Brucejack Gold Mine
2016 CEAA Annual Report

Report Authored By:
Pretium Resources Inc.

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EXECUTIVE SUMMARY

Pretium Resources Inc. (Pretivm) received the Canadian Environmental Ministers Decision Statement on July 30, 2015 for the Brucejack Gold Mine, an underground gold mine located 65 km north of Stewart, British Columbia (BC). Construction activities commenced on September 5, 2015, and in 2016 included:

- Building of permanent camp, mill building and other infrastructure at the mine site;
- Construction of water management structures at the mine site;
- Establishment of infrastructure at Knipple Transfer Area;
- Construction of 75% of the transmission line and electrical substations; and
- Myriad of other activities to support the development of the Brucejack Gold Mine.

Underground mine development began January 12, 2016.

The Implementation Schedule was provided to Aboriginal groups and the Canadian Environmental Assessment Agency (CEAA) in August 2015. There were no updates or revisions to the implementation schedule during 2016.

At the mine site, fish and fish habitat protection included continued operation of the water treatment plant (WTP) during the reporting period and maintenance of the three turbidity curtains at the outlet to Brucejack Creek. No tailings were generated in 2016; waste rock from surface development and underground activities was sub-aqueously disposed of into Brucejack Lake. Effluent monitoring continued as per the BC *Environmental Management Act* permit 107835. Metal Mining Effluent Regulations (MMER) water quality monitoring was also undertaken in 2016.

Pre-clearing surveys were conducted as required for bat roosts, raptor nests, and migratory birds. No bat hibernacula or raptor nests were found in areas subject to tree clearing. No migratory birds, or their nests, were harmed or destroyed during clearing activities and no bat roosting habitat structures were found as a result of clearing activities.

Air quality management focused on measures to reduce fugitive dust. Installation of the monitoring network at the Tsetsaut/Skii km Lax Ha Lodge was completed in spring 2016 and monthly and quarterly data were collected.

Pretivm maintained a security gate at the start of the Brucejack Access Road during 2016. The "No Hunting, No Fishing, No Trapping Policy" remained in place. The Brucejack Access Road was managed to protect wildlife with attention to preventing wildlife being trapped on the road by high snowbanks and continual reminders regarding speed limits.

No heritage or archaeological sites were discovered during 2016 project development activities or during archaeological surveys.

No accidents or malfunctions with the potential to cause adverse environmental effects occurred during 2016.

Record keeping is continued using the systems established in 2015.

In 2016 Pretivm worked closely with local and regional First Nations to provide information and to maximize benefits associated with employment, training, and business opportunities. Pretivm is in regular contact with First Nations' employment representatives to communicate job postings, provide information about required skills and experience, and organize recruitment events. Pretivm continues to work with First Nations to identify training needs and opportunities, as well as opportunities for First Nations' businesses to provide goods and services to the Project.

RÉSUMÉ

Pretium Resources Inc. (Pretivm) a reçu le 30 juillet 2015 la déclaration de décision de la ministre de l'Environnement du Canada relativement au Projet de mine d'or Brucejack, mine d'or souterraine située à 65 km au nord de Stewart en Colombie-Britannique (C.-B.). Les travaux de construction ont débuté le 5 septembre 2015 et comprenaient en 2016 :

- La construction d'un camp permanent; d'une usine de concentration et d'autres infrastructures sur le site de la mine;
- La construction de structures pour la gestion de l'eau sur le site de la mine;
- L'édification d'une infrastructure à l'aire de transbordement Knipple;
- La construction de 75 % de la ligne de transmission et de postes électriques;
- Une multitude d'autres travaux visant à soutenir le développement de la mine d'or Brucejack.

L'aménagement de la mine souterraine a débuté le 12 janvier 2016.

Le calendrier de la mise en œuvre a été fourni aux groupes autochtones et à l'Agence canadienne d'évaluation environnementalel (ACEE) en août 2015. Le calendrier de la mise en œuvre n'a pas été actualisé ni révisé en 2016.

Sur le site de la mine, pour protéger le poisson et l'habitat du poisson, l'usine de traitement des eaux (UTE) fonctionnait en permanence durant la période visée, ainsi que les trois rideaux de confinement au point de rejet du ruisseau Brucejack. Il n'y a pas eu de production de résidus en 2016; les roches stériles provenant de l'aménagement de la surface et des travaux souterrains ont été éliminées dans les eaux du lac Brucejack. La surveillance des effluents s'est poursuivie en vertu du permis 107835 de l'*Environmental Management Act* de la C.-B. La surveillance de la qualité de l'eau a aussi été entreprise en 2016 en vertu du Règlement sur les effluents des mines de métaux (REMM).

Les relevés préalables au défrichage ont été effectués comme il se doit pour les perchoirs de chauves-souris, les nids de rapaces et les oiseaux migrateurs. Aucun hibernacle de chauve-souris ou nid de rapace n'a été trouvé dans les zones susceptibles d'être déboisées. Ni les oiseaux migrateurs ni leurs nids n'ont été endommagés ou détruits durant les travaux de défrichage et aucune structure d'habitat de perchoir de chauve-souris n'a été trouvée à la suite des travaux de défrichage.

La gestion de la qualité de l'air a été axée sur des mesures visant à réduire les poussières diffuses. L'installation du réseau de contrôle au pavillon Tsetsaut/Skii km Lax Ha s'est terminée au printemps 2016; des données mensuelles et trimestrielles ont été recueillies.

Pretivm a maintenu une barrière de sécurité à l'entrée de la route d'accès Brucejack durant l'année 2016. La consigne « Interdiction de chasser, de pêcher et de piéger » reste en vigueur. Gérer la route d'accès Brucejack consiste à protéger la faune et à s'assurer que les animaux ne restent pas bloqués sur la route dans des bancs de neige élevés; des limites de vitesse seront rappelées aux conducteurs.

Aucun site patrimonial ou archéologique n'a été découvert durant les travaux de développement du projet de 2016 ou durant les études archéologiques.

Aucun accident ou dysfonctionnement susceptibles de causer des dommages à l'environnement n'ont eu lieu en 2016.

La tenue des dossiers s'effectue toujours selon les systèmes établis en 2015.

En 2016, Pretivm a travaillé étroitement avec les Premières Nations locales et régionales en vue de fournir des renseignements et de maximiser les avantages associés à l'emploi, à la formation et aux occasions d'affaires. Pretivm communique régulièrement avec les représentants des Premières Nations responsables de l'emploi pour leur transmettre des offres d'emploi, leur donner des renseignements sur les compétences et l'expérience requises, et organiser des activités de recrutement. Pretivm continue à travailler avec les Premières Nations en vue de définir les besoins et les occasions de formation, et de voir également si leurs entreprises pourraient offrir des biens et services pour ce projet.

1 Introduction

The Brucejack Gold Mine is a gold-silver underground mine located approximately 65 kilometres north of Stewart, British Columbia (Figure 1). The mine will produce approximately 16 million tonnes of mineralized material at a rate of up to 2,700 tonnes per day over a minimum 18-year mine life.

Pretivm received a provincial Environmental Assessment Certificate (# M15-01) on March 26, 2015 and a Canadian Environmental Ministers Decision Statement on July 30, 2015. All of the various provincial and federal permits required to construct, operate and decommission the mine have also been received. Surface construction activities began at the Brucejack Mine Site following the federally mandated pre-construction notice on September 5, 2015 and continued throughout 2016.

This report has been developed to meet Decision Statement Condition 2.5: *the Proponent shall, from the reporting year where construction starts, submit to the Agency an annual report*. The report is laid out such that each heading addresses an annual reporting requirement as defined within the subheadings of Condition 2.5.

2 Condition 2.5.1: Update on Implementation of Decision Statement Conditions

Condition 2.5.1: The proponent shall document in the annual report implementation activities undertaken in the reporting year for each of the conditions set out in this Decision Statement.

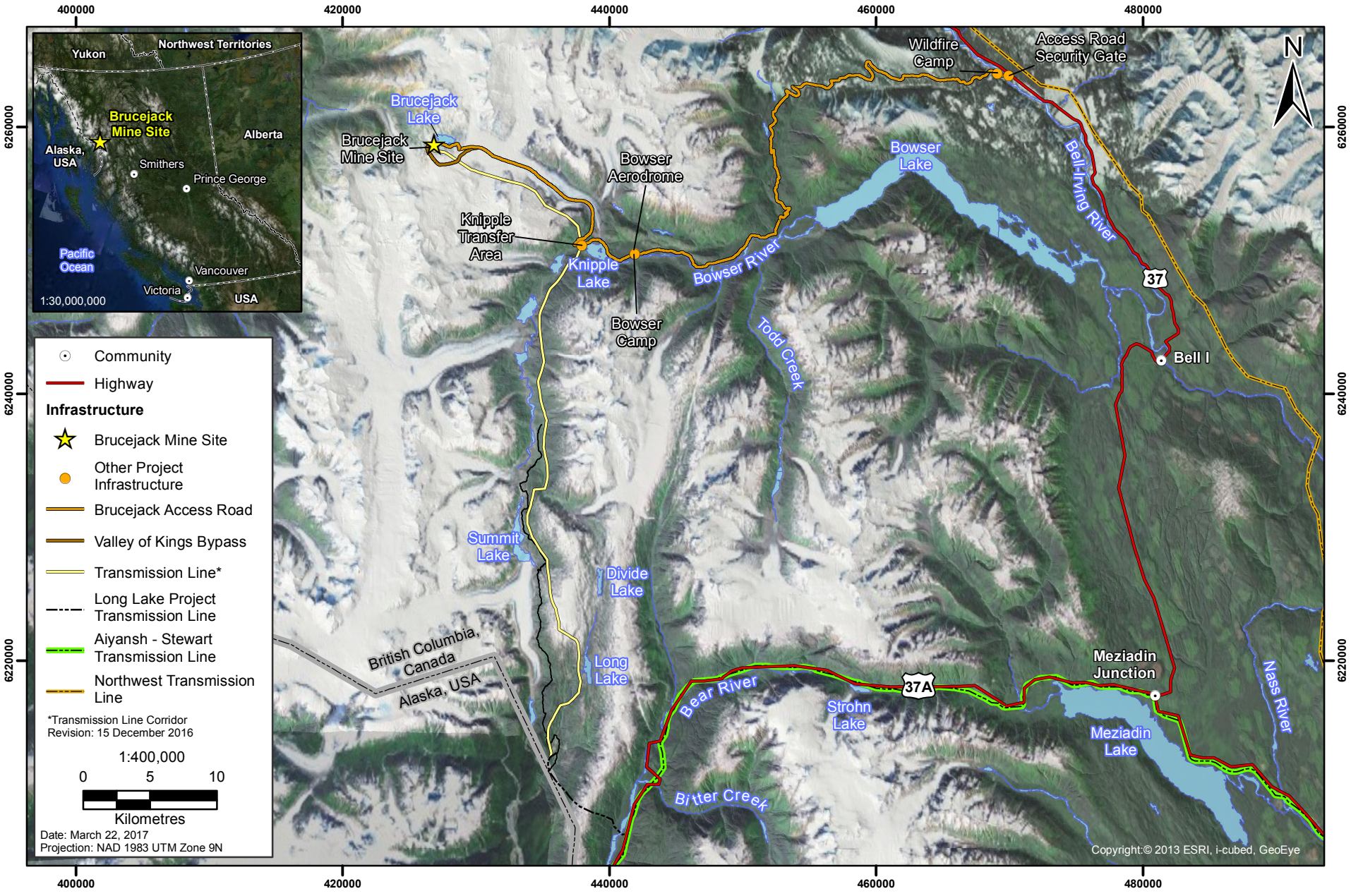
Refer to Appendix A for the table titled *Brucejack Gold Mine Project: Implementation activities undertaken (as per CEAA Decision Statement Condition 2.5.1)* for a compilation of implementation activities that took place during 2016.

3 Condition 2.5.2 Informed Technology and Knowledge

Condition 2.5.2: The proponent shall document in the annual report how it has considered and incorporated the factors set out in condition 2.1 in the implementation of the conditions set out in this Decision Statement.

> *Condition 2.1: The Proponent shall, throughout all phases of the Designated Project, ensure that its actions in meeting the conditions set out in this Decision Statement are informed by the best available information and knowledge, including community and Aboriginal traditional knowledge, are based on validated methods and models, are undertaken by qualified individuals, and have applied the best available economically and technologically feasible measures.*

Figure 1
Brucejack Gold Mine Location Map



In 2016 Pretivm continued to engage the services of numerous reputable consulting companies (Lorax Environmental Services Ltd., ERM Consultants Canada Ltd., BGC Engineering Inc., SRK Consulting) to provide the qualified individuals (e.g. R.P.Bio., P. Eng., P. Geo.) needed to implement all activities according to requirements. For example these activities included, pre-clearing surveys for bats and birds prior to tree cutting, invasive plant species survey, ongoing water quality monitoring in Brucejack Creek, monitoring ambient air quality parameters at the Tsetsaut/Skii km Lax Ha Lodge, construction of a wildlife tunnel at prioritized location for the passage of Western Toad (*Anaxyrus boreas*) beneath road, and initiated construction of a weir at the outlet of Brucejack Lake to precisely monitor flow from the lake into Brucejack Creek.

Pretium continues to engage Veolia Water Technologies, who specialize in technological solutions regarding the design of the Water Treatment Plant, and OpusDaytonKnight, who support Pretivm with the design and operation of the sewage treatment plants.

First Nation individuals working on the winter maintenance of the access road use their knowledge of large ungulate movement to ensure that snow clearing activities do not trap ungulates on the road as per condition 6.5. First Nations individuals also assisted in a 2016 archaeological survey.

4 Condition 2.5.3: Considerations from Consultation

The proponent shall document in the annual report for conditions set out in this Decision Statement for which consultation is a requirement, how the Proponent has considered any views and information that the Proponent received during or as a result of the consultation.

The following sections identify the Decision Statement conditions that required consultation, and how the Proponent has considered the views and information received as per the requirements set out in Condition 2.2:

- *2.2.1 provide a written notice of the opportunity for the party or parties being consulted to present their views on the subject of the consultation;*
- *2.2.2 provide sufficient information and a reasonable period of time to permit the party or parties being consulted to prepare their views;*
- *2.2.3 provide a full and impartial consideration of any views presented by the party or parties being consulted; and*
- *2.2.4 advise the party or parties that have provided comments on how the views and information received have been considered by the Proponent.*

4.1 Condition 2.4.2

Discuss consultation activities relative to Condition 2.4.2: Where the results of the monitoring and analysis indicate issues with respect to accuracy of the environmental assessment and/or the effectiveness of any mitigation measures that may lead to adverse environmental effects, identify the

means by which the Proponent determines whether additional mitigation measures are required, including the need for consultation with other parties in reaching that determination.

There were no monitoring results during 2016 that required additional mitigation measures, therefore consultation with other parties was not required.

4.2 Conditions 5.2 and 5.4

Discuss consultation activities relative to Condition 5.2: The Proponent shall, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, monitor and assess any changes to ambient air quality at the Tsetsaut/Skii km Lax Ha Lodge that result from the Designated Project during all phases for particulate matter (10 microns in diameter or less) and fine particulate matter (2.5 microns in diameter or less) using the Canadian Ambient Air Quality Standards of the Canadian Council of Ministers of the Environment as a benchmark, as well as for nitrogen oxide, sulphur dioxide and carbon monoxide.

Ambient air quality monitoring at the Tsetsaut/Skii km Lax Ha Lodge began in March 2016. Monitoring was supported by the installation of a passive air sampling system (PASS) and a 3M EVM-7 Environmental Monitor at the Tsetsaut/Skii km Lax Ha Lodge on March 6, 2016. Ambient NO_2 and SO_2 were measured approximately monthly, while monitoring for PM_{10}, $PM_{2.5}$ and CO was completed quarterly via the portable air analyzer. A memorandum regarding these 2016 monitoring results at the Tsetsaut/Skii km Lax Ha Lodge was prepared by a Qualified Professional and has been provided to the Nisga'a Nation and Tsetsaut/Skii km Lax Ha for review. Any request for consultation on the results will be followed up on by Pretivm.

Discuss consultation activities relative to Condition 5.4: The Proponent shall develop and implement, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, a follow-up program based on the monitoring specified in condition 5.2 to evaluate the effectiveness of mitigation measures identified under condition 5.1. The follow-up program shall start with construction and ceases at the end of the decommissioning phase.

During the permitting process in 2015, Pretivm consulted the Nisga'a Nation and the Tsetsaut/ Skii km Lax Ha on the development of the Air Quality Monitoring Plan. Ambient air quality monitoring occurred in 2016 and if an assessment of the results from these data indicates that current mitigation measures are not effective, Pretivm will consult the Nisga'a Nation and the Tsetsaut/ Skii km Lax Ha regarding the need for additional mitigation measures. A memorandum regarding 2016 monitoring results at the Tsetsaut/Skii km Lax Ha Lodge was prepared by a Qualified Professional and was provided to the Nisga'a Nation and Tsetsaut/Skii km Lax Ha for review on March 22, 2017.

In response to a potential geotechnical hazard, a decision was made in 2016 to close the Bowser Camp and the Temporary Construction Camp at Bowser on March 31, 2017. After camp structures are removed and reclamation efforts are undertaken emissions are expected to reduce as the only traffic near the Tsetsaut/Skii km Lax Ha Lodge will be their private vehicles.

4.3 Condition 5.3

Discuss consultation activities relative to Condition 5.3: The Proponent shall develop and implement, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, a mechanism for receiving noise complaints due to noise caused by the Designated Project during all phases, and respond in a timely manner to any noise complaint received.

A Noise Complaint Form was developed by Pretivm and provided to the Nisga'a Nation and Tsetsaut/Skii km Lax Ha for their review and input on September 2, 2015. The form was revised based on comments received from the Tsetsaut/Skii km Lax Ha on September 2, 2015 and reissued shortly thereafter. No other comments and no complaints were received in 2016.

4.4 Conditions 6.6 and 6.7

Discuss consultation activities relative to Condition 6.6: The Proponent shall, following consultation with Tsetsaut/Skii km Lax Ha, provide access to the Project Area to the Tsetsaut/Skii km Lax Ha for traditional purposes, to the extent that such access is safe.

Discuss consultation activities relative to Condition 6.7: The Proponent shall, following consultation with the Nisga'a Nation, provide access to the Project Area for the Nisga'a Nation to exercise rights under the Nisga'a Final Agreement, to the extent that such access is safe.

The Traffic and Access Management Plan, which states that "Persons authorized to use the Brucejack Access Road will include First Nations people conducting traditional use activities under authorization of their Nation's government", was reviewed during the *Mines Act-Environmental Management Act* Permits Application review process in 2015, at which time comments from the Tsetsaut/Skii km Lax Ha were received and reflected in the Traffic and Access Management Plan. No comments were received from the Nisga'a Nation and no additional communications with either the Nisga'a Nation or the Tsetsaut/Skii km Lax Ha regarding requests for site access occurred in 2016.

4.5 Condition 6.8

Discuss consultation activities relative to Condition 6.8: Develop and implement, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, a follow-up program to determine the effectiveness of the mitigation measures used to avoid mortality of fauna, including ungulates and furbearers, along the access road and to verify the accuracy of the environmental assessment.

During the permitting process in 2015, Pretivm consulted the Nisga'a Nation and the Tsetsaut/Skii km Lax Ha on the development of the Wildlife Management Plan (WMP). As per the WMP, Pretivm established a Wildlife Advisory Committee. Members of the Nisga'a Nation and Tsetsaut/Skii km Lax Ha attended the initial meeting of the committee held in April, 2016. Pretivm proposed that the Wildlife Advisory Committee would be an appropriate venue for discussion of the effectiveness of

mitigation measures, wildlife mortalities, accuracy of impacts to wildlife and potential additional mitigation measures.

The monitoring activities outlined in the WMP were ongoing in 2016. The number of wildlife observations in 2016 was 384 separate reports; however this includes reports of the same animals on the same day. Numbers per sighting ranged from a single animal to groups of 16 mountain goats, small herds of moose and small flocks of Canada Geese. No mortalities occurred in 2016 on the access road, at the various camps or at the mine site. Should mortalities occur along the access road Pretium will provide a review of fauna mortalities to the wildlife committee during annual meetings, and consult on the effectiveness of mitigation plans to determine if adaptive management measures are required. No additional meetings of the Wildlife Advisory Committee occurred in 2016, the follow-up program will be discussed during meetings in 2017.

4.6 Condition 7.1

Discuss consultation activities relative to Condition 7.1: Develop and implement, in consultation with Aboriginal groups, an archaeological and heritage resources management plan for the Designated Project prior to construction.

The Heritage Management Plan, and associated Heritage Chance Find Procedure, was reviewed by Aboriginal groups during the *Mines Act-Environmental Management Act* Permits Application review process and completed in 2015. No comments were received. During construction activities in 2016 crews were made aware of and trained to use the Chance Find Procedure. No new archaeological or heritage resources were identified during construction activities. Consistent with the Heritage Management Plan and permit requirements, Aboriginal groups were consulted in 2016 in relation to archaeological assessment work being completed in the vicinity of mine site access road. A First Nation individual assisted with the field assessment work in 2016.

4.7 Conditions 9.2 and 9.4

Discuss consultation activities relative to Condition 9.2: The Proponent shall, prior to construction, consult with Aboriginal groups to identify potential accidents and malfunctions that may result in an adverse environmental effect, and on the measures to be applied to prevent such accidents and malfunctions.

Discuss consultation activities relative to Condition 9.4: Develop and implement a communication plan, in consultation with Aboriginal groups that shall include:

> *9.4.1: The types of accidents or malfunctions requiring a notification by the Proponent to the respective Aboriginal groups;*
> *9.4.2: The manner by which Aboriginal groups shall be notified by the Proponent of an accident or malfunction and of any opportunities for the Aboriginal groups to assist in the response to the accident or malfunction; and*

9.4.3: The contact information of the representatives of the Proponent that the Aboriginal groups may contact and of the respective Aboriginal groups to which the Proponent provides notification.

Pretivm sent a letter on September 4, 2015 to Aboriginal groups regarding Conditions 9.2 and 9.4.

Specifically the letter stated that Pretivm considered the consultation undertaken during the *Mines Act-Environmental Management Act* Permits Application review process to have by and large fulfilled Condition 9.2, to consult with Aboriginal groups to identify potential accidents and malfunctions that may result in an adverse environmental effect, and on the measures to be applied to prevent such accidents and malfunctions. Though Pretivm did encourage groups to review the materials provided in the letter regarding accidents and malfunctions and invited suggestions for change or additions to the plan or further consultation on the matters. Pretivm has not received any responses to date.

With regards to development and implementation of a communications plan concerning accidents and malfunctions (Condition 9.4), the September 2015 letter from Pretivm suggested to the Tsetsaut/Skii km Lax Ha and the Tahltan Central Council that the methods of notification and contact information included in the Aboriginal Consultation Plan (developed in consultation with these groups) be used. For the Nisga'a Lisims Government (NLG), Pretivm suggested that the Impacts and Benefits Agreement between Pretivm and NLG provide the platform for fulfilling Condition 9.4.

Regarding notification to Aboriginal groups about types of accidents and malfunctions, Condition 9.4.1, Pretivm provided in the September 2015 letter a table of types of accidents and malfunctions, and associated risk and mitigation strategies to prevent the accident or malfunction. The table is intended as a basis for discussion of notification. Pretivm also asked Aboriginal groups for suggestions on how they would like to assist in response to an accident or malfunction, as per Condition 9.4.2. To date Pretivm has received no responses from any of the Aboriginal groups to this letter.

Tsetsaut/Skii km Lax Ha have participated in company risk assessment meetings in the Vancouver office (July 2016) and follow-up meetings by conference calls.

5 Condition 2.5.4: Follow-up Programs

Condition 2.5.4: The proponent shall document in the annual report the results of the follow-up program requirements identified in conditions 3.4, 5.4 and 6.8.

5.1 Condition 3.4: Water Quality and Fish and Fish Habitat Follow-up Program

The Proponent shall develop and implement a water quality and fish and fish habitat follow-up program that shall include:

3.4.1 Monitoring the quality of water flowing from Brucejack Lake into Brucejack Creek to verify the accuracy of the water quality and fish and fish habitat predictions in the environmental assessment; and

3.4.2 Determining whether mitigation measures implemented to protect the quality of water flowing from Brucejack Lake into Brucejack Creek and downstream fish and fish habitat are effective.

Water flowing from Brucejack Lake to Brucejack Creek continues to be monitored in 2016 as per Appendix B of Effluent Discharge permit 107835, as well as the Aquatic Effects Monitoring Plan, during the reporting period. The 2016 monitoring results identified one sample for dissolved aluminum that was elevated above the permitted maximum of 0.05 mg/L. The incident was reported on May 11, 2016 to Tsetsaut/Skii km Lax Ha, Nisga'a Nation, Tahltan Central Council, Alaska Department of Natural Resources and BC Ministry of Environment. The short-term exceedance was below the applicable guidelines for the protection of aquatic life and the expectation was that a negative effect to aquatic life in Brucejack Creek did not occur.

The Brucejack Gold Mine became subject to MMER on January 12, 2016 and the First Biological Monitoring Study Design was submitted in January 2017. The objective of the First Design Study is to present a biological monitoring program that will determine potential effects to the aquatic environment from effluent discharges.

5.2 Condition 5.4: Tsetsaut/Skii km Lax Ha Lodge Ambient Air Quality Monitoring Follow-up Program

The Proponent shall develop and implement, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, a follow-up program based on the monitoring specified in condition 5.2 to evaluate the effectiveness of mitigation measures identified under condition 5.1. The follow-up program shall start with construction and ceases at the end of the decommissioning phase.

In 2016, monthly passive monitoring of sulphur dioxide (SO_2) and nitrogen dioxide (NO_2) and quarterly ambient particulate and carbon monoxide (CO) sampling was completed at the Tsetsaut/Skii km Lax Ha (TSKLH) Lodge. Results indicated that annual average concentrations for SO_2 and NO_2 and all results for CO and $PM_{2.5}$ were below the respective benchmarks (Canadian Ambient Air Quality Standards of the Canadian Council of Ministers of the Environment), therefore not requiring any additional mitigation measures.

Further details regarding 2016 air quality results have been made available in the memorandum regarding monitoring results at the Tsetsaut/Skii km Lax Ha Lodge (Appendix B).

5.3 Condition 6.8: Effectiveness of Mitigation Measures to Avoid Mortality of Fauna Follow-up Program

The Proponent shall develop and implement, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, a follow-up program to determine the effectiveness of the mitigation measures used to avoid mortality of fauna, including ungulates and furbearers, along the access road and to verify the accuracy of the environmental assessment.

During the permitting process in 2015, Pretivm consulted the Nisga'a Nation and the Tsetsaut/ Skii km Lax Ha on the development of the Wildlife Management Plan (WMP). The monitoring activities outlined in the WMP were ongoing in 2016. The wildlife observations in 2016 were recorded in 385 separate reports, commonly the same animals in multiple reports and multiple animals in single reports. Zero mortalities occurred along the access road or at facilities in 2016.

6 Condition 2.5.5: Additional Mitigation Measures Implemented

Condition 2.5.5: The proponent shall document in the annual report any additional mitigation measures implemented or proposed by the Proponent, as determined under condition 2.4.

> *Condition 2.4: The Proponent shall, where a follow-up program is a requirement of a condition set out in this Decision Statement:*
>
> > *2.4.1. Undertake monitoring and analysis to verify the accuracy of the environmental assessment as it pertains to the particular condition and/or to determine the effectiveness of any mitigation measure(s);*
> >
> > *2.4.2. Where the results of the monitoring and analysis indicate issues with respect to the accuracy of the environmental assessment and/or the effectiveness of any mitigation measures that may lead to adverse environmental effects, identify the means by which the Proponent determines whether additional mitigation measures are required, including the need for consultation with other parties in reaching that determination; and*
> >
> > *2.4.3. If additional mitigation measures are required pursuant to condition 2.4.2, implement and monitor these additional mitigation measures pursuant to condition 2.4.1.*

No additional mitigation measures to those presented within Component Plans under the Environmental Management System and within permits, were required to be implemented or proposed in 2016. However, in response to a potential geotechnical hazard a decision was made in 2016 to close Bowser Camp and the Temporary Construction Camp at Bowser in 2017.

APPENDIX A:
Decision Statement Conditions – Implementation Activities Undertaken

Section	Sub-section	Condition	Implementation Activities Undertaken
2	**General Conditions**		
2.1		The Proponent shall, throughout all phases of the Designated Project, ensure that its actions in meeting the conditions set out in this Decision Statement are informed by the best available information and knowledge, including community and Aboriginal traditional knowledge, are based on validated methods and models, are undertaken by qualified individuals, and have applied the best available economically and technologically feasible measures.	Refer to 2016 CEAA Annual Report Section 3.
2.2		The Proponent shall, where consultation is a requirement of a condition set out in this Decision Statement:	Consultation is guided by the Aboriginal Consultation Plan developed by Pretivm, as a condition of their Environmental Assessment Certificate, with review and input from First Nations. Consultation activities will also be directed per the Impact Benefit Agreement established with the Nisga'a Nation, and those that may be established with the Tsetsaut/Skii km Lax Ha, and Tahltan Nation.
	2.2.1	Provide a written notice of the opportunity for the party or parties being consulted to present their views on the subject of the consultation;	This practice has been implemented and will continue for the duration of the Project.
	2.2.2	Provide sufficient information and a reasonable period of time to permit the party or parties being consulted to prepare their views;	This practice has been implemented and will continue for the duration of the Project.
	2.2.3	Provide a full and impartial consideration of any views presented by the party or parties being consulted; and	This practice has been implemented and will continue for the duration of the Project.
	2.2.4	Advise the party or parties that have provided comments on how the views and information received have been considered by the Proponent.	This practice has been implemented and will continue for the duration of the Project.
2.3		The Proponent shall, where consultation with Aboriginal groups is a requirement of a condition set out in this Decision Statement, and prior to initiating that consultation, communicate with each Aboriginal group to determine the manner by which to satisfy the consultation requirements referred to in condition 2.2.	Consultation will be guided by the Aboriginal Consultation Plan developed by Pretivm, as a condition of their Environmental Assessment Certificate, with review and input from First Nations. Consultation activities will also be directed per the Impact Benefit Agreement established with the Nisga'a Nation, and those that may be established with the Tsetsaut/Skii km Lax Ha, and Tahltan Nation.
2.4		The Proponent shall, where a follow-up program is a requirement of a condition set out in this Decision Statement:	
	2.4.1	Undertake monitoring and analysis to verify the accuracy of the environmental assessment as it pertains to the particular condition and/or to determine the effectiveness of any mitigation measure(s);	Monitoring and analysis of data to verify the accuracy of the environmental assessment has been implemented as per *Mines Act* permit M-243 issued by the Ministry of Energy and Mines and *Environmental Management Act* permits 107835 (effluent) and 107025 (air) issued by the Ministry of Environment, in addition to various other permits that contain monitoring requirements.
	2.4.2	Where the results of the monitoring and analysis indicate issues with respect to the accuracy of the environmental assessment and/or the effectiveness of any mitigation measures that may lead to adverse environmental effects, identify the means by which the Proponent determines whether additional mitigation measures are required, including the need for consultation with other parties in reaching that determination; and	Refer to 2016 CEAA Annual Report Section 4.1.
	2.4.3	If additional mitigation measures are required pursuant to condition 2.4.2, implement and monitor these additional mitigation measures pursuant to condition 2.4.1.	No additional mitigation measures have been required to date.
2.5		The Proponent shall, from the reporting year where construction starts, submit to the Agency an annual report, including an executive summary of the annual report in both official languages. The annual report shall be submitted by the Proponent no later than March 31 following the reporting year. The Proponent shall document in the annual report:	Refer to 2016 CEAA Annual Report.
	2.5.1	Implementation activities undertaken in the reporting year for each of the conditions set out in this Decision Statement;	Implementation activities undertaken are tabulated in this Appendix.
	2.5.2	How it has considered and incorporated the factors set out in condition 2.1 in the implementation of the conditions set out in this Decision Statement;	Refer to 2016 CEAA Annual Report Section 3
	2.5.3	For conditions set out in this Decision Statement for which consultation is a requirement, how the Proponent has considered any views and information that the Proponent received during or as a result of the consultation;	Refer to 2016 CEAA Annual Report Section 4.

Section	Sub-section	Condition	Implementation Activities Undertaken
	2.5.4	The results of the follow-up program requirements identified in conditions 3.4, 5.4 and 6.8; and	Refer to 2016 CEAA Annual Report Section 5.
	2.5.5	Any additional mitigation measures implemented or proposed by the Proponent, as determined under condition 2.4.	Refer to 2016 CEAA Annual Report Section 6.
2.6		The Proponent shall publish on the Internet, or any similar medium, the annual report and the executive summary referred to in condition 2.5, the archaeological and heritage resources management plan referred to in condition 7.1, and the implementation schedule and any updates or revisions to that schedule referred to in condition 10, upon submission of these documents to the parties referenced in the respective conditions. The Proponent shall keep these documents publicly available for twenty-five years following the end of operation or until the end of decommissioning of the Designated Project, whichever comes first.	The Heritage Management Plan and the Implementation Schedule are available on Pretivm's website at: http://www.pretivm.com/sustainability/default.aspx
2.7		The Proponent shall notify the Agency in writing no later than 60 days after the day on which there is a transfer of ownership, care, control or management of the Designated Project in whole or in part.	Not applicable. No activity undertaken.
2.8		In the event another party becomes the Proponent of the Designated Project, it is bound by the conditions set out in this Decision Statement.	Not applicable. No activity undertaken.
3	**Fish and fish habitat**		
3.1		The Proponent shall, for all effluent discharges, comply with the *Fisheries Act*, the Metal Mining Effluent Regulations, and any discharge limits for effluent set by British Columbia that meet or exceed the requirements of the *Fisheries Act* and the Metal Mining Effluent Regulations. In addition, the Proponent shall:	Pretivm has implemented effluent monitoring as per *Environmental Management Act* permit 107835 and the Brucejack Aquatic Effects Monitoring Plan.
	3.1.1	Design and construct the perimeter ditching around the waste rock stockpile, mill building and portals to accommodate a 200-year rain-on-snow event;	Design has been completed and approved by provincial government. Where facility construction interfered with ditching temporary piping and pumping is installed to provide adequate capacity for a 200-year rain-on-snow-event.
	3.1.2	Capture and divert surface drainage and mine water effluent to the water treatment plant for treatment prior to discharge into Brucejack Lake;	Surface contact water ditches constructed, other than where temporary piping and pumping installed. Replacement of temporary measures by permanent drainage expected to be completed August 2017.
	3.1.3	Immobilize tailings and deposit potentially acid generating rocks on the bottom of Brucejack Lake where they shall remain submerged at all times or in decommissioned stopes; and	Waste rock from surface development and underground activities continued to be deposited into Brucejack Lake during 2016; tailings will not be generated until 2017.
	3.1.4	Use multiple turbidity curtains at the outlet of Brucejack Lake.	The three turbidity curtains installed at the outlet of Brucejack Lake in September 2015 remain in place.
3.2		The Proponent shall protect fish and fish habitat during all phases of the Designated Project, which shall include the implementation of mitigation measures to avoid causing harm to fish and fish habitat when using explosives or conducting activities in or around water frequented by fish, as well as on the Knipple Glacier.	At the mine site the mine water treatment plant continues to be operational, as well, three turbidity curtains were installed at the outlet of Brucejack Lake; a Standard Operating Procedure and management plan related to the crossing of the Knipple Glacier is in place, as are Emergency and Spill Response Plans; monitoring for hydrocarbons was implemented downstream of the Knipple Glacier in 2016.
3.3		The Proponent shall, during decommissioning, reclaim riparian habitats along the access road which shall include the planting of native plant species.	No decommissioning activities were undertaken in 2016
3.4		The Proponent shall develop and implement a water quality and fish and fish habitat follow-up program that shall include:	Refer to 2016 CEAA Annual Report Section 5.1
	3.4.1	Monitoring the quality of water flowing from Brucejack Lake into Brucejack Creek to verify the accuracy of the water quality and fish and fish habitat predictions in the environmental assessment; and	Refer to 2016 CEAA Annual Report Section 5.1
	3.4.2	Determining whether mitigation measures implemented to protect the quality of water flowing from Brucejack Lake into Brucejack Creek and downstream fish and fish habitat are effective.	Refer to 2016 CEAA Annual Report Section 5.1
4	**Migratory birds**		
4.1		The Proponent shall carry out all phases of the Designated Project in a manner that protects and avoids harming, killing or disturbing migratory birds or destroying, disturbing or taking their nests or eggs. In this regard, the Proponent shall take into account Environment Canada's Avoidance Guidelines. The Proponent's actions in applying the Avoidance Guidelines shall be in compliance with the *Migratory Birds Convention Act*, 1994 and with the *Species at Risk Act*.	Pre-clearing surveys for raptor nests and migratory birds continued in 2016 for those areas where timber and brush was cleared in 2016. No raptor nests were found nor were migratory bird nests disturbed.

Section	Sub-section	Condition	Implementation Activities Undertaken
4.2		The Proponent shall design and build the transmission line in a manner that prevents electrocution, discourages nesting and makes the transmission line more visible to migratory birds taking into account the Avian Power Line Interaction Committee's Suggested Practices for Avian Protection on Power Lines.	Design of the transmission line has included these requirements. Initial construction activities commenced on September 5, 2015 with clearing of the right-of-way; construction activities that included installation of the transmission towers and stinging the line, resumed in the spring 2016 and continued until the end of the year. Installation of the transmission line is near to complete.
5	**Health and Aboriginal peoples**		
5.1		The Proponent shall implement mitigation measures to manage air emissions of the Designated Project during all phases, including:	
	5.1.1	Those mitigation measures required to comply with the Waste Discharge Regulation under British Columbia's *Environmental Management Act* for operational air emissions;	Mitigation measures implemented during 2016 to manage air emissions were as per the *Environmental Management Act* permit 107025 and the Brucejack Air Quality Management Plan.
	5.1.2	Fugitive dust best management practices; and	In June 2016, a calcium/magnesium chloride brine was applied to the Brucejack Access Road from km 0 to km 59 and to the lower camp areas to assist in suppressing fugitive dust. Road watering also continued to be used as a mitigation measure for managing fugitive dust along the Brucejack Access Road, Bowser Camp and at the mine site. At the mine site, high traffic areas have been capped with quarried clean non-PAG crushed rock. Along the Access Road, awareness around speed limits, which minimizes dust generation, has been implemented through road signage and a Safe Working Instructions. As well, grading of the Access Road to mix the heavy dust layer that accumulates on top of the road (over time) into the more stable soil/gravel, is practiced where applicable.
	5.1.3	Use of low-sulphur diesel fuel equipment and pollution control equipment on mobile heavy equipment.	Diesel fuel is being sourced from a company supplying ultra-low Sulphur diesel (<2ppm sulphur content).
5.2		The Proponent shall, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, monitor and assess any changes to ambient air quality at the Tsetsaut/Skii km Lax Ha Lodge that result from the Designated Project during all phases for particulate matter (10 microns in diameter or less) and fine particulate matter (2.5 microns in diameter or less) using the Canadian Ambient Air Quality Standards of the Canadian Council of Ministers of the Environment as a benchmark, as well as for nitrogen oxide, sulphur dioxide and carbon monoxide.	Refer to 2016 CEAA Annual Report Section 4.2.
5.3		The Proponent shall develop and implement, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, a mechanism for receiving noise complaints due to noise caused by the Designated Project during all phases, and respond in a timely manner to any noise complaint received.	Refer to 2016 CEAA Annual Report Section 4.3.
5.4		The Proponent shall develop and implement, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, a follow-up program based on the monitoring specified in condition 5.2 to evaluate the effectiveness of mitigation measures identified under condition 5.1. The follow-up program shall start with construction and ceases at the end of the decommissioning phase.	Refer to 2016 CEAA Annual Report Section 4.2 and Section 5.4.
5.4.1		The Proponent shall inform the Nisga'a Nation and Tsetsaut/Skii km Lax Ha in cases of exceedances at the Tsetsaut/Skii km Lax Ha Lodge of the Canadian Ambient Air Quality Standards of the Canadian Council of Ministers of the Environment parameters specified in condition 5.2.	Ambient air quality monitoring at this site commenced in March 2016. No exceedances were noted in the Tsetsaut/Skii km Lax Ha Lodge results.
6	**Current use of lands and resources for traditional purposes**		
6.1		The Proponent shall provide Aboriginal groups with the implementation schedule and any updates or revisions to that schedule as stated in condition 10 at the same time the Proponent provides the schedule to the Agency.	The Implementation Schedule was provided to Aboriginal groups and the Agency August 2015. There were no updates or revisions to the schedule during 2016.
6.2		The Proponent shall prohibit any hunting, fishing and trapping within the Project Area by the Proponent's employees and contractors hired by the Proponent, unless an employee or a contractor is provided access for traditional purposes as per condition 6.6 or for exercising rights as per condition 6.7.	Pretivm drafted a No Hunting No Fishing No Trapping Policy (dated August 27, 2015) to address this commitment. The draft policy was distributed to Aboriginal groups, and comments received incorporated into the final version.
6.3		The Proponent shall prohibit public access to the access road.	Pretivm continues to operate a manned security gate at the junction of the Brucejack Access Road and Highway 37. The gate is located on the east side of the Bell-Irving River.

Section	Sub-section	Condition	Implementation Activities Undertaken
6.4		The Proponent shall impose speed limits on the access road taking into account provincial guidelines.	Speed limits are established in the Brucejack Traffic & Access Management Plan based on the road design, and signage in both directions of travel has been posted along the Brucejack Access Road to advise of road speed. In addition, speed limits are discussed in the Safe Work Instructions (SWI) road procedure which is issued to all drivers/contractors prior to travelling the access road.
6.5		The Proponent shall construct and maintain gaps in snow banks large enough to provide passage for fauna, including ungulates and furbearers.	Once the depth of snow warranted it, gaps in the snow banks were constructed and maintained along the access road during 2016. Additionally, for much longer sections, the grader cut down the height of the snow banks to allow for wildlife passage along the length of the banks, not just at gaps. Grading practices will continue to be evaluated on an ongoing basis through the winter.
6.6		The Proponent shall, following consultation with Tsetsaut/Skii km Lax Ha, provide access to the Project Area to the Tsetsaut/Skii km Lax Ha for traditional purposes, to the extent that such access is safe.	Refer to 2016 CEAA Annual Report Section 4.4.
6.7		The Proponent shall, following consultation with the Nisga'a Nation, provide access to the Project Area for the Nisga'a Nation to exercise rights under the Nisga'a Final Agreement, to the extent that such access is safe.	Refer to 2016 CEAA Annual Report Section 4.4.
6.8		The Proponent shall develop and implement, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, a follow-up program to determine the effectiveness of the mitigation measures used to avoid mortality of fauna, including ungulates and furbearers, along the access road and to verify the accuracy of the environmental assessment.	Refer to 2016 CEAA Annual Report Section 4.5 and Section 5.3.
7	**Physical and cultural heritage and structures, sites or things of … significance**		
7.1		The Proponent shall develop and implement, in consultation with Aboriginal groups, an archaeological and heritage resources management plan for the Designated Project prior to construction. The archaeological and heritage resources management plan shall take into account British Columbia's Handbook for the Identification and Recording of Culturally Modified Trees. The archaeological and heritage resources management plan shall include:	Refer to 2016 CEAA Annual Report Section 4.6. A Heritage Management Plan and accompanying Heritage Chance Find Procedure was developed in 2015 and implemented prior to the start of construction activities and in use throughout 2016.
	7.1.1	A description of structures, sites or things of historical, archaeological, paleontological or architectural significance (including Culturally Modified Trees) that may be encountered by the Proponent during construction;	A Heritage Management Plan and accompanying Heritage Chance Find Procedure was developed and implemented prior to the start of construction activities.
	7.1.2	Procedures and practices for on-site monitoring of construction activities that may affect a structure, site or thing of historical, archaeological, paleontological or architectural significance (including a Culturally Modified Tree) and for the identification and removal of the resource; and	A Heritage Management Plan and accompanying Heritage Chance Find Procedure was developed in 2015 and implemented prior to the start of construction activities and in use throughout 2016.
	7.1.3	A chance find protocol if a previously unidentified structure, site or thing of historical, archaeological, paleontological or architectural significance (including a Culturally Modified Tree) is discovered by the Proponent or brought to the attention of the Proponent by an Aboriginal group or another party during construction.	A Heritage Management Plan and accompanying Heritage Chance Find Procedure was developed in 2015 and implemented prior to the start of construction activities and in use throughout 2016.
8	**Species at risk**		
8.1		The Proponent shall conduct pre-clearing surveys to determine distribution of Little Brown Myotis (Myotis lucifugus) and Northern Myotis (Myotis septentrionalis), and establish a 50-metre buffer zone around active hibernacula and active roosts.	No clearing of timber suitable for bat roosts was completed in 2016, no bat roosts were found.
8.2		The Proponent shall, prior to construction and throughout all phases of the Designated Project, install and maintain roosting structures to offset if there is loss of Little Brown Myotis (Myotis lucifugus) and Northern Myotis (Myotis septentrionalis) bat roosting habitat.	No roosting structures were found during the bat roosting surveys in 2015 or during clearing activities in 2015 and 2016, therefore no monitoring is required and no mortalities observed.
8.3		The Proponent shall monitor mortality of Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*) and their usage at buffer-zones and of roosting structures, to determine the effectiveness of the mitigation measures during construction and operation.	No roosting structures were found during the bat roosting surveys in 2015 or during clearing activities, no mortalities observed. Therefore, no mitigation measures were instituted.
8.4		The Proponent shall construct wildlife tunnels and fencing along the access road to allow passage of the Western Toad (Anaxyrus boreas) beneath the road as close as possible to existing migration corridors taking into account British Columbia's Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in BC.	The placement of wildlife tunnels and fencing along the access road to allow for Western Toad passage under the road was incorporated into the design for access road upgrades. During 2016, one of two proposed wildlife tunnels was installed. The fencing for that tunnel and the second tunnel are planned for 2017.
9	**Accidents or malfunctions**		

Section	Sub-section	Condition	Implementation Activities Undertaken
9.1		The Proponent shall take all reasonable measures to prevent accidents and malfunctions that may result in adverse environmental effects and shall implement emergency response procedures and contingencies developed in relation to the Designated Project.	All management plans relevant to mitigate for accidents and malfunctions have been implemented.
9.2		The Proponent shall, prior to construction, consult with Aboriginal groups to identify potential accidents and malfunctions that may result in an adverse environmental effect, and on the measures to be applied to prevent such accidents and malfunctions.	Refer to 2016 CEAA Annual Report Section 4.7.
9.3		In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall:	No accidents or malfunctions with the potential to cause adverse environmental effects occurred during 2016.
	9.3.1	Notify relevant federal and provincial authorities, including notifying the Agency in writing of the accident or malfunction as soon as possible in the circumstances;	No accidents or malfunctions with the potential to cause adverse environmental effects occurred during 2016.
	9.3.2	Implement immediate measures to minimize any adverse environmental effects associated with the accident or malfunction;	No accidents or malfunctions with the potential to cause adverse environmental effects occurred during 2016.
	9.3.3	Submit a written report to the Agency as soon as possible in the circumstances, but no later than 30 days after the day on which the accident or malfunction took place. The written report shall include:	No accidents or malfunctions with the potential to cause adverse environmental effects occurred during 2016.
	9.3.3.1	A description of the accident or malfunction and of its adverse environmental effects;	No accidents or malfunctions with the potential to cause adverse environmental effects occurred during 2016.
	9.3.3.2	The measures that were taken by the Proponent to mitigate the environmental effects of the accident or malfunction;	No accidents or malfunctions with the potential to cause adverse environmental effects occurred during 2016.
	9.3.3.3	A description of any residual environmental effects, and any additional measures required to address residual environmental effects; and	No accidents or malfunctions with the potential to cause adverse environmental effects occurred during 2016.
	9.3.3.4	If an emergency response plan was implemented, details concerning its implementation.	No accidents or malfunctions with the potential to cause adverse environmental effects occurred during 2016.
	9.3.4	As soon as possible in the circumstances, but no later than 90 days after the day on which the accident or malfunction took place, submit a written report to the Agency on the changes made to avoid a subsequent occurrence of the accident or malfunction and on the implementation of any additional measures to mitigate residual environmental effects.	No accidents or malfunctions with the potential to cause adverse environmental effects occurred during 2016.
9.4		The Proponent shall develop and implement a communication plan, in consultation with Aboriginal groups, that shall include:	Refer to 2016 CEAA Annual Report Section 4.7.
	9.4.1	The types of accidents or malfunctions requiring a notification by the Proponent to the respective Aboriginal groups;	Refer to 2016 CEAA Annual Report Section 4.7.
	9.4.2	The manner by which Aboriginal groups shall be notified by the Proponent of an accident or malfunction and of any opportunities for the Aboriginal groups to assist in the response to the accident or malfunction; and	Refer to 2016 CEAA Annual Report Section 4.7.
	9.4.3	The contact information of the representatives of the Proponent that the Aboriginal groups may contact and of the respective Aboriginal groups to which the Proponent provides notification.	Refer to 2016 CEAA Annual Report Section 4.7.
10	**Implementation Schedule**		
10.1		The Proponent shall submit an implementation schedule for conditions contained in this Decision Statement to the Agency, or anyone designated pursuant to section 89 of the *Canadian Environmental Assessment Act, 2012*, at least 30 days prior to construction. The implementation schedule shall indicate the commencement and completion dates for each activities relating to conditions set out in this Decision Statement.	The Implementation Schedule was provided to Aboriginal groups and the Agency August 2015.
10.2		The Proponent shall submit an update to this implementation schedule in writing to the Agency, or anyone designated pursuant to section 89 of the *Canadian Environmental Assessment Act, 2012*, every two years on or before March 31, until completion of the activities.	Not applicable this year.

Section	Sub-section	Condition	Implementation Activities Undertaken
10.3		The Proponent shall provide the Agency, or anyone designated pursuant to section 89 of the *Canadian Environmental Assessment Act, 2012*, with a revised implementation schedule if any change occurs from the initial schedule or any subsequent updates. The Proponent shall provide the revised implementation schedule at least 30 days prior to the implementation of the change.	There were no updates or revisions to the implementation schedule during 2016.
11	**Record keeping**		
11.1		The Proponent shall maintain a written record, or a record in an electronic format compatible with that used by the Agency, and retain and make available that record to the Agency, or anyone designated pursuant to section 89 of the *Canadian Environmental Assessment Act, 2012*, at a facility close to the Designated Project (local facility). The record shall include information related to the implementation of the conditions set out in this Decision Statement, and the results of all associated monitoring, including:	All records required under the Decision Statement are kept in electronic format accessible at the Brucejack Mine Site and from Pretivm's offices in Smithers and Vancouver.
	11.1.1	the place, date and time of any sampling, as well as techniques, methods or procedures used;	This practice occurred during 2016.
	11.1.2	the dates and the analyses that were performed;	This practice occurred during 2016.
	11.1.3	the analytical techniques, methods or procedures used in the analyses;	This practice occurred during 2016.
	11.1.4	the names of the persons who collected and analyzed each sample and documentation of any professional certifications relevant to the work performed that they might possess; and	This practice occurred during 2016.
	11.1.5	the results of the analyses.	This practice occurred during 2016.
11.2		The Proponent shall retain and make available upon demand to the Agency, or anyone designated pursuant to section 89 of the *Canadian Environmental Assessment Act, 2012*, the information contained in condition 11.1 at a facility close to the Designated Project (or at a location within Canada and agreed upon by the Agency, should the local facility no longer be maintained). The information shall be retained and made available throughout construction and operation, and for twenty-five years following the end of operation or until the end of decommissioning of the Designated Project, whichever comes first.	Required information can be accessed from the Brucejack Mine Site or either of Pretivm's offices in Smithers and Vancouver.

APPENDIX B:
2016 Air Quality Monitoring Results – Tsetsaut/Skii km Lax Ha Lodge

Memorandum

Date:	March 27, 2017
To:	Max Holtby, Pretivm Director of Permitting
From:	Philip Porter, P.Eng., and Greg Norton, M.Sc. (ERM)
Cc:	Sylvia Van Zalingen, Pretivm Environmental Manager
Subject:	**2016 Air Quality Monitoring Results – Tsetsaut/Skii km Lax Ha Lodge**

1. BACKGROUND

Pretium Resources Inc. (Pretivm) was granted approval to proceed with the Brucejack Gold Mine Project (Brucejack) by the Government of Canada on July 30, 2015 in a Decision Statement that included a series of conditions. Brucejack is required to conduct quarterly ambient air quality monitoring at the Tsetsaut/Skii km Lax Ha (TSKLH) Lodge as presented within Section 5 of the 2015 Decision Statement issued under Section 54 of the *Canadian Environmental Assessment Act* (CEA; CEA 2012) and copied below:

> 5.2 *The Proponent shall, in consultation with the Nisga'a Nation and Tsetsaut/Skii km Lax Ha, monitor and assess any changes to ambient air quality at the Tsetsaut/Skii km Lax Ha Lodge that result from the Designated Project during all phases for particulate matter (10 microns in diameter or less) and fine particulate matter (2.5 microns in diameter or less) using the Canadian Ambient Air Quality Standards of the Canadian Council of Ministers of the Environment as a benchmark, as well as for nitrogen oxide, sulphur dioxide and carbon monoxide.*

This memorandum specifically summarizes the air quality results of the quarterly monitoring at the TSKLH Lodge.

2. METHODOLOGY

2.1 Passive Air Sampling System (PASS)

Emissions of sulphur dioxide (SO_2) and nitrogen dioxide (NO_2) resulting from fuel combustion were monitored at the TSKLH Lodge as per the Decision Statement with a Passive Air Sampling System (PASS). The PASS monitors gas or vapour pollutants through the process of diffusion through a static air layer or permeation through a membrane. The sample media were installed in the field and exposed in protective shelters that were mounted to a support pole for a period of 30 days. Following the exposure period the sample media were retrieved, replaced, and sent to Maxxam Analytics for laboratory analysis along with meteorological data including air temperature, wind speed, and relative humidity, to determine the ambient concentration of the compound over the sampling period.

Monitoring results are compared to the Canadian Ambient Air Quality Standard (CAAQS) for SO_2, the National Ambient Air Quality Objective (NAAQO) for NO_2.

2.2 Carbon Monoxide and Particulate Matter

The TSKLH Lodge is the only private residence that potentially may be impacted by elevated particulate matter levels related to use of the access road. As per the Decision Statement, Pretivm conducted particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$) and carbon monoxide (CO) monitoring via a portable air analyzer on a quarterly basis near the TSKLH Lodge. Monitoring results are compared to the relevant CAAQS for $PM_{2.5}$ and the NAAQO for CO. There is no CAAQS or NAAQO for PM_{10}.

To monitor for PM_{10}, $PM_{2.5}$, and CO, a 3M Detection Solutions EVM-7 or similar portable unit was used. This type of monitor is used for industrial hygiene surveys. This portable unit was available through an environmental equipment rental company and was pre-calibrated.

3. DISCUSSION AND RESULTS

3.1 PASS

PASS was conducted at the TSKLH Lodge from March 6, 2016 to December 29, 2016. During the ten (10) monitoring months, nice (9) PASS samples were collected and sent to Maxxam Analytics for analysis. The average annual concentration of SO_2 and NO_2 at the TSKLH Lodge during the 2016 monitoring period was 0.7 and 7.4 micrograms per cubic metre ($\mu g/m^3$), respectively. The annual average concentrations for SO_2 and NO_2 were well below the relevant standard/objective of 13 (standard) and 60 (objective) $\mu g/m^3$, respectively. Table 3-1 provides the results of PASS monitoring at the TSKLH Lodge during the 2016 monitoring period.

Table 3-1. 2016 PASS Lodge Monitoring Results

		SO_2 [a] ($\mu g/m^3$)	NO_2 [a] ($\mu g/m^3$)
Standard/Objective [b]	Annual	13	60
	Daily	-	-
	1-Hour	183	188
Monitoring Month	Mar-16	0.5	7.5
	Apr-16	0.2	3.8
	May-16	0.5	5.6
	Jun-16	0.1	6.0
	Jul-16	0.5	11.3
	Aug-16	1.0	12.2
	Sep-16	0.5	4.9
	Oct-16	0.5	5.1
	Nov-16	2.6	10.0
Annual Average		**0.7**	**7.4**

[a] *Values reported by the laboratory as being less than the detection limit were replaced with values equal to half the detection limit to allow for their use in simple descriptive statistics.*
[b] *(CCME 1999; CCME 2000)*

3.2 Carbon Monoxide and Particulate Matter

Quarterly CO, PM_{10}, and $PM_{2.5}$ monitoring was conducted at the TSKLH Lodge during the following onsite monitoring events:

- March 5-8, 2016;
- June 22-27, 2016;
- September 17-25, 2016; and
- December 10-15, 2016.

During the June 22-27, 2016 quarterly monitoring event, the EVM-7 stand fell over between June 27, 2016 at 4:48 PM and June 28, 2016 at 12:46 PM. The data collected during this time therefore was not used in the analysis. The cause of the stand to fall over was not determined.

The results presented in the table shows the maximum result per the monitoring frequency during the monitoring event i.e. the maximum 1-hour average of all the 1-hour averages calculated during the monitoring event.

All results for CO and $PM_{2.5}$ were below the respective benchmarks. Table 3-2 summarizes the results of the CO, PM_{10} and $PM_{2.5}$ monitoring as well as the respective benchmarks.

The maximum 1-hour and 8-hour results recorded at the TSKLH Lodge were 883.3 and 193.2 µg/m^3, respectively. Thus observed CO levels were below the NAAQO.

The maximum 24-hour PM_{10} and 24-hour $PM_{2.5}$ concentrations at the Project were 32 and 26.7 µg/m^3, respectively (Pretivm 2014). The 24-hour $PM_{2.5}$ concentrations were below the CAAQS.

Table 3-2. 2016 Quarterly CO, PM_{10}, and $PM_{2.5}$ Lodge Monitoring Results

	Contaminant:	CO (µg/m^3)		PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)
	Benchmark:	15,000 (1-Hour)	6,000 (8-Hour)	- (24-Hour)	28 (24-Hour)
Sampling Event	Sampling Dates				
1st Quarterly Sampling Event	March 5-8, 2016	0.0	0.0	-	8.8
	March 7-8, 2016	0.0	0.0	-	-
2nd Quarterly Sampling Event	June 22-25, 2016	530.8	94.8	-	4.4
	June 25-27, 2016	833.3	193.2	6.1	-
3rd Quarterly Sampling Event	September 17-20, 2016	757.6	106.1	1.1	-
	September 20-25, 2016	0.0	0.0	-	26.7
4th Quarterly Sampling Event	December 10-13, 2016	0.0	0.0	32	-
	December 13-15, 2016	0.0	0.0	-	20.8

Note:
Dash (-) indicates data not measured or insufficient data, as the monitoring equipment can only test for one measurement (PM_{10} or $PM_{2.5}$) at a time.

4. CLOSING

Monthly PASS monitoring was conducted at the TSKLH Lodge from March 6, 2016 to December 29, 2016. The annual average concentrations for NO_2 and SO_2 were well below the respective benchmark concentrations.

Quarterly CO, PM_{10}, and $PM_{2.5}$ monitoring was conducted at the TSKLH Lodge in March, June, September, and December 2016. All results for CO and $PM_{2.5}$ were below the respective benchmarks.

Prepared by:

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Philip Porter, P.Eng.
Senior Consultant

Reviewed by:

_____

Greg Norton, M.Sc.
Partner

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