

Re: PLP White Paper No. 3: Active Metal Mines of the Fraser River Basin and Fish - Case Studies, Oscar Gustafson, Knight Piesold, Vancouver, B.C., July 20, 2012

Subj: Peer Review Comments

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The analysis of the mines presented in White Paper No. 3 lacks a consistent analytical format, so it is difficult to compare the mines with each other.

There is no attempt to compare the mines discussed in White Paper No. 3 directly with Pebble. The Pebble project would be larger than these mines. And, more significantly, the Pebble project is in an area with more precipitation and groundwater than the Fraser River mines.

There is no mention of the problems with salmon in the Fraser River, which are considerable.

Specific Comments:

3.1. Appropriate Mine Siting

"The disturbance footprints of the four mines examined in this white paper do not directly impact fish habitat that is critical to fisheries, and thus it has been concluded these mines have been sited appropriately." (White Paper No. 3, p. 8)

The proposed Pebble project is sited directly in fish habitat. This is an important distinction when comparing the proposed Pebble Mine and fisheries impacts. For example:

- The Gibraltar Mine is not constructed on top of salmon spawning or rearing habitat.
"The Gibraltar Mine is situated within the headwaters of Cuisson Creek, which is a relatively small stream with limited fisheries production potential. Anadromous use is limited to the first 0.3 km of the creek above its confluence with the Fraser River, while the tailings facility is located 17 km upstream." (White Paper No. 3, p. 5)

and;

"The stream distance between the mine site and anadromous fish habitat is more than 20 km." (White Paper No. 3, p. 3)

The Pebble Mine would be constructed directly on top of salmon producing tributaries to Bristol Bay's most productive salmon systems – the Nushagak and Kvichak.¹

- The Gibraltar Mine, at 36,000 tons per day, is much smaller and generates less waste than the proposed Pebble Mine, at 100,000-200,000 tons per day.²

¹ Renewable Resources Coalition, Trout Unlimited and True North GIS, Map of the Proposed Pebble Mine and Relationship to Observed Fish Populations, based on Fisheries Report in reference to Permit No. 8F-2004-114 and Amendment No. 8F-2004-114-A-1 from HDR Alaska, Inc. to Alaska Dept. of Fish and Game.

² http://www.ndmpebblemine.com/project_information/overview_history;

- The climate at the Gibraltar Mine is significantly different than that at the Pebble deposit location.
 - “*The Southern Basin lies in the rain shadow of the Coast and Cascade Mountains. Annual precipitation in the valleys grades from an average of 300 mm to 750 mm in a northerly trend. The average annual precipitation for the Gibraltar Mine from AES station (W l) for the period of record is 511 mm.*”³ (511 mm = 20.1 inches, precipitation for the Pebble mine site area is estimated to be 36.6 inches.⁴)
 - The annual potential evapotranspiration at the Gibraltar Mine ranges from 654 mm to 1179 mm⁵ (25.7 to 46.4 inches per year). Mean annual lake evaporation for the Pebble area is estimated to be 7 inches.⁶

3.5. Monitoring of Seepage and Discharge

"The Gibraltar Mine and Endako Mine periodically release contact water to the receiving environment under effluent discharge permit conditions." (White Paper No. 3, p. 8)

The Gibraltar mine opened under Environmental Management permit #PE-416, originally issued in July of 1971. The mine operated without a discharge to surface waters, storing the runoff in the tailings impoundment and the mined out Gibraltar East pit. In 2006 the Province of BC, Ministry of Water, Land and Air protection (WLAP) issued the amended discharge permit to allow wastewater disposal from the tailings impoundment and Gibraltar East Pit into the Fraser River (April 12, 2006). The discharge has elevated levels of TDS, sulphate, conductivity, hardness, aluminum, and molybdenum.⁷

The issuance of the permit, which authorized a mixing zone in the Fraser River, was controversial. The Xats'ull First Nation opposed the issuance of the permit to discharge mine effluent into the Fraser River and filed an appeal of the permit decision with the BC Environmental Appeals Board (EAB) in May, 2006.

The Xats'ull raised concerns that additional treatment to remove metals should be required in the discharge permit. The WLAP decided that treatment for molybdenum is not needed because there is ample dilution in the Fraser River.⁸ The Xats'ull raised concerns that the cumulative effects of many discharges into the Fraser were not addressed. Of concern was how the Gibraltar Mine effluent might add to existing anthropogenic metal sources, particularly with respect to molybdenum.

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³ Gibraltar Mines Ltd., 2004 Environmental and Reclamation Report, p. 3-1.

⁴ Preliminary Assessment of the Pebble Project, Southwest Alaska, Ghaffari et al., Wardrop-Northern Dynasty Mines, February 17, 2011, p. 351.

⁵ Gibraltar Mines Ltd., 2004 Environmental and Reclamation Report, Table 3.3 Annual Potential Evapotranspiration

⁶ Preliminary Assessment of the Pebble Project, Southwest Alaska, Ghaffari et al., Wardrop-Northern Dynasty Mines, February 17, 2011, p. 350.

⁷ 2004 Environmental and Reclamation Report, Taseko Mines, March 2005.

⁸ Douglas Hill, P.Eng. BC Ministry review of Gibraltar Mines Discharge permit application PE-00416 April 10, 2006, p. 8.