	2023	2024	Total
Sustaining Capital Costs									
Underground Mine Infrastructure	$000	2,417	280	0	0	0	0	0	**2,697**
Underground Mine Development	$000	5,948	4,423	224	0	0	0	0	**10,595**
Diamond Drilling	$000	990	960	480	480	240	120	60	**3,330**
Mine Total	**$000**	**9,355**	**5,663**	**704**	**480**	**240**	**120**	**60**	**16,622**
Tailings and Other Ponds	$000	1,664	3,408	2,740	1,000	1,000	0	0	**9,812**
Mill Infrastructure	$000	3,383	745	386	352	232	153	101	**5,353**
Milling and Tailing Total	**$000**	**5,048**	**4,153**	**3,126**	**1,352**	**1,232**	**153**	**101**	**15,165**
Restigouche Water Management	$000	500	500	500	500	500	500	500	**3,500**
Miscellaneous	$000	0	1,500	1,500	500	250	125	63	**3,938**
Sustaining Total	**$000**	**14,903**	**11,815**	**5,830**	**2,832**	**2,222**	**898**	**724**	**39,224**
Other Costs									
Financial Equipment Leases	$000	2,003	2,544	2,674	3,047	0	0	0	**10,269**
Interest on Financial Leases	$000	801	599	417	223	38	0	0	**2,077**
Mine Closure	$000	0	0	0	0	0	0	12,480	**12,480**
Grand Total	**$000**	**17,706**	**14,959**	**8,921**	**6,102**	**2,260**	**898**	**13,204**	**64,050**

RPA is of the opinion that sustaining capital costs are reasonable for an operation of the size and scope of Caribou.

The underground mine infrastructure includes geotechnical and engineering department equipment and software, underground pumping upgrades, ventilation system upgrades, mine electrical upgrades and expansion, and safety equipment.

Mine development includes the excavation of 2,844 m of waste headings and 935 m of rehabilitation. Diamond drilling includes 17,490 m of delineation drilling and 7,500 m of stope definition drilling.

The tailings and other ponds sustaining costs include the Forty Mile TMF EIA, hydrology, geotechnical work, water management, detailed engineering, starter dam, and a new WTP. In addition, the cost includes STTP dam stabilization, as well as dam stabilization QA/QC, and supervision.

Mill infrastructure sustaining capital costs include mill equipment and upgrades, OSA software, assay laboratory repairs and equipment, Programmable Logic Controller (PLC) upgrades, control upgrades in the mine WTP, motor starter upgrades for grinding mills, and various repairs and upgrades to surface installations.

Restigouche water management includes collection, treatment, and discharge.

An allowance has been included for miscellaneous undefined capital costs.

In 2017, Trevali committed to a partnership with Sandvik Mining for Sandvik to supply and maintain a full fleet of mining equipment for the Caribou mine operations. Trevali operates and manages all aspects of the underground mining operation and Sandvik is responsible and accountable for the maintenance of the fleet. The financial equipment lease and interest cover this cost.

Mine closure cost totals $12.5 million which includes site reclamation, construction of a new dam, and water treatment for three years. The new dam will enable rehabilitation of historical liabilities.

OPERATING COSTS

Table 21-2 details the forecast LOM operating costs per tonne milled. The operating costs are based upon a continuation of the current operations and operating practices.

TABLE 21-2 LIFE OF MINE OPERATING COSTS
Trevali Mining Corporation – Caribou Mine

	Units	2018	2019	2020	2021	2022	2023	2024	Total
Mining	$/t milled	24.33	21.95	22.15	24.17	25.47	28.17	31.44	**23.83**
Processing	$/t milled	24.59	23.62	23.84	26.39	28.94	34.75	34.77	**25.91**
Surface	$/t milled	3.60	3.17	3.18	4.15	5.47	9.34	9.34	**4.22**
G&A	$/t milled	4.00	3.72	3.74	4.85	6.53	11.52	11.52	**4.97**
Total	$/t milled	**56.52**	**52.46**	**52.91**	**59.56**	**66.40**	**83.78**	**87.07**	**58.94**

Table 21-3 presents a breakdown of the LOM mine operating cost.

TABLE 21-3 MINE OPERATING COST
Trevali Mining Corporation – Caribou Mine

	Units	2018	2019	2020	2021	2022	2023	2024	Total
Labour	$/t milled	9.99	9.36	7.77	9.41	9.41	9.41	9.41	**9.16**
Consumables	$/t milled	4.71	4.20	3.31	3.19	3.21	3.21	3.21	**3.73**
Supplies	$/t milled	1.35	1.13	0.89	1.07	1.41	1.41	1.45	**1.17**
Energy	$/t milled	2.66	2.47	2.42	2.86	3.55	5.58	5.58	**2.95**
Contract Services	$/t milled	11.15	8.49	7.62	7.18	7.29	7.49	10.72	**8.42**
Other	$/t milled	0.38	0.35	0.35	0.45	0.61	1.07	1.07	**0.46**
Subtotal	**$/t milled**	**30.24**	**25.99**	**22.35**	**24.17**	**25.47**	**28.17**	**31.44**	**25.91**
Allocation to Capital	$/t milled	(5.91)	(4.04)	(0.20)	-	-	-	-	**(2.07)**
Total	**$/t milled**	**24.33**	**21.95**	**22.15**	**24.17**	**25.47**	**28.17**	**31.44**	**23.83**

Table 21-4 presents a breakdown of the LOM mill operating cost.

TABLE 21-4 MILL OPERATING COST
Trevali Mining Corporation – Caribou Mine

	Units	2018	2019	2020	2021	2022	2023	2024	Total
Labour	$/t milled	4.92	4.60	4.68	6.11	6.97	9.53	9.53	**5.64**
Consumables	$/t milled	8.25	8.25	8.23	8.23	8.23	8.23	8.23	**8.24**
Supplies	$/t milled	3.18	2.70	2.91	3.48	4.43	7.25	7.27	**3.56**
Energy	$/t milled	3.69	3.68	3.68	3.72	3.72	3.72	3.72	**3.69**
Contract Services	$/t milled	4.35	4.24	4.20	4.68	5.35	5.59	5.59	**4.58**
Other	$/t milled	0.19	0.15	0.14	0.18	0.25	0.43	0.43	**0.20**
Total	**$/t milled**	**24.59**	**23.62**	**23.84**	**26.39**	**28.94**	**34.75**	**34.77**	**25.91**

Table 21-5 presents a breakdown of the LOM surface operating cost.

TABLE 21-5 SURFACE OPERATING COST
Trevali Mining Corporation – Caribou Mine

	Units	2018	2019	2020	2021	2022	2023	2024	Total
Labour	$/t milled	0.72	0.67	0.68	0.89	1.20	2.11	2.11	**0.91**
Consumables	$/t milled	0.54	0.50	0.50	0.64	0.87	1.53	1.53	**0.66**
Supplies	$/t milled	0.38	0.35	0.35	0.45	0.61	1.07	1.07	**0.46**
Energy	$/t milled	0.63	0.58	0.59	0.76	0.91	1.30	1.30	**0.72**
Contract Services	$/t milled	0.85	0.63	0.62	0.83	1.12	1.97	1.97	**0.88**
Other	$/t milled	0.48	0.44	0.44	0.57	0.77	1.36	1.36	**0.59**
Total	**$/t milled**	**3.60**	**3.17**	**3.18**	**4.15**	**5.47**	**9.34**	**9.34**	**4.22**

Table 21-6 presents a breakdown of the LOM general and administration operating cost.

TABLE 21-6 GENERAL AND ADMINISTRATIVE OPERATING COST
Trevali Mining Corporation – Caribou Mine

	Units	2018	2019	2020	2021	2022	2023	2024	Total
Labour	$/t milled	1.68	1.56	1.59	2.07	2.79	4.92	4.92	**2.11**
Consumables	$/t milled	0.00	0.00	0.00	0.00	0.00	0.01	0.01	**0.00**
Supplies	$/t milled	0.05	0.05	0.05	0.06	0.08	0.15	0.15	**0.06**
Energy	$/t milled	0.04	0.04	0.04	0.06	0.08	0.13	0.13	**0.06**
Contract Services	$/t milled	0.40	0.38	0.38	0.49	0.66	1.16	1.16	**0.50**
Other	$/t milled	1.83	1.68	1.68	2.17	2.92	5.14	5.14	**2.23**
Total	**$/t milled**	**4.00**	**3.72**	**3.74**	**4.85**	**6.53**	**11.52**	**11.52**	**4.97**

MANPOWER

Table 21-7 presents a breakdown of the LOM manpower quantities.

TABLE 21-7 LIFE OF MINE MANPOWER QUANTITIES
Trevali Mining Corporation – Caribou Mine

Position	LOM
Administration	
General Manager	1
First Nations Benefits Coordinator	1
Subtotal	**2**
Finance	
Senior Buyer	1
Purchasing Coordinator	1
Contracts Administrator	1
Site Controller	1

Position	LOM
Accountant, Mine	2
Administrator, Finance	1
Administrator, Payroll & Benefits	1
Student, Summer, Finance	1
Subtotal	**9**
Human Resources	
Supervisor, Human Resources	1
Human Resources Assistant	1
Communication Specialist	1
Subtotal	**3**
Health and Safety	
Supervisor, Health & Safety	1
Advisor, Health & Safety	1
Clerk, Safety	1
Trainer, Emergency Response	1
Trainer, Mine	2
Student, Summer Health & Safety	1
Subtotal	**7**
Warehouse	
Warehouse Attendant	2
Clerk, Warehouse	1
Equipment Operator, Surface	1
Student, Summer Warehouse	1
Subtotal	**5**
Mine	
Mine Management	
General Foreman, Mine	1
Superintendent, Mine Operations/Technical	1
Subtotal	**2**
Mine Technical	
Core Sampler	1
Engineer (Long Range/Projects)	1
Engineer (Mid/Long Range)	1
Engineer In Training (EIT)	1
Engineer, Geotechnical	1
Geologist	4
Geologist, Senior	1
Mine Technician (Planning)	4
Production Coordinator	1
Student Co-Op Mine Dispatch	4

Position	LOM
Student, Summer Geology	1
Technical Lead	1
Subtotal	**21**
Mine – Underground	
Administrative Assistant, Mine	1
Captain, Acting	2
Construction	2
Miner 1	8
Miner 2	32
Miner 3	14
Miner 4	26
Miner 5	8
Supervisor, Underground	6
Subtotal	**99**
Mine - Electrical	
Apprentice Electrician	2
Journeyman Electrician (Shift) - Mine	4
Lead, Electrical	1
Supervisor, Underground Electrical	1
Subtotal	**8**
Mill Operations	
Assay Lab Technician	2
Dewatering Operator	4
Floatation Operator	4
General Foreman, Mill Metallurgist	1
Grinding Helper	4
Grinding Operator	4
Labour, Mill	7
Metallurgist In Training (MIT)	3
Metallurgical Technician	2
Metallurgist	1
Reagent Mix Operator	2
Sample Prep	2
Superintendent, Mill	1
Supervisor, Assay Lab	1
Supervisor, Mill	4
Swing Operator	4
Trainer, Mill Operations	1
Water Treatment Plant Operator	4
Subtotal	**52**

Position	LOM
Mill - Electrical	
Apprentice, Instrumentation	1
Journeyman Electrician (Days)	1
Journeyman Electrician (Shift)	4
Journeyman Instrumentation	2
Programming	1
Supervisor, Electrical	1
Subtotal	**10**
Mill – Mechanical	
Apprentice, Industrial Mechanic	3
Industrial Mechanic (Days)	9
Junior Maintenance Planner	2
Mobile Planner	1
Pipefitter	2
Superintendent, Maintenance and Mobile	1
Supervisor, Mechanical	2
Technical Support	1
Welder	2
Subtotal	**23**
Surface	
Superintendent, Electrical	1
Environmental Co-ordinator	1
Environmental Lead	1
Load Out Operator	2
Labour, Surface	4
Student, Summer, Environment	1
Student, Summer, Surface	1
Supervisor, Surface Projects	1
Surface and Building Caretaker	1
Subtotal	**13**
Grand Total	**253**

22 ECONOMIC ANALYSIS

A Cash Flow Projection has been generated from the LOM Plan production schedule and capital and operating cost estimates, and is summarized in Table 22-1. The associated process recoveries, metal prices, operating costs, refining and transportation charges, royalties, and capital expenditures (sustaining) were also taken into account. All costs are based on fourth quarter of 2017 estimates and presented in US dollars. Metal prices, as provided by Trevali, are based on consensus, long term forecasts from banks, financial institutions, and other sources. Some of the key parameters and assumptions for the pre-tax cash flow are as follows:

Revenue

- 2,930 tpd
- LOM head grade: 5.8% Zn, 2.2% Pb, 63.2 g/t Ag
- Mill recovery averaging: 81.4% Zn, 64.4% Pb, and 54.7% Ag
- Metal prices based on consensus forecasts by year, averaging: US$1.21/lb Zn, US$1.00/lb Pb, and US$18.50/oz Ag at an exchange rate of US$/C$ 0.80
- Smelting and transport costs totalling $0.52 per pound payable zinc
- NSR: $97 per tonne milled.

Costs

- Mine life: 6 years
- Sustaining capital: $39.2 million
- Average operating cost over the mine life: $58.94/t milled
- Closure costs: $12.5 million
- Salvage costs: nil
- New Brunswick Mining Royalty: $26.3 million
- 10% NPI: N/A
- Net cash cost (equivalent to C1 cost), including capital, of $0.70 per pound of payable zinc (net of by-product credits).

The after-tax NPV at an 8% discount rate is $88 million.

TAXATION AND ROYALTIES

Canadian mining operations are subject to an essentially three-tiered tax system:

- Federal income tax is levied on a mining operation's taxable income (generally being net of operating expenses, depreciation on capital assets, and the deduction of exploration and pre-production development costs).
- Provincial and territorial income taxes are based on the same (or similar) taxable income.
- Provincial and territorial mining taxes, duties, or royalties are levied on a separate measure of production profits or revenues.

The *Metallic Minerals Taxation Act* imposes two forms of mineral tax on operators of metallic minerals mines in New Brunswick.

- a 2% royalty based on the annual net revenue (net revenue tax), and
- a 16% net profit tax

The 2% net revenue tax applies to the operator's net revenue for the year. Net revenue is the amount of the gross income from mining operations for the taxation year less allowable costs. Allowable costs include the following:

- transportation costs for output sold,
- smelting, processing, and milling costs,
- 8% of the original cost of the milling or concentrating assets and 15% of the original cost of smelting or refining assets (together not exceeding 25% of new revenue)

Other than processing allowance, no deduction is allowed in respect of capital costs of building or machinery and equipment, depletion of a mine, or capital investment.

The net profit tax is imposed on annual net profits exceeding C$100,000. The net profit is calculated as the mine's gross revenues less allowable costs, specified allowances for depreciation, financing expenses, processing and eligible exploration expenditures, as well as the 2% royalty paid.

The Caribou deposit is subject to a 10% NPI in favour of the Fern Trust.

CASH FLOW ANALYSIS

Considering the Project on a stand-alone basis, the undiscounted pre-tax cash flow totals $129 million over the mine life.

The after-tax NPV at an 8% discount rate is $88 million.

The Caribou mine cash flow projection is shown in Table 22-1.

TABLE 22-1 CASH FLOW SUMMARY
Trevali Mining Corporation - Caribou Mine

	INPUTS	UNITS	TOTAL	2018	2019	2020	2021	2022	2023	2024
MINING										
Caribou										
Operating Days		days	1,743	365	365	365	289	215	120	24
Tonnes milled per day		tonnes / day	2,930	2,757	3,002	3,002	2,936	2,936	2,991	2,936
Production		'000 tonnes	5,106	1,006	1,096	1,096	849	631	358	72
Au Grade		g/t	-	-	-	-	-	-	-	-
Ag Grade		g/t	63.2	65.8	62.6	63.7	66.3	56.6	59.8	68.5
Pb Grade		%	2.2%	2.2%	2.2%	2.2%	2.2%	2.0%	2.0%	2.2%
Zn Grade		%	5.8%	5.6%	6.0%	5.8%	6.0%	5.9%	5.7%	5.7%
PROCESSING										
Mill Feed		'000 tonnes	5,106	1,006	1,096	1,096	849	631	358	72
Au Grade		g/t	-	-	-	-	-	-	-	-
Ag Grade		g/t	63.2	65.8	62.6	63.7	66.3	56.6	59.8	68.5
Pb Grade		%	2.2%	2.2%	2.2%	2.2%	2.2%	2.0%	2.0%	2.2%
Zn Grade		%	5.8%	5.6%	6.0%	5.8%	6.0%	5.9%	5.7%	5.7%
Contained Au		oz	-	-	-	-	-	-	-	-
Contained Ag		oz	10,382,423	2,128,190	2,206,542	2,244,682	1,810,223	1,147,095	687,486	158,204
Contained Pb		tonnes	109,872	22,372	23,656	23,743	18,896	12,613	7,034	1,559
Contained Zn		tonnes	298,213	56,705	65,666	63,675	50,579	37,293	20,221	4,075
Recovery Grade										
Pb Concentrate	Recovery #1	%								
Au			0%	0%	0%	0%	0%	0%	0%	0%
Ag			37%	37%	37%	37%	37%	37%	37%	37%
Pb			64%	63%	64%	65%	65%	65%	65%	65%
Zn			0%	0%	0%	0%	0%	0%	0%	0%
Zn Concentrate	Recovery #2	%								
Au			0%	0%	0%	0%	0%	0%	0%	0%
Ag			17%	16%	17%	18%	18%	18%	18%	18%
Pb			0%	0%	0%	0%	0%	0%	0%	0%
Zn			81%	80%	81%	82%	82%	82%	82%	82%
Recovered Amount										
Pb Concentrate	Recovery #1									
Au		oz	12,103	2,449	2,631	2,611	2,078	1,387	774	171
Ag		oz	3,868,387	789,558	823,040	837,266	675,213	427,867	256,432	59,010
Pb		tonnes	70,732	14,093	15,140	15,433	12,282	8,198	4,572	1,013
Zn		tonnes	9,834	2,019	2,169	2,152	1,713	1,143	638	-
Zn Concentrate	Recovery #2									
Au		oz	14,924	2,824	3,311	3,183	2,528	1,864	1,011	204
Ag		oz	1,811,740	345,014	378,888	397,239	328,723	208,304	124,843	28,729
Pb		tonnes	15,094	2,896	3,395	3,263	2,592	1,911	1,036	-
Zn		tonnes	242,744	45,364	53,190	52,214	41,474	30,580	16,581	3,341
Grades in Concentrate										
Pb Concentrate		tonnes	188,216	38,090	40,919	40,613	32,322	21,574	12,032	2,666
Au grade in concentrate		g/t	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ag grade in concentrate		g/t	639.3	644.7	625.6	641.2	649.8	616.85	662.90	688.45
Cu grade in concentrate		%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
Pb grade in concentrate		%	37.6%	37.0%	37.0%	38.0%	38.0%	38%	38%	38%
Zn grade in concentrate		%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
Concentrate Moisture		%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%
Zn Concentrate		tonnes	510,086	96,519	113,169	108,778	86,405	63,709	34,545	6,961
Au grade in concentrate		g/t	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Ag grade in concentrate		g/t	110.5	111.2	104.1	113.6	118.3	101.70	112.41	128.37
Cu grade in concentrate		%	0.80%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Pb grade in concentrate		%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Zn grade in concentrate		%	47.6%	47.0%	47.0%	48.0%	48.0%	48%	48%	48%
Fe grade in concentrate		%	11.4%	11.4%	11.4%	11.4%	11.4%	11.4%	11.4%	11.4%
Concentrate Moisture		%	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%
Total Tonnes Concentrate		wmt	768,077	148,052	169,487	164,317	130,589	93,811	51,232	10,588
Total Recovered										
Ag		**oz**	**5,680,127**	**1,134,572**	**1,201,928**	**1,234,506**	**1,003,936**	**636,171**	**381,275**	**87,739**
Pb		**tonnes**	**70,732**	**14,093**	**15,140**	**15,433**	**12,282**	**8,198**	**4,572**	**1,013**
Zn		**tonnes**	**242,744**	**45,364**	**53,190**	**52,214**	**41,474**	**30,580**	**16,581**	**3,341**

	INPUTS	UNITS	TOTAL	2018	2019	2020	2021	2022	2023	2024
REVENUE										
Metal Prices		**Input Units**								
Au		US$/oz Au	$1,257.27	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,285.00	$1,285.00	$1,285.00
Ag		US$/oz Ag	$18.40	$18.50	$18.50	$18.50	$18.50	$18.00	$18.00	$18.00
Pb		US$/lb Pb	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00
Zn		US$/lb Zn	$1.20	$1.25	$1.20	$1.20	$1.20	$1.13	$1.13	$1.13
Exchange Rate		C$/US$	$0.80	$0.80	$0.80	$0.80	$0.80	$0.80	$0.80	$0.80
Concentrate Payable %										
Pb Concentrate Payable %										
Payable Au		%		53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%
Payable Ag		%		92.2%	92.0%	92.2%	92.3%	91.9%	92.5%	92.7%
Payable Pb		%		91.9%	91.9%	92.1%	92.1%	92.1%	92.1%	92.1%
Zn Concentrate Payable %										
Payable Au		%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Payable Ag		%		1.4%	0.0%	2.7%	5.2%	0.0%	2.0%	9.9%
Payable Zn		%		83.0%	83.0%	83.3%	83.3%	83.3%	83.3%	83.3%
Concentrate Payable										
Pb Concentrate Payable										
Payable Au		oz	6,456	1,307	1,404	1,393	1,109	740	413	91
Payable Ag		oz	3,565,925	728,348	757,284	772,002	623,271	393,197	237,097	54,726
Payable Pb		tonnes	65,085	12,951	13,912	14,214	11,313	7,551	4,211	933
Zn Concentrate Payable										
Payable Au		oz	-	-	-	-	-	-	-	-
Payable Ag		oz	37,910	4,679	-	10,735	17,099	-	2,559	2,838
Payable Zn		tonnes	201,937	37,642	44,136	43,511	34,562	25,484	13,818	2,784
Zn Eq. Lbs		Lbs	627,361,611	118,049,055	135,926,172	135,483,506	107,946,734	78,013,878	42,963,197	8,979,068
Gross Revenue										
Au Gross Revenue		US$ '000	$8,114	$1,633	$1,754	$1,741	$1,386	$951	$530	$118
Ag Gross Revenue		US$ '000	$66,326	$13,561	$14,010	$14,481	$11,847	$7,078	$4,314	$1,036
Pb Gross Revenue		US$ '000	$143,448	$28,543	$30,663	$31,329	$24,933	$16,642	$9,281	$2,057
Zn Gross Revenue		US$ '000	$532,215	$103,516	$116,961	$115,305	$91,589	$63,485	$34,423	$6,936
Total Gross Revenue		**US$ '000**	**$750,102**	**$147,253**	**$163,388**	**$162,856**	**$129,755**	**$88,156**	**$48,548**	**$10,146**
Total Charges										
Trucking to Port										
Pb Concentrate		US$ '000	$5,968	$1,147	$1,346	$1,294	$1,028	$686	$383	$85
Zn Concentrate		US$ '000	$2,275	$453	$487	$483	$384	$283	$154	$31
Ocean Transport										
Pb Concentrate		US$ '000	$28,319	$5,731	$6,157	$6,111	$4,863	$3,246	$1,810	$401
Zn Concentrate		US$ '000	$74,901	$14,173	$16,618	$15,973	$12,688	$9,355	$5,073	$1,022
Treatment										
Pb Concentrate		US$ '000	$23,470	$4,750	$5,103	$5,064	$4,031	$2,690	$1,500	$332
Zn Concentrate		US$ '000	$93,154	$15,926	$20,370	$20,450	$16,417	$12,105	$6,563	$1,323
Refining cost										
Au		US$ '000	$116	$24	$25	$25	$20	$13	$7	$2
Ag		US$ '000	$3,604	$733	$757	$783	$640	$393	$240	$58
Total Charges		**US$ '000**	**$230,186**	**$42,935**	**$50,863**	**$50,183**	**$40,071**	**$27,803**	$15,194	$3,137
Net Smelter Return		**US$ '000**	**$519,917**	**$104,318**	**$112,525**	**$112,673**	**$89,684**	**$60,353**	**$33,355**	**$7,009**
Royalty NSR		US$ '000	$26,300	$5,400	$6,900	$7,200	$4,900	$1,500	$400	$0
Net Revenue		**US$ '000**	**$493,617**	**$98,918**	**$105,625**	**$105,473**	**$84,784**	**$58,853**	**$32,955**	**$7,009**
Unit NSR		**US$/t milled**	**$96.67**	**$98.31**	**$96.40**	**$96.27**	**$99.90**	**$93.30**	**$92.17**	**$97.50**
OPERATING COST										
Mining (Underground)		US$/t milled	$23.83	$24.33	$21.95	$22.15	$24.17	$25.47	$28.17	$31.44
Processing		US$/t milled	$25.91	$24.59	$23.62	$23.84	$26.39	$28.94	$34.75	$34.77
Surface		US$/t milled	$4.22	$3.60	$3.17	$3.18	$4.15	$5.47	$9.34	$9.34
G&A		US$/t milled	$4.97	$4.00	$3.72	$3.74	$4.85	$6.53	$11.52	$11.52
Total Operating Cost		**US$/t milled**	**$58.94**	**$56.52**	**$52.46**	**$52.91**	**$59.56**	**$66.40**	**$83.78**	**$87.07**
Mining (Underground)		US$ '000	$121,704	$24,480	$24,051	$24,264	$20,510	$16,065	$10,073	$2,260
Processing		US$ '000	$132,321	$24,740	$25,881	$26,120	$22,399	$18,255	$12,426	$2,500
Surface		US$ '000	$21,571	$3,626	$3,477	$3,489	$3,521	$3,448	$3,339	$671
G&A		US$ '000	$25,377	$4,024	$4,072	$4,100	$4,118	$4,118	$4,118	$828
Total Operating Cost		**US$ '000**	**$300,973**	**$56,870**	**$57,481**	**$57,973**	**$50,549**	**$41,885**	**$29,956**	**$6,259**
Total Opex / Zn Equiv Payable		US$/lb pay Zn	$0.89	$0.89	$0.85	$0.85	$0.88	$0.92	$1.07	$1.06
C1 Cost		US$/lb pay Zn	$0.70	$0.68	$0.64	$0.63	$0.69	$0.80	$1.02	$1.01
Operating Cashflow		**US$ '000**	**$192,643**	**$42,048**	**$48,144**	**$47,500**	**$34,236**	**$16,968**	**$2,998**	**$750**

	INPUTS	UNITS	TOTAL	2018	2019	2020	2021	2022	2023	2024
CAPITAL COST										
Sustaining Capital Cost										
Underground Mine Infrastructure		US$ '000	$2,697	$2,417	$280	$0	$0	$0	$0	$0
Underground Mine Development		US$ '000	$10,595	$5,948	$4,423	$224	$0	$0	$0	$0
Diamond Drilling		US$ '000	$3,330	$990	$960	$480	$480	$240	$120	$60
Tailings and Other Ponds		US$ '000	$9,812	$1,664	$3,408	$2,740	$1,000	$1,000	$0	$0
Mill Infrastructure		US$ '000	$5,353	$3,383	$745	$386	$352	$232	$153	$101
Restigouche Water Management		US$ '000	$3,500	$500	$500	$500	$500	$500	$500	$500
Miscellaneous		US$ '000	$3,938	$0	$1,500	$1,500	$500	$250	$125	$63
Total Sustaining Cost		**US$ '000**	**$39,224**	**$14,903**	**$11,815**	**$5,830**	**$2,832**	**$2,222**	**$898**	**$724**
Other Costs										
Financial Equipment Leases		US$ '000	$10,269	$2,003	$2,544	$2,674	$3,047	$0	$0	$0
Interest on Financial Leases		US$ '000	$2,077	$801	$599	$417	$223	$38	$0	$0
Reclamation and closure		US$ '000	$12,480	$0	$0	$0	$0	$0	$0	$12,480
Total Capital Cost		**US$ '000**	**$64,050**	**$17,706**	**$14,959**	**$8,921**	**$6,102**	**$2,260**	**$898**	**$13,204**
PRE-TAX CASH FLOW										
Net Pre-Tax Cashflow		US$ '000	$128,593	$ 24,341	$ 33,185	$ 38,579	$ 28,133	$ 14,708	$ 2,100	$ (12,454)
Cumulative Pre-Tax Cashflow		US$ '000		$ 24,341	$ 57,526	$ 96,106	$ 124,239	$ 138,947	$ 141,047	$ 128,593
Taxes		US$ '000	$23,200	$ -	$ 6,900	$ 8,700	$ 6,000	$ 1,600	$ -	$ -
After-Tax Cashflow		US$ '000	$105,393	$ 24,341	$ 26,285	$ 29,879	$ 22,133	$ 13,108	$ 2,100	$ (12,454)
Cumulative After-Tax Cashflow		US$ '000		$ 24,341	$ 50,626	$ 80,506	$ 102,639	$ 115,747	$ 117,847	$ 105,393
PROJECT ECONOMICS										
Pre-Tax IRR		%	0.0%							
Pre-tax NPV at 5% discounting	5.0%	US$ '000	$113,994							
Pre-tax NPV at 8% discounting	8.0%	US$ '000	$106,360							
Pre-tax NPV at 10% discounting	10.0%	US$ '000	$101,682							
After-Tax IRR		%	0.0%							
After-Tax NPV at 5% discounting	5.0%	US$ '000	$94,030							
After-Tax NPV at 8% discounting	8.0%	US$ '000	$88,039							
After-tax NPV at 10% discounting	10.0%	US$ '000	$84,351							

SENSITIVITY ANALYSIS

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined through analysis of cash flow sensitivities:

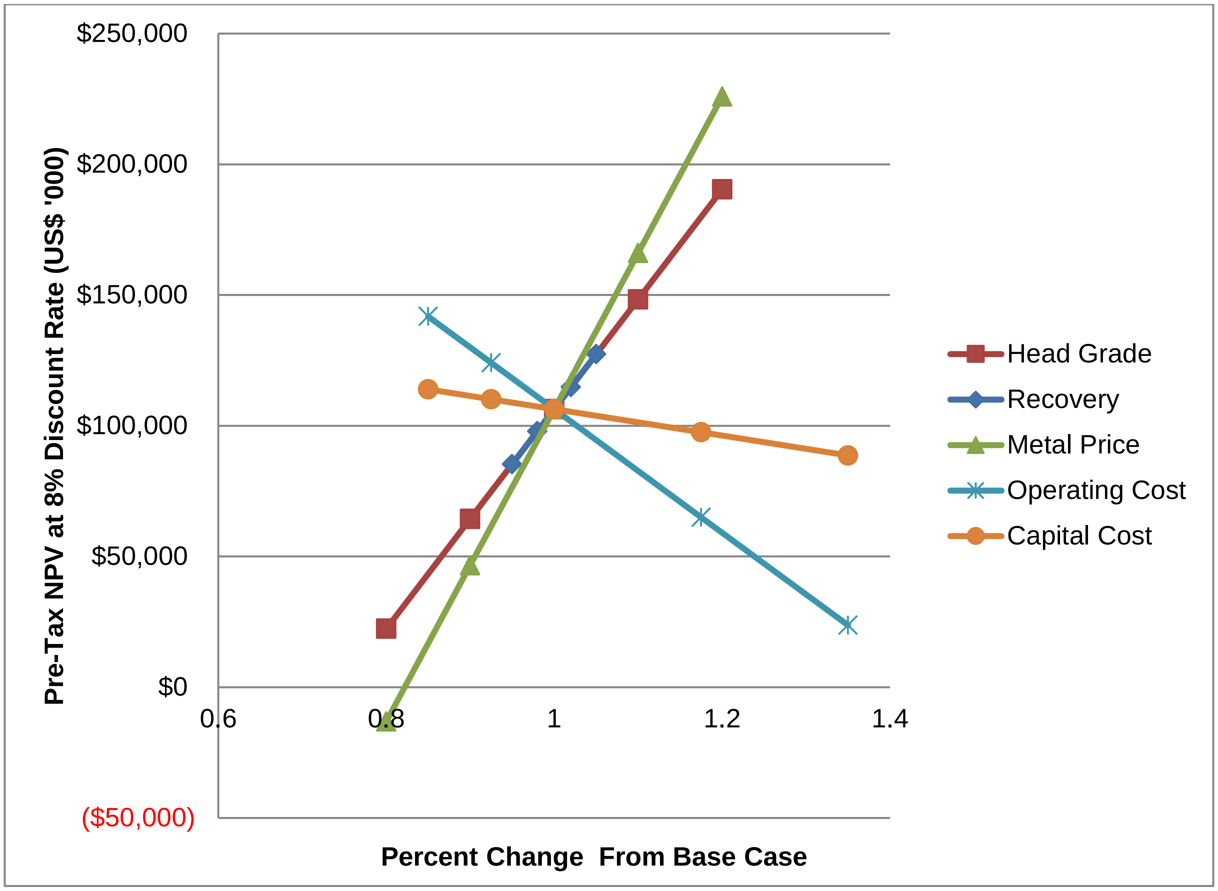
- Head grade
- Zinc recovery
- Zinc price
- Operating costs
- Sustaining capital costs

Pre-tax NPV at 8% discount sensitivities over the Base Case have been calculated per Table 22-1. The sensitivities are shown in Table 22-2 and Figure 22-1. The Project return is most sensitive to the product of changes in the head grade and zinc price followed by changes in the recovery, capital costs, and operating costs.

TABLE 22-2 SENSITIVITY ANALYSIS
Trevali Mining Corporation – Caribou Mine

	Head Grade (% Zn)	NPV at 8% ($M)
0.80	4.7	22.3
0.90	5.3	64.3
1.00	**5.8**	**106.4**
1.10	6.4	148.4
1.20	7.0	190.4
	% Recovery	**NPV at 8% ($M)**
0.95	77.3	85.4
0.98	79.8	98.0
1.00	**81.4**	**106.4**
1.02	83.0	114.8
1.05	85.5	127.4
	Zinc Price ($/lb)	**NPV at 8% ($M)**
0.80	0.96	(13.2)
0.90	1.08	46.6
1.00	**1.20**	**106.4**
1.10	1.32	166.1
1.20	1.44	225.9
	Operating Costs ($M)	**NPV at 8% ($M)**
0.85	255.8	141.8
0.93	278.4	124.1
1.00	**301.0**	**106.4**
1.18	353.6	65.0
1.35	406.3	23.7
	Capital Costs ($M)	**NPV at 8% ($M)**
0.85	54.4	113.9
0.93	59.2	110.2
1.00	**64.1**	**106.4**
1.18	75.3	97.5
1.35	86.5	88.7

FIGURE 22-1 SENSITIVITY ANALYSIS – PRE-TAX NPV



RPA is of the opinion that the study work on the Caribou mine is suitable for the declaration of Mineral Reserves.

23 ADJACENT PROPERTIES

This section is not applicable.

24 OTHER RELEVANT DATA AND INFORMATION

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.

25 INTERPRETATION AND CONCLUSIONS

Based on RPA's site visit, discussion with Caribou personnel, and review of the available documentation, RPA offers the following interpretation and conclusions.

GEOLOGY AND MINERAL RESOURCES

- The geology and mineralization is well understood by Caribou geology personnel.
- Drilling, sampling, QA/QC, and sample preparation and analyses were appropriate for the style of mineralization and adequate for Mineral Resource estimation.
- The assumptions, parameters, and methodology are appropriate for the style of mineralization.
- Mineral Resources were estimated consistent with CIM (2014) definitions.
- Caribou Measured plus Indicated Mineral Resources total 8.89 Mt grading 6.11% Zn, 2.28% Pb, 0.38% Cu, and 68 g/t Ag containing approximately 543,400 t of zinc, 203,400 t of lead, 33,800 t of copper, and 19.4 million ounces of silver.
- Caribou Inferred Mineral Resources total 7.0 Mt grading 5.7% Zn, 2.1% Pb, 0.3% Cu, and 65 g/t Ag containing approximately 388,400 t of zinc, 148,100 t of lead, 21,000 t of copper, and 14.6 million ounces of silver.
- The 2017 Mineral Resource estimate completed in Leapfrog is reasonable. RPA, does, however, note that considerable work is still required in order to implement the new software that will replace the previously integrated geology/mine planning system at Caribou with the same robustness and operational flexibility.

EXPLORATION

- The extent of the orebody and mine has been generally defined by exploration drilling, however, the potential below and lateral to current orebodies is considered high and is being investigated.
- Geological interpretation utilizing wide spaced drilling, lithology, structures, grades, and existing knowledge of the Caribou geology, has been used to outline an exploration target of 3 Mt to 7 Mt grading 5% to 6% Zn, 1% to 3% Pb, 0% to 1% Cu, and 50 g/t to 100 g/t Ag. The potential quantity and grade is conceptual in nature, and there has been insufficient exploration to define a Mineral Resource. It is uncertain if further exploration will result in the target being delineated as a Mineral Resource.
- RPA concurs with Trevali's opinion that the Bathurst Mining Camp is a mature mining district that needs to be explored with new tools and approaches.

MINING AND MINERAL RESERVES

- The Mineral Reserve estimate was prepared using MSO in Deswik to determine potential mineable stope shapes per level based on a NSR cut-off value which captures the full cost of the mining operation including mining, processing, shipping, and smelting costs.

- The NSR cut-off values used for Mineral Reserve estimation are acceptable.

- Caribou Proven and Probable Mineral Reserves total 5.11 Mt grading 5.84% Zn, 2.15% Pb, and 63.2 g/t Ag containing 298,100 t of zinc, 109,800 t of lead, and 10.4 million ounces of silver.

- The Mineral Reserve estimate has been prepared utilizing acceptable estimation methodologies and the classifications of Proven and Probable Mineral Reserves conform to CIM (2014) definitions.

MINERAL PROCESSING

- The process plant includes crushing, screening, and grinding followed by lead/zinc flotation and filtering to produce separate lead and zinc concentrates.

- The zinc metallurgy is very consistent with respect to grade over the past two and a half years of operation. The recovery has continued to increase and is expected to continue improving as it approaches the 84% recovery forecast that has been achieved on several individual days of operation.

- The lead metallurgy has been very consistent on grade and recovery has seen significant improvements year on year.

- The silver recovery has steadily increased since the commissioning of the plant.

- The previous copper circuit design within a PEA prepared by SRK in 2015 is currently not considered feasible.

ENVIRONMENTAL, SOCIAL, COMMUNITY

- The Caribou mine has approval to operate the mine under COA I-10085.

- Trevali has a LELA with the province of New Brunswick, where the province accepted the environmental liability associated with historical operations.

- The construction of the proposed TMF may be delayed due to permitting timelines. To allow adequate permitting time, engineering and planning studies have been initiated by Trevali for the environmental infrastructure and proposed TMF design.

- No evidence of environmental issues that could materially impact the ability to extract the Mineral Resources or Mineral Reserves at the Caribou mine were observed. There are, however, environmental and social risks that need to be mitigated and managed.

- The Caribou mine supports and funds various projects within the community and has a 14% workforce of Mi'kmag First Nation at the mine.

26 RECOMMENDATIONS

RPA offers the following recommendations.

GEOLOGY AND MINERAL RESOURCES

- Formally document SOPs for all geological procedures including drill layout and core/sampling logging and QA/QC procedures.

- Whole core sampling for mine definition BQ core should be reinstated. The recent introduction of splitting the BQ sized core does allow for a representative sample when compared against the split exploration NQ sized core. In RPA's opinion, short holes less than 100 m in length should be whole core sampled and holes greater than 100 m in length should be whole core sampled or drilled NQ size.

- Additional effort should be undertaken to monitor QA/QC inputs and results.
    - Compare sample weights recorded during bulk density testing against laboratory received weights to check for sample mix-ups.
    - Review blank material source, preferably certified, as well as blank weight submitted. Blanks should be inserted after high grade intersections.
    - Do not use Certified Reference Materials that do not require an over-limit assay (<10,000 ppm) for Mineral Resource grade samples.

- Implement double manual keyed data entry and validation of the handwritten Caribou Lab Assay Results.

- The drill hole database should be added to the normal Caribou server daily backup with offsite backup.

- Review of the resource domains identified a number of minor snapping and nesting errors, and these should be addressed prior to the next resource update.

- Conduct a study to test density weighting the block grade estimate.

- As of the date of this report, no comparison has been made for 2017 production against the new Leapfrog model. RPA recommends that these reconciliation studies be completed on a monthly basis and summarized for year-end review and model validation.

EXPLORATION

- In-mine drilling should continue to explore for economic downdip potential.

- The 2018 New Brunswick exploration budget of approximately $4.0 million is warranted. The work on the Caribou deposit will include approximately 20,000 m of underground resource definition and exploration drilling, and approximately 1,500 m of surface exploration surface drilling along with mapping and sampling.

- Potential additional sources of feed to supplement Caribou production warrant advanced engineering studies and supplementary exploration, if required, at the regional targets of Restigouche, Heath Steele, and Murray Brook deposits.

MINING AND MINERAL RESERVES

- Complete additional reconciliation studies to confirm stope dilution and extraction assumptions.

- Complete additional delineation drilling and definition drilling in both mining limbs to upgrade Mineral Resources to Mineral Reserves.

- Complete a CRF method trial to assess the potential of increasing mining recovery of sill pillars and at-risk stopes.

- Convert to fully using bulk emulsion powder in the future, in order to further control of hanging wall stability.

- Carry out diamond drilling at the formerly producing Restigouche mine in order to advance start-up and provide a potential additional source of feed for the Caribou mill.

MINERAL PROCESSING

- Utilize data generated from baselining to establish the next series of process optimizations.

- Evaluate the opportunity to recovery more liberated fines through size by size analysis.

- Continue work towards understanding the mechanism(s) of seasonal metallurgy.

ENVIRONMENTAL, SOCIAL, COMMUNITY

- To allow adequate permitting time, continue engineering and planning studies that have been initiated for the environmental infrastructure and proposed TMF design, as follows:
    - Site geotechnical investigation to assess TMF infrastructure foundations and borrow sources
    - Hydrogeological studies including water balance, surface, and groundwater models
    - Detailed testing of waste rock for acid generating potential
    - Environmental assessment
    - Alternatives assessment for the proposed TMF

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28 DATE AND SIGNATURE PAGE

This report titled Technical Report on the Caribou Mine and dated May 31, 2018 was prepared and signed by the following authors:

(Signed and Sealed) "*Torben Jensen*"

Dated at Toronto, ON
May 31, 2018

Torben Jensen, P.Eng.
Principal Mining Engineer

(Signed and Sealed) "*Ian T. Blakley*"

Dated at London, UK
May 31, 2018

Ian T. Blakley, P.Geo., EurGeol
Principal Geologist

(Signed and Sealed) "*Tracey Jacquemin*"

Dated at Johannesburg, SA
May 31, 2018

Tracey Jacquemin, Pr.Sci.Nat.
Corporate Manager, HSEC
Trevali Mining Corporation

(Signed and Sealed) "*Shaun C. Woods*"

Dated at Bathurst, NB
May 31, 2018

Shaun C. Woods, P.Eng.
Mill Superintendent, Caribou Mine
Trevali Mining Corporation

29 CERTIFICATE OF QUALIFIED PERSON

TORBEN JENSEN, P.ENG.

I, Torben Jensen, P.Eng., as an author of this report entitled “Technical Report on the Caribou Mine, New Brunswick, Canada” prepared for Trevali Mining Corporation and dated May 31, 2018, do hereby certify that:

1. I am a Principal Mining Engineer with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON, M5J 2H7.

2. I am a graduate of South Dakota School of Mines and Technology in 1978 with a B.Sc. degree in Mining Engineering.

3. I am registered as a Professional Engineer in the Province of Ontario (Reg.#9028688). I have worked as a mining engineer for a total of 40 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Preparation of NI 43-101 Technical Reports, feasibility studies, and due diligence reviews for a wide range of commodities including gold, silver, nickel, lead, zinc, uranium, coal, asbestos, potash, copper, and diamonds.
   - Vice President Corporate Development with a Canadian gold mining company, responsible for the evaluation of investment opportunities.
   - Vice President Engineering with a Canadian base metal mining company, responsible for preparation of feasibility studies related to property acquisitions and development, engineering design of underground and open pit projects, short and long range mine planning, capital and operating cost estimation for budgets, and permitting.
   - Manager of Engineering with a Canadian based mining company, responsible for the reopening of a former nickel mine.
   - Chief Mining Engineer with a Canadian-based coal company, responsible for mine contracting, short and long range mine planning, budget preparations, scheduling, project management, feasibility studies related to property acquisitions, open pit and underground engineering design, underground construction design, costing, and supervision.

4. 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.

5. I visited the Caribou mine from February 20 to 22, 2018.

6. I am responsible for Sections 15, 16, 18, 19, 21, and 22 and share responsibility for Sections 1, 24, 25, 26, and 27 of this Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

8. I have had no prior involvement with the property that is the subject of the Technical Report.

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

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report Sections 15, 16, 18, 19, 21, and 22 for which I am responsible and Sections 1, 24, 25, 26, and 27 for which I share responsibility contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated 31st day of May, 2018

(Signed and Sealed) "*Torben Jensen*"

Torben Jensen, P.Eng.

IAN T. BLAKLEY, P.GEO., EURGEOL

I, Ian T. Blakley, P.Geo., EurGeol, as an author of this report entitled "Technical Report on the Caribou Mine, New Brunswick, Canada" prepared for Trevali Mining Corporation and dated May 31, 2018, do hereby certify that:

1. I am a Principal Geologist and Vice-President and General Manager of RPA UK Ltd. of One Fetter Lane, Suite 311, London, UK EC4A 1BR.

2. I am a graduate of the University of Waterloo, Waterloo, Ontario, Canada, in 1984 with a Bachelor of Science degree in Honours Co-operative Applied Earth Sciences/Geology Option.

3. I am registered as a Professional Geoscientist in the Province of Ontario (Reg. #1446). I am also a member of the European Federation of Geologists (No. 1480) as well as a Professional Geologist (No. 271) associated with the Institute of Geologists of Ireland. I have worked as a Geologist for a total of 35 years since my graduation. My relevant experience for the purpose of the Technical Report is:
    - Review and reporting, including Mineral Resource estimation, as a geological consultant on numerous exploration and mining projects around the world for due diligence and regulatory requirements.
    - Vice-President – Exploration with a Canadian private company exploring and developing world-class gold assets in northeastern Kazakhstan.
    - Chief Geologist with a major Canadian mining company responsible for the management of geological exploration, resource definition and production.
    - Senior Mines Exploration Geologist for new capital underground mining projects including exploration and definition drilling, resource definition, infrastructure positioning, production and reconciliation.
    - Exploration Geologist responsible for sampling and mapping programs at gold and base metal properties in Canada.

4. 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.

5. I visited the Caribou mine from February 20 to 22, 2018.

6. I am responsible for Sections 2 to 12, 14, and 23 and share responsibility for Sections 1, 24, 25, 26, and 27 of this Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

8. I have had no prior involvement with the property that is the subject of the Technical Report.

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

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Technical Report Sections 2 to 12, 14, and 23 for which I am responsible and Sections 1, 24, 25, 26, and 27 for which I share responsibility contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated 31st day of May, 2018

(Signed and Sealed) "*Ian T. Blakley*"

Ian T. Blakley, P. Geo., EurGeol

TRACEY JACQUEMIN, PR.SCI.NAT

I, Tracey Jacquemin, Pr.Sci.Nat 400163/12, as an author of item 20 of this report entitled "Technical Report on the Caribou Mine, New Brunswick, Canada" prepared for Trevali Mining Corporation and dated May 31, 2018, do hereby certify that:

1. I am Corporate Manager, HSEC with Trevali Mining Corporation at 1400 - 1199 West Hastings Street, Vancouver, BC Canada, V6E 3T5.

2. I am a graduate of University of the Witwatersrand, Johannesburg, South Africa in 2004 with a Bachelor of Science Degree with Honours (BSc Hons.) Ecology, Environment and Conservation Biology.

3. I am registered as a Professional Environmental Scientist in the Country of Republic of South Africa (Pr.Sci.Nat 400163/12). I have worked as an Environmental Scientist for a total of 14 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Four years of consulting experience in Sub-Sahara Africa including, but not limited to, Environmental project management, contract management, due diligences, Environmental Impact Assessments, Basic Assessments, Water Use Licence Applications and Waste Licence Applications Permitting in terms of the South African Legislative Framework, Environmental Compliance Assessments and Auditing, Environmental Management System Development and Implementation and Environmental Control Officer work.
   - Environmental Manager for an Underground Mining Project
   - Environmental Project Manager / Environmental Assessment Practitioner for a South African Mine.

4. 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.

5. I visited the Caribou mine from November 29 to December 2, 2017.

6. I am responsible for Section 20 of the Technical Report and share responsibility for Sections 1, 24, 25, 26, and 27 of this Technical Report.

7. I am not independent of the Issuer applying the test set out in Section 1.5 of NI 43-101 as I am an employee of the Issuer.

8. I have been involved with the Caribou mine, subject of the Technical Report, since October 2017 in my capacity as Corporate Manager, HSEC.

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

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains Sections 13 and 17 for which I am responsible and Sections 1, 24, 25, 26, and 27 for which I share responsibility contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated 31st day of May, 2018

(Signed and Sealed) "*Tracey Jacquemin*"

Tracey Jacquemin, Pr.Sci.Nat 400163/12

SHAUN C. WOODS, P.ENG.

I, Shaun C. Woods, P.Eng., as an author of items 13 and 17 of this report entitled "Technical Report on the Caribou Mine, New Brunswick, Canada" prepared for Trevali Mining Corporation and dated May 31, 2018, do hereby certify that:

1. I am Mill Superintendent with Trevali Mining Corporation of 9361 Rte 180 Hwy, Bathurst, NB, E2A 3Z1.

2. I am a graduate of Dalhousie University, Halifax N.S. in 2006 with a Bachelor of Materials Engineering.

3. I am registered as a Professional Engineer in the Province of New Brunswick (Reg. #M6884). I have worked as a metallurgical engineer for a total of 12 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Metallurgist/Sr. Metallurgist at Brunswick Mine Cu/Pb/Zn (2006-2013).
   - Sr. Metallurgist with Caribou Project (2013-2016).
   - Mill Superintendent at Caribou Mine (2016-present).

4. 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.

5. I currently work onsite at the Caribou mine, subject of the Technical Report and interface regularly with management and operations.

6. I am responsible for Sections 13 and 17 and parts of Sections 1, 25, and 26 of the Technical Report.

7. I am not independent of the Issuer as described in section 1.5 of NI 43-101, as I am an employee of a subsidiary of the Issuer.

8. I have been involved with the Caribou mine, subject of the Technical Report, since January 2013 in my capacity as Sr. Metallurgist/Mill Superintendent.

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

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains Sections 13 and 17 and parts of Sections 1, 25, and 26 for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated 31st day of May, 2018

(Signed and Sealed) "*Shaun C. Woods*"

Shaun C. Woods, P.Eng.

30 APPENDIX 1

MINERAL TENURE INFORMATION

TABLE 30-1 UNIT IDS FOR RIGHT 1773

Right 1773 - Woodside Brook	
Unit ID	**Expiry Date**
1321003I	2018-06-15
1321003J	2018-06-15
1321003K	2018-06-15
1321003L	2018-06-15
1321003M	2018-06-15
1321003N	2018-06-15
1321003O	2018-06-15
1321003P	2018-06-15
1321004A	2018-06-15
1321004B	2018-06-15
1321004C	2018-06-15
1321004D	2018-06-15
1321004E	2018-06-15
1321004F	2018-06-15
1321004G	2018-06-15
1321004H	2018-06-15
1321004I	2018-06-15
1321004J	2018-06-15
1321004K	2018-06-15
1321004L	2018-06-15
1321004N	2018-06-15
1321004O	2018-06-15
1321005B	2018-06-15
1321013I	2018-06-15
1321013J	2018-06-15
1321013K	2018-06-15
1321013L	2018-06-15
1321013M	2018-06-15
1321013N	2018-06-15
1321013O	2018-06-15
1321013P	2018-06-15
1321014A	2018-06-15
1321014B	2018-06-15
1321014C	2018-06-15
1321014D	2018-06-15
1321014G	2018-06-15
1321014H	2018-06-15
1321014I	2018-06-15
1321004G	2018-06-15
1321004H	2018-06-15
1321004I	2018-06-15
1321004J	2018-06-15
1321004K	2018-06-15
1321004L	2018-06-15
1321004N	2018-06-15
1321004O	2018-06-15
1321005B	2018-06-15
1321013I	2018-06-15

Right 1773 - Woodside Brook

Unit ID	Expiry Date
1321013J	2018-06-15
1321013K	2018-06-15
1321013L	2018-06-15
1321013M	2018-06-15
1321013N	2018-06-15
1321013O	2018-06-15
1321013P	2018-06-15
1321014A	2018-06-15
1321014B	2018-06-15
1321014C	2018-06-15
1321014D	2018-06-15
1321014G	2018-06-15
1321014H	2018-06-15
1321014I	2018-06-15

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To: Anna Ladd, Chief Financial Officer, Trevali Mining Corporation

From: George L. Cooper

Date: June 16, 2014

Re: Trevali Mining (New Brunswick) Ltd./Caribou Mine Tenure Report

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Thank you for your request for a report on title and tenure information pertaining to the interest of Trevali Mining (New Brunswick) Ltd. ("Trevali NB") in the Caribou Mine, located at or near Bathurst Camp, New Brunswick. We are able to report as follows:

<u>Title, Tenure and Registered Encumbrances</u>

1. The Caribou Mine is comprised of:

    a) Mineral Claim 1773 (also known as Woodside Brook and hereinafter the "Mineral Claim");

    b) Mining Lease No. ML-246 (the "Mining Lease");

    c) The freehold lands located in the Province of New Brunswick, known as PID 50072032 (the "Freehold Lands"); and

    d) Industrial Surface Lease No. SIML2271 (also referred to as Crown Lands Lease #415060027and hereinafter referred as the "Surface Lease").

2. The Mineral Claim is presently held in the name of Trevali NB, as the holder of the claim on record. The Mineral Claim is in good standing and expires June 15, 2015. The Mineral Claim is subject to a Limited Environmental Liability Agreement dated as of January 30th, 2013, as well as a Debenture in favor of Computershare Trust Company of Canada filed with the Recorder of Mines under the Mining Act (New Brunswick) on May 29th, 2014.

3. The Mining Lease is presently held in the name of Trevali NB as the holder or lessee on record. The Mining Lease is in good standing and is renewed to October 27th, 2028; the annual rent is paid to October 27th, 2014. The Mining Lease is subject to a Limited Environmental Liability Agreement dated as of January 30th, 2013, as well as a Debenture in favor of Computershare Trust Company of Canada filed with the Recorder of Mines under the Mining Act (New Brunswick) on May 29th, 2014.

4. The Surface Lease is held in the name of Trevali NB and is registered over the lands and premises located in the Province of New Brunswick identified as apparent PID

50237924 (the "Leasehold Lands"). It is presently in good standing and the last site inspection conducted in 2012 showed that the physical site was in conformance with departmental terms and conditions per the terms of the Surface Lease. Rent is paid in full for 2014. It is subject to a Debenture in favor of Computershare Trust Company of Canada filed with the Department of Natural Resources (New Brunswick) on May 29th, 2014. The freehold interest in the Leasehold Lands is held by the New Brunswick Department of Natural Resources & Energy. The underlying freehold interest in the Leasehold Lands is subject to Easement #27017459 (registered on 2009-04-09) in favour of New Brunswick Power Transmission Corporation, which easement is over a small portion (approximately 20m x 30m) of the Subject PID, being Lot 93-1, Plan 3255, which is near the Settling pond at Caribou Lake.

5. Title to the Freehold lands is registered to Trevali NB. Trevali NB's title to the Freehold Lands is subject to a Debenture in favor of Computershare Trust Company of Canada registered in the Restigouche County Registry Office on May 29th, 2014, as document no. 33812364.

6. The Caribou Mine (including the Mineral Claim, the Mining Lease, the Surface Lease and the Freehold Lands) is subject to a 10% Net Profits Interest in favour of the Fern Trust. The 10% Net Profits Interest in the Caribou Mine, in favour of the Fern Trust, affects the Freehold Lands, notwithstanding that it is not listed as an encumbrance on the Certificate of Registered Ownership pertaining to the Freehold Lands.

Scope of Report

For the purposes of this report, we have examined an executed copy of the Mining Lease and the Surface Lease. We have also examined copies of certificates of public authorities, corporate records and other documents and materials, and have made such investigations, as we have determined are relevant and necessary or appropriate as a basis for providing this report.

For purposes of this report, we have also assumed and relied upon the following:

1. With respect to all documents examined by us, the genuineness of all signatures, the legal capacity of individuals signing any documents, the authenticity of all documents submitted to us as originals and the conformity to authentic original documents of all documents submitted to us as certified, confirmed, telecopied or photocopied copies;

2. The accuracy, currency and completeness of the indices and filing systems maintained by the public offices and registries where we have searched or enquired or have caused searches or enquiries to be made; and

3. The accuracy and completeness of the records maintained by the Recorder of Mines, appointed pursuant to the Mining Act (New Brunswick), including abstracts and indices prepared by the Recorder, which records and indices suffer from inherent weaknesses, as unrecorded but delivered instruments may affect title to mining

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leases or mineral claims and unrecorded instruments may give rise to the assertion of interests in the Mineral Claim, the Mining Lease or the Surface Lease by parties unknown to us and undiscoverable by a search of the records

Qualifications of Report

Our report is subject to the following qualifications which may affect title to the Mining Lease, the Surface Lease, the Freehold Lands or the Leasehold Lands, but to which we have not investigated:

1. Title to the underlying freehold interest of the New Brunswick Department of Natural Resources & Energy to the Leasehold Lands, prior to January 1st, 2012.

2. The existence of any intervening rights of any party having an interest in the Mineral Claim, the Mining Lease, the Surface Lease, the Freehold Lands or Leasehold Lands that is not discoverable on a search of the public registries and subject to applicable bankruptcy and insolvency legislation or similar laws affecting the rights of creditors generally.

3. Potential aboriginal title or interests, whether by treaty or otherwise, in and to in the Mineral Claim, the Mining Lease, the Surface Lease, the Freehold Lands or the Leasehold Lands.

4. A physical inspection of the lands or premises to which the Mining Lease, the Surface Lease, the Leasehold Lands or the Freehold Lands pertains.

5. Certificates or reports pertaining to environmental matters affecting the Freehold Lands or the Leasehold Lands or the Mining Lease and Mineral Claim.

6. Overriding incidents set out in section 17(4) of the Land Titles Act of New Brunswick, as well as:

    a) any subsisting exceptions, reservations, covenants and conditions in favour of the Crown contained in or implied by grant of the land from the Crown or excepted or reserved by statute, including any standing trees and timber vested in the Crown;

    b) the right of a lessee under a subsisting lease or agreement for a lease for a period not exceeding three years where there is actual occupation of the land under the lease or agreement; and

    c) any rights which may have been acquired by prescription or adverse possession (squatters rights) in respect of the real property or any part thereof.

The contents of this report are not to be construed as a legal opinion of Cox & Palmer but only as a report concerning matters of title.

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31 APPENDIX 2

CERTIFICATE OF APPROVAL

Approval to Operate I- 10085, as issued by New Brunswick Environment

(Page 1 Attached, for Details, contact Trevali Mining Corporation)

New Nouveau Brunswick

APPROVAL TO OPERATE

I-10085

Pursuant to paragraph 8(1) of the *Water Quality Regulation - Clean Environment Act*, this Approval to Operate is hereby issued to:

Trevali Mining (New Brunswick) Ltd.
for the operation of the
Caribou Mine

Description of Source:	the Caribou Mine	
Source Classification:	Fees for Industrial Approvals Regulation - Clean Water Act	Class 1A
Parcel Identifier:	50072032, 50237924	
Mailing Address:	P.O. Box 790 Station Main Bathurst, NB E2A 4A5	
Conditions of Approval:	See attached Schedule "A" of this Approval	
Supersedes Approval:	I-8310	
Valid From:	April 01, 2018	
Valid To:	June 30, 2018	

Issued by: ______________________ for the Minister of Environment and Local Government

March 28, 2018
Date