



THE STATE  
of **ALASKA**  
GOVERNOR SEAN PARNELL

**Department of Natural Resources**

OFFICE OF PROJECT MANAGEMENT & PERMITTING

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October 1, 2014

Rob Hajdú  
Canadian Environmental Assessment Agency  
410-701 West Georgia Street  
Vancouver, British Columbia V7Y 1C6  
Submitted via email to [Rob.Hajdu@ceaa-acee.gc.ca](mailto:Rob.Hajdu@ceaa-acee.gc.ca)

Re: Brucejack Gold Project

Dear Mr. Hajdú,

The State of Alaska has reviewed portions of the Brucejack Gold Mine Project: Application for an Environmental Assessment Certificate/Environmental Impact Statement (Application/EIS). Our review focused on assessing the adequacy of the information contained in the Application/EIS and on identifying potential adverse impacts to water quality, fish habitat, and fisheries that could negatively affect Alaska. Please consider the following consolidated comments in your assessment of the Brucejack Gold Project.

General Information

The Brucejack Gold Project (Project), proposed by Pretium Resources Inc. (Project Proponent), is located in northwestern British Columbia (BC), approximately 950 kilometers (km) northwest of Vancouver, 65 km north-northwest of Stewart, and 45 km upstream of the border with Alaska (via the Unuk River, Sulphurets Creek, and Brucejack Creek).

The Project is located in the Sulphurets District, Iskut River, Skeena Mining District, which is the same region as the proposed Kerr-Sulphurets-Mitchell (KSM) Project. However, there are notable differences between the two projects.

The Brucejack Project is proposed as an underground gold mine with a 22 year mine life producing 2,700 tons per day of ore using a long-hole stoping method. Gold and silver will be produced using gravity and flotation circuits. Final products leaving the mine site will consist of doré bars and a gold/silver concentrate that will be hauled offsite for smelting. No tailings dams are proposed as part of the Project.

Fisheries and Fish Habitat

The Project Proponent proposes to store mine tailings and waste rock in the non-fish bearing 85 meter (m) deep glacial-fed Brucejack Lake, located 1,370 m above sea level. Brucejack Lake discharges into Brucejack Creek, passes beneath the Sulphurets glacier, and discharges into Sulphurets Creek, a tributary of the transboundary Unuk River. Fish have never been documented above a 200 m cascade barrier in Sulphurets Creek, 20 km downstream of the outlet from Brucejack Lake. Chinook, coho, and sockeye salmon, and Dolly Varden char, are

documented below the cascade barrier in the Unuk River. The Unuk River supports runs of Chinook, coho, pink, chum and sockeye salmon, which support commercial, recreational, and subsistence fisheries in Alaska.

To date, our review of the Application/EIS has not identified any Project-related potential adverse impacts to fish or fish habitat in the lower reach of Sulphurets Creek or the Unuk River.

### Water Management

Water management at the mine site will consist of ditches, a storage pond for contact water, and treatment systems. Ditches will be used to divert non-contact water around the surface facilities and into Brucejack Lake or Brucejack Creek. Contact water from the mine site will be stored in a lined storage pond and treated before being used in the mill or discharged to Brucejack Lake. Water from underground will be pumped to the surface and treated. The proposed water treatment plant is a Veolia ACTIFLO® High Rate Clarifier. This is a proven technology for the treatment of suspended solids and heavy metals in wastewater. A turbidity curtain will be used at the outlet of Brucejack Lake to remove suspended sediments in the water.

The Application/EIS states (Executive Summary, page 51)

*Effects on surface water quality are predicted to be restricted to the Brucejack watershed, and are not expected to affect surface water quality of mid- and far-field receiving environments. The potential for transboundary effects on surface water quality on the lower Unuk River in Alaska is considered extremely low.*

Proportionally, the watershed area for Brucejack Lake represents approximately 0.7% of the watershed area of the Unuk River at the Canada/US border. Modeling indicates that average annual flows from Brucejack Lake will increase by about 6% above existing conditions as a result of mining activities. This increase will be due to the introduction of tailings slurry water and reduced water volume in Brucejack Lake (as a result of the deposited tailings). Modeling further estimates that the mean annual flows from Brucejack Lake during post-closure will be similar to the baseline flows (Application/EIS, Section 10.6.1.1).

To date, our review of the Application/EIS has not identified any Project-related potential adverse impacts to water quality in the Unuk River. Considering the modelling data, size, engineering design and mitigation measures for the Project, the Project Proponent's conclusion that "...the Unuk River will not experience changes in water quality due to metals, process chemicals, nitrogen, or phosphorus" seems reasonable (Section 15.6.3.5).

### Waste Management

A portion of the tailings and waste rock from the mine will be disposed of subaqueously in Brucejack Lake, and the balance will be backfilled into underground stopes. The Application/EIS states (Executive Summary, page 25) that "*Over the [life of the mine], 45% of development waste rock and 47% of tailings generated from milled ore will be returned underground. The balance will be disposed of in Brucejack Lake.*"

Geochemical testing indicates that the tailings are not potentially acid generating (PAG). The majority of the waste rock, on the other hand, is projected to be PAG. Subaqueous disposal can be ideal for PAG material, as the water cover acts as a barrier to oxygen. Brucejack Lake is deep (85 m), typically stratified, and has ample storage capacity for the expected volumes of tailings and waste rock that will be produced by the mine. No dams will be required to impound the stored tailings. After closure, the underground mine workings will be allowed to flood and the backfilled tailings and waste rock will also be submerged.

To date, our review of the Application/EIS has not identified any Project-related potential adverse impacts to Alaska interests from the proposed methods of waste management.

Should Canadian or British Columbian governments require a waste rock and tailings invertebrate habitability study, we recommend using the methods described by Willson-Naranjo and Kanouse (2014).

#### Reclamation

The Application/EIS states (Section 30.4.1.1)

*The overall lack and/or poor quality of soil or soil-textured material in the Brucejack Mine Site area requires that a key objective of the local salvage program will be to recover any surficial material that may be suitable for use as root zone material (growth medium) for reclamation.*

Please confirm whether additional growth medium will be brought in from off site sources if the Project Proponent is unable to salvage sufficient volumes of growth medium locally for the required reclamation activities.

In closing, the State of Alaska appreciates the opportunity to participate in the environmental assessment process for the Brucejack Gold Project. We look forward to engaging in the technical working group process. Please contact me if you have any questions regarding our comments.

Sincerely,



Kyle Moselle  
Large Project Coordinator

CC:

Jackie Timothy, ADF&G-Habitat  
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#### Reference

Willson-Naranjo, G.R. and K.M. Kanouse. 2014. Kensington Gold Mine tailings treatment facility studies, 2013. Alaska Department of Fish and Game, Technical Report 14-03, Douglas, Alaska. [available at [http://www.adfg.alaska.gov/static/home/library/pdfs/habitat/14\\_03.pdf](http://www.adfg.alaska.gov/static/home/library/pdfs/habitat/14_03.pdf)]