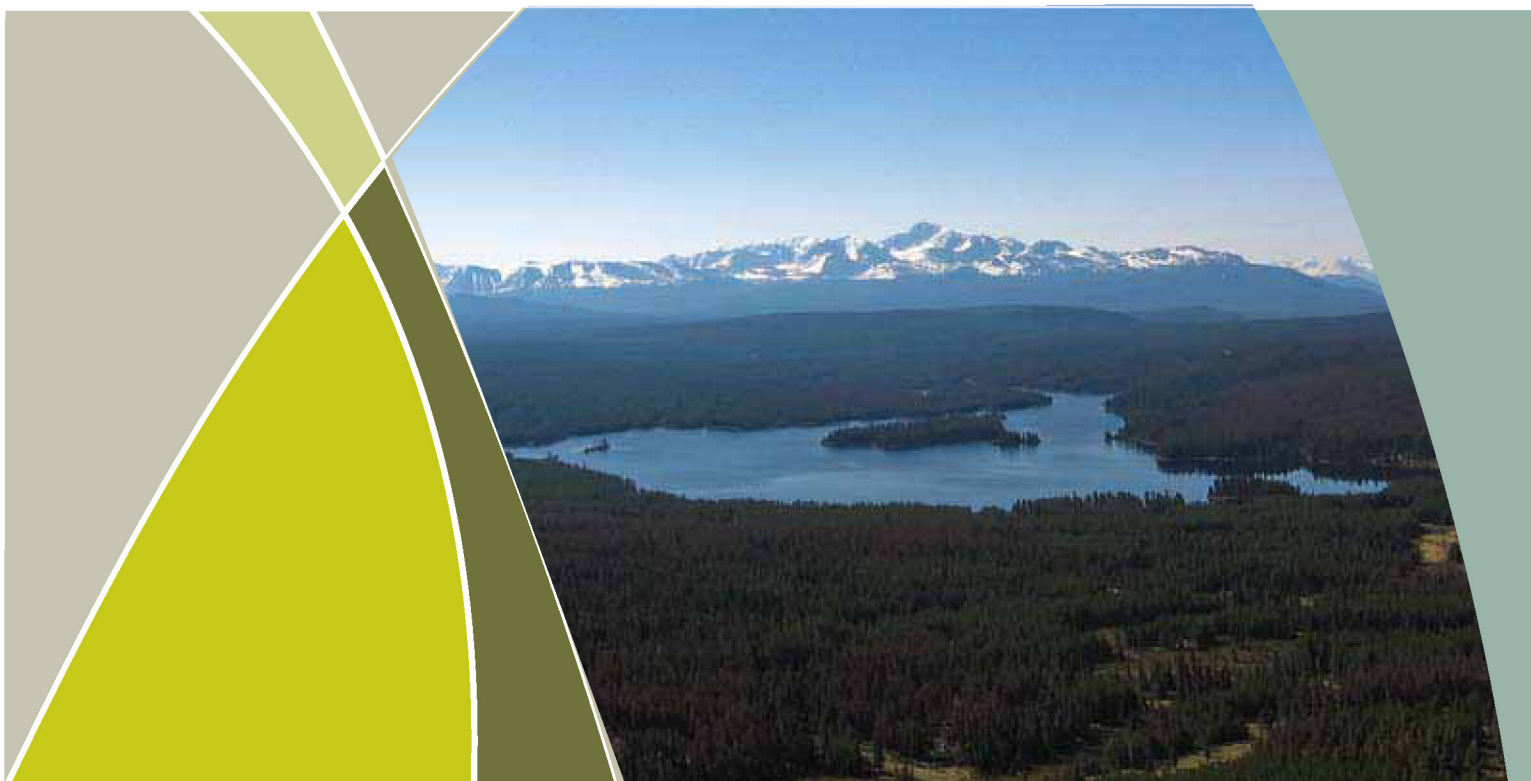


# Report of the Federal Review Panel

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Prosperity Gold-Copper Mine Project  
Taseko Mines Ltd.  
British Columbia



Review Panel established by the Federal Minister of the Environment

**025134**

**REPORT OF THE FEDERAL REVIEW PANEL  
ESTABLISHED BY THE MINISTER OF THE ENVIRONMENT**

**TASEKO MINES LIMITED'S  
PROSPERITY GOLD-COPPER MINE PROJECT**

**July 2, 2010**

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**025135**

Canadian Environmental Assessment Agency  
22nd Floor, 160 Elgin Street  
Ottawa, ON K1A 0H3  
Tel (613) 957-0700 Fax (613) 957-0941  
Email: [info@ceaa-acee.gc.ca](mailto:info@ceaa-acee.gc.ca)  
Web Address: [www.ceaa-acee.gc.ca](http://www.ceaa-acee.gc.ca)

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## LIST OF ACRONYMS

<b>Acronym</b>	<b>Meaning</b>
µg/L	microgram per litre
BC	British Columbia
cm	centimetre
dB	decibel
EIS	Environmental Impact Statement
ha	hectares
km	kilometres
km <sup>2</sup>	square kilometres
KV	kilovolts
m	metre
M	million
m <sup>2</sup>	square metre
m <sup>3</sup> /day	cubic metres per day
masl	metres above sea level
Mg/L	milligrams per litre
Mm <sup>3</sup>	Million cubic metres
PM <sub>2.5</sub>	particulate matter less than 2.5 micrometres in diameter
PM <sub>10</sub>	particulate matter less than 10 micrometres in diameter
US	United States

## EXECUTIVE SUMMARY

Taseko Mines Ltd. (Taseko) proposed to develop the Prosperity Gold-Copper Mine (the Project) approximately 125 km southwest of Williams Lake, British Columbia. The Project would involve the construction, operation, decommissioning and abandonment of a large mine with a 20 year operating life. Its main elements would include an open pit mine, a 125 km transmission line, an onsite mill, a new site access road and fish compensation works.

Federal approval to proceed with the Project would require authorizations under the *Fisheries Act*, a permit under the *Navigable Waters Protection Act* and a licence under the *Explosives Act*.

The federal Prosperity Review Panel (the Panel) was appointed on January 19, 2009 by the Minister of the Environment, the Honourable Jim Prentice, to conduct a review of Taseko's Project. This report presents the Panel's overall conclusions and recommendations and takes into consideration information obtained during the course of the review, including 30 days of public hearing sessions held in 10 communities in the Project area from March 22 to May 3, 2010. The public hearing provided an opportunity to receive additional information on the views of participants, the current use of lands and resources for traditional purposes by First Nations and on their cultural heritage, and to thoroughly examine Taseko's proposal.

The Project would be located in the Cariboo-Chilcotin Regional District, a sparsely populated region with Williams Lake as the regional service centre. The economy within the local study area was reported to be highly reliant on the resource sector, and in particular, on forestry. The effects of the mountain pine beetle infestation and the downturn in the forest industry had a detrimental effect on the local economy. Unemployment rates were well above the provincial average. Many in the Williams Lake area saw the Project as an opportunity to improve the economy and were strong supporters of Taseko's proposal.

The mine site would cover a 35 square km area in the Teztan Yeqox (Fish Creek) watershed. The watershed, which drains to the Dasiqox (Taseko River), includes Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake) and the surrounding area called Nabas. The area was described by participants as a pristine, untouched, and unique ecosystem with exceptional vistas, clear glacial fed lakes and streams, relative remoteness and abundant wildlife. A postcard featuring Teztan Biny was issued by GoBC as one in a series promoting tourism in the province. The mine would involve the destruction of Teztan Biny, Y'anah Biny and portions of Teztan Yeqox. A new lake, called Prosperity Lake, would be created as part of the fish and fish habitat compensation plan. A 125 km transmission line would supply power to the mine site from the existing BC Hydro north-south transmission line east of the Fraser River.

First Nations have continued to occupy and use the Project area for traditional purposes since pre-European contact. The First Nations that would be affected by the Project include the Tsilhqot'in and Secwepemc Nations. First Nations have consistently expressed strong opposition to the Project.

The British Columbia Environmental Assessment Office undertook a separate but coordinated review of the Project and the provincial decision was announced in January, 2010. The Province's conclusion was that the Project would have a significant adverse effect on fish and fish habitat but that the effects were justified in the circumstances. The Panel

has made a number of observations related to the challenges resulting from the application of separate environmental assessment processes. In particular, the Panel notes that the Province was not able to consider the final comments from federal departments nor was it able to take advantage of information received during the public hearing from First Nations on the current use of lands and resources for traditional purposes and effects on cultural heritage. The Panel notes that the public hearing was instrumental in gathering information from First Nations on these matters.

The Terms of Reference issued by the Minister of the Environment require the Panel to conduct an assessment of the environmental effects of the Project which includes the effects on the current use of lands and resources for traditional purposes and cultural heritage. The Panel was also instructed to fully consider and include in its report information on how the Project might affect potential and established Aboriginal rights or title. The Panel interprets its mandate to mean that Aboriginal rights and title should be assessed in the same way as environmental effects. However, the Panel does not have a mandate to make any determination as to the validity of the rights or title claims asserted by First Nations or the strength of those claims.

**The Panel concludes that the Project would result in significant adverse environmental effects on fish and fish habitat, on navigation, on the current use of lands and resources for traditional purposes by First Nations and on cultural heritage, and on certain potential or established Aboriginal rights or title. The Panel also concludes that the Project, in combination with past, present and reasonably foreseeable future projects would result in a significant adverse cumulative effect on grizzly bears in the South Chilcotin region and on fish and fish habitat.**

The reasons for these conclusions are summarized as follows:

**Fish and Fish Habitat**

The Project would result in the destruction of approximately 90,000 rainbow trout in Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake). For First Nations, lake trout are an important and well established food source when salmon populations are low. Teztan Biny is also a fishing lake valued by recreational fishers.

The fish and fish habitat compensation plan would result in the creation of a new replacement lake called Prosperity Lake. Although it would be designed to support approximately 20,000 larger rainbow trout, it would neither meet Fisheries and Oceans Canada No Net Loss policy nor provide assurance to First Nations that the fish would be safe for consumption. Also, the success of re-creating a lake with adjacent spawning and rearing channels is questionable as no information was presented regarding the successful replacement of an entire lake and stream system as a self-sustaining ecosystem. It is unlikely that the plan would meet the requirements for the establishment of a self-sustaining rainbow trout population, or a replacement First Nation food fishery. Perpetual maintenance of spawning channels and ongoing lake stocking by governments would likely be required to achieve the proposed provincial fisheries objectives. The Panel finds that the fish and fish habitat compensation plan would not mitigate the effects of the loss of the fishery in the Teztan Yeqox (Fish Creek) watershed. The Panel concludes that the Project would result in a high magnitude, long-term and irreversible effect. Also, if the mine expands to extract the announced increase in mineral reserves, the expanded tailings storage facility would have an additional cumulative effect on the

fish habitat compensation plan for the present Project. This would place further stress on the likelihood of success of the compensation plan proposed for this Project.

### **Navigation**

Transport Canada expressed concerns about how the Project would interfere with navigation and the lack of suitable mitigation to compensate for these losses. The Panel notes Transport Canada's assertion that Prosperity Lake would not adequately mitigate the losses of the fishing and recreational experience at Teztan Biny (Fish Lake) or the use by First Nations. Transport Canada has linked these issues to navigation. The Panel notes that the Project's effects on navigation in the absence of effective mitigation measures would be high magnitude and irreversible. Therefore, the Panel agrees with Transport Canada's conclusion that the Project would have a significant adverse effect on navigation.

### **Current use of lands and resources for traditional purposes and cultural heritage**

The Tsilhqot'in and Secwepemc's current use of the mine site and the transmission line corridor for traditional purposes includes hunting, fishing, trapping, gathering of plants and berries for food and medicinal purposes, as well as ceremonial and spiritual activities.

First Nations people of all ages told the Panel that Teztan Biny (Fish Lake) was integral to the Tsilhqot'in culture. The Teztan Biny and Nabas areas were described as a place in their traditional territory where they go to exercise their established Aboriginal right to hunt and trap, their potential Aboriginal right to fish in Teztan Biny, to carry out activities for traditional purposes such as gathering plants for sustenance and medicinal purposes, and to ensure the continuation of intergenerational knowledge through cultural gatherings, ceremonies and the teaching of traditions to younger generations. The island in Teztan Biny (Fish Lake), which would be destroyed by the mine waste storage area, is a place of spiritual power and healing for the Tsilhqot'in. The archaeological finds in the area are important to the Tsilhqot'in as such finds are evidence of their ancestral heritage and an integral part of their cultural traditions. The area of the mine site was reported by the Tsilhqot'in to contain numerous heritage resources of importance including pit houses, cache pits, cremation sites, and graves, including at least 1 identified grave site and others that were reported but had not been located during the surveys. Sites that have not been identified would likely be uncovered or inadvertently destroyed during construction.

First Nations stated that the Nabas area, located immediately to the south of Teztan Biny (Fish Lake), had been occupied for generations. This area would be removed from future use as a result of the Project. The mine would reduce the area available for current use activities for traditional purposes. While there are other areas where some activities such as hunting, trapping and gathering of plants and berries could occur, the availability of such areas has been reduced due to logging, ranching and private land ownership in the area. In the Panel's view, the ability to practice these activities in one location, together with cultural and spiritual values and the archaeological importance of the Teztan Biny (Fish Lake) area, contributed to the special value of this area for the Tsilhqot'in. The Panel heard that the cultural importance and spiritual value of the Teztan Biny area could not be replaced or mitigated. Thus, the Panel's overall conclusion is that the Project would have a high magnitude, long term, irreversible effect on the Tsilhqot'in.



The effects of the Project on the Secwepemc would result mainly from the proposed transmission line. The Panel notes that there would be some flexibility to adjust the location of the final centreline for the transmission line and the placement of poles to avoid most sensitive areas. Therefore, it is the Panel's conclusion that with mitigation, the effects of the Project on the Secwepemc's current use of lands and resources for traditional purposes and on cultural heritage would not be significant.

First Nations stated they were not opposed to mining in general, but rather to a development that would result in the destruction of Teztan Biny (Fish Lake). Taseko had not proposed any measures to offset losses other than to refer to British Columbia's recent policy on revenue sharing with affected First Nations. Many First Nation members indicated that no amount of monetary compensation could replace the loss of the Teztan Biny ecosystem.

**Potential or established rights and title**

The mine site would be located in the area known as the Claim Area in *Tsilhqot'in Nation vs. British Columbia*, 2007 SCBC 1700 (the *William* case). In that case, the Supreme Court of British Columbia found that the Tsilhqot'in have a right to hunt and trap birds and animals throughout the Claim Area, to trade in skins and pelts, and capture and use horses for transportation and work. The Panel concludes that the Project would have a significant adverse effect on established Tsilhqot'in Aboriginal rights, recognized and affirmed in the *William* case, as the area of the proposed mine site would no longer be available for their use in exercising these rights throughout all phases of the Project. The Panel was not made aware of any offers of compensation to offset losses other than a reference made by Taseko to the recently announced British Columbia revenue sharing policy.

In addition, the Tsilhqot'in asserted an Aboriginal right to fish in Teztan Biny (Fish Lake) in a pending court action, *Baptiste et al. v. Taseko Mines Ltd.*, HMTQ BC and AGC. The Panel concludes that the effects of the Project on this asserted Aboriginal right would be significant as the lake and its fishery would be destroyed and replaced with a waste rock storage area.

While the Court found that Aboriginal title could not be granted in the *William* case due to the way the case was argued, the Court indicated that had the case been pleaded differently, it probably would have found Aboriginal title for the Tsilhqot'in to almost half of the Claim Area. However, the land to which title would have been granted did not include the Project area. The decision is under appeal by all parties. However, the Tsilhqot'in have asserted title to the Project area. The Panel concludes that the effects of the Project on the potential Tsilhqot'in title would be significant as the value of the claim would be reduced substantially due to changes in the landscape and the loss of the area for current use for traditional purposes.

No treaties have been signed in the Project area with potentially affected First Nations. However, portions of the transmission line would be located in areas that were reported to be under negotiation through the British Columbia treaty process. Both the Esketemc (Alkali Lake Band) and the Stswecem'c/Xgat'tem (Canoe Creek Band), members of the Secwepemc Nation, stated they were in stage 4 of the 6-stage treaty process. The Secwepemc Nation stated it had a proven Aboriginal right to hunt in the region, as per the *Alphonse* case, and a proven right to fish. The Stswecem'c/Xgat'tem and Esketemc also asserted Aboriginal rights and title over portions of the area crossed by the

transmission line. The Stswecem'c/Xgat'tem noted that they had uncontested rights to hunt and fish in the area of the transmission line.

With respect to the Esketemc (Alkali Lake Band) and the Stswecem'c/Xgat'tem (Canoe Creek Band), the Project would have a direct effect on their title claim as the transmission line would reduce the availability of land for selection during the treaty process. The Panel concludes that, depending on the size of the land settlement through the treaty process, the Project may result in a significant adverse effect on Aboriginal title that could be granted to them. The transmission line would also adversely affect the established right to hunt, but the Panel concludes that this would not be a significant effect. As with the Tsilhqot'in, no offer of compensation has been made to offset these losses.

### **Grizzly Bears**

The past effects of logging and other activities such as ranching have resulted in a significant adverse effect on the sustainability of the South Chilcotin grizzly bear as indicated by its classification by the Province as threatened in the region. While the Project would result in a relatively small loss in habitat, it would contribute to a further decline of the present situation. Logging is expected to continue to affect habitat in the area due to the increased harvesting in response to the mountain pine beetle infestation. This would place even greater pressure on the remaining bear habitat in the South Chilcotin region.

Taseko's mitigation measures included strict enforcement of speed limits to minimize bear-vehicle collisions and a policy of using a non-lethal approach in resolving any incident involving bears, should they arise. These mitigation measures would not replace lost habitat, nor would they reduce fragmentation of the landscape. Further, speed limits for vehicles may be difficult to enforce. Given the increased road traffic and further loss and fragmentation of habitat caused by the Project, in combination with reasonably foreseeable forestry activities, the Panel concludes that the Project would likely result in high magnitude, long-term effects on the South Chilcotin grizzly bear population.

In addition, at the local level, the Panel concludes that the Project would have significant adverse effects on the users of the meadows within the Teztan Yeqox (Fish Creek) watershed, on the Xení Gwet'in (Nemiah Band)/Sonny Lulua trapline and on Taseko Lake Outfitters. The users of the meadows would be unable to graze their livestock in these meadows, the Xení Gwet'in (Nemiah Band) would be unable to trap in the mine area and Taseko Lake Outfitters would likely not be able to continue its ecotourism business due to the proximity of the mine site.

While the Panel has also examined information on the employment and economic benefits associated with the Project, it has not reached a conclusion on this subject. The Panel's Terms of Reference limit it to addressing changes in socio-economic conditions caused by a change the Project may make in the environment. Economic issues (e.g. employment, income, government finances and economic and regional development), in the Panel's opinion, do not result from an environmental change caused by the Project.

However, information on employment and economic benefits is relevant to the issue of whether the significant adverse environmental effects of the Project are justifiable. While the Panel has no mandate to reach conclusions on justifiability, it is mandated to include such information in its report.

The potential employment and economic benefits of the Project were considered by many to be beneficial. Taseko indicated that the Project was expected to generate, on average, approximately 375 direct jobs per year during the construction and operations phases. Additionally, approximately 600 indirect and induced jobs per year on average would be created within British Columbia during the 20 year operating life of the mine. Spending in the regional and provincial economy would be approximately \$200 million with government revenue estimated to be \$30 million annually over the life of the Project.

With respect to the mine site, the Panel notes that Taseko stated the only economically viable option, given the location of the ore body in proximity to Teztan Biny (Fish Lake), was the preferred mine development plan. Therefore, if the Project proceeds, there would be no other viable alternatives that could be explored to avoid the significant adverse environmental effects identified by the Panel.

The Panel has also provided, in accordance with its mandate, recommendations relating to appropriate procedures for the management of environmental effects, should a decision be made to approve the issuance of authorizations, permits or approvals that would be required to enable this Project to proceed. These recommendations are in addition to commitments made by Taseko and contained in the provincial Environmental Assessment Certificate, and include measures to further mitigate potential effects and to assist in future consultation with First Nations. However, the Panel believes that these recommendations would not eliminate or accommodate the significant loss First Nations would experience as a result of the Project.

## SECTION 1: ENVIRONMENTAL ASSESSMENT REVIEW PROCESS

This report presents the results of the federal Review Panel's (the Panel) examination of the potential environmental effects of the proposed Prosperity Gold-Copper Mine project (the Project) by Taseko Mines Ltd. (Taseko). In accordance with the *Canadian Environmental Assessment Act*, an environmental assessment must be completed before federal departments are able to issue any permits, approvals or authorizations necessary to enable a project to proceed. This report includes a summary of the comments received from the public and First Nations<sup>1</sup> and the Panel's conclusions and recommendations.

Taseko has proposed to develop a gold-copper mine, located approximately 125 kilometres (km) southwest of Williams Lake, British Columbia. The Project would include an open pit mine and associated infrastructure, an access road, a transmission line, a rail load-out facility, and fish and fish habitat compensation works. Facilities associated with the open pit mine would include a plant site, camp, onsite mill, waste rock stockpiles, and a tailings storage facility.

The Panel is satisfied that it has complied with its Terms of Reference and that it has gathered enough information to form conclusions on the potential environmental effects of the Project and, where appropriate, make recommendations regarding appropriate procedures for the management of short and long term environmental effects associated with the Project, should it proceed.

### 1.1: BACKGROUND

Taseko began its environmental assessment in 1993 when it applied for a provincial mine development certificate. In 1995, the British Columbia *Environmental Assessment Act* was proclaimed and the review of the Project was transferred to the new provincial environmental assessment process.

The environmental assessment under the *Canadian Environmental Assessment Act* commenced on July 10, 1997 as a comprehensive study, with Fisheries and Oceans Canada as the responsible authority<sup>2</sup>. However, due to weak metal prices and a poor price performance outlook, Taseko put the Project on hold in 2000. Taseko re-activated the British Columbia environmental assessment process in 2002 and the federal environmental assessment process in 2006. At that time, Fisheries and Oceans Canada, Transport Canada and Natural Resources Canada identified themselves as responsible authorities.

On February 19, 2007, Fisheries and Oceans Canada, with the support of Transport Canada and Natural Resources Canada, referred the Project to the Minister of the Environment for

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<sup>1</sup> The Panel has used the term "First Nation" throughout the report rather than "Aboriginal" as this was the term most commonly used by participants during the review process. The term "Aboriginal" is only used when citing or referring to legal text, referring to Aboriginal rights and title or quoting a participant.

<sup>2</sup> Under the *Canadian Environmental Assessment Act*, departments that have to exercise a power, duty or function to enable a project to be carried out in whole or in part are referred to as "responsible authorities". In their capacity as responsible authorities, these departments will lead the development of a government response to this report and seek approval of the response from the governor in council (i.e., the federal cabinet).

referral to a review panel, as per subsection 21(2)(b) of the *Canadian Environmental Assessment Act*. The responsible authorities concluded that the Project had the potential to cause significant adverse environmental effects that could not be readily mitigated and that there were important public and First Nations resource use issues that warranted the referral to a federal review panel.

In accordance with the Canada-British Columbia Agreement on Environmental Assessment Cooperation, work was undertaken by the federal and provincial governments to develop a joint review panel process for the Project. However, on June 22, 2008, the provincial Minister of Environment issued a Section 14 order under the British Columbia *Environmental Assessment Act* requiring a review by the British Columbia Environmental Assessment Office rather than a joint review process with the federal government.

On January 19, 2009, the Minister of the Environment referred the Project to a federal review panel. Although the federal and provincial environmental assessment processes were conducted separately, efforts were made to coordinate the two to the extent possible. Additional information regarding the separate environmental assessment processes that occurred for the Project can be found in Section 4.5.

## **1.2: PANEL'S TERMS OF REFERENCE**

In October 2008, the Canadian Environmental Assessment Agency issued draft Terms of Reference for establishing a federal review panel for the Project. The purpose of the Terms of Reference was to define the mandate of the Panel and the scope of the environmental assessment. Following a public comment period, the Terms of Reference were finalized by the Minister of the Environment and issued to the Panel when it was appointed in January 2009. A copy of the Panel's Terms of Reference is included in Appendix 1. The Panel consisted of Mr. Robert Connelly as the Panel chair and Ms. Nalaine Morin and Mr. William Klassen as members. A short biographical description of each Panel member is included in Appendix 2.

## **1.3: ENVIRONMENTAL IMPACT STATEMENT GUIDELINES**

In October 2008, the Canadian Environmental Assessment Agency and the British Columbia Environmental Assessment Office released joint draft Guidelines for the Preparation of the Environmental Impact Statement / Application Terms of Reference (herein referred to as Environmental Impact Statement Guidelines) for the proposed Project. The Environmental Impact Statement (EIS) Guidelines developed for the Project were based on the Project Report Specifications that were developed in 1998 through the provincial environmental assessment process. The purpose of the EIS Guidelines was to identify the scope and extent of the information to be contained in the EIS. Following a public comment period, the EIS Guidelines were finalized and jointly issued to Taseko by the federal Minister of the Environment and the British Columbia Environmental Assessment Office in January 2009.

## **1.4: PARTICIPANT FUNDING PROGRAM**

Participant funding was made available for the review pursuant to subsection 58(1.1) of the *Canadian Environmental Assessment Act*. The Participant Funding Program was comprised of two funding envelopes: the regular funding envelope and the Aboriginal funding envelope.

A Funding Review Committee, independent from the Panel, was established to review funding applications and recommend the allocation of funding. The Canadian Environmental Assessment Agency awarded funding to the following applicants:

- Share Cariboo-Chilcotin Resources Society: \$5,050;
- Friends of the Nemaiah Valley: \$25,000;
- Williams Lake and District Chamber of Commerce: \$15,000;
- MiningWatch Canada: \$37,200;
- Esketemc (Alkali Lake Band): \$75,000;
- T'exelc (Williams Lake Band): \$41,931;
- Tsilhqot'in National Government: \$300,000; and
- Stswecem'c/Xgat'tem (Canoe Creek Band): \$53,469.

The recommendations of the Funding Review Committee were made available on the Canadian Environmental Assessment Registry internet site for the Project.

**1.5: SITE TOUR**

On May 12, 2009, the Panel notified parties of its intention to conduct a site tour on its own, without the presence of Taseko or any interested party. At this time, the Panel also invited interested parties to suggest areas to visit. In June 2009, the Panel and its Secretariat toured the proposed Project area. During the tour, the Panel and the Secretariat visited the proposed mine site location at Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake) and viewed the proposed transmission line routing via helicopter, visited the campsite at Fish Lake, and drove the proposed access roads from the mine site to the rail load-out facility at Macalister.

On April 16, 2010, as part of the community hearing session with the Stswecem'c/Xgat'tem (Canoe Creek Band), a site visit was conducted of the Little Dog area, in the vicinity of the proposed Fraser River crossing for the transmission line. The site visit was open to all interested parties and members of the public.

**1.6: REVIEW OF THE ENVIRONMENTAL IMPACT STATEMENT**

In accordance with its Terms of Reference, the Panel was required to determine whether the EIS contained sufficient information to enable it to proceed to the public hearing. The steps taken by the Panel to review the information in the EIS are summarized in Table 1. Given that it was during the review of the EIS that the timing of the federal and provincial environmental assessment processes diverged, reference is also provided to the key steps and decisions in the provincial process where appropriate. Although the Panel's Terms of Reference included set timelines for different stages of the process, there were no time limits specified for the review of the EIS. Conversely, the provincial process had a 180-day time limit for the completion of the review from the time of the acceptance of the EIS as complete. The provincial process did allow for the suspension of the timeline when awaiting information from Taseko.

**Table 1: Steps taken by the Panel to Review the EIS**

<b>Date</b>	<b>Process Step</b>
January 26, 2009	Taseko submitted its draft EIS for screening to the British Columbia Environmental Assessment Office.
March 16, 2009	Taseko submitted its final EIS to the Panel and the British Columbia Environmental Assessment Office.

**REPORT OF THE FEDERAL PROSPERITY REVIEW PANEL**

<b>Date</b>	<b>Process Step</b>
March 25 to May 25, 2009	A joint 60-day public comment period was established to review the EIS and comments were received from federal and provincial governments, First Nations, non-governmental organizations and the public. This public comment period included open houses hosted by the British Columbia Environmental Assessment Office, which were attended by the Panel Secretariat.
June 24, 2009	The Panel issued a deficiency statement and requested further information from Taseko in 10 areas.
July 2, 2009 to October 2, 2009	Following its review of comments received on the EIS, the British Columbia Environmental Assessment Office suspended its review, pending receipt of further information from Taseko.
July 14 to September 25, 2009	The Panel Secretariat held discussions with First Nations on the most appropriate means to obtain information on the current use of land and resources for traditional purposes by First Nations and on their cultural heritage.
August 3, 2009	Taseko provided responses to all information requests from the Panel, with the exception of information requests relating to the mine waste management alternatives assessment and future mine expansion scenarios.
August 12, 2009	After reviewing Taseko's responses to its information requests, the Panel wrote to Taseko requesting clarification on responses to 3 of the information requests.
August 14, 2009	Taseko responded to the Panel's requests for clarification with supplemental material.
August 19 to September 18, 2009	The Panel invited comment on Taseko's response to the information requests and comments were received from federal and provincial governments, First Nations, non-governmental organizations and the public.
October 6, 2009	The Panel issued a deficiency statement to Taseko, including a second set of information requests. The Panel also requested First Nations submit information on the current use of lands and resources for traditional purposes and cultural heritage by November 17, 2009. In making this request of First Nations, the Panel indicated that the public hearing would allow First Nations to supplement this information through oral presentations.
October 9, 2009	Taseko submitted its response to the hydrology questions included in the second set of information requests.
October 16, 2009	The Panel requested clarification on Taseko's response to the hydrology questions included in the second set of information requests.
October 21, 2009	Taseko submitted its response to the questions of clarification raised by the Panel regarding the hydrology questions included in the second set of information requests.

**REPORT OF THE FEDERAL PROSPERITY REVIEW PANEL**

<b>Date</b>	<b>Process Step</b>
October 26 to November 8, 2009	The Panel invited comments on Taseko's response to the hydrology questions raised in the second set of information requests.
November 2, 2009	Taseko announced an increase in the gold and copper reserves at the Project and indicated that this could extend the mine life from 20 years to 33 years.
November 5 to November 16, 2009	The British Columbia Environmental Assessment Office suspended its review, pending clarification from Taseko on the implication of the increased mineral reserves at the Project.
November 10 to November 30, 2009	The Panel sought clarification from Taseko about the increased mineral reserves at the Project and requested that Taseko provide additional information on the potential cumulative effects of the proposed Project in combination with a potential 13-year mine life expansion.
December 4, 2009	Taseko raised concerns regarding a potential apprehension of bias on the part of Panel member Morin.
December 9 to January 12, 2010	The Panel suspended its review pending the outcome of its investigation of Taseko's allegation of reasonable apprehension of bias (see Section 1.9 for further details regarding this matter).
December 10, 2009	Taseko submitted a report in response to the Panel's second set of information requests providing its assessment of information provided by First Nations on the current use of lands and resources for traditional purposes.
December 12, 2009 to January 2, 2010	The Panel invited comments on Taseko's response to the information request regarding the current use of lands and resources for traditional purposes by First Nations.
December 17, 2009	The British Columbia Environmental Assessment Office completed its review in accordance with its 180 day timeline.
January 14, 2010	The British Columbia Environmental Assessment Office recommendations were accepted by the provincial Ministers of the Environment and Energy, Mines and Petroleum Resources and an environmental assessment certificate was issued.
January 18, 2010	Taseko responded to the Panel's request for information regarding the possible cumulative effects of the potential extension of the mine life as a result of the increased mineral reserves.
January 20 – 29, 2010	The Panel invited comment on Taseko's response to its questions regarding the possible cumulative effects of the potential extension of the mine life as a result of the increased mineral reserves.
February 2, 2010	The Panel announced that the EIS, supplemented with the additional information submitted by Taseko, was sufficient to proceed to the public hearing and announced that the hearing would begin on March 22, 2010.



<b>Date</b>	<b>Process Step</b>
March 22 – May 3, 2010	The Panel held public hearing sessions in the Cariboo-Chilcotin area.
July 2, 2010	The Panel submitted its report containing its conclusions and recommendations with respect to the Project to the Ministers of Environment, Fisheries and Oceans Canada, Transport Canada and Natural Resources Canada.

**1.7: PUBLIC HEARING**

The Panel held its public hearing from March 22 to May 3, 2010 in the communities most affected by the Project. The Panel held three types of hearing sessions: general, community, and topic-specific. The general hearing sessions were held from March 22 to 27, 2010 in Williams Lake, 100 Mile House and Alexis Creek. The Panel held community hearing sessions in the First Nation communities of Xeni Gwet'in (Nemiah Band) (March 29 to April 1, 2010), Yunesit'in (Stone Band) (April 7-8, 2010), Tl'esqox (Toosey Band) (April 9-10, 2010), Tl'etinqox (Anaham Band) (April 12-13, 2010), Tsi Del Del (Redstone Band) (April 15-16, 2010), Stswecem'c/Xgat'tem (Canoe Creek Band) (April 16-17, 2010), and Esketemc (Alkali Lake Band) (April 19-21, 2010). Topic specific sessions on alternative means of carrying out the Project, water quality and quantity, fish and fish habitat, terrestrial environment and socio-economics were also held in Williams Lake from April 26 to April 30, 2010. Closing remarks were received in Williams Lake on May 1 and May 3. The Panel was in session for 30 hearing days, over 42 calendar days. The public hearing sessions were very well attended, with approximately 320 presentations being made to the Panel and a total of approximately 2,700 people attending the various hearing sessions. A listing of all people who appeared before the Panel can be found in Appendix 3.

**1.8: CONFIDENTIALITY REQUESTS**

Section 35 of the *Canadian Environmental Assessment Act* included provisions for the non-disclosure of information under certain circumstances. In addition, the EIS Guidelines stated that "the review panel will consider the views of communities and traditional knowledge holders during the review process and determine which information should be kept confidential."

In accordance with these provisions, the Tsilhqot'in National Government and the Esketemc (Alkali Lake Band) requested that certain information be received by the Panel in confidence. No procedure for receipt of such information had been developed by the Canadian Environmental Assessment Agency or any other previous review panel. Consequently, after consulting with interested parties, the Panel developed its own procedure for this purpose. The draft procedures for requesting confidentiality were made available for public comment on June 23, 2009 and were finalized on July 22, 2009.

The Panel received 3 non-disclosure requests from the Esketemc (Alkali Lake Band). In the first request dated August 30, 2009, the Esketemc invited the Panel to participate in a site tour of culturally important areas along the proposed transmission line. After failing to come to an agreement with the Esketemc regarding the conditions under which the confidential site tour could occur, the Panel decided not to grant the request for confidentiality. The Esketemc subsequently requested another confidential site tour on February 17, 2010. However, as a result of the late confirmation of request, the Panel was unable to

accommodate the requested date. The third request was with respect to the public hearing. On February 17, 2010, the Esketemc requested that information on archeological and sacred sites be kept confidential from the general public during the community hearing session. This request was granted and an *in-camera* session, attended by the Panel, its Secretariat, Taseko and the Esketemc and their consultants, was held on April 20, 2010.

The Tsilhqot'in National Government also requested non-disclosure of information. On November 6, 2009, the Tsilhqot'in National Government requested that a series of maps associated with its submission on the current use of lands and resources for traditional purposes be held in confidence and only disclosed to the Panel, its Secretariat and specified representatives of Taseko. The Panel granted the request for confidentiality. On March 18, 2010, the Tsilhqot'in National Government also requested that the Panel hold an *in-camera* session during the community hearing session in Xeni Gwet'in (Nemiah Band) on the topic of current use of lands and resources for traditional purposes. This request was granted and the *in-camera* session, attended by the Panel, its Secretariat, Taseko and Tsilhqot'in members and their consultants, was held on March 29, 2010.

### **1.9: APPREHENSION OF BIAS**

On December 4, 2009, special counsel for Taseko wrote to the Panel stating that Taseko had become aware of facts which it alleged raised a reasonable apprehension of bias on the part of Panel member Morin and requested that she recuse herself from the Panel. After consultation with Panel member Morin, the Panel Chair wrote to Taseko on December 9, 2009 indicating that she would not voluntarily recuse herself from the Panel. The letter also outlined a process that would be followed by Panel members Connelly and Klassen to consider Taseko's request and advised that the panel review would be suspended pending the outcome of the investigation into the allegation.

The investigative process involved the engagement of *amicus* counsel by the Panel to ensure that both sides of the argument were fully and properly argued, opportunities for comment by interested parties and the opportunity for Taseko to respond to the submissions by *amicus* counsel and interested parties.

On December 15, 2009, Taseko filed an application in the Federal Court to seek, among other matters, an order that Panel member Morin be disqualified from acting as a Panel member on the Prosperity Review Panel.

On January 12, 2010, Panel members Connelly and Klassen, after reviewing submissions received from Taseko, *amicus* counsel and interested parties, concluded that the matters identified by Taseko did not raise a reasonable apprehension of bias on the part of Panel member Morin; therefore, she was not asked to recuse herself from the Panel. The Panel also indicated that the review of the Project would resume. The report entitled "Reasons for Decision in the Matter of a Request by Taseko Mines Limited that Panel Member Nalaine Morin be Recused from the Federal Panel reviewing the Prosperity Gold-Copper Mine Project" was posted on the Canadian Environmental Assessment Registry internet site for the Project.

Taseko responded to the Panel on February 5, 2010, and indicated that it accepted the decision by Panel members Connelly and Klassen and that it would discontinue the Federal Court action on the matter and would not seek a judicial review of the Panel's decision.

## SECTION 2: PROJECT DESCRIPTION AND SETTING

### 2.1: PROJECT SETTING

#### 2.1.1: LOCAL SETTING

The Project would be located 125 km southwest of Williams Lake and approximately 25 km east of the community of Xeni Gwet'in (Nemiah Band), in the Cariboo-Chilcotin Regional District in south central British Columbia. The mineral deposit was described as being located 1 km north of Teztan Biny (Fish Lake) and 10 km northeast of lower Dasiqox Biny (Taseko Lake), and within the Teztan Yeqox (Fish Creek) watershed (see Figure 1). The mine site would be located on a 35 km<sup>2</sup> parcel of land.

The Teztan Yeqox (Fish Creek) watershed was reported to be located immediately east of the Coast Mountain range as it transitions into the Chilcotin plateau. It was characterized as being approximately 93.4 km<sup>2</sup> in size and ranging in elevation from 1330 to 1830 meters above sea level (masl). It was reported to be located between the Dasiqox (Taseko River) to the west and Tête Hill to the east. Y'anah Biny (Little Fish Lake) and Teztan Biny (Fish Lake) were located within the Teztan Yeqox watershed. The two lakes were joined by upper Teztan Yeqox, forming a highly productive valley. Water flowed north from Teztan Biny into lower Teztan Yeqox eventually draining into the Dasiqox.

At the time of the review, Teztan Biny (Fish Lake) was used recreationally for camping, fishing, and boating and by First Nations for traditional purposes. There was an estimated 388 to 654 recreational days of fishing on Teztan Biny, during which approximately 4,100 to 4,900 trout were caught annually by approximately 400 to 850 visitors from June to September.

An adventure tourism operator, Taseko Lake Outfitters, was reported to operate in the area of the proposed mine site. Taseko Lake Outfitters managed a lodge, known as Taseko Lake Lodge, as part of its business, and the owners, the Reuter family, resided at the lodge. Taseko Lake Lodge was located immediately west of the proposed mine site between Jidizay Biny (Big Onion Lake) and the north end of Dasiqox Biny (Taseko Lake), approximately 10 km south-west of the proposed milling facility and camp and approximately 3 km from the west embankment of the tailings storage facility. Taseko Lake Outfitters used the Teztan Yeqox (Fish Creek) watershed to make hay and graze their horses as well as for their tourism operations.

The Tsilhqot'in referred to the general area south of Teztan Biny (Fish Lake) surrounding Y'anah Biny (Little Fish Lake) as Nabas. The Nabas area was characterized as being used for subsistence hunting, fishing, collecting berries and medicines as well as many other traditional cultural practices such as teaching and holding cultural gatherings. It was also stated that it was used extensively by First Nations and non-First Nations people to make hay and graze horses and cattle.

The Panel heard differing interpretations of the exact boundaries of Nabas. Nabas Central was described as encompassing the area south of Teztan Biny (Fish Lake), including Y'anah Biny (Little Fish Lake), upper Teztan Yeqox (Fish Creek) and adjacent wetlands and meadows, as well as Wasp Lake. In contrast, Greater Nabas included Teztan Biny as well



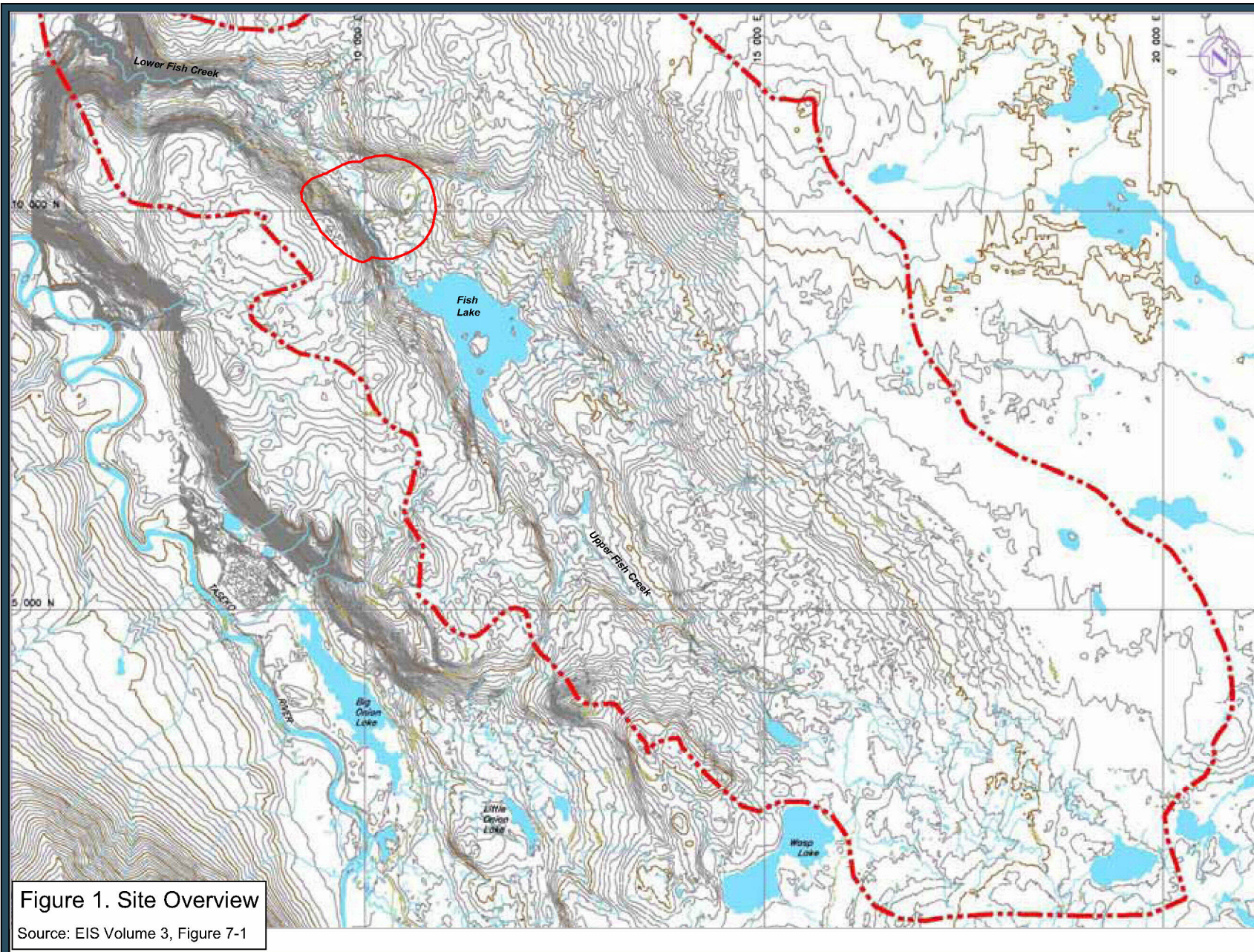
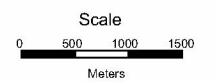


Figure 7-1  
Site Overview

LEGEND

- - - Fish Creek watershed
- Final open pit outline
- 5 and 20 m contours
- 100 m contours

Source:  
Modified from Taseko Mines Limited, Prosperity Gold-Copper Project Reclamation and Closure Plan, Post-Closure Arrangement", file B17.dwg, prepared by Knight Piesold Consulting Ltd., dated Sept 18 2007.



Data Sources:  
Drawing B17.dwg, Sept.18/07,  
Knight Piesold Consulting Ltd.

Produced by: DBM  
Verified by: DBM  
Date: July 2008  
Rev #: 01

Figure 1. Site Overview

Source: EIS Volume 3, Figure 7-1

File Name: Fig7-1 Site overview.ppt

as some of the surrounding mountains. For the purposes of this report, when referring to Nabas, the Panel is referring to the area described above as Nabas Central.

### 2.1.2: REGIONAL SETTING

The Cariboo-Chilcotin District of British Columbia, in which the Project would be located, consisted of rural agricultural lands, small acreage holdings, and forested lands. The Cariboo-Chilcotin Land Use Plan, which provided high level direction for the use of Crown lands and resources, was comprised of 4 zones:

- Enhanced Resource Development Zone;
- Integrated Resource Development Zone;
- Special Resource Development Zone; and
- protected areas.

The Project would be located in both the Integrated Resource Development Zone and the Special Resource Development Zone. The Integrated Resource Development Zone allowed for forestry, mineral/placer exploration and mining development, cattle grazing, tourism, recreation, fishing, trapping and hunting. The Special Resource Development Zone was for land units where significant fish, wildlife, ecosystem, back country recreation and tourism values existed. The Cariboo-Chilcotin Land Use Plan stated that timber harvesting, mining and grazing could take place in this zone in a manner that respected these values.

A number of parks and protected areas in the region were reported to be located in the area. Those closest to the proposed mine site included Nenduwh Jid Guzit'in (Nemiah Aboriginal Wilderness Preserve), ?Elegesi Qiyus (Wild Horse Preserve), Ts'yl-os Provincial Park, Big Creek Park, Spruce Lake Protected Area, Nuntsi Park, and Bull Canyon Wilderness Area. Parks and protected areas in the area of the proposed transmission line included Churn Creek Protected Area to the south and the Junction Sheep Range Provincial Park to the north at the confluence of the Tsilhqox (Chilcotin River) and Fraser River. A small recreation area site at Brigham Springs was located at the east end of the proposed transmission line right-of-way.

The Nenduwh Jid Guzit'in (Nemiah Aboriginal Wilderness Preserve) comprised 779,000 hectares (ha) including the Tsilhqox (Chilcotin River) and Dasiqox (Taseko River) upper watersheds. The Preserve was declared August 23, 1989 in an effort to maintain and protect the Xeni Gwet'in Caretaker Area from commercial logging, mining, and hydro-electric projects. The Nemiah Aboriginal Wilderness Preserve included both the Brittany Triangle (Tachelach'ed) and the Trapline Territory, including Teztan Biny (Fish Lake), as defined in the *William* case below.

The Xeni Gwet'in Caretaker Area, located within the Tsilhqox (Chilko River) watershed, was delineated as the traditional Tsilhqot'in territory of the Xeni Gwet'in (Nemiah Band). The Caretaker Area included the Dasiqox Biny (Taseko Lake) and Dasiqox (Taseko River), as well as the drainage of Tsilhqox Biny (Chilko Lake) and Tsilhqox. The Teztan Yeqox (Fish Creek) watershed was not reported to be within the Caretaker Area.

Tachelach'ed (Brittany Triangle) was reported to encompass the area between the Dasiqox (Taseko River) and the Tsilhqox (Chilcotin River) comprising almost 142,000 ha. It was largely characterized by its topography which ranged from the mountains in the south, transitioning to the Chilcotin plateau between Dasiqox and Tsilhqox. The majority of the Xeni Gwet'in (Nemiah Band) reserves were located within the southern border of Tachelach'ed.



The Nemiah Valley roughly formed the southern boundary of Tachelach'ed (Brittany Triangle), running from the eastern edge of Tsilhqox Biny (Chilko Lake) to the eastern edge of Xenii Biny (Konni Lake) where it followed the Taseko Lake / Whitewater Road (also known as the Nemiah Road) to the Davidson Bridge at the Dasiqox (Taseko River). The northern point was formed by the confluence of the Dasiqox and Tsilhqox (Chilcotin River), which was known as ?Elhixidlin.

The Eastern Trapline area encompassed Teztan Biny (Fish Lake) as well as Dasiqox Biny (Taseko Lake), Nabas Dzelh (Anvil Mountain), and Gwetex Natel?as (Red Mountain). The Western Trapline area overlapped much of Tachelach'ed (Brittany Triangle). The proposed Project would be located within the Eastern Trapline territory.

The Project would also be located in the area known as the Title Case Area (herein referred to as the Claim Area) in the *William* case. The Claim Area included the Tachelach'ed (Brittany Triangle) and the Eastern and Western Trapline Territories. In that case, the Supreme Court of British Columbia found that the Tsilhqot'in Nation had an Aboriginal right to hunt and trap birds and animals throughout the Claim Area, to trade in skins and pelts, and capture and use horses for transportation and work. While the Court found that Aboriginal title could not be granted due the way the case was argued, the Court indicated that had the lawsuit been pleaded differently, it probably would have found Aboriginal title to the Tsilhqot'in people to almost half of the Claim Area. The area to which title would have been granted did not include the Project area. Further discussion on the Claim Area, including a map, can be found in Section 9.

Portions of the transmission line would be located in areas that were reported to be under negotiation through the British Columbia treaty process. Both the Esketemc (Alkali Lake Band) and the Stswecem'c/Xgat'tem (Canoe Creek Band) indicated that they were in stage 4 of the 6-stage treaty negotiation process. The Stswecem'c/Xgat'tem and Esketemc asserted both Aboriginal rights and title over portions of the area crossed by the proposed transmission line. The effects of the Project on Aboriginal rights and title are discussed further in Section 9.

## **2.2: PROJECT COMPONENTS**

### **2.2.1: PROJECT OVERVIEW**

As proposed, the Project would involve an open-pit mine that would produce gold and copper over a 20 year operating life with a production capacity of approximately 70,000 tonnes per day. The Project would include five main elements: mine site, access road, transmission line, rail load-out facility and fish and fish habitat compensation works (Figure 2). The mine site would include an open pit, a camp, an onsite mill, support infrastructure, waste rock stockpiles, a tailings storage facility, and typical large-scale open pit mining equipment, including a primary crusher and overland conveyor. Access to the mine site would be via a 2.8 km access road which would be extended from the existing 4500 road. Electricity would be provided via a 125 km long, 230 KV power transmission line, connected to a new switching station at the existing British Columbia Hydro north-south transmission corridor in the vicinity of Dog Creek, east of the Fraser River. The ore would be processed in the mill and the resulting concentrate would be trucked to the existing rail loading facility at Macalister. A map showing the general arrangements of Project components is included in Figure 3 and Figure 4 illustrates the routing of the proposed transmission line corridor.

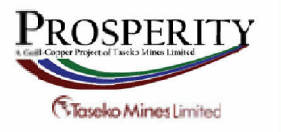
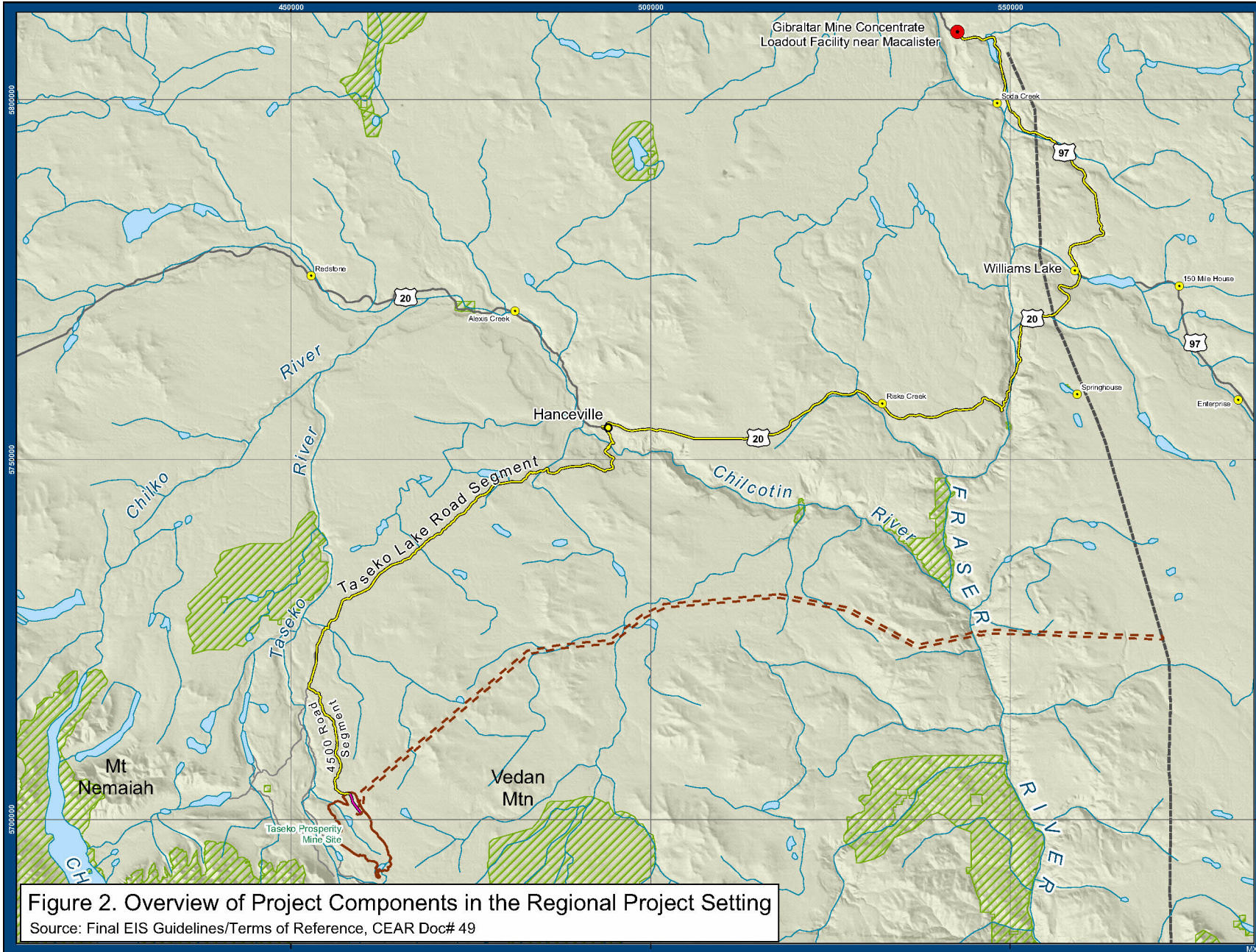
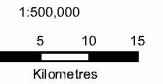


Figure 3  
Off-site Infrastructure  
for Mine Development  
and Operations

**LEGEND**

- Loadout Facility near Macalister
- Existing Access Road
- Proposed Prosperity Mine Access Road
- Proposed Transmission Corridor (500m)
- Mine - Maximum Potential Disturbance Area
- City/Town
- Highway
- Road
- BC Hydro Transmission Line
- River (1:2mil)
- Lake (1:2mil)
- Protected Area



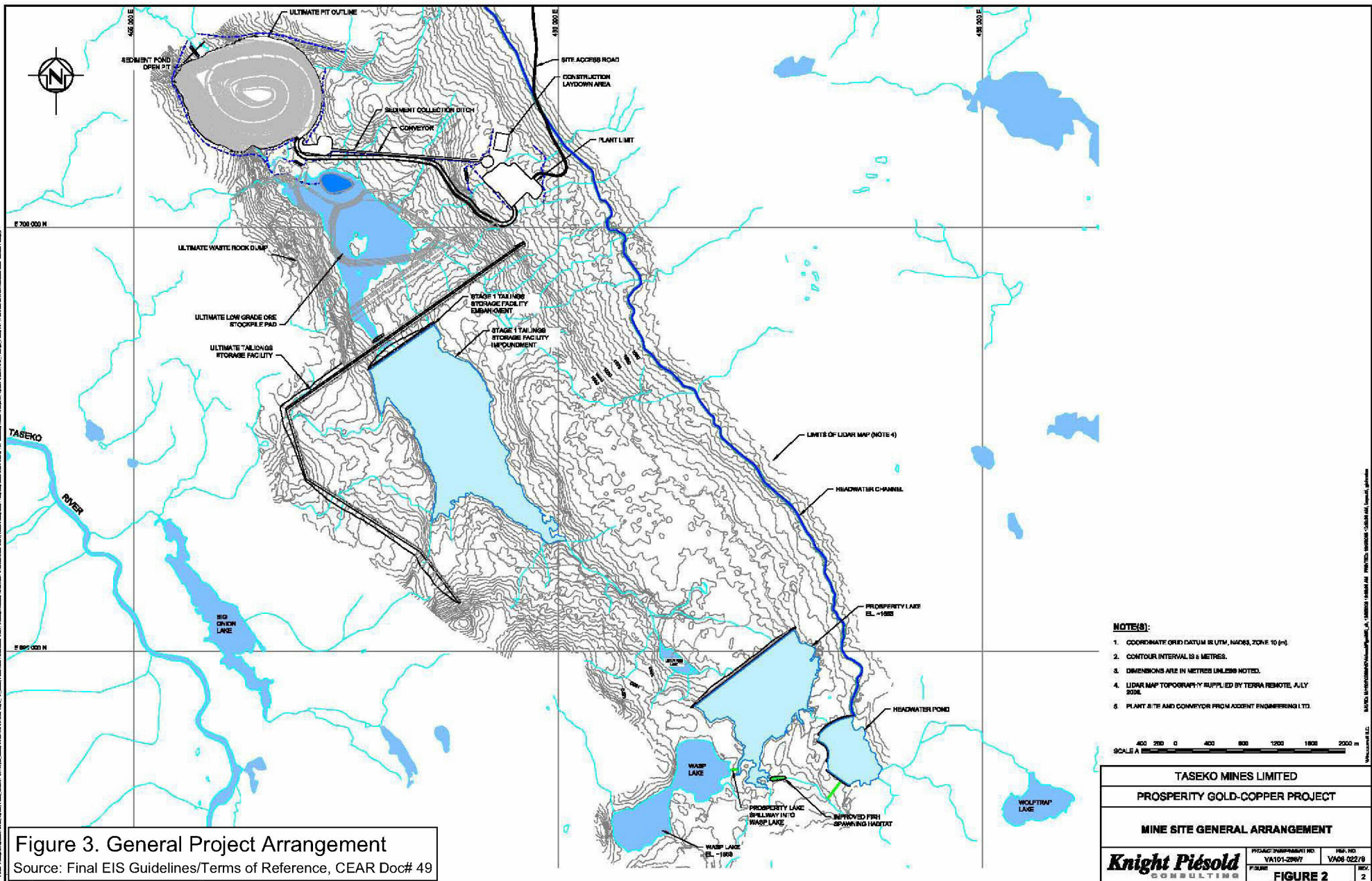
Map Prepared by  
Jacques Whitford AXYS Ltd.

Data Sources:  
Province of British Columbia, Taseko Mines Ltd.  
Projection: UTM Zone 10, NAD 83

Produced by: Sarah Forbes  
Verified by: Tony Drinnen  
Date: July 31, 2008  
Rev #: 01

Figure 2. Overview of Project Components in the Regional Project Setting  
Source: Final EIS Guidelines/Terms of Reference, CEAR Doc# 49





**NOTES:**

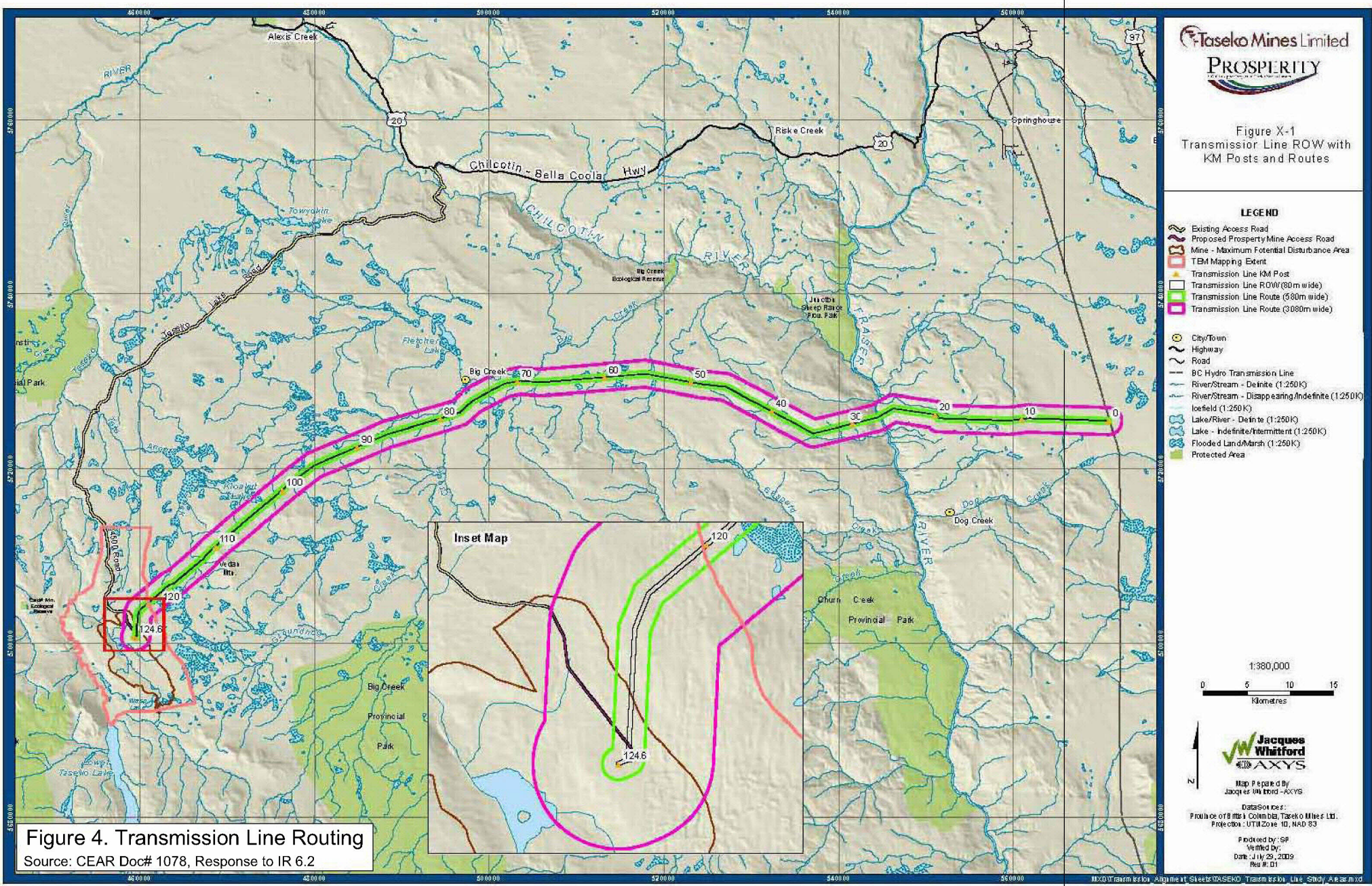
1. COORDINATE GRID DATUM IS UTM, NAD83, ZONE 10 (m).
2. CONTOUR INTERVAL IS 5 METRES.
3. DIMENSIONS ARE IN METRES UNLESS NOTED.
4. LIDAR MAP TOPOGRAPHY SUPPLIED BY TERRA REMOTE, JULY 2008.
5. PLANT SITE AND CONVEYOR FROM ACCENT ENGINEERING LTD.

SCALE 1:5000  
 0 200 400 600 800 1000 1200 1400 1600 1800 2000 m

<b>TASEKO MINES LIMITED</b>	
<b>PROSPERITY GOLD-COPPER PROJECT</b>	
<b>MINE SITE GENERAL ARRANGEMENT</b>	
<b><i>Knight Piésold</i></b> CONSULTING	PROJECT/INSTRUMENT NO. VA101-2007
	REV. NO. VA06 02278
<b>FIGURE 2</b>	REV. 2

**Figure 3. General Project Arrangement**  
 Source: Final EIS Guidelines/Terms of Reference, CEAR Doc# 49





**Figure 4. Transmission Line Routing**  
Source: CEAR Doc# 1078, Response to IR 6.2



Teztan Biny (Fish Lake) would be drawn down to allow for the creation of a storage area for non-potentially acid generating waste rock, low grade ore and overburden. The tailings storage facility would encompass the area currently occupied by Y'anah Biny (Little Fish Lake), portions of Teztan Yeqox (Fish Creek) and the surrounding wetlands and meadows, and would be used for the storage of tailings and potentially acid generating waste rock. At the south end of the storage tailings facility, a proposed new lake, referred to as Prosperity Lake<sup>3</sup> would be created as a component of the plan to compensate for fish and fish habitat lost in Teztan Biny, Y'anah Biny and Teztan Yeqox.

### **2.2.2: CONSTRUCTION PHASE**

The construction of the Project would begin with the development of a 2.8 km access road, which would connect the existing 4500 road to the mine site. The mine site access road, 4500 road, and site infrastructure roads would be further upgraded towards the end of the construction phase in order to accommodate large vehicles hauling ore concentrate and the smaller vehicles needed for mine operation. The construction period would span from the pre-construction period (defined as Year -1) to Year 1.

Construction activities at the proposed mine site would include initial site clearing, pit pre-production, construction of site infrastructure, construction of embankments for the tailings storage facility, and stockpile development. A headwater diversion channel would also be constructed on the east side of the proposed mine site, parallel to Teztan Yeqox (Fish Creek) to intercept surface water runoff from the eastern portions of the watershed. Development of the fish and fish habitat compensation works would involve the construction of a south embankment to the tailings storage facility for the creation of Prosperity Lake, a headwater retention pond at the southern end of the headwater diversion channel and spawning channels.

In terms of the transmission line, construction phase activities would include timber harvesting in the area of the right-of-way, construction of the transmission line, and construction of the Dog Creek switching station by the British Columbia Transmission Corporation.

### **2.2.3: OPERATION PHASE**

Taseko proposed that the Project would be in operation for 20 years, from Year 1 to Year 20. The operation phase would include the time period from when construction was completed (Year 1) through to the end of milling (Year 20). This phase would primarily involve mining activities, including the sequential enlarging of the open pit to a depth of 500 meters (m) to allow for mining, the processing of ore, and development and milling of the low grade ore stockpile. The low grade ore would be processed at the end of the mine life, from Year 17 through Year 20. The height of the main and west embankments of the tailings storage facility would also be increased during operations. There would be no direct discharge of water affected by the mine site to the receiving environment during operations.

During operations, the site water management plan would involve diverting water around the mine site. Clean water from the eastern portion of the Teztan Yeqox (Fish Creek) watershed would be intercepted by the headwater diversion channel and diverted either south for use in the site water management plan or north for release back into lower Teztan Yeqox. Water

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<sup>3</sup> Taseko noted that the name "Prosperity Lake" was a working name only, and a different name for the lake could be chosen in consultation with First Nations if the Project was approved.

diverted south would flow from the headwater retention pond (at the base of the headwater diversion channel) into Prosperity Lake and then into the tailings storage facility. Any water not needed for Prosperity Lake or the tailings storage facility would flow into Wasp Lake and flow into Bisqox (Beece Creek) at the southern end of the Project area. Water from the headwater diversion channel that drains north would flow around the Project area and be discharged back into lower Teztan Yeqox.

In November 2009, Taseko announced an increase in mineable reserves at the Project. As a result of this increase in reserves, Taseko stated that in the event it decided to mine the additional reserves, the Project mine life could be extended from 20 to 33 years. The Panel considered the potential future mine life extension to be a reasonably foreseeable future project and has included the potential effects of such actions within the cumulative effects assessment section of this report (see Section 6.11).

#### **2.2.4: CLOSURE PHASE**

The mine plan included a 24 year closure phase. The closure phase would include the time period from the end of tailings production (Year 21) through to the time period when the open pit would fill with water and start discharging to the receiving environment (Year 44).

During the closure phase, the mill and crusher sites as well as other facilities and equipment not necessary for long-term closure would be removed. The transmission line, including poles and lines, would also be decommissioned. Water from around the site would continue to flow into the headwater diversion channel south into Prosperity Lake. An engineered spillway from Prosperity Lake into the tailings storage facility would be established to maintain water in the tailings storage facility. Water from the tailings storage facility would in turn flow into the open pit via a spillway in the main embankment, which would be constructed in Year 21.

Starting in Year 17, the open pit would begin to fill with water. Taseko estimated that it would take 27 years to fill the open pit after the mining ended (i.e. from Year 17 to Year 44).

Taseko proposed a conceptual reclamation and decommissioning plan. The plan included re-establishing productive land use for wildlife, vegetation, and recreation. Taseko would recontour surfaces and replace soil to encourage plant establishment and suitable forage for animal consumption. All waste rock stockpiles would be resloped and revegetated. Tailings beaches would also be capped with soil and revegetated. Taseko indicated that a 100 m buffer from the high water mark of the tailings storage facility would not be capped with soil but would be seeded. Once monitoring indicated that water quality in the tailings storage facility was of acceptable standards for wildlife use, wetlands species would be introduced to enhance natural succession. Taseko proposed to reclaim the transmission line right-of-way using natural succession, planting and seeding only when necessary.

#### **2.2.5: POST CLOSURE PHASE**

The post-closure period was indicated to begin in Year 44 and last until Taseko was relieved of its responsibilities under its various permits, authorizations, and approvals. Post closure land-use goals included forestry, wildlife, and recreation. Taseko proposed to return aquatic and terrestrial environmental components to a self-sustaining state.

By Year 44, Taseko predicted that the open pit would be filled with water, creating "Pit Lake". Pit Lake would discharge water to lower Teztan Yeqox (Fish Creek) and ultimately

into the Dasiqox (Taseko River). Taseko predicted this water would be within acceptable water quality guidelines. However, if, after monitoring, the Pit Lake discharge water exceeded water quality guidelines, Taseko stated it would implement water treatment measures. Water from Wasp Lake would flow into Prosperity Lake via a constructed channel. Taseko's proposed post-closure mine arrangement can be found in Figure 5.

In terms of recreational values, Taseko indicated that an access road would be developed to Prosperity Lake; however, routing details were not available by the close of the public hearing.

Taseko indicated that it would continue post-closure activities, including monitoring, until such time as it was released of its obligations under the provincial *Mines Act* and other regulatory permits.



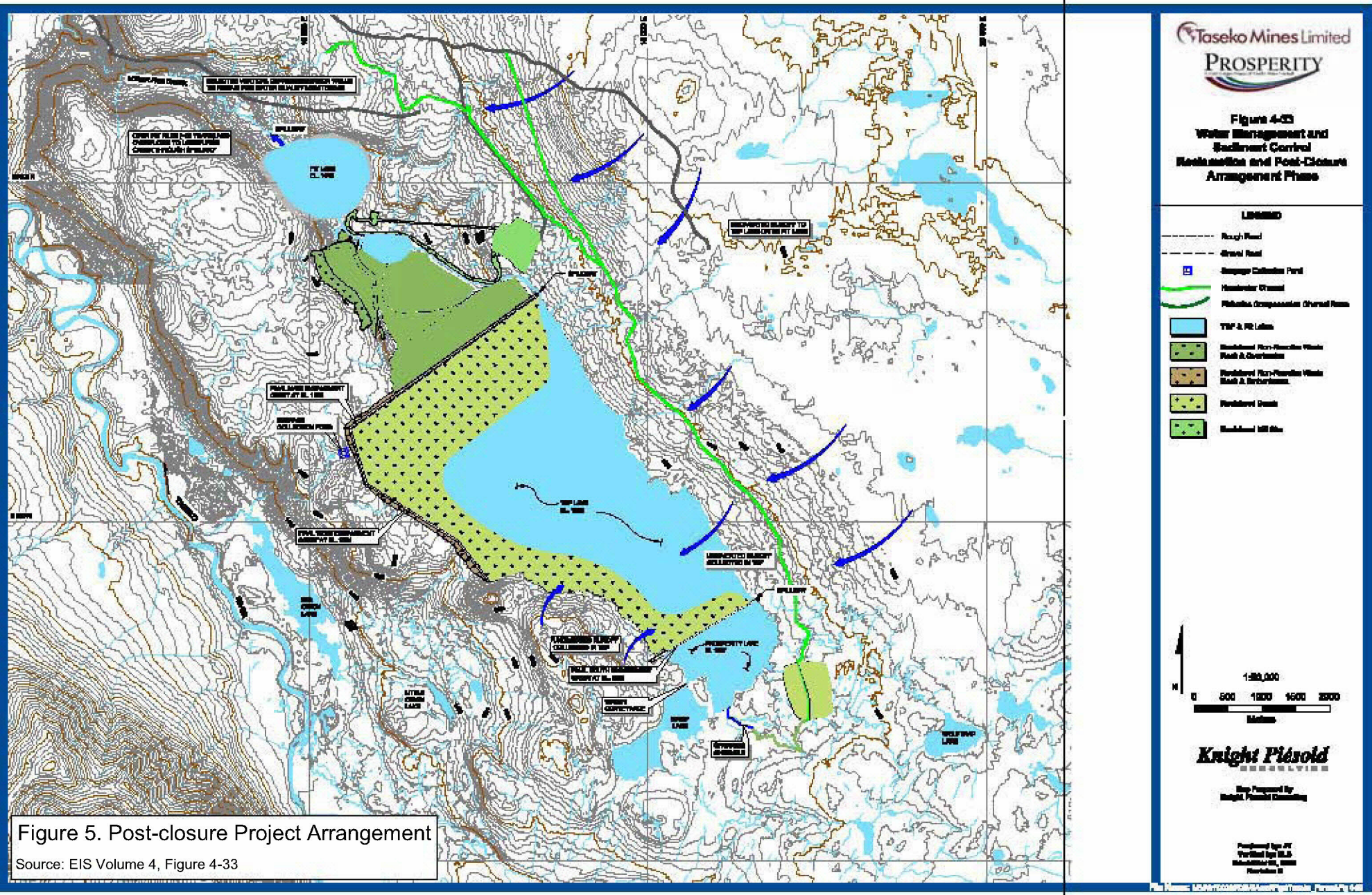


Figure 5. Post-closure Project Arrangement

Source: EIS Volume 4, Figure 4-33



## **SECTION 3: INVOLVEMENT OF INTERESTED PARTIES**

### **3.1: OPPORTUNITIES FOR PUBLIC INPUT**

Opportunities for participation by interested parties were provided throughout the environmental assessment process by the federal and provincial governments, the Panel, and Taseko. The Canadian Environmental Assessment Registry internet site for the Project allowed for public access to all documents associated with the environmental assessment.

In addition to the opportunities for public input during the course of the review outlined in Section 1.6, there were also opportunities for involvement during the period of time prior to the appointment of the Panel. A public comment period was held by the Canadian Environmental Assessment Agency from November 3 to December 3, 2008 on the draft Terms of Reference for the Review Panel. Similarly, a joint public comment period was held by the Canadian Environmental Assessment Agency and the British Columbia Environmental Assessment Office from November 3 to December 3, 2008 on the EIS Guidelines. This public comment period included open houses hosted by the British Columbia Environmental Assessment Office and the Canadian Environmental Assessment Agency.

The Panel also provided opportunities for interested parties to comment on various process related items during the course of the review. The Panel invited public comment on its draft Procedures for the Public Hearing and on draft Procedures for Requesting Confidentiality. The Panel also solicited input during its investigation into Taseko's allegation of a reasonable apprehension of bias, as outlined in Section 1.9. The Secretariat held two sets of process information sessions to communicate the review process and answer questions on process matters from interested parties. The Panel also invited public comment on a procedural matter raised during the public hearing relating to the showing of the film "Blue Gold".

Taseko outlined its consultation program in its First Nation Consultation Report submitted to the British Columbia Environmental Assessment Office and the Panel. Its program was designed to meet the requirements of the Section 14 order issued by the British Columbia Environmental Assessment Office. In addition to its consultation activities specific for First Nations, Taseko held a variety of consultations with stakeholders, including open houses, meetings, and participated in provincial working group meetings.

### **3.2: THE PARTICIPANTS**

A number of different groups participated in the federal review panel process, including federal and provincial government departments, local governments, First Nations, national and local non-governmental organizations, local businesses and members of the public. Participation ranged from submitting written comments to the Panel to participating in the review of the EIS to presenting before the Panel during the public hearing.

The views of the various participants relating to the specific issues addressed are summarized in the following sections. While the Panel considered and assessed all information brought before it, not all of this information is summarized in this report. The

Panel has included all important and relevant information for its conclusions and recommendations as outlined in the various sections of this report.

During the course of the review, the Panel became aware of the divide in the potentially affected communities regarding the Project. This divide, between those who supported the Project and those who did not, was also recognized by various participants during the public hearing, including the mayor of Williams Lake, First Nation members and members of the public. Participants indicated that the Project appeared to have pitted community members against each other. For instance, the Panel heard from parents concerned about their children being bullied at school as a result of their views on the Project and of tension between neighbours who had differing views regarding the Project. First Nations also expressed concern regarding how their views had been characterized in the local media.

The atmosphere and the tension created by this split in the community were apparent during the review of the EIS as well as during the first few days of the public hearing. It was evident to the Panel that the Project had evoked strong emotions on all sides and that the participants felt strongly about the potential beneficial or adverse effects of the Project.

### **3.2.1: FEDERAL GOVERNMENT**

Federal government departments that participated in the review process included Fisheries and Oceans Canada, Transport Canada, Natural Resources Canada, Environment Canada, and Health Canada. These federal government departments provided input and expertise to the Panel during the review process through direct interventions and through participation in the provincial environmental assessment process. Each department also made presentations to the Panel during the public hearing.

Fisheries and Oceans Canada participated in the review process as a responsible authority. The Project would require an authorization under section 32 of the *Fisheries Act* to permit the destruction of fish by means other than fishing. The Project would also require an authorization under section 35(2) of the *Fisheries Act* to harmfully alter, disrupt or destroy fish habitat. Finally, the Project would require designation of portions of the Teztan Yeqox (Fish Creek) watershed as a tailings impoundment area and listing on Schedule 2 of the *Metal Mining Effluent Regulations* under the *Fisheries Act*.

During the course of the review, Fisheries and Oceans Canada provided written comments to the Panel on its review of the EIS and Taseko's responses to information requests. Fisheries and Oceans Canada also participated in the early stages of the provincial environmental assessment process. Fisheries and Oceans Canada provided a written submission for the public hearing and presented at both the general and topic-specific hearing sessions on the subject of fish and fish habitat.

Transport Canada participated in the review process as a responsible authority. The Project would require approvals under section 5(2) and section 5(3) of the *Navigable Waters Protection Act* and would also require Taseko to seek an exemption under section 23 on the same Act.

During the course of the review, Transport Canada provided written comments to the Panel on its review of the EIS, Taseko's responses to information requests, and the potential cumulative effects of the possible mine life extension. Transport Canada provided written

submissions for the public hearing and presented at both the general hearing session and the topic-specific hearing session on the subject of navigable waters.

Natural Resources Canada participated in the review process as a responsible authority. The storage of explosives and the mixing facility proposed by Taseko would require a licence under paragraph 7(1)(a) of the *Explosives Act*.

During the course of the review, Natural Resources Canada provided written comments to the Panel on its review of the EIS, Taseko's responses to information requests, and the potential cumulative effects of the possible mine life extension. Natural Resources Canada was also an active participant in the provincial environmental assessment process. Natural Resources Canada provided written submissions for the public hearing and presented at both the general and topic-specific hearing sessions on the subjects of geology and geochemistry, hydrogeology, and earthquakes and seismic hazards.

Environment Canada participated throughout the panel review process, providing written comments to the Panel on its review of the EIS, Taseko's responses to information requests, and the potential cumulative effects of the possible mine life extension. Environment Canada was also an active participant in the provincial environmental assessment process. Environment Canada provided written submissions for the public hearing and presented during the topic-specific hearing session on the issues of alternative means of carrying out the Project, water quality and quantity, and terrestrial environment.

Health Canada also participated in the review process, providing written comments to the Panel on its review of the EIS and Taseko's responses to information requests. It provided written submissions for the public hearing and presented during the general hearing session on human health effects related to air quality, noise, drinking water and the contamination of country foods.

### **3.2.2: PROVINCIAL GOVERNMENT**

Provincial government ministries participated in the review of the EIS and contributed comments during the consultation on the sufficiency of the information to proceed to the public hearing. Through the cooperative approach to the review of the EIS, the Panel was also able to benefit from the comments made by the provincial ministries through their participation in the provincial working group. The provincial working group was a body formed by the British Columbia Environmental Assessment Office that consisted of federal and provincial government officials, First Nations and local governments to assist the British Columbia Environmental Assessment Office in its review. The participating ministries included the British Columbia Ministry of Environment (including the Environment Protection Division, the Environmental Stewardship Division, and the Water Stewardship Division), the British Columbia Ministry of Energy, Mines and Petroleum Resources, and the British Columbia Ministry of Tourism, Culture and the Arts.

The British Columbia Environmental Assessment Office completed its review of the Project on December 17, 2009 and submitted a report for consideration by the Ministers of Environment and Energy, Mines and Petroleum Resources. The Environmental Assessment Office's recommendations were accepted by the Ministers and Environmental Assessment Certificate #M09-02 was issued on January 14, 2010. The provincial environmental assessment process concluded that the Project would result in a significant adverse effect to fish and fish habitat that could be justified in the circumstances. All other adverse



environmental effects were considered not significant. The report also included 104 commitments made by Taseko to mitigate adverse environmental effects. Those commitments are replicated in Appendix 4 of this report.

On February 4, 2010 the Panel invited provincial government ministries to participate in the public hearing. However, the provincial ministries decided not to participate, indicating that the submissions made during the provincial review of the Project provided sufficient information and analysis to support the conclusions reached by the various ministries.

### **3.2.3: FIRST NATIONS**

A number of First Nations were identified by Taseko as being potentially affected by the Project, including the Esketemc (Alkali Lake Band), the Tsilhqot'in Nation (including the ?Esdilagh (Alexandria Band), Yunesit'in (Stone Band), Tl'esqox (Toosey Band), Xenigwet'in (Nemiah Band), the Tsi Del Del (Redstone Band), and the Tl'etinqox (Anaham Band)), the Stswecem'c/Xgat'tem (Canoe Creek Band), the Ulkatcho First Nation, the T'exelc (Williams Lake Band), the Llenlney'ten (High Bar Band), the Teq'escen' (Canim Lake Band) and the Xat'sull First Nation (Soda Creek Band).

In March 2009, the Panel solicited input on the location for community hearing sessions. Based on comments received from First Nations and the Tsilhqot'in National Government, the Panel held community hearing sessions in the Tsilhqot'in communities of Xenigwet'in (Nemiah Band), Yunesit'in (Stone Band), Tl'esqox (Toosey Band), Tl'etinqox (Anaham Band), Tsi Del Del (Redstone Band), and in the Secwepemc communities of Stswecem'c/Xgat'tem (Canoe Creek Band) and Esketemc (Alkali Lake Band).

Throughout the course of the federal environmental assessment, the Esketemc (Alkali Lake Band) and the Tsilhqot'in National Government (representing the ?Esdilagh (Alexandria Band), Yunesit'in (Stone Band), Tl'esqox (Toosey Band), Xenigwet'in (Nemiah Band), Tl'etinqox (Anaham Band), and Tsi Del Del (Redstone Band)) were the most active First Nation participants. Both First Nations provided comments to the Panel at various stages in the review of the EIS, including but not limited to the review of the draft Terms of Reference for the Panel and the draft EIS Guidelines, the review of the EIS and subsequent information requests, and the review of information regarding the possible cumulative effects of an extended mine life scenario. Both the Tsilhqot'in National Government and the Esketemc also actively participated in all three types of public hearing sessions and engaged expert consultants to assist with their preparation for and participation in the public hearing.

The Stswecem'c/Xgat'tem (Canoe Creek Band) participated in the early stages of the environmental assessment process prior to the appointment of the Panel, providing input into the development of the Panel's Terms of Reference and the EIS Guidelines. The Stswecem'c/Xgat'tem also participated in process information sessions and in the development of an approach to gathering information on the current use of lands and resources for traditional purposes. The Stswecem'c/Xgat'tem also participated in the community hearing sessions of the public hearing and engaged expert consultants to assist with their submission to the Panel for the public hearing.

The T'exelc (Williams Lake Band) participated in the development of an approach to gathering information on the current use of lands and resources for traditional purposes and provided a written submission for the public hearing.

Members from other potentially affected First Nations also participated at the public hearing. Representatives from the Teq'escen' (Canim Lake Band) were present during the general hearing session in 100 Mile House and performed a drumming ceremony to start the session. Representatives from the Xat'sull First Nation (Soda Creek Band) participated during the community hearing sessions in Stswecem'c/Xgat'tem (Canoe Creek) and Esketemc (Alkali Lake Band), and representatives from the Ulkatcho First Nation participated during the session in Tsi Del Del (Redstone Band).

The Northern Shuswap Tribal Council, representing the 4 communities that make up the Northern Secwepemc te Qulmucw (which includes the T'exelc (Williams Lake Band), Stswecem'c/Xgat'tem (Canoe Creek Band), Tsq'escen' (Canim Lake Band) and the Xat'sull/Cmetem (Soda Creek Band)), also became involved in the review, corresponding with the Panel later in the process. The Northern Shuswap Tribal Council participated in the review of the Tsilhqot'in Nation's request for confidentiality.

The Panel also heard from various chiefs of the Secwepemc Nation during the community hearing session in Esketemc (Alkali Lake Band), including the Neskonlith First Nation, Sexqeltqin First Nation (Adams Lake Band), the Skeetchestn First Nation and the Tk'emlups First Nation (Kamloops Band). Representatives from the Okanagan Nation were also present during the general hearing session. Grand Chief Stewart Phillip, President of the Union of British Columbia Indian Chiefs attended a number of the public hearing sessions and presented to the Panel.

During the public hearing, the Panel heard that while potentially affected First Nations were opposed to the development of the Project, they were not opposed to resource extraction projects such as mining in general. First Nations indicated to the Panel that they were opposed to this Project for a number of reasons, including the importance of the Project area to them, as well as the lack of meaningful engagement by Taseko. The Panel heard that First Nations were disappointed by the lack of opportunities for collaboration and partnership on the Project. First Nations also stated that Crown consultation in relation to the Project had been inadequate.

#### **3.2.4: OTHER PARTIES**

A variety of non-governmental organizations expressed interest in the panel review. While many organizations provided comments on various documents, the following organizations were active participants: MiningWatch Canada; 'Yes to Prosperity' Citizens Group; Council of Canadians; Friends of the Nemaiah Valley; Share the Cariboo-Chilcotin Resources Society; Williams Lake Field Naturalists; and Williams Lake and District Chamber of Commerce. The Reuter family, owners of Taseko Lake Outfitters, was also active participants during the course of the review and during the public hearing.

## **SECTION 4: MANDATE OF PANEL AND SCOPE OF REVIEW**

The Panel derived its authority from the *Canadian Environmental Assessment Act* and its Terms of Reference. The *Canadian Environmental Assessment Act* provided the legislative framework in which a review panel must conduct its review. The Panel's Terms of Reference, which were fixed by the Minister of the Environment in consultation with the responsible authorities, defined the Panel's specific mandate and the scope of its assessment of the Project (i.e. the factors to be considered in conducting the review).

At various times in the review and particularly during the public hearing, participants sought clarification on the Panel's mandate or expressed opinions regarding how the Panel should interpret its mandate. Discussion focussed on:

- the manner in which the Panel would address the justifiability of the Project should it reach a conclusion that the Project would result in significant adverse environmental effects;
- the Panel's mandate with regards to Aboriginal rights and title and, in the case of potential rights or title, the strength of those claims; and
- the Panel's role in fulfilling the Crown's obligation to consult and accommodate First Nations.

Also, many participants raised concerns about the implications of separate federal and provincial environmental assessments of the same Project, particularly given that the provincial assessment concluded before the Panel's public hearing began. For example, several participants raised the issue of how the Panel would take into consideration the results of the provincial assessment in its own review.

The purpose of this section is to provide an overview of the Panel's interpretation of its mandate and a summary of the comments received regarding the separate environmental assessment processes for the Project.

### **4.1: ASSESSMENT OF ENVIRONMENTAL EFFECTS**

The Panel's fundamental purpose was to conduct an environmental assessment of the Project. Section 2(1) of the *Canadian Environmental Assessment Act* defined an environmental assessment as "an assessment of the environmental effects of the project." As stated in Section 16(1)(b), an assessment of environmental effects must also include an assessment of the significance of those effects.

The term "environmental effect" was broadly defined in the *Canadian Environmental Assessment Act*. It included not just any change that a project may cause in the environment, but also any effect of any change in the environment on (i) health and socio-economic conditions; (ii) physical and cultural heritage; and (iii) the current use of lands and resources for traditional purposes by aboriginal persons. Also, Section 16.1 of the *Canadian Environmental Assessment Act* provided that community knowledge and Aboriginal traditional knowledge may be considered in conducting an environmental assessment. Thus, the potential impact of the Project on local First Nations clearly fell within the Panel's mandate to assess environmental effects.

The Panel's Terms of Reference confirmed that the Panel's mandate was to conduct an assessment of the environmental effects of the Project and to report to the Minister and the responsible authorities in accordance with section 34 of the *Canadian Environmental Assessment Act*. The Terms of Reference went on to state:

*The Panel shall consider and provide conclusions on the significance of the environmental effects of the Project. Where, taking into account the implementation of any mitigation measures, the Project is likely to cause significant adverse environmental effects, the Panel should also ensure that information with respect to the justifiability of any significant adverse environmental effects is obtained.*

#### **4.2: DETERMINING SIGNIFICANCE**

The Panel interpreted its mandate to mean that it was required to examine all of these factors (environmental and matters related to Aboriginal rights or title) from the perspective of whether an effect would be adverse, whether, after the implementation of mitigation measures, it would be significant and whether it would be likely to occur. The Panel has followed the Canadian Environmental Assessment Agency's reference guide entitled "Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects"<sup>4</sup> (November 1994) to assist it in this regard.

To determine whether an effect would be adverse, the Panel has compared the existing state of the environment with the predicted state of the environment if the Project was in place.

The Panel has used the following criteria to assist it in determining whether the adverse effect might be significant after mitigation measures have been considered:

- magnitude - the severity of the effects;
- geographic extent - whether the effects are local or regional;
- duration and frequency – whether the effects are long term or temporary;
- reversibility - whether the effects are reversible;
- ecological context - whether the location has been previously affected or is ecologically fragile; and
- dose/exposure - would the dose or exposure result in an unacceptable level of risk.

To determine whether any significant adverse environmental effects are likely, the Panel used the following criteria:

- probability of occurrence - If there is a high probability that the identified significant adverse effect would occur, then it is likely; and
- scientific uncertainty - this involves determining confidence levels based on statistical methods or best professional judgement.

In arriving at a decision on the significance of effects, the Panel has relied on information presented by Taseko, First Nations, interested parties, government agencies, and members of the public and it has applied its best professional judgement in making its determination.

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<sup>4</sup> This reference guide is available on the Canadian Environmental Assessment Agency's website at [http://www.ceaa-acee.gc.ca/Content/D/A/C/DACB19EE-468E-422F-8EF6-29A6D84695FC/Adverse-Environmental-Effects\\_e.pdf](http://www.ceaa-acee.gc.ca/Content/D/A/C/DACB19EE-468E-422F-8EF6-29A6D84695FC/Adverse-Environmental-Effects_e.pdf)

### 4.3: JUSTIFIABILITY OF SIGNIFICANT ADVERSE EFFECTS

A number of participants referred the Panel to the Joint Panel report on the proposed Kemess North Copper-Gold Project (dated September 12, 2007)<sup>5</sup>. These participants were of the view that if the Panel were to reach a conclusion that the Project would result in a significant adverse environmental effect, it should also determine whether it was justifiable under the circumstances.

In its closing remarks, Taseko stated that if the Panel concluded that the Project was likely to cause significant environmental effects, the Panel should forward to the Minister and the responsible authorities the information on justifiability that it had obtained, with the expectation that the federal government would make a determination of justifiability. In making this determination, Taseko stated that the federal government should take into account the information provided by the Panel and whatever other information and public policy factors it considered appropriate in the circumstances.

The Panel considers that its Terms of Reference were very clear with respect to its mandate on this issue: should the Panel conclude, taking into account applicable mitigation measures, that the Project is likely to cause a significant adverse environmental effect, it shall include in its report information to assist decision makers with respect to the justifiability of any such effect. The Panel itself does not have the mandate to reach a conclusion on justifiability.

### 4.4: ABORIGINAL RIGHTS AND TITLE

On the matter of Aboriginal rights and title, the Panel's Terms of Reference stated the following:

*The Panel will have the mandate to invite information from First Nations related to the nature and scope of potential or established Aboriginal rights or title in the area of the Project, as well as information on the potential adverse impacts or potential infringement that the Project may have on potential or established Aboriginal rights or title.*

*The Panel shall fully consider and include in its report:*

1. *information provided by First Nations regarding the manner in which the Project may adversely affect potential or established Aboriginal rights or title; and*
2. *in the case of potential Aboriginal rights or title, information provided by the First Nation regarding the First Nation's strength of claim respecting Aboriginal rights or title.*

*The Panel will not have a mandate to make any determinations as to:*

1. *the validity of Aboriginal rights or title claims asserted by First Nations or the strength of those claims;*
2. *the scope of the Crown's duty to consult First Nations; and/or*

<sup>5</sup> In the Kemess report, the Joint Panel concluded that the Kemess North project not be approved as proposed and that in its present form, it would not be in the public interest for the project to proceed. In other words, it concluded that the project would have significant adverse environmental effects that could not be justified.

3. *whether Canada has met its respective duty to consult and accommodate in respect of rights recognized and affirmed by section 35 of the Constitution Act, 1982.*

The Panel's Terms of Reference required it to specifically invite First Nations to provide information related to the nature and scope of potential or established Aboriginal rights or title in the area of the Project as well as information on the potential adverse impacts or potential infringement that the Project may have on these rights. Therefore, the Panel solicited this information from First Nations on the following occasions:

- June 24, 2009 – in determining that the EIS was not sufficient to proceed to the public hearing, the Panel requested that additional information from First Nations on a variety of issues be submitted as soon as possible. The Panel stated that it *anticipates that the information required to evaluate the anticipated effects of the project on the current use of fish and fish habitat in the project area for traditional purposes by Aboriginal persons will be submitted by First Nations soon or in some cases following the finalization of the "Procedures for Requesting Confidentiality."*
- September 14, 2009 – a teleconference was held with the Panel Secretariat, Taseko and representatives from the Stswecem'c/Xgat'tem (Canoe Creek Band), the Esketemc (Alkali Lake Band), the T'exelc (Williams Lake Band), and the Tsilhqot'in National Government to discuss a potential path forward for obtaining information on the current use of lands and resources for traditional purposes and on cultural heritage, after a series of correspondence between Taseko, First Nations and the Panel regarding capacity issues revealed that further written information from First Nations would not be forthcoming.
- September 18, 2009 – a path forward on gathering information on the current use of lands and resources for traditional purposes and on cultural heritage was proposed by the Panel Secretariat. Subsequent correspondence from First Nations indicated that the proposed approach to gathering information on the current use of lands and resources for traditional purposes and on cultural heritage would not be supported by First Nations.
- October 6, 2009 – in determining that the EIS was not sufficient to proceed to the public hearing, the Panel set a deadline of November 17, 2009 for First Nations to provide available written information on the current use of lands and resources for traditional purposes and on cultural heritage.
- October 26, 2009 – in responding to a letter from the Stswecem'c/Xgat'tem (Canoe Creek Band), the Panel specifically encouraged the Band to provide any available information on current use of lands and resources for traditional purposes.
- February 4, 2010 – the Panel sent letters to each First Nation potentially affected by the Project inviting their participation at the upcoming public hearing and specifically inviting information on the nature and scope of potential or established Aboriginal rights or title in the area of the Project and the potential adverse impacts or potential infringement that the Project may have on potential or established Aboriginal rights or title.
- March 28 – April 21, 2010 – The Panel held community hearing sessions in the First Nation communities of Xeni Gwet'in (Nemiah Band), Yunesit'in (Stone Band), Tl'esqox (Toosey Band), Tl'etinqox (Anaham Band), Tsi Del Del (Redstone Band), Stswecem'c/Xgat'tem (Canoe Creek Band) and Esketemc (Alkali Lake Band) to allow, in part, an opportunity for First Nations to provide information on how the

Project may adversely affect potential or established Aboriginal rights or title and in the case of potential rights, the related strength of the claim.

On the first day of the public hearing, concern was raised by Mr. Bruce Stadfeld, legal counsel for the Stswecem'c/Xgat'tem (Canoe Creek Band), that the Panel's mandate was not simply to act as a "conduit" to collect, summarize and include in its report information given to it regarding Aboriginal rights or title. Rather, Stswecem'c/Xgat'tem submitted that the Panel had a mandate to "consider, assess and make recommendations."

By letter dated March 28, 2010, the Panel provided its response to Stswecem'c/Xgat'tem's (Canoe Creek Band) concerns. The Panel stated that it would consider and assess all information it received in its review, including information received from First Nations on Aboriginal rights or title.

With respect to the extent of the Panel's mandate to make recommendations in its report, the Panel had regard for section 34 of the *Canadian Environmental Assessment Act* and its Terms of Reference, both of which expressly stated that the Panel may make recommendations "relating to the environmental assessment" of the Project. Given the broad definition of "environmental effects" in the Act, the Panel concluded that it may make recommendations:

- which relate to the effects which the Project may have on First Nations' current use of lands and resources for traditional purposes; and
- which relate to the manner in which the Project may adversely affect potential or established Aboriginal rights or title.

However, the Panel concluded that its Terms of Reference were clear that it does not have a mandate to make determinations as to the validity of Aboriginal rights or title claims asserted by First Nations or the strength of those claims.

#### **4.4.1: STRENGTH OF CLAIM**

In its closing remarks, the Stswecem'c/Xgat'tem (Canoe Creek Band) stated that in the case of potential Aboriginal rights or title, the Panel's consideration of the strength of claim of such potential rights must include a weighing of the evidence in advance of the determination that would be made by the Minister of the Environment and the responsible authorities. Consequently, it was argued, the Panel's report must include a consideration of the evidence of strength of claim of established or potential Aboriginal rights or title.

As noted in the Panel's March 28, 2010 letter to Stswecem'c/Xgat'tem (Canoe Creek Band), the Panel determined that it does not have a mandate to make recommendations on the strength of claim of potential rights; for example, that one First Nation has a strong claim to Aboriginal rights or title in the Project area or that another First Nation does not have a strong claim. Further information regarding how the Panel considered strength of claim information is contained in Section 9.

#### **4.4.2: THE DUTY TO CONSULT AND ACCOMMODATE**

During closing remarks, the Esketemc (Alkali Lake Band) submitted that the Panel process was "wholly deficient to satisfy the duty to consult and accommodate." It noted that the federal government had stated that it would rely on the Panel to discharge the duty to consult to the extent possible. Further, it noted that there had been a lack of effort by Taseko to show that it had genuinely listened to and heard the Esketemc's concerns and that if there

was no real and meaningful response to their concerns, then there could be no accommodation.

In its closing remarks, the Stswecem'c/Xgat'tem (Canoe Creek Band) stated that the Panel's consideration of the issue of accommodation of Aboriginal rights and title must include a weighing of the evidence of the need for and means of accommodating Aboriginal title and rights, including an assessment of any accommodation measures proposed to date.

Taseko noted in its closing remarks that although some procedural aspects of consultation may be delegated to the proponent, the legal responsibility for consultation remained with the Crown.

In considering this issue, the Panel noted that the federal government appointed a Crown Consultation Coordinator for this Project. On February 9, 2010, the Crown Consultation Coordinator sent a letter to the First Nations in the Project area which summarized the government's consultation process for the Project. With respect to the Panel's role in the consultation process, the letter stated that information provided by First Nations to the Panel regarding the manner in which the Project may adversely affect potential or established Aboriginal rights or title, as well as other relevant information, would be used by the federal government to determine the validity of Aboriginal rights or title claims in relation to the Project, the scope of the Crown's duty to consult and whether Canada has met its duty to consult and accommodate.

The Panel recognizes that the federal government would rely on information provided by it to assist the Crown in fulfilling its legal duty to consult and accommodate if necessary. However, the Panel also recognizes that the federal government would ultimately be responsible for ensuring adequate consultation and accommodation, if necessary. Consultation with potentially affected First Nations began before the Panel was appointed, with respect to the EIS Guidelines and the Panel's Terms of Reference. The Panel further understands that consultation will continue after it has submitted its report to the Minister, prior to a decision being taken by the federal government on whether or under which conditions the Project may proceed.

The Panel's Terms of Reference are clear that it does not have a mandate to make any determination as to the scope of the Crown's duty to consult First Nations and/or whether Canada has met its respective duty to consult and accommodate in respect of rights recognized and affirmed by section 35 of the *Constitution Act, 1982*. However, where measures have been proposed by Taseko to mitigate or accommodate any First Nations' rights or title, the Panel has examined and reached a conclusion on their effectiveness in this report.

#### **4.5: DUAL FEDERAL AND PROVINCIAL ENVIRONMENTAL ASSESSMENT PROCESSES**

As indicated above, the Panel received many comments during the course of the review regarding the lack of harmonization between the federal and provincial environmental assessment processes. This section provides a summary of the comments received from Taseko, the public and First Nations on the decision by the Government of British Columbia to conduct a separate environmental assessment process on the proposed Project.



Given the challenges resulting from the application of two separate, but coordinated processes, this section also provides a few observations about the implications of this decision. The comments and observations are as follows:

- Taseko and the Tsilhqot'in National Government, both of which had some involvement in the discussions on the development of a joint review process, indicated that British Columbia had unilaterally decided to conduct a separate process leaving the federal government to pursue its own panel review process;
- although Taseko produced one EIS for both processes, and a joint public comment period was held to review the EIS, the two processes began diverging, with different timing after the public comment period on the EIS ended;
- some organizations (e.g. the British Columbia Mining Association and the British Columbia Chamber of Commerce) expressed concern that the federal and provincial governments were unable to reach an agreement on a single review process and noted the inefficiencies that had resulted;
- First Nations were critical about the lack of consultation by the Province during its environmental assessment; although invited to participate in the provincial working group, First Nations indicated that they did not have the resources to participate in both processes and chose to participate primarily in the Panel review;
- many members of the public and First Nations were critical of the lack of participation by provincial Ministries during the public hearing process;
- criticism was directed toward Taseko for proceeding with the provincial permitting process while the Panel was still conducting its review;
- the lack of participation by British Columbia meant that during the course of the public hearing, Taseko was, at times, placed in a position of trying to explain provincial policy on matters such as revenue sharing, archaeology and fisheries management;
- while it received some input from federal departments during the provincial working group process, the British Columbia Environmental Assessment Office was not able to consider the final reviews from the federal departments on alternatives, surface and groundwater quality and quantity, the feasibility of the proposed fish and fish habitat compensation plan, effects on migratory birds, health effects and navigation;
- the Panel received input from provincial ministries while the provincial working group was functioning, but participation of the provincial ministries ended when the Environmental Assessment Office submitted its report; therefore, during the public hearing, the Panel was not able to receive clarification regarding provincial ministries mandates, the issues they raised, or to take advantage of their expertise;
- the provincial process was not able to take advantage of information received from First Nations during the Panel's public hearing process on the current use of lands and resources for traditional purposes and effects on cultural heritage;
- the Province did not consider the potential future mine extension to be sufficiently certain to proceed to require further assessment and therefore did not assess the cumulative effects of this potential scenario in its report;
- the public and First Nations often questioned how much weight the Panel might give to the provincial Assessment Report and related Environmental Assessment Certificate, given that Taseko often referred to it and the commitments contained therein that it would have to follow if the Project proceeds; this in turn often resulted in critical comments about the results of the provincial assessment; and
- the federal government would have different information to consider than the province in reaching a decision on whether to enable the Project to proceed.

While the Province issued an Environmental Assessment Certificate for the Project in January 2010, the Panel finds it is appropriate to consider the comments raised by the provincial experts on the various valued ecosystem components during the course of the review of the EIS. Therefore, where appropriate, the comments from the provincial experts are reflected in the summaries of the views of participants for each valued ecosystem component.

The Panel notes that as a result of the two separate processes and their divergent timing, updated and new information was presented to the Panel that was not available to the British Columbia Environmental Assessment Office in completing its assessment. The manner in which the Panel has considered this additional information is addressed in each of the relevant sections of this report.

#### **4.6: PRECAUTIONARY PRINCIPLE**

One of the purposes of the *Canadian Environmental Assessment Act* was "to ensure that projects are considered in a careful and precautionary manner before federal authorities take action in connection with them, in order to ensure that such projects do not cause significant adverse environmental effects".

The *Canadian Environmental Assessment Act* did not provide a definition for the precautionary principle. However the Panel notes that the generally accepted definition is found in Principle 15 of the 1992 Rio Declaration on Environment and Development: "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

In applying the precautionary approach, the EIS Guidelines required Taseko to:

- demonstrate that the proposed actions were examined in a careful and precautionary manner in order to ensure that they did not cause serious or irreversible damage to the environment, especially with respect to environmental functions and integrity, considering system tolerance and resilience, and would not interfere with the conservation of wildlife in a protected area;
- outline the assumptions made about the effects of the proposed actions and the approaches used to minimize these effects;
- identify any follow-up and monitoring activities planned, particularly in areas where scientific uncertainty existed in the prediction of effects; and
- present public views on the acceptability of these effects.

The application of the precautionary principle was not specifically addressed by Taseko in the EIS. In response to a comment on the EIS, Taseko indicated that the precautionary approach was used throughout the environmental assessment to avoid or mitigate the possible adverse effects of development on the environment, and that this was reflected in the Project design.

During the public hearing, Taseko suggested that an appropriate application of the precautionary principle to the Project would be to ensure that the Project was developed in such a way as to ensure that future expansion would be possible. Specifically, Taseko stated that it applied the precautionary principle by asking themselves the following question: "With the current Project in front of us today, the 20-year mine life, is there

anything in the design of that Project that we are doing today that would preclude the ability to do a 33-year mine life if it were to happen in the future?”

The Tsilhqot'in National Government noted that both the EIS Guidelines and the *Canadian Environmental Assessment Act* addressed the precautionary principle. The Tsilhqot'in submitted that there were two ways to implement the precautionary principle. With respect to projects that were relatively benign, the environmental assessment process could either allow them to proceed or help to strengthen the mitigation measures to ensure there would be no significant environmental effects. The Tsilhqot'in submitted that the second purpose of environmental assessment was to stop projects from proceeding if they could not be mitigated to the point that there would be no significant impacts. Further, the Tsilhqot'in indicated that the EIS Guidelines indicated that the precautionary principle should inform decision-makers to take a cautionary approach, or to err on the side of caution, especially where there was a large degree of uncertainty or high risk.

The Panel has carefully examined each effect of the Project on valued ecosystem components. It has identified a number of areas where there is uncertainty associated with the prediction of environmental effects. These include:

- whether there would be sufficient water available to maintain the minimum water cover in the tailings storage facility to ensure prevention of acid generation from the submerged mine waste rock;
- whether water treatment would be required for the discharge from Pit Lake at mine closure;
- whether seepage from the tailings storage facility and discharge from the mine site post-closure would affect water quality in Jidizay Biny (Big Onion Lake) and the Dasiqox (Taseko River), respectively, and effect the important salmon fishery;
- whether the fish and fish habitat compensation plan would successfully result in a long-term viable fishery in Prosperity Lake that would adequately compensate for the loss of Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and portions of Teztan Yeqox (Fish Creek);
- whether the fish and fish habitat compensation plan would require ongoing maintenance in perpetuity to maintain its effectiveness;
- whether the Project would adversely affect wildlife;
- whether the mine site, transmission line and the increased mine vehicle traffic would be the incremental cause of further reduction of the threatened grizzly bear population in the area;
- whether compensation for loss of navigation in Teztan Biny (Fish Lake), and Y'anah Biny (Little Fish Lake) would be possible;
- the extent to which the mine and the transmission line would affect First Nation's current use of land and resources for traditional purposes and cultural heritage; and
- whether potential and established Aboriginal rights and title would be affected.

The Panel has reached conclusions on each of these issues in various sections of its report and it believes it has incorporated the precautionary principle into its conclusions.

## SECTION 5: NEED, PURPOSE AND ASSESSMENT OF ALTERNATIVES

### 5.1: OVERVIEW

Section 16 of the *Canadian Environmental Assessment Act* requires that review panels consider the purpose of a project and alternative means of carrying out a project that are technically and economically feasible and the environmental effects of any such alternative means. As required by its Terms of Reference, the Panel also considered the need for and alternatives to the Project.

### 5.2: NEED FOR AND PURPOSE OF THE PROJECT

#### 5.2.1: PROPONENT'S ASSESSEMENT

The purpose of the Project, according to Taseko, was to maximize the proven mineral reserves found at the mine site in order to provide economic returns to its shareholders while also creating value and opportunity for the people of British Columbia and Canada.

The need for the Project was to respond to predicted world copper demand which was expected to exceed copper concentrate production from existing and permitted mines as early as 2012. While the proposed annual gold production from the Project was not expected to impact world markets, Taseko indicated that gold finds were increasingly more difficult, and the Project would help to fill a current gap that exists between the production of, and demand for, gold.

Taseko filed several Technical Reports on the System for Electronic Document Analysis and Retrieval (SEDAR) website<sup>6</sup>. These reports discussed, amongst other matters, the economic feasibility of the Project in relation to ore grades and commodity prices. In its report dated December 17, 2009, Taseko noted that the ore grade for the Project was 0.24% for copper and 0.41 grams/tonne for gold.

#### 5.2.2: VIEWS OF PARTICIPANTS

MiningWatch Canada expressed the view that the Project was a low grade ore mine. It provided examples of other gold and copper mines in Canada, all of which had higher ore grades than the Project. MiningWatch Canada indicated that the success of the Project would be very dependent, among others factors, on currency exchange rates, commodity prices, affordable financing and fuel costs and unknowns such as the cost of future reclamation bonding and any accommodation with First Nations.

MiningWatch Canada also noted that the gold was dispersed throughout the ore body and could not be recovered without mining the copper. As a result, the price of copper would become the determining factor in the feasibility of the mine production. MiningWatch Canada stated that the Project's economics were marginal, that it would not result in any net benefits to the region or British Columbia and would likely close prematurely. These issues are further discussed in Section 7.5.

<sup>6</sup> SEDAR is the system used for electronically filing most securities related information with the Canadian securities regulatory authorities.

### 5.2.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS

The Panel notes that Taseko was aware of the many variables that would affect the Project's viability. Taseko noted on a number of occasions throughout the review that it would only proceed with the Project if the economics were favourable.

**The Panel concludes that Taseko has adequately outlined the purpose and need for the Project for the purposes of this environmental assessment.**

### 5.3: ALTERNATIVES TO THE PROJECT

The Canadian Environmental Assessment Agency defined "alternatives to the project" as the functionally different ways to meet a project's need and achieve a project's purpose<sup>7</sup>. It also has noted that the "alternatives to" a project should be established in relation to the project need and purpose and from the perspective of the proponent.

The "alternatives to" the Project considered by Taseko included underground mining rather than open pit mining and the selection of a corridor for the transmission line.

#### 5.3.1: PROPONENT'S ASSESSEMENT

With respect to the mine site, the EIS and the subsequent discussions during the public hearing focussed largely on alternative means of carrying out the Project rather than alternatives to the Project. However, in the initial examination of alternatives between 1995 and 1999, alternatives involving an underground mine, and combination open pit and underground mine were examined by Taseko. They were examined as possible alternatives to avoid encroaching on Teztan Biny (Fish Lake). However, both were rejected on the basis that the cost of mining would be greater than the value of the extracted minerals. Taseko noted that these alternatives would not make economic sense and that there would be no reason to develop the Project if an underground mine were the only alternative available. On this basis, no further consideration was given to underground mining, and only open pit configurations were examined.

With respect to how to supply power to the mine site, the only alternative examined was supplying electricity by means of a 230 KV transmission line connecting to the British Columbia electricity grid. Therefore, "alternatives to" the proposed transmission line in this case were different corridor options.

Taseko completed a transmission line selection study in 1997. The study initially identified 9 corridor options through a map analysis using 3 km wide corridors. Each option was examined according to a procedure outlined in the "Guide to the British Columbia Environmental Assessment Process". The criteria used in the analysis were technical/engineering, cost, socio-economic, and environmental. As a result of this analysis,

<sup>7</sup> The Operational Policy Statement entitled *Addressing "Need for", "Purpose of", "Alternatives to" and "Alternative Means" under the Canadian Environmental Assessment Act* is available at [http://www.ceaa-cee.gc.ca/013/0002/addressing\\_e.htm](http://www.ceaa-cee.gc.ca/013/0002/addressing_e.htm) and the *Glossary of Terms commonly used in Federal Environmental Assessments* is available at [http://www.ceaa-acee.gc.ca/012/015/index\\_e.htm](http://www.ceaa-acee.gc.ca/012/015/index_e.htm)

two options were selected for further examination: a 145 km line from the Soda Creek substation, north of Williams Lake, which would run southwest to Hanceville and then south to the mine site; and a 124 km line from a proposed substation near Dog Creek which would run west to the mine site. The Dog Creek corridor was selected as the preferred alternative for examination of a right-of-way within the 500 m wide route. In 2008, Taseko re-examined the criteria used in the 1997 study and concluded that while there had been some changes, they were not significant enough to warrant a re-evaluation of the corridor selection process.

### **5.3.2: VIEWS OF PARTICIPANTS**

During the community hearing sessions, a few people suggested that a smaller mining project and selective mining could be more sustainable than the current Project. The David Suzuki Foundation provided comments during the review of the EIS which indicated that the underground and select open pit mine design that was reviewed by Taseko as part of its initial examination of alternatives in 1995-1999 could be feasible.

The Tsilhqot'in National Government noted that the proposed Kemess North copper-gold mine, which involved an open pit and which did not receive approval to proceed, had recently announced further exploratory work to examine the feasibility of an underground mine. The ore grade was similar to that of the Project.

During the public hearing, the Panel heard much opposition to the preferred transmission line corridor from Dog Creek to the mine site, primarily from the Esketemc (Alkali Lake Band). A key concern regarding the preferred transmission line was the potential for the right-of-way to open the land to increased access to non-native hunters and recreational vehicle users. The Esketemc were also particularly concerned that the proposed right-of-way would disrupt and fragment the mule deer and moose winter habitat on the east side of the Fraser River, as well as add to the fractured landscape on the west side. Some participants recommended that other forms of clean energy, such as wind or solar, be created within the Chilcotin region to stimulate local, sustainable industry.

The Panel was also informed that the Tsilhqot'in National Government and Western Power Biomass Cooperation were, as a joint venture, proposing a biomass fired, thermal electric power generating plant near Hanceville to produce energy from wood affected by the mountain pine beetle. This project would involve construction of a 70 km, 230 KV transmission line from the Hanceville site to the Soda Creek substation in order to supply power to the British Columbia electricity grid. The corridor would be along the same or a similar routing to the option that was examined by Taseko in 1997.

### **5.3.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on the alternatives to the Project, the Panel considered the following factors to be particularly relevant:

- the EIS and the subsequent discussion during the public hearing focussed largely on alternative means of carrying out the Project rather than alternatives to the Project;
- alternatives to the Project examined by Taseko included underground mining and a combination of open pit and underground mining; these alternatives were examined as possible alternatives to avoid encroaching on Teztan Biny (Fish Lake);
- both underground mining and the combination of open pit and underground mining were rejected on the basis that the cost of mining would be greater than the value of the extracted minerals;

- the EIS Guidelines directed Taseko to focus its assessment of the proposed transmission line on a 230 KV transmission line connecting to the British Columbia electricity grid; therefore, no other alternatives to this component of the Project were examined; for this Project, "alternatives to" the proposed transmission line were considered to be different corridor options;
- after studying 9 corridor options, 2 options were selected for further examination and the Dog Creek corridor was selected as the preferred alternative for examination of a right-of-way within the 500 m wide route;
- the Panel heard much opposition to the preferred transmission line corridor from Dog Creek to the mine site;
- concerns regarding the preferred transmission line included the potential for the right-of-way to open the land to increased access to non-native hunters and recreational vehicle users and for the disruption and fragmentation of mule deer and moose winter habitat on the east side of the Fraser River; and
- the Tsilhqot'in National Government proposed a separate 230 KV transmission line in the Project area, running from the Hanceville area to the Soda Creek substation, which would follow a similar route to the option that was examined by Taseko in 1997.

As noted in Section 5.2, the Project would mine a low-grade ore deposit. Large-scale open pit mining was considered by Taseko as necessary for a mineral deposit that involved a low-grade porphyry ore. No substantive information was submitted during the course of the review that disputed Taseko's conclusion regarding the elimination of underground mining as an alternative to its proposed open pit proposal.

**The Panel concludes that Taseko's decision that an open pit mine would be the only feasible alternative to mine ore of this grade was reasonable.**

With respect to the transmission line, the Panel notes that the EIS Guidelines required that the preferred transmission line corridor selected at the conclusion of the selection study in 1997 be discussed in detail as part of the EIS. In accordance with the EIS Guidelines, Taseko provided more detailed information on the environmental effects of constructing a transmission line within the preferred corridor. Therefore the Panel did not examine this corridor in a comparative manner with other rejected options.

The Panel notes that when the corridor selection process was undertaken, the criteria did not include consideration of effects on First Nations' current use activities for traditional purposes and cultural heritage nor that logging may have altered the landscape in ways that were not predicted in 1997 when both corridors were initially compared. The Panel was unable to examine these factors but it notes that should the Hanceville biomass fired, thermal electric power generating plant proceed, the construction of a much shorter line from Hanceville to the mine site might be an option. The Panel recognizes that this would be a modification to the Project and would require some re-examination of environmental effects by the British Columbia Environmental Assessment Office and possibly by federal responsible authorities.

## **RECOMMENDATION 1**

If the Project proceeds, the Panel recommends that Taseko and appropriate parties re-examine the choice of transmission line corridor to determine whether one transmission line would be an appropriate alternative to serve both the Project and the Tsilhqot'in National Government's proposed biomass fired, thermal electric power plant, should that project proceed prior to construction of the transmission line.

### **5.4: ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT**

Alternative means of carrying out a project are the various technically and economically feasible ways for a project to be implemented or carried out. This could include, for example, alternative locations, routes and methods of development, implementation and mitigation.

#### **5.4.1: MINE DEVELOPMENT PLANS**

##### **5.4.1.1: Proponent's Assessment**

Between 1997 and 1999, Taseko conducted an alternatives assessment involving regulatory agencies and consulting with First Nations and the public. In preparation for the submission of its EIS to the British Columbia Environmental Assessment Office and the Panel, Taseko re-evaluated this previously completed work on the alternatives assessment.

In response to deficiencies and concerns identified by the Panel, Environment Canada, the British Columbia Environmental Assessment Office and the provincial Ministry of Energy Mines and Petroleum Resources, Taseko submitted a report entitled "Supplemental Report on the Assessment of Alternatives for Tailings and Waste Rock Storage" in August 2009. In this report, Taseko built upon the body of work previously completed between 1997 and 2000, as well as work conducted in 2008 for the EIS. Additionally, Taseko recognized that additional economic data would be required in order to meet the requirements of the *Metal Mining Effluent Regulations* for listing a tailings impoundment on Schedule 2 of the Regulations. This report was, therefore, also designed to help satisfy regulatory requirements.

Taseko indicated that the driving factors in the assessment of alternatives included economic considerations and the location of the ore body. The EIS Guidelines required Taseko to undertake an analysis of alternative means of carrying out the Project that were technically and economically feasible. Taseko determined early on in the assessment that there was only one economically viable option, Mine Development Plan 3, and concentrated its efforts on developing the detailed engineering and planning around that option.

In Taseko's view, the assessment of alternatives was also driven largely by the geographic proximity of the ore body to Teztan Biny (Fish Lake). Given that it was not possible to move the ore body, mine components would need to be built around it. Furthermore, while the desire to preserve Teztan Biny was expressed, Taseko noted during the public hearing that "it is not possible to preserve Fish Lake as a viable and functioning ecosystem while at the same time maximizing the full potential of the defined resource." As such, Taseko noted that a goal was to ensure that nothing in the selected mine development plan would prevent potentially expanding the mine in the future.

Taseko undertook an investigation of alternatives for mine waste management. Alternatives assessed included traditional (slurry) tailings, thickened tailings, dry-stacked tailings, and



paste tailings comingled with potentially acid generating waste rock. Each alternative mine waste management option was evaluated against criteria including water management, construction and operation, reclamation and closure, environmental, social and overall Project costs.

Dry-stacked tailings would involve de-watering and thickening the tailings using thickeners and a filter plant, and would require transportation of waste using conveyers as well as additional mitigation measures for water management. Dry-stacked tailings would need to be stored and managed for the duration of the mine life until they could be deposited back into the open pit after closure. Taseko proposed to store dry-stacked tailings approximately 10 km north-east of the open pit in an area known as Tête Hill.

Paste tailings co-mingled with potentially acid generating waste rock was also considered. Paste tailings would require a separate storage facility to meet the needs of the mill and to manage runoff. Taseko proposed to store paste tailings at Tête Hill.

While Taseko did evaluate the initial feasibility of thickened tailings as a mine waste storage alternative, it concluded that thickened tailings were not viable due to additional capital and operating costs, and was deemed to have little positive environmental or socio-economic benefits. Thickened tailings were primarily excluded as it would not result in a substantially smaller tailings storage facility, would considerably increase the potential for fugitive dust and was not economically feasible.

Overall, Taseko concluded that dry-stacked, paste and thickened tailings were not viable alternatives mainly due to excessive economic costs and unproven engineering at the scale required for the Project. Therefore, traditional (slurry) tailings were identified as the preferred mine waste management option.

In order to develop alternative mine development plans, Taseko initially conducted a pre-screening assessment of potentially achievable mine components and the alternatives for the candidate facilities. Fifteen (15) alternatives for the disposal of tailings and potentially acid-generating waste rock, and 10 alternatives for the disposal of low grade ore, overburden and non-potentially acid generating waste rock were assessed.

As a result of the pre-screening assessment analysis of tailings and potentially acid-generating waste rock storage locations, 4 technically and economically achievable tailings storage locations were identified:

- Fish Creek North;
- Fish Creek South;
- Cone Hill; and
- Tête Angela Creek.

The Fish Creek North location was deemed the preferable alternative because it had the shortest distance to the open pit and the lowest maximum elevation difference for the tailings pipeline. Furthermore, Taseko believed that restricting the tailings location to one watershed (Teztan Yeqox (Fish Creek)) would reduce the Project's environmental effects and risks.

Of the potential alternatives for low grade ore, overburden and non-potentially acid generating waste rock locations, only two of the sites were carried forward:

- Teztan Biny (Fish Lake), located immediately south of the open pit - as the preferred site; and
- Teztan Yeqox (Fish Creek) Valley, located on the north-east side of the valley.

These alternatives were then shortlisted to identify potentially achievable mine development plans. Three (3) mine development plans were identified as being conceptually feasible with varying degrees of mitigation to Teztan Biny (Fish Lake). Each of the plans is discussed further below, and the locations are outlined in Figures 6A, 6B and 6C.

Mine Development Plan 1 located the tailings storage facility in the Tête Angela Creek watershed, approximately 8 km north-east of the open pit, with waste rock storage also being located to the north-east of the pit. The mill location was different for this development plan than for Mine Development Plans 2 and 3. This plan was proposed to maximize mitigation of the potential effects of mining activities on Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and upper Teztan Yeqox (Fish Creek).

According to Taseko's Multiple Accounts Evaluation, Mine Development Plan 1 was identified as the most environmentally sound as it located all the waste storage facilities upstream of Teztan Biny (Fish Lake), thereby maintaining the ecological integrity of the Teztan Yeqox (Fish Creek) ecosystem. According to Taseko's economic analysis provided in the Supplemental Report, the undiscounted life of mine capital and operating costs associated with this mine development plan would be approximately \$536 million more than Mine Development Plan 3, the preferred option, as it would require waste materials to be transported a greater distance and would increase the complexity of water management.

In Mine Development Plan 2, the tailings storage facility would be located at the southern reaches of the Teztan Yeqox (Fish Creek) watershed, thereby avoiding the destruction of Y'anah Biny (Little Fish Lake) and some of upper Teztan Yeqox. Additionally the waste rock, low grade ore and overburden would be stored to the north-east of the open pit. This plan was proposed to provide partial mitigation for the effects of mining activities on Teztan Biny (Fish Lake). According to Taseko's economic analysis provided in the Supplemental Report, the undiscounted life of mine capital and operating costs associated with this mine development plan would be approximately \$337 million more than the preferred option primarily due to the additional distance to transport waste materials as well as additional measures to mitigate seepage.

Mine Development Plan 3 was identified early on in the planning stage as the preferred alternative. Mine Development Plan 3 proposed to locate the tailings storage facility south of Teztan Biny (Fish Lake), and would eliminate Teztan Biny, Y'anah Biny (Little Fish Lake) and the majority of upper Teztan Yeqox (Fish Creek). The main embankment would be located across the Teztan Yeqox valley at the inlet to Teztan Biny. Teztan Biny would be drained to accommodate the storage of non-potentially acid generating waste rock, low grade ore and overburden. To compensate for the loss of Teztan Biny, Y'anah Biny and upper and lower Teztan Yeqox, Taseko proposed a fish and fish habitat compensation plan.

Taseko noted that, with appropriate mitigation, Mine Development Plan 3 offered the safest, most environmentally responsible plan as it confined all Project components within a single watershed and in the event of a dam failure, the tailings would report to the open pit

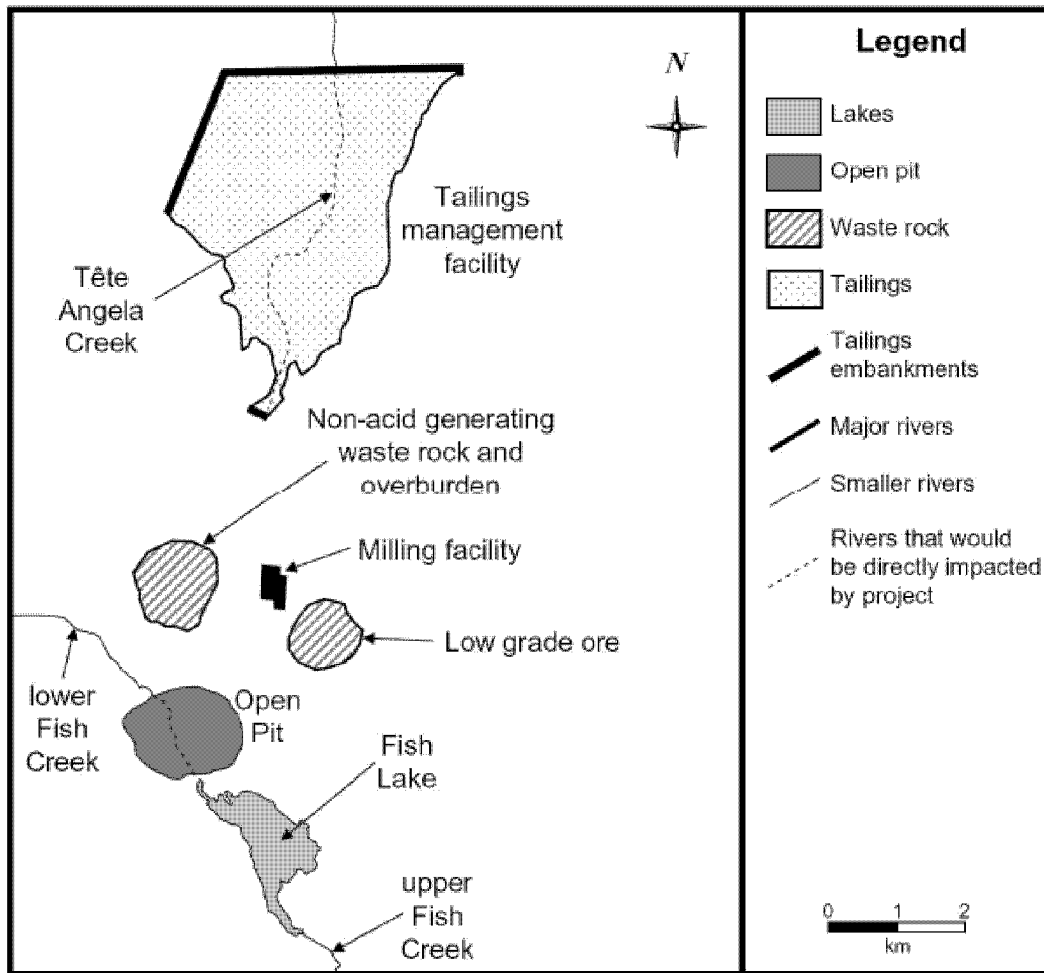


Figure 6A. Mine Development Plan 1

Source: CEAR Doc# 2113

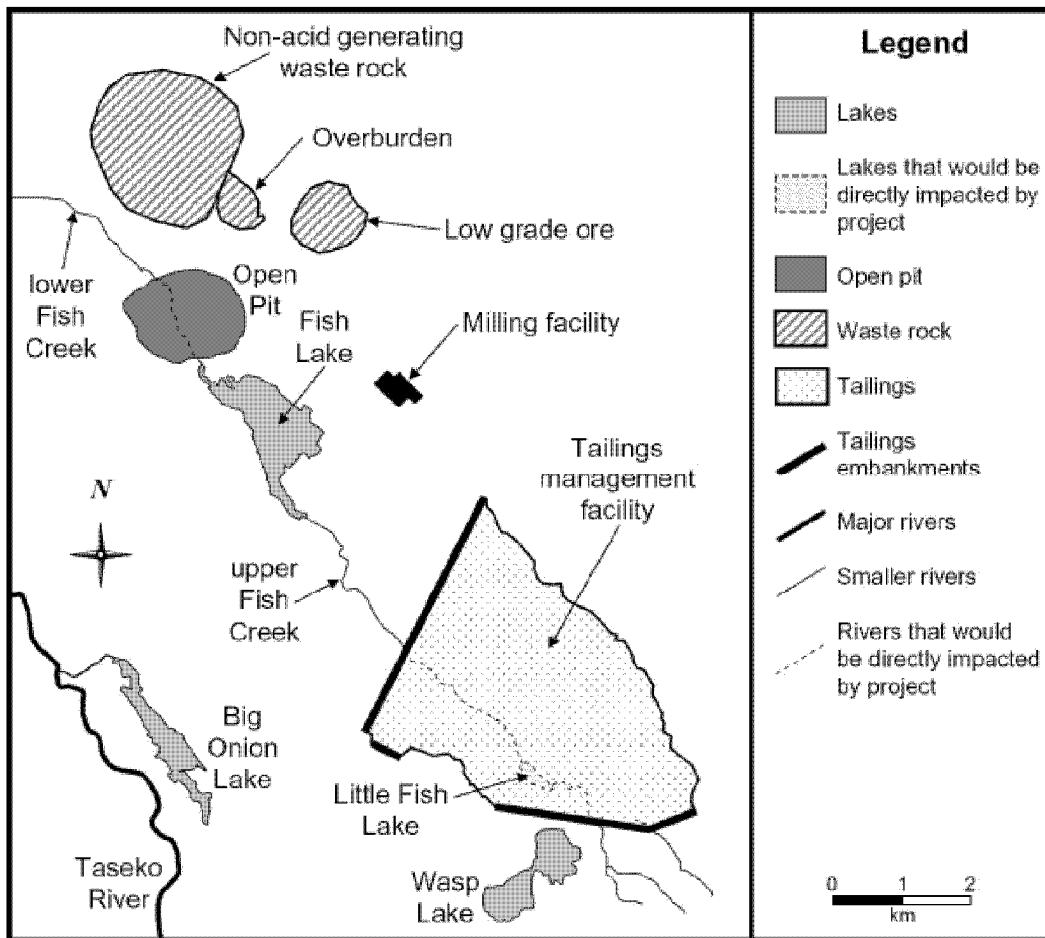


Figure 6B. Mine Development Plan 2

Source: CEAR Doc# 2113

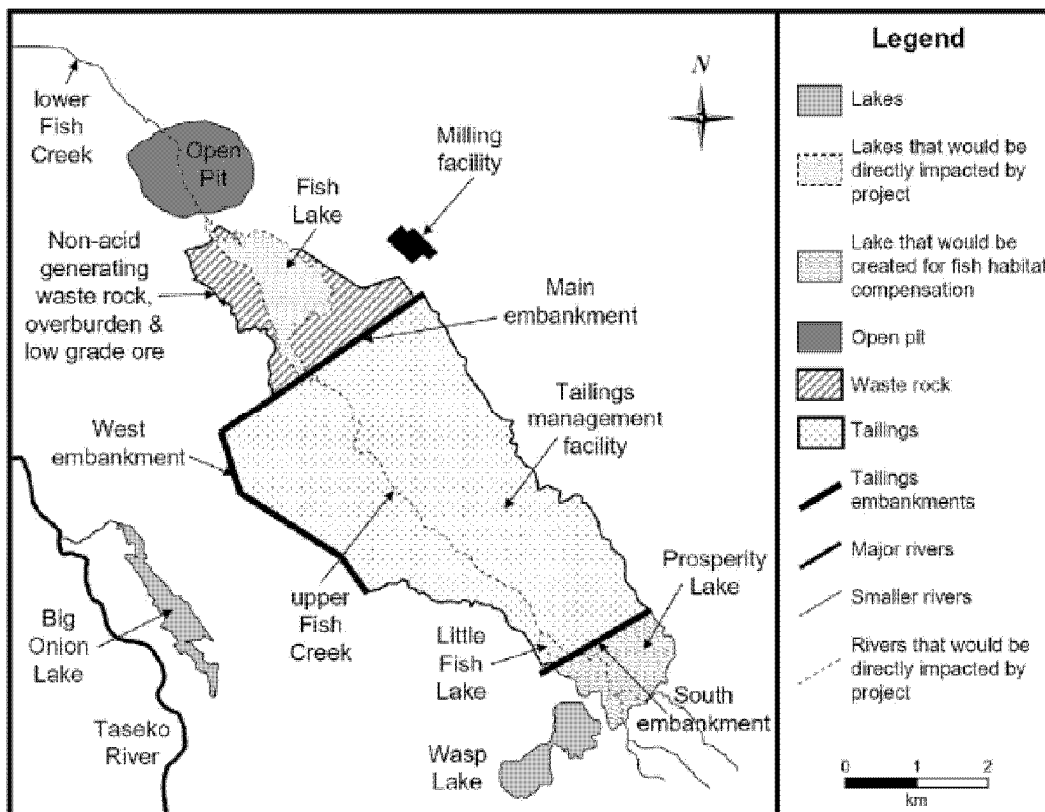


Figure 6C. Mine Development Plan 3 (preferred option)

Source: CEAR Doc# 2113

A fourth option, Mine Development Plan 3(b), was examined at the request of government agencies. This mine development plan would use the preferred tailings location in the upper Teztan Yevox (Fish Creek) watershed combined with waste rock, low grade ore, and overburden stockpiles to the north-east of the open pit, thus preserving Teztan Biny (Fish Lake). Examination of Mine Development Plan 3(b) provided insight into whether Teztan Biny could be preserved, given that the proposed tailings storage facility would comprise 83% of the catchment area and the main embankment would be located at the inlet to Teztan Biny. The results of Taseko's analysis showed that seepage from the tailings storage facility would eventually negatively impact the water quality in Teztan Biny to insufficient standards for fish. Further, Mine Development Plan 3(b) did not provide mitigation for the loss of fish and fish habitat.

The August 2009 Supplemental Report included a detailed Multiple Accounts Analysis for the 3 mine development plans identified as technically and economically feasible alternative means of carrying out the Project. In this analysis, Taseko applied similar assessment categories including a non-inclusive list of criteria utilized in the pre-screening assessment of options. The categories used were: technical, physical environment, terrestrial and aquatic life, socio-economic and economic. Early in the assessment, Taseko determined that Mine Development Plans 1 and 2 were fatally flawed due to excessive economic risk and that Mine Development Plan 3 was the most appropriate option. Taseko stated that impacts to aquatic life could be addressed by the fish and fish habitat compensation plan. While the Multiple Accounts Analysis indicated that Mine Development Plan 1 would be preferred in terms of effects to aquatic and terrestrial values, it confirmed Taseko's previous conclusion that Mine Development Plan 3 was the only technically and economically feasible option.

Following requests for additional information and clarifications from the Panel, Taseko provided an assessment on the spatial extent of the potential expansion of the open pit and whether future expansion of the open pit would necessitate the draining of Teztan Biny (Fish Lake). Taseko characterized 3 pit designs with varying degrees of size and impacts to Teztan Biny, analyzed from the point of view of the potential for encroachment on Teztan Biny (see Figure 7). The results showed that, in the case of an expansion, there was a high safety risk as the open pit would encroach on the necessary buffer distance between the open pit and Teztan Biny.

The Supplemental Report noted that the Project, as proposed, was designed such that:

- the tailings storage facility could accommodate future reserve increases;
- non-potentially acid generating waste rock and low grade ore storage could accommodate future reserve increases; and
- mine infrastructure and facilities would not increase in spatial extent.

Taseko noted that in order to maximize the resource, the current mine plan should not be designed in any way that would restrict the potential for future mine expansion. If expansion were contemplated in the future, Taseko indicated that at that time, it would be required to meet regulatory standards.



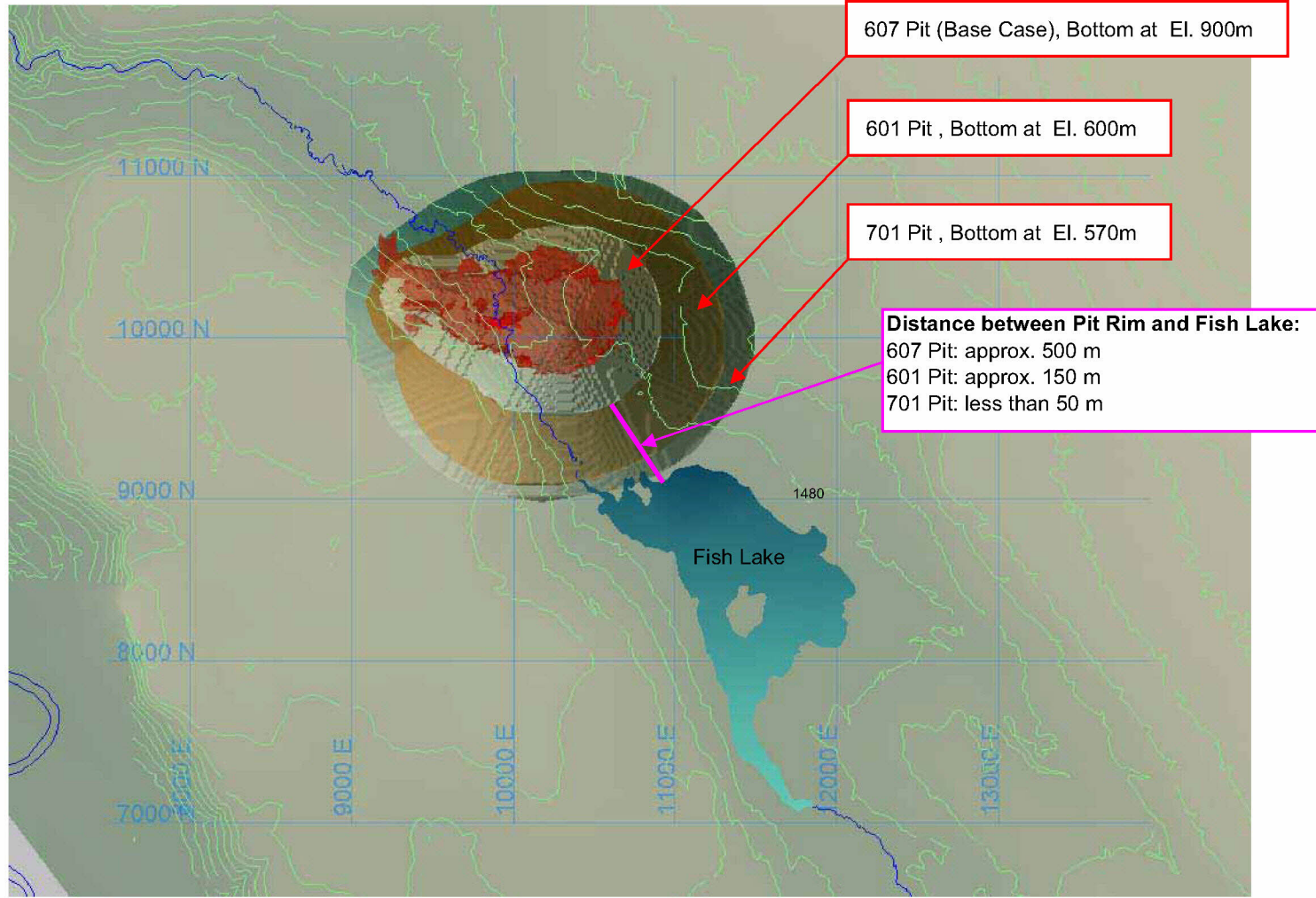


Figure 7. Alternative Open Pit Configurations  
 Source: CEAR Doc# 1078, Response to IR 1.1

TASEKO MINES LIMITED			
PROSPERITY GOLD-COPPER PROJECT			
<b>MINE ALTERNATIVES ASSESSMENT PIT SHELL MODELS AND FISH LAKE</b>			
<i><b>Knight Piésold</b></i> CONSULTING	P/A NO. VA101-266/9	REF NO. VA09-01065	REV 0
	<b>FIGURE 1</b>		

#### 5.4.1.2: Views of Participants

Environment Canada was of the opinion that all three mine development plans were potentially viable. Environment Canada agreed with Taseko that Mine Development Plan 3, the preferred option, would be less technically challenging than Mine Development Plans 1 and 2 due to the layout, which took advantage of the natural gradient of water flow and posed less of a problem from a water management perspective. Environment Canada noted however, that under Mine Development Plan 3, there could be a need for long-term treatment of water discharged from Pit Lake during post-closure. Environment Canada also noted that although it agreed that Mine Development Plans 1 and 2 would be more difficult to manage, those options were not beyond the technical complexity of many mines currently in operation.

Environment Canada stated that while Mine Development Plan 3 would have the greatest immediate impact to the aquatic environment, it had a potentially lower long-term environmental risk than Mine Development Plans 1 and 2. Environment Canada also noted that Taseko's assessment of alternatives examined the environmental impacts to aquatic values on an area basis. It was argued that this approach did not take into account the ecological productivity of the ecosystem being effected. The location of Mine Development Plan 3 for example, was assessed to have a much higher ecological productivity than the Tête Angela Creek watershed that would be used in Mine Development Plan 1. Environmental Canada indicated that if Taseko had taken into account the productive capacity of the locations of the various mine components, it may have influenced the overall outcome of the alternatives assessment.

In its submission to the Panel for the topic-specific session on the assessment of alternatives, Environment Canada noted that Taseko did not take into account the proper location of the milling facility for Mine Development Plan 1. Environment Canada believed that this error could have influenced the outcome of the feasibility of Mine Development Plan 1 from both a technical and economic perspective. As noted above, Taseko responded that it had taken the two different milling facilities locations into account in its analysis.

Concern was expressed that the economic evaluation for the assessment of alternatives was not based on a holistic approach and did not take into account the net benefits and/or costs attributed to society. The Panel heard, for example, that the socio-economic criteria used to assess the alternatives did not take into account the importance of Teztan Biny (Fish Lake) and Nabas to the Tsilhqot'in people. Along these lines, the Tsilhqot'in National Government expressed that if Taseko applied a fatal flaw criteria based on socio-economics, Mine Development Plan 3 would have been found to be unacceptable.

It was expressed by all First Nations that they were not consulted properly on the different alternatives and that their views and beliefs were not considered. In the community hearing session, the Xení Gwet'in (Nemiah Band) acknowledged that Taseko had informed them of alternative plans early on in the environmental assessment process, but that the working relationship deteriorated and resulted in a lack of meaningful consultation. Furthermore, former Chief Roger William told the Panel that the Tsilhqot'in had informed Taseko during those initial meetings of the cultural significance of the area and that they were opposed to the loss of Teztan Biny (Fish Lake). To that end, he stated: "It was very clear right from the beginning that we didn't want to lose Fish Lake."

Concern was expressed by many interested parties that mine development plans that would have retained Teztan Biny (Fish Lake) were eliminated prematurely in the analysis as a result of the application of economic fatal flaws. It was argued that economic fatal flaw criteria were neither applied appropriately nor transparently. Environment Canada for example, noted that although Mine Development Plans 1 and 2 would be more costly, their exclusion was not properly justified. This was also noted in the provincial Environmental Assessment Report.

#### **5.4.2: TECHNICAL AND ECONOMIC FEASIBILITY OF ALTERNATIVES**

##### **5.4.2.1: Proponent's Assessment**

During the public hearing, Taseko stated that the assessment of alternatives completed for the EIS was one of the most comprehensive alternatives assessments ever undertaken for a mining project.

To fulfil the requirements of the EIS Guidelines, Taseko undertook an economic-based comparison of the mine alternatives in the EIS. The evaluation consisted of a cost comparison of Mine Development Plans 1 and 2 relative to the preferred option 3. Upon requests from the Panel for more information on the economic justification for those alternatives eliminated due to 'fatal flaws', Taseko submitted additional costing information in its Supplemental Report on the Assessment of Alternatives.

Taseko argued that Mine Development Plan 3 was the only economically feasible alternative based primarily on the additional capital and operating costs associated with Mine Development Plans 1 and 2. According to Taseko, Mine Development Plans 1 and 2 would require additional undiscounted life-of-mine capital and operating costs of \$536 million and \$337 million respectively, compared to option 3. Taseko noted that these estimates did not take into consideration the loss of unmined reserves should the Project proceed and a decision be made to extend the mine beyond the proposed 20 years. Moreover, Taseko submitted that its estimates were conservative as they did not include all additional capital and operational costs it would be required to invest.

Taseko's justification for eliminating Mine Development Plans 1 and 2 was based on economic thresholds, the most important of which were the waste rock and tailings storage methods and locations. Given the potential for metal leaching and acid rock drainage, it was determined by Taseko that sub-aqueous storage of potentially acid-generating waste rock was the only viable option. Taseko indicated that other potentially acid-generating waste rock management method had not been proven at the appropriate scale and would be uneconomical. In its Supplemental Report, Taseko reported that traditional or sub-aqueous storage of waste rock and tailings would require operating costs of \$0.10/tonne, while dry-stacked tailings would cost \$2.53 per tonne, and paste tailings would cost \$3.56 per tonne. Therefore, alternative mine waste storage and transport methods such as dry-stacked and paste tailings were deemed to be cost prohibitive.

##### **5.4.2.2: Views of Participants**

Environment Canada concluded in its presentation to the Panel at the public hearing that all 3 mine development plans were technically feasible. However, it noted that Mine Development Plan 3 did offer some advantages over plans 1 and 2, particularly with respect to the complexity of water management and seepage control measures. From an economic

perspective, Environment Canada agreed with Taseko that Mine Development Plan 3 would be the least costly.

The Panel consistently heard that the economic analysis completed by Taseko in the assessment of the alternative means of carrying out the Project did not include monetary values for social and cultural components that would be lost or affected by the mine. For instance, Environment Canada stated in its comments on the EIS, "the alternatives assessment fails to consider the environmental and social costs of alternatives considered." Numerous examples of social and cultural issues that participants felt should have been included in the alternatives assessment were presented to the Panel, including aesthetic values, social and cultural values and the intrinsic values of fishing, hunting, spiritual and cultural practices.

Participants noted that there were methods available for use that would quantify the social, cultural, and ecological values of the natural environment and the use of the natural environment. In response, Taseko stated that since the EIS Guidelines did not specify the methodology to be used for evaluating alternatives, it was not required to undertake such studies. Throughout the public hearing, First Nations participants maintained that it would be impossible to identify economic justification for the social and cultural impacts resulting from the loss of the Teztan Biny (Fish Lake) area, which they indicated had provided traditional food, medicine, and cultural continuity for generations.

During the public hearing, First Nations participants did not speak specifically about Mine Development Plans 1 or 2. However, they maintained their position of opposition regarding Mine Development Plan 3 and the resultant destruction of Teztan Biny (Fish Lake). Other participants raised concerns regarding the implementation of fatal flaw criteria based on economic risk and the justification of eliminating Plans 1 and 2 based on Taseko's conclusions regarding 'excessive' economic risk.

#### **5.4.3: TRANSMISSION LINE**

As a result of the direction in the EIS Guidelines, the only transmission line alternative examined was supplying electricity by means of a 230 KV transmission line connecting to the British Columbia electricity grid. Therefore, "alternatives to" the proposed transmission line in this case were different corridor options, as discussed in Section 5.3. This section addresses the proposed approach to selecting a right-of-way for the transmission line within the selected 500 m wide route in the preferred corridor from Dog Creek to the mine site.

##### **5.4.3.1: Proponent's Assessment**

Taseko identified Option 6 as the preferred corridor for the transmission line. Having selected the preferred option for the transmission line corridor, Taseko conducted a detailed assessment based on a 500 m wide route within which the 30 m to 80 m wide right-of-way would be located. Taseko indicated that the exact location of the right-of-way and the exact placement of transmission line poles (i.e. the centerline) would not be known until after the environmental assessment process was completed. The proposed transmission line would be constructed using two wooden-poles with a crossbar and three lines.

Taseko indicated in its EIS that the proposed transmission line would run west through the Secwepemc traditional territories, including the trap lines of the Esketemc (Alkali Lake Band) and Stswecem'c/Xgat'tem (Canoe Creek Band) on the west side of Fraser River, and through the Tl'esqox (Toosey Band) trap line on the east side of the river. Taseko stated that

the Fraser River aerial crossing would be 700 m wide. The grassland ecosystem bordering the Fraser River was reported as a delicate ecosystem, therefore, Taseko proposed the use of helicopters to transport and install the equipment and poles. Taseko noted that much of the proposed transmission line would be located in predisturbed land. The area had been affected by the forest industry, through clear-cut practices and an extensive network of access roads, as well as the mountain pine beetle infestation.

Taseko stated that they would minimize building new access roads during the construction of the transmission line by utilizing existing forestry roads to the extent possible. During the public hearing, Taseko also indicated the need to build a maintenance road along the right-of-way so it could access every pole if necessary. Taseko stated that it was in the process of determining the exact existing forestry roads that would be used and where, if any, new maintenance roads would need to be built.

In response to information request 6.2 from the Panel concerning mitigation strategies for the transmission line right-of-way, Taseko indicated that efforts would be made, to the extent possible, to construct the transmission line during non-critical periods for certain wildlife species (e.g. avoiding mule deer winter habitat during the winter months). More information on such mitigation strategies is provided in Section 6.7.

Concerning the assessment of archaeological and heritage resources potentially affected by the transmission line, the EIS Guidelines required Taseko to provide the results of a previously completed archaeological overview assessment. Taseko indicated during the public hearing that it had engaged an archaeological firm to begin conducting the detailed archaeological impact assessment that would be required prior to construction. This study would assist in determining the final centerline of the transmission line. Similarly, more detailed environmental studies were proposed to assist in the centerline location. Taseko noted that sensitive areas would be avoided given the flexibility in the placement of poles. Taseko indicated that they would be undertaking these assessments in the permitting phase, with particular regard to the Secwepemc areas around the Fraser River crossing.

#### **5.4.3.2: Views of Participants**

In the community hearing sessions, the Esketemc (Alkali Lake Band) indicated that they had not been consulted by Taseko nor had the effects of the proposed transmission line on their current use of lands and resources for traditional purposes or their Aboriginal rights and title been considered. They also reiterated that Taseko did not take into account their right to self-determination and their ambitions for the future. Furthermore, the Esketemc expressed concern that they did not have the capacity to meaningfully participate in the selection of the transmission line corridor.

Many interveners, especially in the Secwepemc communities of Stswecem'c/Xgat'tem (Canoe Creek Band) and Esketemc (Alkali Lake Band), raised concerns that Taseko had not completed an archaeological impact assessment on the proposed transmission line as part of the EIS. Taseko indicated that the reason behind the proposed archaeological impact assessment was to indicate where archaeology sites existed so that the first mode of mitigation could be to avoid their disturbance, where possible. However, First Nations indicated that the prospect of removing archaeological artifacts to be displayed in a museum was unacceptable. Some presenters indicated that the entire 500 m wide route and not just the 30 m to 80 m wide right-of-way would need to be assessed. Along these lines, some First Nation participants expressed support for an archaeological impact assessment to be

undertaken so that they could identify important sites for future protection and cultural learning purposes.

The Esketemc (Alkali Lake Band) forest manager, Mr. Chipman, expressed concern that a portion of the transmission line right-of-way would cross through the Esketemc Community Forest, an exclusive timber harvest zone. The Esketemc stated that it held a tenure right management licence to the forest comprised of approximately 26,000 ha. He indicated that the proposed transmission line would be the largest cut block in the Community Forest. Mr. Chipman also indicated the importance of the Community Forest to mule deer as part of their winter habitat. It was reported that the Esketemc practiced selective logging, leaving the forest canopy for winter habitat. He also indicated that the Community Forest included an old growth management area, although the extent to which the proposed transmission line would impact old growth areas in the Community Forest was unknown.

With the goal of maintaining the visual quality of the Fraser River valley, Ms. Kooy from the Stswecem'c/Xgat'tem (Canoe Creek Band) suggested Taseko widen the aerial crossing and use only 1 power line rather than 3. Taseko, however, indicated that widening the aerial crossing would require more robust poles and support infrastructure possibly increasing the negative ecological impact of installation and maintenance. Additionally, Taseko noted that the new structures would likely need to be larger, possibly resulting in a larger effect to the visual environment.

#### **5.4.4: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on the alternatives means of carrying out the Project, the Panel considered the following factors to be particularly relevant:

- the Panel heard that Mine Development Plans 1, 2 and 3 were all technically feasible, and that Mine Development Plan 3 was preferred by Taseko;
- participants noted that Mine Development Plan 3 would provide technical advantages over Mine Development Plans 1 and 2 in terms of water and waste management;
- Taseko stated the only economically viable option given the location of the ore body in proximity to Teztan Biny (Fish Lake) was the preferred mine development plan;
- participants also noted that Mine Development Plan 3 would have the greatest immediate environmental impact, particularly on the aquatic environment, and would have a potentially lower long-term environmental risk than Mine Development Plans 1 and 2;
- as a result of the close proximity of the ore body to Teztan Biny (Fish Lake), it would not be preserved as a functioning ecosystem under the preferred mine development plan;
- if expansion of the open pit were to occur in the future to maximize the extraction of the resource, the open pit would encroach on and eliminate Teztan Biny (Fish Lake) even if attempts were made to preserve it;
- criticism of Taseko's examination of alternative means of carrying out the Project focussed on the fact that it did not consider the ecological productivity of the affected areas, that the "fatal flaw" criteria used to eliminate Mine Development Plans 1 and 2 and the criteria used to evaluate the socio-cultural value of the land were not applied properly, and that there was inadequate consultation with First Nations; and
- the selection of the transmission line right-of-way would be chosen from within a 500 m wide route to avoid sensitive areas.



The Panel notes that the location of the open pit in proximity to Teztan Biny (Fish Lake) was a key issue in developing various mine development plans. While flexibility would exist to place the mill, the tailings storage facility and the waste rock stockpiles such that Teztan Biny would not be affected, the ore body itself was fixed. The Panel notes that Taseko examined 2 alternatives that would avoid the destruction of Teztan Biny. Mine Development Plan 2, with the tailings storage facility located upstream of Teztan Biny, would in time likely result in contamination of Teztan Biny. While Mine Development Plan 1 would preserve Teztan Biny, it would result in mine water discharge to another watershed and could also affect Teztan Biny if Taseko decided in the future to expand the open pit. While offering short terms benefits, the Panel agrees with the observations made by Taseko and Environment Canada that Mine Development Plans 1 and 2 would result in greater long-term environmental risk than the preferred alternative.

The Panel notes that expansion of the open pit would encroach on Teztan Biny (Fish Lake). While Taseko indicated that future mine expansion did not influence its consideration of alternatives, the Panel recognizes that there would be pressure to mine the full ore body in the future to maximize resource extraction. If the current Project proceeds and if future expansion was approved, Teztan Biny would be eliminated in any case.

While First Nations were clearly opposed to the preferred alternative, no support was offered for any of the other alternatives. The Panel observes that the proximity of the open pit and associated mining facilities would be close enough to Teztan Biny (Fish Lake) to eliminate the intrinsic value of the area to First Nations even if another alternative were chosen. It appears to the Panel, therefore, that none of the alternative mine development plans examined would receive support from First Nations.

The Panel notes that the *Canadian Environmental Assessment Act* requires the "examination of alternative means of carrying out the project that are economically feasible". Taseko indicated that there would be a substantial incremental cost associated with the two other mine development plans that would, from its perspective, render the Project uneconomical. The Panel is also aware that if the Project proceeds, Environment Canada would examine in more detail the choice of alternatives with respect to the deposit of mine waste into a natural fish-bearing water body, in accordance with provisions of the *Metal Mining Effluent Regulations*. Nevertheless, the Panel considers that the approach used by Taseko to select its preferred alterative was consistent with the requirements of the *Canadian Environmental Assessment Act*.

With respect to the proposed transmission line, the approach selected by Taseko, once the specific 3 km wide corridor had been chosen, was to select a 500 m wide route for further environmental studies. Within the selected route, further studies would be completed to identify and avoid sensitive environmental and archeological resource areas for the location of a 30 m to 80 m wide right-of-way. Within the right-of-way, Taseko would locate the centerline of the transmission line. The Panel also notes that considerable flexibility would exist in the actual location of the poles to avoid sensitive areas. In the Panel's view, this was an appropriate procedure for the consideration of alternative centreline locations for the transmission line.

**The Panel concludes that Taseko's rationale for selecting its preferred alternative for the mine development plan and its approach to selecting the centreline for the transmission line were reasonable for the purposes of this environmental assessment.**

## **SECTION 6: ENVIRONMENTAL EFFECTS**

### **6.1: OVERVIEW**

During the course of the review, participants focused their comments and submissions on areas they considered important, such as legislative requirements, the magnitude of the potential effects, the importance attributed to the ecosystem component or a personal connection to the issue. As such, rather than summarizing all the information contained in the EIS, the Panel has focused its conclusions and recommendations on those issues which in its opinion were important. These issues include areas of dispute between experts, areas where uncertainty in Taseko's conclusions or proposed mitigation existed, and areas where substantial new information was received during the course of the review.

### **6.2: SURFACE WATER**

Key issues relating to surface water (hydrology and water quality) identified by the Panel included changes to streamflow and watershed areas, the annual water balance, the role of acid rock drainage and metal leaching in developing the water quality model, receiving water quality and the associated effects on fish health. Each of these issues is discussed in more detail below. While groundwater contributes to surface water, the effects of the Project on groundwater are discussed in Section 6.3.

#### **6.2.1: CHANGES TO STREAMFLOW AND WATERSHED AREAS**

##### **6.2.1.1: Proponent's Assessment**

The Teztan Yeqox (Fish Creek) watershed was described by Taseko as having three discrete stream sections. Teztan Biny (Fish Lake) was characterized as the middle section, dividing the watershed into upper Teztan Yeqox and lower Teztan Yeqox. Drainages in the upper valley were stated to discharge primarily into small low-lying wetlands, bogs and lakes, which would slowly discharge into upper Teztan Yeqox. Upper Teztan Yeqox was reported to discharge into the southern arm of Teztan Biny (approximate elevation of 1457 masl). Teztan Biny would then drain into lower Teztan Yeqox, which would flow northeast and discharge into the Dasiqox (Taseko River) after passing through a steep canyon downstream of the Project (approximate elevation of 1275 masl).

The creeks in the Project area were generally characterized by high flows in the spring due to snowmelt and rainfall, and low flows in the late summer/early fall and winter. Teztan Biny (Fish Lake) was characterized as a natural storage reservoir for the flows of Teztan Yeqox (Fish Creek) above the ore body, so that water levels fluctuated less than 0.5 m for much of the year.

Wasp Lake, located at the southern boundary of the Teztan Yeqox (Fish Creek) watershed, was characterized as periodically draining south into Bisqox (Beece Creek). While situated outside of the Teztan Yeqox watershed, it could potentially be influenced by the Project.

Taseko stated that the Project would have adverse effects on surface water streamflow in Teztan Yeqox (Fish Creek), particularly during operations. The creation of the headwater diversion channel, tailings storage facility and Prosperity Lake would permanently alter the baseline flow regime for the Teztan Yeqox watershed. The impoundment of a large portion

of the natural runoff in Teztan Yeqox in the tailings storage facility would result in up to a 72% reduction in watershed area contributing to lower Teztan Yeqox. As a result, Taseko predicted that the annual flow volumes in lower Teztan Yeqox would decrease by approximately 65% during operations.

During operations, water from the south-flowing portion of headwater diversion channel that would not be required to maintain the minimum pond volume in the tailings storage facility would be directed to Wasp Lake, which would drain into Bisqox (Beece Creek). This additional streamflow was predicted to increase the contributing drainage area to Wasp Lake and Bisqox up to 14% during the pre-construction period until closure. As Wasp Lake was stated to discharge into Bisqox, Taseko predicted that the annual flow volume in the Creek would increase by approximately 4% during operations. Taseko concluded that the increased flow into Bisqox would be within the range of natural variability during the spring freshet for the Creek. Taseko also concluded that it would be unlikely for the increased flows in Bisqox to affect channel morphology.

Taseko reported that Teztan Yeqox (Fish Creek) only contributed approximately 1% of the Dasiqox (Taseko River) flow for the majority of the year. As a result of diverting a portion of the Teztan Yeqox watershed into Prosperity Lake, annual flow volumes in the Dasiqox would be reduced by 0.5%. During spring freshet, when the Dasiqox flow would be at its lowest, Teztan Yeqox would contribute up to 11% of the Dasiqox flow. Taseko indicated that any effect of reduced flows in the Dasiqox as a result of the Project would be immeasurable and insignificant.

In closure and post-closure, the Teztan Yeqox (Fish Creek) watershed would be restored to 104% of original baseline watershed area, as the Wasp Lake catchment would be incorporated in that drainage. While the watershed area would be restored to baseline conditions, Taseko predicted that during post-closure, the runoff regime of the Teztan Yeqox catchment would be altered from baseline conditions, as approximately 25% of the surface area in the catchment would be comprised of Pit Lake and tailings storage facility.

For Bisqox (Beece Creek), Taseko stated that in post-closure, water from Wasp Lake would flow into Prosperity Lake via a constructed channel. Therefore, there would be a small decrease in the Bisqox watershed area by 3.8 km<sup>2</sup>, reducing annual flow volumes by 0.5%. The decrease in surface water streamflow during closure and post-closure would be irreversible. However, due to the large size of the Bisqox watershed, Taseko stated that the annual decrease in flow volume due to the Project would be considered minor compared to the mean annual runoff for Bisqox.

Taseko proposed a number of mitigation measures to minimize the Project effects on surface water hydrology, including diverting a portion of the undisturbed upper Teztan Yeqox (Fish Creek) watershed north of the open pit via the headwater diversion channel. The diversion channel would help to minimize Project effects on lower Fish Creek by diverting approximately 1.25 Mm<sup>3</sup> of water annually. Additionally, Taseko proposed to restore the natural flow paths to lower Teztan Yeqox in post-closure. Finally, at closure, Taseko also proposed to construct a spillway in the crest of the main embankment of the tailings storage facility to allow the tailings storage facility supernatant pond to overflow and contribute to the surface water runoff to lower Teztan Yeqox via the open pit. This additional flow in lower Teztan Yeqox would be realized starting in post closure. With the application of these mitigation measures, Taseko predicted that the residual effect to surface water streamflow would not be significant.

### **6.2.1.2: Views of Participants**

During the public hearing, questions were raised regarding the effect that reduced flows in Teztan Yeqox (Fish Creek) would have on the Dasiqox (Taseko River). Fisheries and Oceans Canada questioned whether any effect on fish habitat in the Dasiqox was predicted as a result of the 11% reduction in flow volume into the river. Members of the Tsilhqot'in Nation expressed concern regarding whether the Dasiqox would experience temperature changes as a result of decreased flows, especially during spring freshet when Teztan Yeqox typically contributed up to 11% of the Dasiqox flow. Chief Marilyn Baptiste also raised questions regarding whether the flow inputs from Teztan Yeqox to the Dasiqox increased in importance during drought conditions as a result of climate change.

The Reuter family, owners of Taseko Lake Outfitters, raised concerns regarding the effects of increased flows in Bisqox (Beece Creek) as a result of the mine site water management plan. The Reuters commented that Bisqox had often come close to overflowing its banks in the past as a result of snowmelt, and expressed concerns that the increased flow into Bisqox via Wasp Lake would increase the likelihood of their property flooding due to increased flows into the creek from the mine site.

## **6.2.2: ANNUAL WATER BALANCE**

### **6.2.2.1: Proponent's Assessment**

Taseko completed annual water balance models for various Project components, including the tailings storage facility, using varying precipitation conditions for each year prior to start-up and for each of the 20 years of operation. Taseko stated that this approach was used to ensure that the tailings storage facility would provide sufficient storage to contain the annual runoff resulting from all reasonably probable precipitation conditions, including unlikely scenarios of consecutive wet or dry years. Further, Taseko stated that sufficient storage would be provided within the tailings storage facility to contain runoff from the 72 Hour–1/10,000 year precipitation event, while accommodating 1 m of wave run-up.

The data used as inputs for the water balance model consisted of 11 years of temperature data, 7 partial years of precipitation data, 1 year of evaporation data, 5 years of snowpack data and stream flow data from 2 different datasets. Taseko stated that in their opinion, the quality and quantity of data was sufficient to complete a feasibility level design of the various mine site structures. Further, Taseko stated most of the data was supported by regional patterns and that the consistency of the meteorological data was verified using a double mass curve analysis<sup>8</sup>.

Taseko stated that the results of the modeling exercise indicated that the tailings storage facility would operate within design criteria and that the site water management objectives would be met. Under extreme dry conditions, Taseko reported that there may be a requirement to divert a portion of flows from the catchment east of the headwater channel in order to maintain the necessary volume in the tailings storage facility to facilitate continuous, uninterrupted mine operations. However, Taseko indicated that there should be no requirement for a permanent make-up water supply as any temporary shortfalls could be appropriately addressed with careful management of water throughout operations.

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<sup>8</sup> Double mass curve analyses are used to determine whether there is a need for corrections to the data to account for changes in data collection procedures or other local conditions.

In response to information requests from the Panel and other interested parties, Taseko completed sensitivity analyses to assess the ability of the proposed water and tailings management plan to accommodate the full range of possible climatic scenarios. Scenarios examined included a most probable scenario, a dry scenario and a wet scenario.

Under the most probable scenario, model results indicated that there was approximately a 50% chance that there would be enough water in the tailings storage facility in almost all years of operation. However, the model indicated that there was a 5-20% chance that there could be an annual water deficit of up to 7,000,000 m<sup>3</sup> in any one year until Year 13.

In a dry scenario, there would be a very high probability of a water deficit occurring in the tailings storage facility, and a similarly high probability that there would be an insufficient supply of water available in Prosperity Lake to meet this need. Taseko modeled that there would be a 95% chance that additional water (up to 4,100,000 m<sup>3</sup>) could be required in any one year from Year 2 through Year 13 under the dry scenario. However, Taseko noted that the model also indicated that there was an approximate equal chance of surplus water being available.

In a wet scenario, Taseko predicted that there would virtually be no chance of having a water deficit in the tailings storage facility.

Taseko also identified the possibility that an additional 70,000,000 tonnes of potentially acid-generating waste rock could exist beyond what was originally estimated. Taseko stated that this volume of material could be accommodated in the tailings storage facility by raising the embankment height. However, Taseko indicated that its water balance modeling exercise did not take into consideration the potential requirement to store this material sub-aqueously in the tailings storage facility.

In response to questions regarding the water balance modeling, Taseko identified three potential sources of water that could be used to compensate for the potential deficits in the tailings storage facility resulting from both dry years or to accommodate the potential 70,000,000 tonnes of additional potentially acid generating waste rock. These sources included:

- the redirection of water in the north flowing headwater diversion channel, which would make 1,200,000 m<sup>3</sup> available; under the proposed mine operation plan, this water would normally flow into lower Teztan Yeqox (Fish Creek) and the Dasiqox (Taseko River);
- the capture of water spilling from Prosperity Lake into Wasp Lake, which would make 1,600,000 m<sup>3</sup> available; under the proposed mine operation plan, this water would normally spill over from Prosperity Lake into Wasp Lake even in extremely dry conditions; and
- pumping of water from deep groundwater aquifers.

Additionally, Taseko stated that if necessary, in order to compensate for any deficits in the tailings storage facility, it could implement additional measures. These measures could include temporarily reducing the minimum volume of water required in the tailings storage facility (established at 3,000,000 m<sup>3</sup>), extracting water from a confined deep groundwater aquifer located immediately south of the proposed open pit and adjacent to Teztan Biny (Fish Lake), or decreasing water demand by temporarily decreasing the throughput of the mine.



Assuming that the north-flowing water from the headwater diversion channel was redirected into the tailings storage facility and that the excess water from Prosperity Lake was captured and directed to the tailings storage facility rather than flowing into Wasp Lake, Taseko predicted that under the most probable mean annual precipitation and runoff scenario, the potential for a water deficit in the tailings storage facility to occur would be limited. Taseko stated the deficit was predicted to occur in Year 1 of operations and that the potential deficit would only potentially range from 645,000 m<sup>3</sup> to 1,700,000 m<sup>3</sup>.

#### 6.2.2.2: Views of Participants

Comments on water balance for the mine site were received from Environment Canada, Natural Resources Canada, the Tsilhqot'in National Government, and during the review of the EIS, from the provincial Ministry of Environment – Environmental Protection Division.

Environment Canada concluded that given the high variability and scarcity of regional hydro-meteorological data, and given the limited amount of local data, there was uncertainty in Taseko's estimates of mean annual precipitation and mean annual unit runoff for the Project. Despite Taseko's conclusions that there was a high probability of surplus water being available on site, Environment Canada stated that the possibility of seasonal water shortages could not be ruled out due to the variable nature of the climate conditions in the area. Overall, Environment Canada concluded that the hydrology and water balance assessment was performed using accepted hydrologic methods given that the Project area was located in an ungauged area and therefore, that the water balance results were plausible.

Natural Resources Canada also commented on the proposed contingency plan of utilizing water from a deep groundwater aquifer to supplement the water balance. While Natural Resources Canada accepted Taseko's conclusion that it was unlikely that groundwater would be required to supplement flows into the tailings storage facility, it noted that if make-up requirements exceeded the groundwater extraction rate estimated for pit dewatering purposes, the environmental effects of the additional pumping would not have been implicitly taken into account. Furthermore, Natural Resources Canada concluded that any such effects would be felt mainly *upstream* of the proposed pit. This would result in increased groundwater seepage from the water collection pond and the tailings storage facility, possibly exacerbating the problem that was supposed to be mitigated in the first place. In Natural Resources Canada's opinion, if groundwater extraction was deemed necessary, a thorough quantitative analysis of these potential effects would be necessary, requiring Taseko to revise the numerical groundwater flow model presented in the EIS.

The Tsilhqot'in National Government retained the Stratus Consulting Group to complete a review of the water balance for the site. On behalf of the Tsilhqot'in National Government, the Stratus Consulting Group questioned the adequacy and reliability of the data used by Taseko to perform the Monte Carlo simulation, due to the lack of site specific data. Given the uncertainties associated with the input data, Dr. Ann Maest with the Stratus Consulting Group stated "...we feel that there's too much uncertainty about the water balance to ensure -- to make everyone feel comfortable that the mitigation measures that are proposed, especially keeping the tailings material wet all the time in perpetuity, can be accomplished."

During the course of the review of the EIS, the provincial Ministry of Environment was involved in the review of the water balance. The Ministry of Environment – Environmental Stewardship Division raised concerns regarding site water balance, stating that the

hydrometeorological data collected for the Project was not representative and of poor quality. The Environmental Stewardship Division also questioned the availability of contingency measures in the event that Taseko had underestimated the amount of water necessary to operate the facilities.

The provincial Ministry of Environment – Environmental Protection Division also raised concerns regarding Taseko’s understanding of the regional hydrogeology, which could affect the availability of water for the tailings storage facility. Concerns regarding hydrogeology are addressed in Section 6.3.

### **6.2.3: DEVELOPMENT OF THE WATER QUALITY MODEL**

#### **6.2.3.1: Proponent’s Assessment**

The results of the kinetic tests for acid rock drainage and metal leaching studies were used to help develop the water quality model. Estimates of chemical loadings from the different Project components were used together with the site water balance to generate overall water quality predictions.

Acid rock drainage and metal leaching would be derived from the natural weathering of sulphide-containing rocks. The environmental impact of acid rock drainage and metal leaching would depend on the magnitude of the acidity, the sensitivity of the receiving environment and the degree of neutralization, dilution and/or attenuation. Pathways through which site-water effected by acid rock drainage and metal leaching could enter the environment include surface water discharges to Teztan Yeqox (Fish Creek), seepage via the west and main embankment, and groundwater discharges to adjacent watersheds.

Taseko began investigation and characterization programs for acid rock drainage and metal leaching in 1993. Investigations included the following:

- a number of phases of static testing carried out to characterize the variability of acid rock drainage potential and metal content of the rocks, including acid-base accounting and short term leach tests;
- kinetic geochemical and tailings characterization programs consisting of laboratory humidity cells and saturated column testing, designed to provide input into waste management planning; and
- water chemistry predictions (source terms) to inform the overall environmental assessment.

Based on the results of these tests, site water chemistry predictions for saturated and unsaturated tailings, non-potentially acid-generating waste rock storage, submerged potentially acid-generating waste and the open pit were produced.

The mineralization studies indicated that the principal sulphide minerals associated with the gold-copper porphyry deposit were pyrite and chalcopyrite. Anhydrite and gypsum were shown to be the major sulphate minerals in the deposit, and occurred below a zone of broken and weakly weathered rock, caused by the dissolution of gypsum. Elements with the potential to leach metals were identified as arsenic, antimony, copper, cadmium, molybdenum, lead and zinc.

The acid-base accounting results revealed that for waste rock, there was no correlation between rock type and neutralization characteristics such as neutralization potential / acid potential ratio, as most rock types exhibited a wide range of neutralization potential / acid

potential values. Further testing was conducted to determine whether the waste rock could be successfully managed by segregating the material into potentially acid-generating and non-potentially acid generating during mining. Overall, the results indicated that segregation would be a feasible waste management strategy for the Project. However, Taseko recognized that segregation during mining would be more challenging in some areas than in others and therefore, it stated that monitoring would be necessary to ensure waste rock was appropriately classified and managed.

Taseko recognized that misclassification of waste rock materials could occur during mining. Although segregation failures as high as 10% had historically been recorded, Taseko indicated that segregation failures at the Project would affect only 3% of the rock, and that it was a typical estimate for modern open pit mine operations. This would mean that about 3% of the rock materials sent to the non-potentially acid-generating waste rock pile would be potentially acid-generating rock.

Further modelling was completed by Taseko to help determine whether the misclassification of waste rock would result in adverse environmental effects. Taseko stated that the non-potentially acid-generating rock mass would contain sufficient material with a high neutralization potential / acid potential to absorb any misclassification errors at the large scale, and that overall, the non-potentially acid-generating waste rock pile would not produce acid rock drainage and metal leaching.

The delay to the onset of acid rock drainage in the potentially acid-generating rock was calculated based on kinetic test results. Taseko predicted that 50% of rock could be expected to become acidic from about 215 years (worst cases estimate) to 385 years (best case estimate). A small proportion of rock (5%) was shown to become acidic within 38 years. Since Taseko planned to flood the potentially acid-generating rock within 2 years of placement, it was expected that pH neutral weathering conditions would be maintained within the potentially acid-generating waste rock pile.

Taseko also reported that tests conducted on ore samples indicated a sufficient neutralization potential to eliminate any acid produced over the planned duration of exposure in both the open pit and the low grade ore stockpile.

Taseko stated that for tailings, test results indicated that the full scale tailings were expected to be non-potentially acid-generating. However, monitoring of the acid base accounting characteristics of the bulk tailings product would be necessary to ensure that full scale tailings conformed to these expectations. Testing also indicated that runoff from exposed tailings beaches would be dominated by leaching of gypsum and therefore, would not be acid generating. Taseko indicated that metal leaching during the operational period would be negligible, and at closure there would be no exposed tailings to contribute loadings to surface runoff. Subaqueous column testing on Phase 5 combined tailings samples indicated that tailings disposed underwater would leach low concentrations of most heavy metal ions.

Taseko noted that an acid rock drainage/metal leaching prediction and prevention plan would be a requirement of the provincial *Mines Act* permit for the Project and that acid rock drainage/metal leaching assessments would need to be continued for mine construction and operations in the form of confirmation of preliminary findings based on short-term testing, calibration of test work results to site conditions and ongoing monitoring to direct waste management activities.

### 6.2.3.2: Views of Participants

During the course of the review, various participants raised concerns regarding the methodology used by Taseko in predicting the lag time prior to the onset of acid rock drainage and metal leaching, the likelihood of neutral pH metal leaching, and the source terms used for site water chemistry predictions.

Environment Canada agreed that Taseko's findings were conservative with respect to the acid generating potential of mine wastes and Taseko's predictions regarding the amount of potentially acid generating material that would be produced. Overall, Environment Canada stated that Taseko had recognized that all potentially acid generating materials would need to be appropriately managed to prevent acid rock drainage.

Natural Resources Canada expressed concern that Taseko did not adequately explain the rationale for the lag time applied before the onset of acid rock drainage and metal leaching. Further, the department noted that the extrapolation of laboratory test results to the field resulted in uncertainties in the water quality predictions. However, as a result of ongoing discussions with Taseko, Natural Resources Canada indicated that it was satisfied that these issues had been adequately addressed and stated during its presentation to the Panel that "there are no fatal flaws in the acid rock drainage metal leaching assessments performed by the Proponent."

Despite Natural Resources Canada's conclusion, it cautioned that two outstanding issues could require further attention: metal or metalloid mobilization under neutral pH, oxygen-poor conditions and the potential occurrence of elevated levels of selenium in mine site waters. Regarding the mobilization of metals under neutral pH, oxygen-poor conditions, Natural Resources Canada concluded that Taseko had not considered the possibility of metal leaching from fresh rocks under near-neutral pH conditions. Natural Resources Canada recommended Taseko should either provide evidence, prior to commencement of mining, that under-water disposal of mine wastes would not lead to significant metal leaching under all conditions or commit to close monitoring of the pertinent elements in all mine-derived waters during operation and post-closure, and treating them if required prior to their discharge to the receiving environment.

Regarding the potential occurrence of elevated levels of selenium of mine derived waters, Natural Resources Canada commented that while Taseko noted the potential occurrence of elevated levels of selenium, it did not provide sufficient detail regarding the possible sources. Natural Resources Canada recommended an appropriate geochemical study be conducted to identify the selenium source(s) and a suitable management plan be developed for handling these suspect materials (e.g. segregation). Alternately, Natural Resources Canada stated it would be acceptable if Taseko implemented appropriate water treatment should selenium levels become a concern during operation or post-closure of the mine.

The Tsilhqot'in National Government retained Dr. Kevin Morin of the Minesite Drainage Assessment Group and Dr. Ann Maest of Stratus Consulting Group to review the acid rock drainage/metal leaching predictions made by Taseko. Dr. Morin and Dr. Maest concluded that Taseko's predictions were unreliable and unsubstantiated due to a number of factors, including inconsistencies in information and lack of supporting data. In particular, Dr. Morin and Dr. Maest expressed concern with:

- the number of acid-base accounting samples used to determine the volume of potentially acid-generating versus non-potentially acid-generating waste on site;

- the lack of larger scale, onsite kinetic tests to supplement the small-scale laboratory humidity cell tests completed by Taseko;
- the uncertainties in predicted results from the use of small-scale laboratory humidity cell test results in the water quality model and the lack of stabilization in kinetic test results indicating the probability that the onset of metal leaching was not fully realized;
- the methodology used for the humidity cell tests, including the use of unrepresentative rock samples and the length of the tests;
- the potential misrepresentation of neutralization potential contained in the waste rock, tailings and overburden;
- the probability of metal leaching and acid rock drainage under neutral pH conditions;
- uncertainty regarding the likelihood that Taseko's prediction of the ratio used to determine which rock would generate acid (i.e. net potential ratio of 2.0) was accurate; and
- disagreement over the time to onset of acid rock drainage and metal leaching due to uncertainty regarding test results used in the calculation, lack of model calibration and application of a correction factor to account for elevation.

In the Tsilhqot'in National Government's opinion, these uncertainties indicated that all the potentially acid-generating and non-potentially acid-generating material stored outside of the tailings storage facility would generate acid quicker than predicted by Taseko. This would cause the downstream water quality estimates to be worse than predicted and as a result, active water treatment would be required much sooner than predicted during operations.

#### **6.2.4: RECEIVING WATER QUALITY AND TREATMENT METHODS**

##### **6.2.4.1: Proponent's Assessment**

Water quality in the Teztan Yeqox (Fish Creek) watershed was characterized as relatively pristine. Metal levels in all the streams studied were within British Columbia and Canadian Council of Ministers of the Environment Environmental Quality Guidelines with few or no exceedances. Exceptions included Teztan Yeqox (iron, total aluminium), Dasiqox (Taseko River) (total and dissolved aluminium, copper and iron), Bisqox (Beece Creek) (total and dissolved aluminium) and Groundhog Creek (iron).

Taseko noted nutrient levels and aquatic productivity tended to be higher in Teztan Yeqox (Fish Creek) than in Dasiqox (Taseko River), reflecting the influence of glacier melt in Dasiqox. Teztan Yeqox displayed moderate to high productivity and diversity, and the presence of many organisms that provide prey for fish.

Based on the Project design, no releases of mine site water to the receiving environment would occur until the post-closure period. Any water that had come into contact with the mine site would be directed to either the supernatant pond within the tailings storage facility or the water collection pond located south of the open pit. During operations, any seepage from the main embankment of the tailings storage facility would be collected in the water collection pond and recycled back into the tailings storage facility and seepage from the west embankment would be collected in seepage collection ponds and pumped back to the tailings storage facility.

In the post-closure period, mine site water, including seepage from the main embankment, would flow through Pit Lake prior to release to the receiving environment. Pit Lake would

also become a groundwater discharge area. Once acceptable water quality was demonstrated, seepage from the west embankment would discharge to the receiving environment (i.e. Jidizay Biny (Big Onion Lake)) via constructed channels from the seepage collection ponds.

Since discharges of surface water to the receiving environment were not predicted to occur during construction, operation or closure, Taseko focused its assessment of water quality effects on the post-closure period. Based on acid-rock drainage and metal leaching predictions, Taseko predicted that levels of most parameters in the tailings storage facility would reach maximum values in Year 20, and then decrease as tailings deposition ended and clean water from the headwater diversion channel was introduced into the tailings storage facility via Prosperity Lake. Taseko predicted that water quality in the tailings storage facility would exceed federal or provincial water quality guidelines for sulphate, fluoride, dissolved aluminum, antimony, arsenic, cadmium, copper and selenium at varying periods until Year 54.

Discharges from the open pit were not predicted to begin until Year 44. At that time, predicted concentrations of many parameters would be considerably higher than baseline conditions. Additionally, sulphate, fluoride, dissolved aluminum, antimony, arsenic, cadmium, copper, mercury, selenium and vanadium were predicted to exceed water quality guidelines. However, despite these exceedances, Taseko stated that levels of metals in the open pit were predicted to be well below authorized limits of deleterious substances in mine effluent, as listed in Schedule 4 of the *Metal Mining Effluent Regulations*.

As a result of inputs from the tailings storage facility and Pit Lake, post-closure levels of metals in Teztan Yeqox (Fish Creek) were predicted to be higher than during operations. In Year 44, maximum concentrations for 24 parameters were predicted to be higher than the maximum concentrations of baseline conditions, by a factor of 1.4 to 280. Modeling of the reasonable worst-case scenario indicated that water quality in lower Teztan Yeqox was predicted to exceed the water quality guidelines year round for sulphate, dissolved aluminum, antimony, arsenic, cadmium, copper, iron, selenium and vanadium. The changes to post-closure water quality in lower Teztan Yeqox were found by Taseko to be high in magnitude, local, and lasting into the far future.

Taseko also assessed the potential effects of the Project on the Dasiqox (Taseko River). Taseko stated that the Dasiqox was more sensitive to acidity and metals than Teztan Yeqox (Fish Creek) and provided important habitat for a number of fish species. Further, given that Teztan Yeqox contributed up to 11% of the Dasiqox flow in the spring, Taseko stated the Dasiqox would be most sensitive in the late winter and early spring periods. Taseko predicted that most parameters would exceed baseline conditions, that dissolved aluminum and cadmium would exceed water quality guidelines year-round, and that selenium and copper may also exceed Canadian Council of Ministers of the Environment water quality guidelines. The changes to post-closure water quality in the Dasiqox were found by Taseko to be regional and extend into the far future, but given the high amount of dilution of Teztan Yeqox water in the river, to be low in magnitude.

In order to mitigate potential effects on Teztan Yeqox (Fish Creek) and to address the inherent uncertainty in the predictions of pit water quality, Taseko stated that it would assess the need for treatment of pit water through monitoring programs during operations and closure. Should monitoring indicate the need for water treatment, Taseko committed to



implementing an appropriate treatment technology. This commitment was included in the provincial Environmental Assessment Certificate (see Appendix 4, Commitment 8.7).

In response to information request 4.1 from the Panel, Taseko provided additional information regarding the proposed water treatment system. Taseko clearly indicated that water treatment was only being considered as a potential contingency and was not a predicted requirement. Taseko stated that its understanding of the water quality at the mine site would be further developed during operational monitoring. If at some point in the future, the water treatment contingency developed into a possibility, a more detailed review of potential technologies would be undertaken by engaging a water treatment specialist. With these caveats, Taseko indicated that a potential treatment methodology would be reverse osmosis. Taseko indicated that reverse osmosis was an industrially proven technology for the treatment of sulphate, selenium and cadmium. While more expensive than other effective and conventional methodologies, it was identified because it was well understood and provided a conservative costing for water treatment.

If only the combined effluent from the main embankment and non-potentially acid-generating waste rock storage area (3.2 million m<sup>3</sup>/year) required treatment starting in Year 20, Taseko estimated that the capital cost of reverse osmosis treatment would be \$7,000,000 USD, with yearly operating costs of \$4,300,000 USD. If the entire volume of the open pit required treatment, Taseko estimated that the capital cost would be \$23,000,000 USD, with yearly operating costs of \$14,000,000 USD. Under both scenarios, Taseko confirmed that the Project would still be economically feasible, based on the assumption that the treatment plant could be in operation for 100 years.

Additionally, Taseko stated that due to the conservative nature of the water quality model, predicted concentrations of parameters were likely to be higher than the actual discharge concentrations. Taseko stated that uncertainty about predicted versus actual pit water discharge concentrations would be addressed by the development of site-specific water quality guidelines for sulphate, dissolved aluminum, cadmium and dissolved and particulate iron.

During the public hearing, Stantec, on behalf of Taseko, stated that the only parameter for which it could not be certain treatment would be effective was sulphate. Taseko predicted that sulphate levels in the Pit Lake discharge would be approximately 3.5 times higher than the provincial water quality guideline. However, Taseko noted that in their opinion the provincial water quality guideline for sulphate was very conservative.

Taseko conducted a second modeling exercise using the lower of either the water quality guidelines or predicted post-closure water quality in the open pit. The second modeling exercise was completed to account for the conservative nature of the model and the development of site-specific water quality guidelines. The results of this modeling exercise indicated that while levels of several parameters would be higher than baseline levels, only sulphate levels in Teztan Yeqox (Fish Creek) are predicted to exceed both water quality guidelines and baseline values. Therefore, Taseko concluded that residual effects were only expected for sulphate. However, based on the development of a site-specific guideline for sulphate, no adverse environmental effects were predicted for Teztan Yeqox as a result of the predicted sulphate levels.

Regarding the development of site specific water quality guidelines, Taseko indicated that site specific guidelines would be appropriate for certain parameters. The Canadian Council

of Ministers of the Environment Water Quality Guidelines were characterized as nationally approved, generic guidelines for protection of water and aquatic life. However, the Environment Water Quality Guidelines did not take into consideration site-specific conditions, such as the naturally high sediment loads found in the glacier-fed Dasiqox (Taseko River), elevated baseline metals levels in mineralized areas (typical of mining areas), total versus dissolved metals or organic carbon content. The British Columbia guidelines were stated to be slightly more representative, as hardness for additional metals was taken into account. If appropriate and necessary, site-specific objectives that take into account local conditions would be developed. Taseko determined that the discharge of water from the open pit to the receiving environment in post-closure was not predicted to result in significant adverse environmental effects.

With respect to seepage from the tailings storage facility, Taseko predicted that seepage rates in the post closure period would be 0.004 m<sup>3</sup>/s throughout the year, which would contribute 0.005% (summer peak flow) and 0.1% (early spring low flow) of the volume of the Dasiqox (Taseko River). Taseko predicted that this seepage into the Dasiqox would not result in any major change to the water quality. Aluminum and cadmium were both predicted to exceed the relevant water quality guidelines. However, Taseko stated that because these parameters naturally exceeded the water quality guideline, coupled with the dilution factor provided by the Dasiqox, the Project would not result in a measurable increase in these parameters in the Dasiqox. The effects of seepage on Jidizay Biny (Big Onion Lake) are discussed in Section 6.3.

#### **6.2.4.2: Views of Participants**

Overall, Environment Canada concluded that no significant deleterious effects on water quality were expected if Taseko followed the good waste and water management practices identified in the EIS. Despite Environment Canada's overall conclusion, it identified a number of risks and uncertainties associated with the predicted water quality and related mitigation measures.

Environment Canada noted in its submission to the Panel for the topic specific hearing sessions that while no discharges to the receiving environment were planned until the post-closure period, it was possible that discharges could occur earlier than expected due to events such as a malfunction or accident, unanticipated water surpluses at the site, or an early mine shutdown. Environment Canada stated that while the risk was low, Taseko should be prepared, on a contingency basis, to address such discharges.

Environment Canada also highlighted uncertainties with respect to Taseko's use of dissolved metals in the modelling exercise rather than total metals, indicating that this may have underestimated water quality effects. Further, the department stated that it was possible that traditional water quality modelling methods may have underestimated potential selenium levels in receiving waters. Environment Canada stated that underestimating selenium levels could potentially be the most significant risk associated with Taseko's modelling.

With respect to the requirement for water quality treatment, Environment Canada stated that if Taseko's predictions as outlined in the EIS were realized, it was likely that water treatment would be required. The importance of the treatment plant was further discussed by Environment Canada, as it indicated that the construction and operation of a treatment plant would be necessary to assure that water quality in the Dasiqox (Taseko River) would not be

significantly affected. Environment Canada highlighted a number of uncertainties regarding the proposed water treatment plant during its presentation to the Panel, including the high cost of reverse osmosis technology and issues with ongoing maintenance, particularly in the long-term.

Another uncertainty in the water quality model highlighted by Environment Canada was with respect to the conservative nature of the water quality predictions. Environment Canada stated during its presentation on water quality:

*...while we may accept that the predicted levels will not likely be exceeded and that conditions will likely be better than predicted, there is no indication by how much better those levels may be and, more importantly, there's no indication of how often we might expect levels to be very much better than expected or how often we might expect levels to be just a little bit better than expected or as predicted. Consequently, we really have no choice but to take those predicted levels at face value and presume that those predicted levels will be the levels that occur. And, as a consequence of that, we look at the unmitigated predictions of water quality at Fish Creek and conclude that there may very well be adverse effects on water quality in Fish Creek if those levels are not mitigated.*

Environment Canada also indicated that there was uncertainty regarding the proposed seepage mitigation measures. Environment Canada noted that, if there were any areas where Taseko was unable to capture the seepage, there was a risk that it would enter the receiving environment unmitigated, potentially resulting in an adverse effect. However, in response to questioning by MiningWatch Canada, Environment Canada indicated that while the risks associated with seepage may be higher than predicted by Taseko, it did not consider those risks to be insurmountable from a technological perspective.

Natural Resources Canada questioned whether the high levels of dissolved organic carbon in Teztan Yeqox (Fish Creek) would affect the conservatism Taseko stated was built into its water quality modeling results. Therefore, Natural Resources Canada was of the opinion that an appropriate treatment of water from the mine site would be required prior to discharge to the receiving environment.

Natural Resources Canada also questioned Taseko regarding the number of copper mines with similar ore characteristics to the Project that required treatment in perpetuity. Taseko replied that of the 13 sites outlined in its presentation to the Panel, 5 were known to require ongoing water treatment.

Based on concerns previously reported regarding the accuracy of the acid rock drainage / metal leaching predictions, the Tsilhqot'in National Government also identified a number of concerns regarding the water quality predictions for the Project. Dr. Ann Maest of Stratus Consulting Group, presenting on behalf of the Tsilhqot'in National Government, indicated that the contaminants of concern modelled by Taseko may not have accurately reflected the full suite of contaminants that could be released from the mine waste and that modeled predictions underestimated concentrations of parameters of concern. Concern was also expressed that as a result of incorrect lag times for the onset of acid rock drainage/metal leaching, active treatment of mine water could be required as early as during the operations phase of the Project. Dr. Maest also expressed concerns regarding the reverse osmosis process for water treatments stating that in her experience it was less than effective.

During the course of the public hearing, the Panel heard concerns from other First Nation organizations regarding contamination of waterbodies surrounding the proposed mine site. In particular, the Chilko Watershed Roundtable indicated that seepage from the mine site into the Dasiqox (Taseko River) and Fraser River was an issue of major concern with the Xení Gwet'in (Nemiah Band). The Panel also heard from First Nation members themselves, who indicated that they wanted to be able to continue to drink directly from lakes and streams in the Project area. Ms. Shari Hughson, Community Health Nurse for the Xení Gwet'in, indicated that people from that community gathered drinking water from rivers and mountain streams, and she was concerned that the Project would negatively affect water quality. Numerous members of the Tsilhqot'in Nation expressed to the Panel the importance of water as a traditional value and how water was sacred to them. During the community hearing session in Xení Gwet'in, members of the community also raised concerns with the potential need for water quality treatment into perpetuity.

The British Columbia Ministry of Environment identified a number of concerns during the course of the review of the EIS. The Ministry of Environment expressed concerns about uncertainties in the modelling and predicted water quality of the open pit and indicated it would require more precise predictions based on actual data as the open pit filled with water. The Ministry of Environment also expressed concern that Taseko had not proposed sufficient monitoring beyond the life of the Project, and indicated that bonding would be required to ensure that monitoring occurred until water quality was within prescribed guidelines and could be discharged into Teztan Yeqox (Fish Creek). However, the Ministry of Environment indicated that it would be satisfied if Taseko met the commitments in the provincial Environmental Assessment Certificate, including the commitment to meet either site specific or generic water quality guidelines through a combination of natural attenuation processes in the open pit and, if required, the implementation of water treatment (Appendix 4, Commitment 8.7).

## **6.2.5: EFFECTS ON FISH HEALTH IN THE DASIQOX (TASEKO RIVER)**

This section addresses changes to water quality that could affect the health of fish. Increased metal levels in fish tissue could occur as a result of uptake of metals discharged from the open pit in the post-closure period.

### **6.2.5.1: Proponent's Assessment**

Taseko collected fish tissue samples from 1993 to 1997 throughout the regional study area to establish background levels for metals. Additional sampling of rainbow trout was conducted in 2006 to augment the baseline data. Fish tissue were analyzed for various metals, including selenium levels, and compared against the British Columbia fish tissue guidelines and literature values. Results of the analysis revealed that baseline levels of metals in fish tissue in the Project area varied depending on the parameter and location of the sample, with exceedances of some guideline levels being reported.

Taseko assessed the effects of the Project on fish health starting in the post-closure period, when discharges to the receiving environment were predicted to begin. Predictions were developed using an ecological risk assessment approach, and combined predicted water quality with an estimation of the amount of contaminants that would accumulate in fish tissue.

Taseko predicted metal levels in fish tissue based on the assumption that the British Columbia water quality guidelines would be met, rather than using worst case water quality

predictions. Based on these guidelines, Taseko predicted that no metals would be expected to exceed British Columbia guidelines for fish tissue.

Taseko undertook a further analysis to predict post-closure levels of metals in fish tissue for arsenic, selenium and mercury to ensure that the method used was appropriate for these contaminants. The results of that analysis indicated that the post-closure levels of arsenic would be lower than initially predicted. For selenium, the analysis revealed that levels in fish may be higher than initially predicted for Teztan Yeqox (Fish Creek) post-closure, although site-specific influences and the likelihood of lower than predicted selenium levels in water would help mitigate this effect. The analysis also concluded that mercury/methyl mercury concentrations in fish were expected to be similar to those observed during the baseline monitoring.

Taseko concluded that the discharge of pit water in the post-closure phase would not result in adverse effects on fish tissue quality in lower Teztan Yeqox (Fish Creek) or the Dasiqox (Taseko River), beyond those already present at baseline, given that water quality would meet site-specific water quality guidelines.

#### **6.2.5.2: Views of Participants**

MiningWatch Canada raised questions regarding the bioavailability of metals in discharge water for fish. MiningWatch Canada also questioned the role of Environment Canada's Environmental Effects Monitoring program under the *Metal Mining Effluent Regulations*. In response, Environment Canada noted that the *Metal Mining Effluent Regulations* only applied to operating mines that discharged a minimum of 50 m<sup>3</sup>/day to the receiving environment. While the definition of effluent under the *Metal Mining Effluent Regulations* included seepage, the application of the Regulations would depend on the timing of when seepage began to occur during mine life. In the absence of the application of the *Metal Mining Effluent Regulations*, Environment Canada stated that at a minimum, the general prohibition regarding the deposit of deleterious substances under the *Fisheries Act* would apply.

The Tsilhqot'in National Government retained Dr. Jeff Morris of Stratus Consulting Group to review the potential effects of the Project on fish health. Dr. Morris indicated that while Taseko compared predicted metal levels in fish tissue to the British Columbia guidelines, a more appropriate guideline for use when determining whether there would be a significant adverse effect would be the British Columbia 30-day guideline, referred to as the 'chronic' guideline.

With specific reference to copper and cadmium, Dr. Morris raised concerns that based on Taseko's predictions, adverse, sub-lethal effects on fish could be observed at the Dasiqox (Taseko River), Teztan Yeqox (Fish Creek) and Jidizay Biny (Big Onion Lake). This was due to Taseko's predictions that levels of contaminants would meet or exceed the British Columbia 30-day guideline for copper and cadmium. Coupled with the uncertainties expressed by other Tsilhqot'in National Government experts regarding the water quality predictions, Dr. Morris expressed concerns that sub-lethal effects, and potentially even lethal effects, to fish could be experienced if Taseko had underestimated the water quality predictions in the receiving environment. Based on Taseko's worst case water quality predictions, Dr. Morris concluded that concentrations of copper would only need to increase by 8 – 27 µg/L and concentrations of cadmium would only need to increase by 0.5 to 1.3 µg/L to reach acutely lethal concentrations.

The Panel heard from a number of First Nation participants regarding the importance of the salmon fishery as a food source for First Nation people. For instance, the Tsilhqot'in National Government retained Mr. Richard Holmes, who provided information during the public hearing on the economic importance of the salmon fishery and the importance of the salmon fishery to the Tsilhqot'in. The Panel also heard that Teztan Biny (Fish Lake) fishery was used by First Nation members as a secondary food fishery when salmon runs were low. Ms. Shari Hughson stated "The salmon run was very low this year, so fishing in the fall and ice fishing in the winter became critical in all the local lakes, including Teztan Biny, which became a critical food supply." In its submission to the Panel for the public hearing, Fisheries and Oceans Canada also recognized the role that Teztan Biny played as a reserve First Nation food fishery, which is discussed further in Section 8.2. Despite Taseko's predictions that fish would not be adversely affected as a result of the Project, the Panel heard from a variety of First Nation individuals, including Nora Johnny and former Chief Tommy Billyboy that fish from the Project area would not be eaten as a result of the perception of risk.

#### **6.2.6: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on surface water, the Panel considered the following factors to be particularly relevant:

- the Project would result in a 65% reduction in the annual flow volumes in lower Teztan Yeqox (Fish Creek) during operations;
- the lower Teztan Yeqox (Fish Creek) watershed area contributing to the Daisqox (Taseko River) would be reduced by approximately 0.5% during operations and restored to approximately 104% at closure;
- the Teztan Yeqox (Fish Creek) watershed contributed about 1% of the flow of the Daisqox (Taseko River) on average and 11% during the spring freshet of Teztan Yeqox;
- during operations, flow from Prosperity Lake to Wasp Lake and into Bisqox (Beece Creek) would increase by approximately 4% and decrease by 0.4% at closure;
- there was uncertainty regarding whether there would be enough water available to meet the requirements of the mine site, particularly with respect to maintaining a sufficient water cover in the tailings storage facility to ensure the submerged mine waste rock would not become acid generating;
- Taseko indicated that as a contingency, additional water could be made available by diverting additional water from the headwater diversion channel into Prosperity Lake and/or using groundwater;
- many of the effects to surface water hydrology would be reversible in the post-closure period;
- the Project would be designed such that there would be no planned discharge of water from the mine site to the receiving environment until Year 44;
- there was uncertainty regarding the quantity of potentially acid generating waste rock and also the predicted acid generation that would result;
- there was uncertainty regarding the characterization of leachable metals;
- there was uncertainty regarding the likelihood of the need for active water treatment in the post-closure period;
- while water treatment was viewed as a contingency by Taseko, it confirmed that, if treatment was required for 100 years, the Project would still be economically feasible;

- similar mines in British Columbia have required ongoing water treatment to meet regulatory requirements; and
- Taseko indicated that metal levels in fish tissue in the Dasiqox (Taseko River) would remain below applicable guidelines; however, First Nations indicated they may not eat salmon from the area due to the perception of contamination.

The retention of water at the mine site during operations and closure would considerably reduce flows from the Teztan Yeqox (Fish Creek) watershed into the Dasiqox (Taseko River). However, the Panel considers these flows to be a small portion of the total flow in the Taseko River even during the spring freshet. During operations the Panel considers these changes to be low in magnitude and would be reversible at closure. With respect to Bisqox (Beece Creek), the flow would increase by 4% during operations. The Panel notes that concerns were raised by the owners of the Taseko Lake Lodge that even a small increase in flow could result in flooding of their property. However, the Panel notes that any increase in flow levels in Bisqox would be within the range of natural variability and that the flow regime would be restored to near baseline conditions at closure. Given the concerns raised regarding flooding at Taseko Lake Lodge, the Panel encourages Taseko to explore options for water management during the spring freshet in order minimize potential flooding at this location.

**The Panel concludes that the Project would not result in a significant adverse effect on surface water hydrology in the Project area.**

#### **RECOMMENDATION 2**

If the Project proceeds, the Panel recommends that Taseko monitor water levels in Bisqox (Beece Creek) and implement appropriate corrective action in order to minimize flooding at Taseko Lake Lodge.

With respect to the matter of ensuring sufficient water to supply Prosperity Lake and provision of cover for the tailings storage facility, the Panel notes that while limited site specific data was available to input into the model, the predictive modelling used by Taseko was consistent with good practice. However, even if the model underestimated the amount of water available in the Teztan Yeqox (Fish Creek) watershed, the Panel notes that adequate contingency plans would be available to ensure sufficient water cover in the tailings storage facility. These include diverting north-flowing water from the headwater diversion channel to Prosperity Lake and using groundwater as a supply if necessary. The Panel is of the opinion that there would be sufficient water for mine operations and environmental protection.

The Panel heard uncertainties about whether the data collected by Taseko was sufficient to accurately predict acid rock drainage and the extent of metal leaching from the mine waste rock. These uncertainties could result in larger quantities of potential acid generating rock or that the onset of acid rock drainage could occur a lot sooner than predicted. However, even if the predictions were underestimated, Taseko committed to ensuring that water discharged from the mine site during post-closure would meet regulatory requirements and that if necessary it would treat the discharge to meet these requirements. The Panel also notes that experience has shown that similar mines in British Columbia have required ongoing mine water discharge treatment. Given the uncertainties and experience with similar mines



in British Columbia, the Panel finds that should the Project proceed, water treatment would likely be required and that the need for this treatment may be required sooner than predicted. The length of time for which water treatment may be required is also uncertain, but the Panel anticipates that it may be well beyond mine closure. However, the Panel is of the view that Taseko's commitments to mitigation and the application of monitoring and adaptive management principles would ensure that a suitable technology would be applied to treat the discharge to meet regulatory requirements and therefore, the effects on water quality and on fish health could be mitigated. The Panel also notes that Taseko confirmed that water treatment would not affect the economic viability of the Project.

The Panel is aware that bonding is a requirement of the provincial *Mines Act* permit. The Panel notes that the Province may need to consider the need for ongoing water treatment in its determination of bonding requirements.

**The Panel concludes that the Project would not result in a significant adverse effect on surface water quality.**

As noted, surface water would not be discharged to Teztan Yeqox (Fish Creek) until the post-closure period. Also, the Panel has concluded that it expects that water quality would meet regulatory requirements in Year 44 and that water treatment would likely be necessary prior to release. These requirements would mean that the heavy metal concentrations in the water would be sufficiently low as to not affect fish health.

**The Panel concludes that the Project would not result in a significant adverse effect on fish health in the Dasiqox (Taseko River).**

Nevertheless, the Panel notes that there is a fear on the part of First Nations that the mine would contaminate the Daisqox (Taseko River) and that the fish would no longer be fit for consumption. If the Project proceeds, there would be a need to provide assurance to First Nations that water quality and fish health would be maintained. This is addressed further in Section 10.6.

### **6.3: GROUNDWATER**

Key issues relating to groundwater (quantity and quality) identified by the Panel include changes to groundwater flow and the effects of seepage through the west embankment of the tailings storage facility.

#### **6.3.1: CHANGES TO GROUNDWATER FLOW**

##### **6.3.1.1: Proponent's Assessment**

In the area of the proposed mine site, groundwater was reported to generally flow from the south eastern portion of the Teztan Yeqox (Fish Creek) watershed to the northwestern portion of the watershed, north of the confluence of the Dasiqox (Taseko River) with Teztan Yeqox.

Groundwater flow in the Teztan Yeqox (Fish Creek) valley system was reported to be generally driven by recharge in upland areas (as a result of precipitation, runoff and snow melt) and discharges in a network of streams and lakes in the valley floor. The water table was stated to be near or above ground surface in low areas, but found at deeper depths along the ridges. Two groundwater divides were reported to be present within the study area. One divide was stated to be located between the open pit and the Dasiqox (Taseko River), and the other was stated to be present along the western edge of the Teztan Yeqox watershed, hydraulically separating the Teztan Yeqox and Dasiqox valleys.

Three main hydrogeologic units were identified for the proposed mine site: glacial till blanketing the majority of the site; fluvial deposits along the Dasiqox (Taseko River) and Bisqox (Beece Creek); and bedrock. The hydraulic conductivity of the bedrock was predicted to decrease with depth. The bedrock in the proposed mine site area was stated to contain a number of faults. Taseko noted that its data showed that the permeability of these faults was similar to that of bedrock, and that there was no evidence to show that the faults had substantial control over groundwater flow.

As a result of the Project, Taseko predicted that the water table in the area of the open pit would be lowered by approximately 500 m to an elevation of 945 masl. This was predicted to shift the location of the groundwater divide separating the Teztan Yeqox (Fish Creek) and Dasiqox (Taseko River) watersheds approximately 200 m closer to the Dasiqox. As a result, this effect would extend outside of the Teztan Yeqox watershed. The proposed mine plan indicated that the open pit would fill with water in the closure phase, creating the Pit Lake. As such, when pit dewatering activities end, the water table in the area of the open pit would gradually recover and increase to 1440 masl. Therefore, the predicted location of the groundwater divide adjacent to Pit Lake would return to near baseline conditions by the time the reclamation of Pit Lake was complete.

In the footprint of the tailings storage facility, the water table elevation was predicted to permanently increase to 1545 masl, as a result of the ponding of water within the facility. Taseko stated that this increase in the elevation of the water table would result in a permanent and irreversible change in groundwater flow direction along the alignment of the western embankment. This would allow groundwater to flow from the tailings storage facility towards Jidizay Biny (Big Onion Lake) and Dasiqox (Taseko River). This loss of a portion of the groundwater divide between the Teztan Yeqox (Fish Creek) and Jidizay Biny watersheds was predicted to occur by about Year 8 of operations.

In spite of the loss of the groundwater divide, inflow rates to Jidizay Biny (Big Onion Lake) were predicted to decrease slightly (1%) during operations and no change was predicted for inflow rate to Little Onion Lake.

The results of Taseko's model indicated that seepage from the tailings storage facility to the underlying groundwater system was predicted to occur at an annual average rate of approximately 1,050 m<sup>3</sup>/d (12.2 L/s) in Year 1. The seepage rate was predicted to decline over time from approximately 400 m<sup>3</sup>/d (4.6 L/s) in Year 19 to a relatively constant rate of approximately 63 m<sup>3</sup>/d (0.73 L/s) at the end of Year 100, as the regional water table rose in response to the presence of the supernatant pond in the tailings storage facility. Based on the predictions for the water table, Taseko identified two potential pathways for the flow of seepage waters:

- from the tailings storage facility through the adjacent western ridge, where the pre-development groundwater divide was predicted to be lost, towards Jidizay Biny (Big Onion Lake) and the Dasiqox (Taseko River); and
- from the tailings storage facility through the center of Teztan Biny (Fish Lake) valley towards the open pit.

Further discussion on the effects of seepage on Jidizay Biny is provided in Section 6.3.2.

Taseko proposed primary mitigation measures to prevent seepage from the tailings storage facility such as the design of the west embankment (e.g. low permeability till core and cut-off keyed into the native till, glacial till liner, embankment drains) and cutoff ditches to collect and divert seepage to seepage collection ponds. Additionally, Taseko indicated it could deposit tailings so as to create beaches along the west embankment which would force the supernatant pond away from the embankment crest to mitigate seepage through the west embankment. If necessary, Taseko also proposed implementing secondary mitigation measures such as recycle wells where seepage was found to bypass the ditches. Taseko anticipated that these measures would mitigate the potential for migration of seepage through the west embankment beyond the vicinity of the seepage collection ponds. While Taseko predicted that seepage would occur beneath the majority of the tailings storage facility, it did not anticipate seepage would migrate far beyond the tailings storage facility limits.

In response to questions raised by interested parties regarding the potential that a hydraulic connection between the Teztan Biny (Fish Lake) and Jidizay Biny (Big Onion Lake) watersheds existed, Taseko stated that based on the geologic mapping and site investigations completed to date, it did not believe that there was evidence to support the presence of highly permeable features in the area of the western embankment or within the Teztan Yeqox (Fish Creek) drainage.

Taseko acknowledged that the geology of the Teztan Yeqox (Fish Creek) valley system was complex. Therefore, a number of assumptions were used in the regional scale groundwater flow model. Taseko also stated that it would be critically important that ongoing monitoring of the change in groundwater elevations occur and that comparison against predicted conditions both within the Project area and in potentially affected adjacent watersheds were completed as part of compliance monitoring for the Project. The proposed data collection program would include:

- installation of a pumping well and monitoring wells (if necessary based on existing wells in the test area) in the ridge dividing Teztan Yeqox (Fish Creek) from the Jidizay Biny (Big Onion Lake) system;
- installation of a pumping well and monitoring wells (if necessary based on existing wells in the test area) adjacent to the open pit and in the vicinity of the identified faults;
- completion of groundwater pumping tests;
- installation of groundwater monitoring wells in the Jidizay Biny watershed to collect water level and hydrogeological data; and
- collection of surface water flow data for Jidizay Biny.

Taseko proposed to commence the data collection immediately if a positive decision on the Project was taken, and would use the data to confirm/refute the current hydrogeologic and hydrologic assumptions and to refine the Project plan to mitigate any potential groundwater impacts.

Given that the results of the modelling indicated that seepage from the western tailings embankment towards the Jidizay Biny (Big Onion Lake) subcatchment would not begin until about Year 8, Taseko stated that it was confident that if the proposed monitoring measures were implemented, there would be adequate time to collect sufficient hydrogeologic data to allow for the design and installation of secondary mitigation measures, if required.

### 6.3.1.2: Views of Participants

Natural Resources Canada commented on the conceptual groundwater model, indicating that Taseko's representation of the permeability of bedrock in the model was over-simplified and could result in large errors in seepage predictions. In particular, Natural Resources Canada stated that the estimated groundwater seepage rate of 63 m<sup>3</sup>/day appeared unrealistically low for an impoundment of the size of the tailings storage facility. To emphasize the importance of developing sound models, the department referred to a study that was completed for groundwater modelling investigations which showed that in 20-30% of the cases, the original conceptual understanding of the groundwater flow system was completely invalid.

Specifically, in its submission to the Panel for the topic-specific hearing session, Natural Resources Canada expressed concern that key features in Taseko's model, such as the gypsum line, were ignored despite the possibility that these features could be highly significant for groundwater flow. In response to the concerns raised by Natural Resources Canada, Taseko submitted additional information on the areal extent of the zone of gypsum in the rocks, and on the relationship between hydraulic conductivity and depth with respect to the gypsum line. Taseko stated that the zone of increased conductivity due to gypsum was almost entirely contained within the footprint of the proposed open pit and would therefore be excavated during the course of mining. Based on this information, Natural Resources Canada was satisfied that the issue had been addressed.

With respect to Taseko's choice of models to predict seepage from the tailings storage facility, Natural Resources Canada stated that this approach assumed that there would always be an excess of water leaving the tailings storage facility by the spillway. Given the uncertainties expressed by other reviewers regarding the water balance (see Section 6.2), Natural Resources Canada noted that this condition may not be met, thereby affecting Taseko's seepage predictions. However, after reviewing the additional information provided by Taseko which detailed different approaches it had taken to estimate seepage from the tailings storage facility and how the resulting estimates could be reconciled, Natural Resources Canada concluded that the issue was satisfactorily resolved.

On behalf of the Tsilhqot'in National Government, Dr. Ann Maest of Stratus Consulting Group also questioned Taseko's predicted seepage rate for the tailings storage facility. Dr. Ann Maest suggested that the seepage through the tailings storage facility was underestimated and that "conductivity of till, the glacial material that is under or presumed to be under the tailings impoundment is at least five times higher than the value used in water balance model". Dr. Maest further suggested the use of a geosynthetic clay liner (i.e. a non-earth material liner), coupled with the seepage collection system would provide 'redundant mitigation' that could help to ensure mitigation was in place for the source (i.e. the tailings storage facility) and that a back-up measure was in place for any seepage that escaped the source control. Without such a system, Dr. Maest expressed concern that

Taseko would not be able to capture the seepage as a result of fractured rock and steep gradient between the tailings storage facility and the Dasiqox (Taseko River).

During the review of the EIS, the provincial Ministry of Environment - Water Stewardship Division and Environmental Stewardship Division raised concerns regarding the appropriateness of the modeling package used to model groundwater flow. In particular, the Water Stewardship Division indicated that additional field data was necessary to support the assumption that the faults in the geology did not influence the hydraulic conductivity of the bedrock formations. The Water Stewardship Division also questioned the accuracy of the model given the uncertainty surrounding stream flow data and hydraulic conductivities. The consultant for Taseko, BGC Engineering Ltd., agreed with the Ministry of Environment - Water Stewardship Division that additional data collection would be justified to support or refute the conclusion that the identified faults did not influence the hydraulic conductivity of the bedrock at the regional scale.

The provincial Ministry of Environment - Water Stewardship Division recommended that additional work be completed by Taseko in order to support the assessment of impacts on groundwater. These recommendations included:

- determining the groundwater flow path given the geologic structure and potential for inter-watershed contamination and whether the Teztan Yeqox (Fish Creek) watershed was connected or isolated from neighboring watersheds;
- verifying and validating the MODFLOW model against actual baseline data from the Teztan Yeqox (Fish Creek) watershed and neighboring watersheds, in order to increase confidence in the simulated results;
- using the validated model, obtaining a better understanding of the groundwater flow regime, including the location and path of contaminate plume and flow in the Teztan Yeqox (Fish Creek) and neighboring watersheds; and
- re-evaluating the plan for Prosperity Lake, as it relies on an assumed runoff yield that may not be sufficient to maintain the limnology of the proposed fish and fish habitat compensation.

### **6.3.2: EFFECTS OF SEEPAGE ON JIDIZAY BINY (BIG ONION LAKE)**

#### **6.3.2.1: Proponent's Assessment**

Based on the groundwater flow model, Taseko predicted groundwater quality could be affected by the tailings storage facility and the open pit. Taseko stated seepage from the tailings storage facility may move west toward Jidizay Biny (Big Onion Lake), and seepage from Pit Lake may seep into the surrounding groundwater toward lower Teztan Yeqox (Fish Creek) and the Dasiqox (Taseko River). This section focuses on the potential effects of seepage from the tailings storage facility through the western ridge toward Jidizay Biny.

A primary mitigation measure proposed by Taseko to help prevent seepage from the tailings storage facility was to line the base of the tailings storage facility with a minimum of 2 m of glacial till. Knight Piesold Consulting, on behalf of Taseko, stated the glacial till liner of the tailings storage facility would be a minimum of 2 m, and that "...mitigation measures include placement of compacted low permeability glacial till in any areas where the natural low permeability till is less than 2 metres thick..."

However, as a result of hydraulic pressures within the tailings storage facility, changes to groundwater flow patterns were predicted to occur starting in Year 8 of operations, and

therefore, there was the potential for tailings storage facility seepage water to enter the groundwater and migrate to Jidizay Biny (Big Onion Lake). In addition to seepage of groundwater to Jidizay Biny, Taseko predicted that in the absence of mitigation, seepage could also reach the surface at low points such as gullies and ephemeral streams below the western embankment of the tailings storage facility.

The Project design included two seepage collection ponds located in natural depressions at the base of the west embankment of the tailings storage facility, with one pond situated in the north portion and the other situated in the south portion of the embankment. During operations, seepage collected would be pumped back to the tailings storage facility. Taseko made contradictory statements in its EIS regarding the ultimate destination of the seepage during the closure and post-closure periods. Taseko reported that once seepage from the west embankment was of suitable quality for release, it would be released to the environment via a discharge channel, which would flow south to the ephemeral outlet channel of Jidizay Biny (Big Onion Lake), reporting ultimately to the Dasiqox (Taseko River). Conversely, it also reported that at closure, all seepage from the main and west embankments would drain toward the open pit. The effects of seepage on water quality in the Dasiqox are discussed in Section 6.2.

Taseko predicted that the concentrations of all parameters, except dissolved aluminum and dissolved manganese, would increase in the groundwater as a result of the seepage from the tailings storage facility. Of all predicted concentrations, fluoride, sulphate, and the dissolved concentrations of arsenic, copper, iron, lead, mercury, molybdenum and selenium were expected to exceed the British Columbia Water Quality Guidelines.

The results of the modeling completed by Taseko indicated the following potential effects in the absence of the proposed mitigation measures:

- during operations, no solute was predicted to reach a surface water receptor at a concentration greater than 1% of the source concentration;
- by Year 30, there was the potential for a solute concentration of 1% to have reached a depression/gully that, in the model, intersected the water table to the northeast of Jidizay Biny (Big Onion Lake). The gully could provide a direct pathway to Jidizay Biny at significantly increased transport rates if it was found to contain water year round; and
- by Year 52, the plume of groundwater originating from the tailings storage facility would reach Jidizay Biny and would have been diluted so that <1% of the original concentrations of parameters of the tailings pore-water would affect the water quality of the lake.

Over the next 48 years (from Year 52 to Year 100) the mixture was predicted to gradually change to between 1% and 7% tailings pore-water with the remainder consisting of background groundwater. At about 5% concentration, only two parameters would exceed the applicable British Columbia Water Quality Guidelines:

- the concentration of dissolved cadmium would be approximately 0.203 µg/L which exceeds the British Columbia Water Quality Guidelines guideline of 0.046 µg/L; and
- the concentration of sulphate would be 103.2 mg/L which exceeds the British Columbia Water Quality Guidelines of 100 mg/L.

Taseko concluded that the extent to which Jidizay Biny (Big Onion Lake) water quality would change as a result of seepage from the tailings storage facility would be a function of a

number of parameters, including how much groundwater contributes to the water balance of the lake, concentrations of seepage within the groundwater and the rate of groundwater movement. To account for the uncertainty in the model, Taseko predicted the post-closure water quality in Jidizay Biny at Year 100 for three scenarios:

- the 'best case' scenario, assuming 10% groundwater contribution to Jidizay Biny (Big Onion Lake) and 1% porewater content;
- the predicted scenario, assuming 25% groundwater contribution to Jidizay Biny (Big Onion Lake) and 5% porewater content; and
- the 'worst case' scenario, assuming 40% groundwater contribution to Jidizay Biny (Big Onion Lake) and 5% porewater content.

In the best case scenario, no parameters would exceed water quality guidelines, and increases over baseline conditions would be from 1 to 4 times. In the predicted scenario, Taseko stated that only cadmium would exceed water quality guidelines. Other parameters were predicted to exceed baseline conditions by 1.5 to 8 times, with copper and manganese experiencing the greatest increases. In the worst case scenario, cadmium would again be the only parameter to exceed water quality guidelines, but exceedances over baseline conditions would range from 1.5 to 13 times higher. Taseko found these effects to be measurable but low magnitude, and rated the effect as not significant. Consequently, Taseko concluded that the effects from seepage from the tailings storage facility on Jidizay Biny and the Dasiqox (Taseko River) would not be significant.

During the public hearing, in response to questioning regarding whether the use of groundwater interception wells would result in an adverse effect on groundwater flows into Jidizay Biny (Big Onion Lake), Taseko indicated that if the wells were found to be affecting groundwater inflows into the lake, it could implement other measures to mitigate the effects of seepage such as liners or grouting.

### 6.3.2.2: Views of Participants

Natural Resources Canada commented during the public hearing that there was uncertainty regarding whether Taseko's model of the length of time it would take contaminants from the tailings storage facility to seep to Jidizay Biny (Big Onion Lake) assumed the plume of tailings pore water had reached a steady state. Natural Resources Canada submitted that the plume of contaminants would likely continue to increase in concentration with time and move further toward Jidizay Biny than predicted by Taseko. Additionally, based on calculations completed by Natural Resources Canada, it predicted that Taseko's worst-case scenario would likely underestimate the proportion of groundwater entering Jidizay Biny.

First Nations community members also expressed concern about the possibility of contamination of rainbow trout in Jidizay Biny (Big Onion Lake) on which they rely for food. These concerns are addressed in Section 6.2.

Based on its concerns raised with respect to inter-watershed flow during the course of the review of the EIS, the British Columbia Ministry of Environment-Water Stewardship Division noted that there was a risk that seepage estimates into Jidizay Biny (Big Onion Lake) could be underestimated. Further, the Water Stewardship Division noted that without a clear understanding of the baseline geohydraulic conditions, the selection of effective mitigation measures to prevent seepage would be a substantive challenge.



The British Columbia Ministry of Environment -Environmental Protection Division also raised concerns regarding the uncertainty surrounding the proposed mitigation measures for seepage from the west embankment during the course of the review of the EIS. In particular, the Environmental Protection Division questioned the feasibility of pumping seepage water back to the tailings storage facility over the long term.

During the review of the EIS, the provincial Ministry of Energy, Mines and Petroleum Resources provided commentary on the environmental risk associated with seepage from the tailings storage facility, examining the hazard potential and the probability of occurrence and the consequence. The Ministry concluded that the hazard potential was low, as the concentrations of parameters in the seepage water would be relatively low compared to other mine sites in British Columbia and given natural attenuation along the groundwater flow path. The Ministry of Energy, Mines and Petroleum Resources noted that while there was some uncertainty with the assessment due to potentially unknown geologic conditions, the risk to Jidizay Biny (Big Onion Lake) from seepage from the tailings storage facility appeared to be low. The Ministry also stated that the mitigation being proposed by Taseko was considered to be accepted, industry strategies. Therefore, given Taseko's commitment to undertake additional hydrogeologic studies in the area of the west embankment and the proposed mitigation measures (Appendix 4, Commitment 8.6), the Ministry indicated that it was satisfied with the resolution of the seepage issue for the purposes of the environmental assessment.

### **6.3.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on groundwater, the Panel considered the following factors to be particularly relevant:

- during operation, the groundwater elevation in the vicinity of the open pit would be lowered by 500 m and the groundwater divide between Teztan Yeqox (Fish Creek) and Dasiqox (Taseko River) would shift 200 m closer to the River; this would be reversed in Year 44 when the pit would be filled;
- the groundwater divide between the Teztan Yeqox (Fish Creek) and Jidizay Biny (Big Onion Lake) watersheds would be permanently lost as a result of the construction of the tailings storage facility;
- seepage through the main embankment of the tailings storage facility would flow towards the water collection pond and then the open pit and be treated if necessary prior to discharge to the environment;
- seepage from the tailings storage facility would flow towards Jidizay Biny (Big Onion Lake) and was predicted by Taseko to reach the lake in approximately Year 50;
- Jidizay Biny (Big Onion Lake), which discharges into the Taseko River, was reported to be an important fishing lake for First Nations and recreational fishers;
- there were uncertainties associated with the concentration of contaminants that would be contained in the seepage to Jidizay Biny (Big Onion Lake), and the level to which water quality, rainbow trout and other aquatic organisms in the lake would be affected;
- no means of improving the quality of water seeping towards Big Onion Lake was proposed; mitigation measures included minimizing seepage and intercepting it and returning it to the tailings storage facility; and
- there was uncertainty regarding the feasibility of using interception wells to intercept and pump the seepage back to the tailings storage facility.

On the matter of changes in groundwater flow, the Panel notes that groundwater levels in the area of the open pit would be restored to pre-construction conditions once the open pit was filled with water. The effects on groundwater levels would be limited in geographic extent and reversible. The Panel notes that alterations to groundwater flows would not necessarily result in adverse environmental effects in and of themselves. However, as contaminants can be transported in groundwater to receiving water bodies, the Panel has considered changes to groundwater flow in the context of effects to receiving water bodies, such as Jidizay Biny (Big Onion Lake).

Seepage from the main embankment would flow ultimately to the open pit. As previously discussed in Section 6.2, water from the open pit would not be discharged until it was of acceptable quality, or it would be treated by a water treatment system. The Panel considers this approach to be an effective means to prevent discharge of contaminated seepage from the main embankment of the tailings storage facility to the environment.

With respect to the loss of the groundwater divide between the Teztan Yeqox (Fish Creek) basin and Jidizay Biny (Big Onion Lake) watershed, the Panel notes that this effect would be permanent and could result in a potential introduction of contaminants into the lake in perpetuity.

The Panel notes the disagreement with respect to timing, volume and contamination of groundwater flows reaching Jidizay Biny (Big Onion Lake). While Taseko has proposed the installation of a series of wells to intercept west-flowing seepage from the tailings storage facility in order to pump it back to the tailings storage facility during operations, the Panel also recognizes the questions raised regarding the feasibility of the proposed mitigation, given the uncertainties associated with Taseko's understanding of the regional geology.

The Panel notes that should the Project proceed, Taseko would have sufficient time to undertake its commitments (Appendix 4, Commitment 8.6) to gather further hydrogeological information to be incorporated in the final design of the seepage collection system. Further, the Panel recognizes that interception wells are considered to be an appropriate practice to intercept seepage. However, if the additional information collected demonstrates that the subsurface was more permeable than predicted, the Panel notes that additional mitigation measures identified by Taseko should be implemented, such as the installation of additional seepage interception wells. Monitoring is discussed further in Section 10.6. The Panel also recognizes that the seepage collection and pump back system may need to be in place for many years after operations ends and would require ongoing maintenance. Nevertheless, the Panel is of the view that the proposed mitigation measures would likely reduce the effects on Jidizay Biny (Big Onion Lake).

**The Panel concludes that seepage from the tailings storage facility would not result in a significant adverse effect on water quality in Jidizay Biny (Big Onion Lake).**

### **RECOMMENDATION 3**

If the Project proceeds, the Panel recommends a long-term follow-up and monitoring program be designed and implemented to verify the predicted seepage rates and concentration of contaminants from the tailings storage facility toward Jidizay Biny (Big Onion Lake) and the effectiveness of the proposed primary mitigation measures.

Should the results show that the movement and concentration of contaminants is higher than predicted, additional mitigation measures should be put in place, such as the addition of more interception wells.

#### **6.4: FISH AND FISH HABITAT**

This section discusses the key effects of the Project on fish and fish habitat as well as the feasibility and potential for Taseko's proposed fish and fish habitat compensation plan to compensate for these effects. Issues of importance identified by the Panel include the permanent alteration and loss of fish and fish habitat in the Teztan Yeqox (Fish Creek) watershed, the effects of the Project on recreational and sport fishing opportunities, and the proposed fish and fish habitat compensation plan, including the use of artificial propagation. Each of these issues is discussed within this section. The issue of food fisheries for First Nations is addressed in Section 8.2.

##### **6.4.1: PERMANENT LOSS/ALTERATION OF FISH AND FISH HABITAT**

###### **6.4.1.1: Proponent's Assessment**

The Project would affect the quality and quantity of fish and fish habitat, including in-stream, lake and riparian habitats in the Teztan Yeqox watershed, all mainstream and tributary habitats down to and including the confluence of Teztan Yeqox with the Dasiqox (Taseko River), the lower Bisqox (Beece Creek) drainage and the Dasiqox at the confluence of Bisqox.

The Teztan Yeqox (Fish Creek) watershed was stated to contain 117.6 ha of lake habitat and 20.6 km of stream habitat. Rainbow trout were found throughout the Teztan Yeqox watershed from the confluence with the Dasiqox (Taseko River) upstream to Little Fish Lake (Y'anah Biny).

Teztan Yeqox (Fish Creek) was described as having three distinct stream sections (lower, middle, and upper), with 10 stream reaches. Lower Teztan Yeqox was defined as the section of stream from the confluence with the Dasiqox (Taseko River) upstream to an 8 m high waterfall (reaches 1-3). Rainbow trout, Chinook salmon, bull trout, mountain whitefish and white sucker were reported to use this habitat by migrating upstream from the Dasiqox (Taseko River). Middle Teztan Yeqox (reaches 4-6) was defined as the area from the waterfall to Teztan Biny (Fish Lake). Upper Teztan Yeqox (reaches 7-10) was described as including Teztan Biny, Y'anah Biny (Little Fish Lake) and their respective tributaries.

Taseko stated that the middle and upper sections of Teztan Yeqox (Fish Creek) provided all the habitat requirements to sustain the Teztan Biny (Fish Lake) population of rainbow trout. Taseko reported that Teztan Biny had a drainage area of 6,490 ha, a total surface area of 111 ha, a shoreline perimeter of 11.7 km, littoral area (lake habitat < 6 m in depth) of 83 ha and a volume of 4.4 Mm<sup>3</sup>. The lake was stated to be shallow with an average depth of 4 m and a maximum depth of 13 m. Taseko stated the lake had both inlet and outlet channels that act as spawning and rearing habitat. Teztan Biny was reported to support approximately 85,000 individual rainbow trout while Y'anah Biny (Little Fish Lake) was estimated to support 5,000 rainbow trout.

The Project would result in the permanent loss and alteration of fish and fish habitat associated with middle and upper Teztan Yeqox (Fish Creek), Teztan Biny (Fish Lake), and

Y'anah Biny (Little Fish Lake). As a result of the Project, Taseko stated that a total of 88,261 m<sup>2</sup> of fish habitat would be permanently lost in the middle and upper Teztan Yeqox watershed and an additional 12,829 m<sup>2</sup> of fish-bearing habitat would be altered during the life of the mine.

Taseko reported that lower Teztan Yeqox (Fish Creek) included 16,371 m<sup>2</sup> of fish-bearing in-stream habitat that would be altered by mine development activities, including 5,685 m<sup>2</sup> of late summer, critical stream flow habitat. Lower Teztan Yeqox was stated to provide seasonal rearing and refuge habitat for Chinook salmon, mountain whitefish, white suckers and bull trout from the Dasiqox (Taseko River) and for rainbow trout from the Teztan Yeqox watershed.

Taseko reported that all in-stream habitats available in lower Teztan Yeqox (Fish Creek) would be temporarily altered by the Project. As reported in Section 6.2, Project activities would reduce flows to lower Teztan Yeqox by 65%, which would be insufficient to sustain fish populations or habitat in the lower reaches of the Creek. The natural flow regime to lower Teztan Yeqox would be re-established in approximately Year 55.

Taseko characterized riparian ecosystems as generally occurring in the transition zones from wetland, lake or stream to upland habitat. According to Taseko, the main issues applicable to riparian ecosystems included loss of habitat and changes in community composition and structure. Taseko estimated that riparian ecosystem loss would be prevalent in the mine site area, with little or no loss anticipated along the transmission line right-of-way or along the access roads. During the operations phase, Taseko predicted that more riparian habitat would be lost as a result of the Project than would be created through the fish and fish habitat compensation plan. Upon mine closure, once the spillway from tailings storage facility into the open pit was established, the ratio of riparian habitat created through the compensation works to riparian habitat affected by the Project would increase to 0.7:1. Finally, once Pit Lake was filled, Taseko indicated that the ratio of total riparian habitat created to riparian habitat affected would be 1:1. The residual loss of riparian habitat from mine development would amount to 3,527,000 m<sup>2</sup>, representing 11% of the riparian ecosystems in the mine site regional study area and less than 5% in the broader regional context. Overall, Taseko estimated that Project related effects to riparian ecosystems would be relatively small and were predicted to be not significant.

In response to comments raised by Fisheries and Oceans Canada, Taseko stated the discrepancy in the overall area of habitat lost versus that habitat created by the fish and fish habitat compensation plan stemmed from the difference in the width of the riparian buffer (30 m) used in various calculations. Further, Taseko was of the opinion that each aspect of habitat loss would not necessarily require compensation at the same ratio. Taseko stated that riparian habitat would typically be compensated for at a much lower ratio compared to multi-species spawning habitat.

A summary of total habitat losses in the Teztan Yeqox (Fish Creek) watershed is presented in Table 2.

**Table 2: Total Habitat Losses in Teztan Yeqox (Fish Creek) Watershed\***

<b>Fish and Fish Habitat Loss / Alteration</b>		
	<b>No. Rainbow Trout</b>	<b>Habitat Loss</b>
Y'anah Biny (Little Fish Lake) (ha)	5000	6.6
Teztan Biny (Fish Lake) (ha)	85,178	111
Teztan Yeqox (Fish Creek) and tributaries	74,945	-
Upper Teztan Yeqox (Fish Creek) / Fish-bearing (m <sup>2</sup> )	-	47,646
Upper Teztan Yeqox (Fish Creek) / Non fish-bearing (m <sup>2</sup> )	-	53,444
Lower Teztan Yeqox (Fish Creek) (m <sup>2</sup> )	-	16,371
Riparian (m <sup>2</sup> )	-	3,527,000
<b>Total</b>	<b>164,945</b>	<b>3,644,461 m<sup>2</sup></b>

\*adapted from report "Feasibility Design of Fisheries Compensation Program" (April 13, 2010)

**6.4.1.2: Views of Participants**

Throughout the review, Fisheries and Oceans Canada noted that lower Teztan Yeqox (Fish Creek) was used by various fish species as off-channel rearing habitat, and therefore, would require compensation. Fisheries and Oceans Canada commented that unless Taseko proved it was not reasonably possible, compensation habitat for the affected species should be provided for in accordance with Fisheries and Oceans Canada's "Policy for the Management of Fish Habitat".

Fisheries and Oceans Canada, in their submission to the Panel for the general hearing session presented calculations of riparian habitat loss of 1,011,840 m<sup>2</sup> for fish-bearing riparian habitat and 3,595,160 m<sup>2</sup> for non fish-bearing riparian habitat. Fisheries and Oceans Canada determined that the proposed plan would not offset the loss of stream and riparian habitat in middle and upper Teztan Yeqox (Fish Creek). Even at the most basic 1:1 ratio, Fisheries and Oceans Canada stated there was a disparity in the overall area of habitat loss versus that habitat created by the fish and fish habitat compensation plan. Fisheries and Oceans Canada indicated that it would normally require a high compensation ratio due to the high productivity of the existing system, the temporal loss, and the risks associated with the plan. Fisheries and Oceans Canada noted that it would continue to work with Taseko to further clarify any discrepancies in calculation methodology and assumptions for the affected riparian habitat area.

MiningWatch Canada noted that the permanent loss of stream habitat in middle and upper Teztan Yeqox (Fish Creek) represented a net loss to the ecosystem that had not been accounted for in the fish and fish habitat compensation plan. MiningWatch Canada stated that in-stream habitat that would be lost consisted of spawning, rearing and overwintering areas in lake, wetland and stream environments. During the life of the mine, MiningWatch noted that the ratio of total stream habitat area to impacted stream habitat area would be 0.5:1. By Year 55, once Pit Lake had filled and flows were returned to reaches 1 to 5 of Teztan Yeqox, the ratio of total stream habitat area to impacted stream habitat area would only be 0.8:1. Therefore, MiningWatch Canada concluded that the proposed fish and fish habitat compensation plan did not adequately mitigate the potential affect of the Project on stream habitat.

The Tsilhqot'in National Government's position was that the destruction of Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake), Nabas, and other areas in the Teztan Yeqox (Fish Creek) watershed would be a significant cultural loss for the Tsilhqot'in. The Tsilhqot'in stated that the destruction of these habitats would also be a significant ecological loss and that neither the cultural nor ecological loss could be adequately mitigated by replacing Teztan Biny with an engineered reservoir. Further details on the effects of the Project on the current use of Teztan Biny and the surrounding area for traditional purposes and its importance for cultural heritage can be found in Sections 8.2 and 8.3. Section 9 contains further details on potential effects on Aboriginal rights and title in the Project area.

The British Columbia Ministry of Environment was of the opinion, as outlined in its Benchmark Statement (2008), that the lower section of Teztan Yeqox (Fish Creek) was of low fish habitat value. It concluded that spawning habitat for Chinook, steelhead and other fish was of very low value as stream flows were low, the channel was naturally unstable, and the bed material too angular to support significant spawning. The low habitat value and the nature of the temporary nature of the effect on reduced streamflow reduced the priority for direct compensation. Therefore, Taseko was directed by the Ministry to focus its compensation plans on the middle and upper watershed and on the region in general where the Ministry felt that greater benefits could be realized.

#### **6.4.2: RECREATIONAL AND SPORT FISHING OPPORTUNITIES**

##### **6.4.2.1: Proponent's Assessment**

The Project would result in the elimination of First Nation, recreational and guided sport fishing activities in the immediate area for both resident and international anglers for the duration of the Project construction and operation periods. The effects of the Project on the First Nation food fishery are discussed in Section 8.2.

In its EIS, Taseko stated that the Cariboo-Chilcotin region supported a sizable recreational and sport fishery and hunting opportunities. Lodges, guide outfitters and other tourism businesses cater to both resident and non-resident anglers. Taseko reported that Teztan Biny (Fish Lake) was the seventh busiest of the 32 lakes surveyed in the Chilcotin region. Teztan Biny was stated to be known for its high population of fish, the relative ease of catch, the lake's exceptional views and its relative seclusion. Teztan Biny and Y'anah Biny (Little Fish Lake) habitat was characterized as productive and with high fish densities, which provided a high yield fishery for smaller rainbow trout. The difficulty associated with accessing the lake was reported to keep fishing pressure low and angling success high. The high catch rates on a wild fish stock in a wilderness setting were stated to provide a unique fishing experience at Teztan Biny. Taseko noted that the displaced activity at Teztan Biny could be easily absorbed by other lakes in the area, but the "fishing experience" at Teztan Biny could not be easily replicated.

With respect to angling opportunities in the Project area, Taseko reported that Teztan Biny (Fish Lake) hosted up to 548 recreational angling days with up to 4,900 fish caught annually, ranging in size from 20 to 34 cm. Despite the biological productivity of Teztan Biny, Taseko indicated that the recreational potential of the lake was not being utilized to its full potential. Many lakes in the region were indicated to support fisheries of between 5,000 and 15,000 angler days per year.

During the public hearing, Taseko also stated Teztan Biny (Fish Lake) was not unique, and that many lakes within the Cariboo region supported monocultures of wild fish. Taseko stated “Fish Lake is similar in all aspects of lake size and watershed size to the great majority of rainbow, wild trout, monoculture lakes in the Cariboo.” Additionally, Taseko submitted that the fish in Teztan Biny were substandard in weight, had poor tissue quality and a high parasite load. In Taseko’s view, the Teztan Biny and Teztan Yeqox (Fish Creek) fish had a lower than average condition factor than trout of most other Chilcotin systems and a lower than average condition than 95 percent of rainbow trout populations in North America. Taseko was of the opinion that Teztan Biny was overpopulated and the competition for food provided a suboptimal environment for rainbow trout. Overall, fish health was reported as relatively poor.

Taseko indicated that a small population of rainbow trout, Chinook salmon, bull trout, and mountain whitefish utilize the lower Teztan Yeqox (Fish Creek) drainage near the confluence with the Dasiqox (Taseko River). The Bisqox (Beece Creek) watershed and Jidizay Biny (Big Onion Lake) were also noted to support a quality rainbow trout fishery. The Chilcotin region as a whole was reported to have a large number of lakes with both self sustaining monoculture rainbow trout and multi-species populations, and lakes containing hatchery released rainbow trout. Collectively, Taseko stated these lakes provide a range of recreational fishing opportunities based on access, stocking rates and recreational experience. The Dasiqox and Tsilhqox (Chilcotin River) were reported to contain valuable stocks of commercially important salmon and resident populations of recreationally important fish species.

Taseko stated that it considered an effect on sport or recreational fishing to be significant if the activity or experience could not be offered in nearby lakes or streams and resulted in a net economic loss to the regional study area. The environmental effects of the Project on recreational fishing opportunities in Teztan Biny (Fish Lake) and Y’anah Biny (Little Fish Lake) would be mitigated through the construction of the proposed compensation lake (Prosperity Lake), the development and operation of a fish culture facility for the life of the mine, the development of recreational access and campsites at Prosperity Lake, the opportunistic stocking of small lakes, and improved access to recipient lakes. Taseko stated it would work with the British Columbia Ministry of Environment to identify candidate lakes for outplanting fry from the fish culture facility. Increased pressure on fresh water fish stocks would be mitigated by placing fishing bans on contractors and mine employees.

#### **6.4.2.2: Views of Participants**

Fisheries and Oceans Canada indicated that the proposed fish and fish habitat compensation plan did not clearly identify when the recipient lakes and Prosperity Lake would be open and readily available to First Nations and the public for fishing activities, or how much fishing pressure could be sustained at these lakes once the lakes were available.

Based on its review of the EIS, Transport Canada concluded that boaters visit Teztan Biny (Fish Lake) to enjoy the remote location and pristine setting and to take advantage of the fishing opportunities. Transport Canada noted that the Project as proposed would eliminate all boating, fishing and recreation activity in the Teztan Yeqox (Fish Creek) watershed. Transport Canada noted the unique aspects of the Project area created a strong link between boating and navigation, and between fishing and recreation. Transport Canada also noted that it had not come upon this close relationship between navigation and recreation in previous projects.



MiningWatch Canada noted that Taseko's EIS dismissed the historical significance of the area, not just for indigenous people who have a spiritual connection to the Teztan Biny (Fish Lake) and surrounding area, but for sport fisherman who have enjoyed the angling opportunities and views of the area and for Taseko Lake Outfitters who depend on the area as a component of its backcountry ecotourism operations.

The Panel heard that Teztan Biny (Fish Lake) was valued by First Nations as a food fishery and as a location for teaching and the transfer of cultural knowledge between generations. The Panel heard from a number of youth, particularly in the community of Xenigwet'in (Nemiah Band) who indicated that they caught their first fish at Teztan Biny. The youth also mentioned how they enjoyed the time spent at Teztan Biny camping and fishing with their families. Further information on the importance of Teztan Biny as a First Nation food fishery and on the use of the area for traditional purposes is provided in Section 8.2.

During the public hearing, the Panel also heard that Jidizay Biny (Big Onion Lake) was used as both a trophy rainbow trout fishery and a First Nation food fishery. Mr. Alex Lulua told the Panel that the fish in Jidizay Biny taste sweeter than fish from other locations. He stated "[t]hey are sweet tasting due to the underwater spring that feeds it. You know, they got the freshest water and that's why they taste. And I've eaten fish everywhere. There's nowhere ever that I ate a fish out of Onion Lake that tasted that way." Mr. Lulua indicated that recreational fishermen also used Jidizay Biny extensively, indicating that it was sometimes difficult to get a campsite at the lake due to the number of sport fishermen. The Panel heard from Mr. Lulua and other First Nation members that they would be unlikely to eat fish from the Project area if the Project proceeds due to the fear of potential contamination.

Many Tsilhqot'in members commented that in light of the recent declines in the Fraser River salmon fishery, which includes the Dasiqox (Taseko River), there would be additional pressures on lake-based fisheries.

The British Columbia Ministry of Environment stated that the fishery supported by Teztan Biny (Fish Lake) provided only a small increment of regional economic benefit as compared to other regional lakes. In contrast to the biological productivity of Teztan Biny, the Ministry stated the recreational potential of the resource was not being utilized to its full potential. The Ministry indicated that Teztan Biny had the biological capacity to support a substantially more valuable fishery in the future (in terms of fish size and fishing effort), if decisions were made to apply management techniques specific to that outcome.

Despite the recognition of the potential of the Teztan Biny (Fish Lake) fishery, the provincial Ministry of Environment stated that it would be preferred if the re-created fishery provided for increased recreational activity that yielded reasonable catch per unit of effort (6 to 10 per day) of fish ranging up to 1 kg (i.e. smaller numbers of larger-sized trout). The Ministry stated that Teztan Biny trout would be transferred to other Chilcotin lakes in order to supplement both recreational and First Nation fishery opportunities. The recreational fisheries in these lakes were estimated to account for 600 recreational angling days. The Ministry noted the productive capacity of Prosperity Lake was expected to be slightly less than Teztan Biny, as it was designed to produce larger fish in order to offer a better angling experience and to achieve regional objectives for fisheries enhancement. The Ministry stated that access improvement and the construction of recreational facilities would likely be required to fully realize the recreational potential of lakes stocked with fish from Teztan Biny.

### 6.4.3: FISH AND FISH HABITAT COMPENSATION PLAN

#### 6.4.3.1: Proponent's Assessment

Taseko stated that the key policies that guided it in its assessment of the Project's effects on fish and fish habitat included Fisheries and Oceans Canada's Policy for the Management of Fish Habitat and its "No Net Loss" principle and the British Columbia Ministry of Environment Benchmark Statement (2008) and associated performance measures. Taseko stated that it designed its compensation plan to conform to the requirements of both policies.

Taseko noted at the public hearing that it had been difficult satisfying both the provincial government, with its jurisdiction and interest in the fishery and the fish, as well as the federal government, with its responsibilities for fish habitat. In Taseko's view, its fish and fish habitat compensation plan met the provincial management objectives and the federal policy objective of No Net Loss.

The key measures identified by Taseko to mitigate and/or compensate for the effects of the Project on fish and fish habitat included a compensation plan and a fish salvage program which would provide a strategy for maintaining the genetic integrity of the Teztan Biny (Fish Lake) stock and to mitigate the loss of recreational fishing opportunities. The fish and fish habitat compensation plan included the construction of Prosperity Lake to replace the loss of Teztan Biny and Y'anah Biny (Little Fish Lake) and spawning channels, new stream and riparian habitat in lower Teztan Yeqox (Fish Creek), the operation of a fish hatchery at Clearwater and outplanting of fish to local recipient lakes as identified by the provincial Ministry of Environment.

In response to concerns raised by Fisheries and Oceans Canada, Taseko submitted additional information on April 13, 2010 related to modifications made to the fish and fish habitat compensation plan to better achieve Fisheries and Oceans Canada's policy goal of No Net Loss. The purpose of the updated fish and fish habitat compensation plan, entitled "Feasibility Design of Fisheries Compensation" was to demonstrate the feasibility and scientific rationale that fish and fish habitat losses associated with the Project could be fully mitigated and compensated.

The key components of Taseko's fish and fish habitat compensation plan, including the modifications introduced in "Feasibility Design of Fisheries Compensation" report, were described as follows:

- **Fish Salvage:** Prior to dewatering of Teztan Biny (Fish Lake) and disturbance of the mine site area, approximately 12,000 fish of various size and age classes would be live-caught from Teztan Biny and placed into recipient lakes. The British Columbia Ministry of Environment had identified Slim Lake as a priority lake for initial transplants. Spawning fish would also be captured for egg (gamete) collection for the hatchery, with the resulting fry placed into Prosperity Lake. While Taseko had originally proposed the use of the Hanceville Hatchery, it indicated during the public hearing that it had been informed by the provincial Ministry of Environment that the Clearwater hatchery was the preferred location. The remaining fish in Teztan Biny would be captured as the lake was drawn down and given to local First Nations as a food source (if desired) or euthanized.
- **Prosperity Lake:** Prosperity Lake would be created to compensate for the loss of Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake), upslope of the south embankment of the proposed tailings storage facility. The lake would be created by

building a 1550 m dam, stripping vegetation and soils from the basin where the lake would be situated and allowing the basin to fill with runoff collected by a headwater diversion channel. Construction of Prosperity Lake was estimated to be completed by the Year 1. It was anticipated that there would be a five to seven year period between the dewatering of Teztan Biny and the availability of Prosperity Lake. Prosperity Lake would support approximately 20,000 fish, stocked with fry from the Clearwater Hatchery. A comparison of the characteristics of Teztan Biny and Prosperity Lake is provided in Table 3.

**Table 3: Comparison of characteristics of Teztan Biny (Fish Lake) and Prosperity Lake**

Physical Characteristic	Teztan Biny (Fish Lake)	Prosperity Lake*
Surface Area (ha)	111	122
Littoral Area (ha)	90**	48
Pelagic Area (ha)	27.5**	74
Shoreline Perimeter (m)	11,700	9,321
Mean Depth (m)	3.7	6.9
Maximum Depth (m)	13	18.4
Volume (Mm <sup>3</sup> )	4.0	8.5

\* Values based on April 13, 2010 "Feasibility Design of Fisheries Compensation" report which differs from the original fish and fish habitat compensation plan proposed in the EIS in 2009. The original plan did not account for Y'anah Biny (Little Fish Lake) as a compensation element.

\*\* Area includes Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake)

- Headwater Diversion Channel:** The headwater diversion channel would be designed to direct clean water around the eastern side of the Teztan Yeqox (Fish Creek) Valley and direct it either downstream into the headwater retention pond or upstream for return into lower Teztan Yeqox north of the proposed open pit. While the fish would not be able access to the headwater diversion channel during operations. Taseko intended to develop riparian habitat and a productive capacity for invertebrates and aquatic vegetation, which would contribute to downstream productivity. At closure, the headwater diversion channel would be made accessible to fish.
- Headwater Retention Pond:** The headwater retention pond would allow for the control of upstream flows into a spawning channel and then into Prosperity Lake. Flows between the headwater retention pond and spawning channel would be regulated by using an intake structure in which several holes would be placed at predetermined heights above the bottom of the intake structure which would withdraw water from various depths of the headwater retention pond during seasonal flow events. An intake valve would be included at the intake structure for additional control over flow and for maintenance. The headwater retention pond would store up to 1 Mm<sup>3</sup> of clean water to support fish rearing and spawning habitat.
- Spawning Channel:** A spawning channel between the headwater retention pond and Prosperity Lake would receive water through paced flows from the headwater retention pond. It would be designed with pool and in-stream structures which would contribute to habitat for primary production.
- Y'anah Biny (Little Fish Lake):** As part of mine development, fish from Y'anah Biny (Little Fish Lake) would be removed. It was anticipated that it would take approximately 7 years for the tailings storage facility to fill to the point that Y'anah Biny would become inundated. Until that time, Y'anah Biny would remain as a refuge for Teztan Biny (Fish Lake) rainbow trout genetic stock and provide a source of

gametes for hatchery-reared fry or as an additional source of stock for outplants into recipient lakes. Various design elements would also be introduced into Y'anah Biny to mitigate the potential for winterkill. Mitigation measures such as an aeration system, ongoing monitoring, the addition of a barrier in the outlet to stop downstream migration, and controlled flows would be used to ensure that Y'anah Biny would be maintained as a "back-up" self-sustaining population of the Teztan Biny rainbow trout stock until inundation by the tailings storage facility at Year 7.

- **Access Improvements to Recipient Lakes:** Access improvements to recipient lakes would provide immediate recreational angling opportunities while Prosperity Lake fish populations became established. Outplanting fish to lakes would contribute to ensuring the minimum viable population of fish stock, and would provide a replacement trout fishery and food fishery opportunities for First Nation.
- **Recreating Habitat:** Water quality monitoring, the introduction of submerged aquatic vegetation, benthic invertebrates and planting of riparian habitat would be conducted once Prosperity Lake was filled and water quality conditions were suitable. Species were also predicted to naturally colonize the new lake shore over time. Local riparian species would be used for the planting. After the initial riparian planting, at least one year of replanting would be completed to fill in areas with unacceptable survivorship.
- **Lower Teztan Yeqox (Fish Creek):** Like-for-like habitat in the lower reaches of Teztan Yeqox (Fish Creek) watershed would be created to offset the reduced flows and subsequent reduction in in-stream habitat. The new habitat would be located on the Dasiqox (Taseko River) floodplain, immediately upstream and downstream of the Teztan Yeqox confluence. It was proposed that 2 compensation channels would run parallel to the Dasiqox and connect to the river providing a total of 18,440m<sup>2</sup> perennial groundwater-fed off-channel rearing, spawning and overwintering habitat. The design included approximately 8,040 m<sup>2</sup> of in-stream habitat and 8,242 m<sup>2</sup> of riparian habitat and included 8,900 m<sup>2</sup> of deep-pools and 1500 m<sup>2</sup> of spawning habitat that would be suitable for rainbow trout.
- **Tailings Storage Facility and Pit Lake:** Both the tailings storage facility and Pit Lake would be incorporated into the fish and fish habitat compensation plan. With the addition of these two elements, the ratio of total habitat area to impacted habitat at the time mining operations ceased (Year 20) would be 7.4:1, which would increase to 8.2:1 when the open pit filled and reach 4 and the remaining portion of reach 5 of Teztan Yeqox (Fish Creek) became accessible to rainbow trout.

Taseko reported that the proposed compensation plan would result in positive fish and fish habitat ratios for lake area, in-stream area for lower Teztan Yeqox (Fish Creek), fry production, and regional angling opportunities. However, it would result in negative fish and fish habitat ratios for stream area and riparian habitat for the middle and upper Teztan Yeqox watershed. Taseko reported that the negative balance of stream and riparian habitat in middle and upper Teztan Yeqox was due to its preferred mine plan, which also limited the ability to construct a stream channel in this portion of the watershed. However, Taseko noted that the balance would become positive at closure when the headwater diversion channel and other channels became accessible to fish.

As proposed, the Prosperity Lake compensation element would replace 48 ha of the affected Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake) littoral habitats and 74 ha of the affected pelagic habitats. Although there would be a decrease in littoral habitat, Taseko stated that Prosperity Lake would have sufficient littoral areas and water quality to support the target fish population and to maintain the genetic composition of rainbow trout

from the upper watershed. In addition, Prosperity Lake would have an increased volume compared to Teztan Biny and Y'anah Biny.

Taseko reported that the greatest loss in terms of habitat balance would occur during the construction phase when Teztan Biny (Fish Lake) would no longer function as habitat, but Prosperity Lake was not yet filled. At this time, the ratio of total habitat area to impacted habitat area would be 0.3:1. Taseko stated that habitat balance would turn positive (1.2:1) once Prosperity Lake had filled. The addition of the 26 ha headwater retention pond during operations (a non-fish bearing pond that would contribute nutrients and food to downstream fish habitats) would result in an increase in the ratio of total lake habitat area to impacted lake habitat area to 1.3:1 during the operations phase.

Upon closure, Taseko stated the Teztan Yeqox (Fish Creek) watershed would become a series of lakes and channels supporting a self-sustaining population of rainbow trout. Fish-bearing stream habitat upon cessation of mining activities would include the headwater diversion channel, the compensation spawning channel inlet to Prosperity Lake, a section of channel between the tailings storage facility and the water collection pond, a channel between the water collection pond and Pit Lake, and the natural channel (Teztan Yeqox reaches 4 and 5) downstream of Pit Lake once the pit was filled. The natural flow regime to lower Teztan Yeqox (reaches 1-3) would also be established once the pit was filled.

In response to Fisheries and Oceans Canada's concern regarding the inclusion of the tailings storage facility as fish habitat, Taseko stated that the tailings storage facility and Pit Lake were not originally included as components of the fish and fish habitat compensation plan despite the fact that it was confident that in time, both would provide suitable fish habitat. However, the updated "Feasibility Design of Fisheries Compensation" included Pit Lake in the calculation of replacement lake habitat and riparian habitat. Taseko noted that at closure, water quality would be monitored and when conditions were shown to be suitable for fish habitat, the tailings storage facility and Pit Lake could be made accessible to fish.

Additionally, habitat compensation was not originally proposed for lower Teztan Yeqox (Fish Creek) as the provincial Ministry of Environment Benchmark Statement described this area as being of low value for fish. After receiving Fisheries and Oceans Canada's evaluation of the fish and fish habitat compensation plan, Taseko proposed to construct perennial multi-species overwintering channel habitat in lower Teztan Yeqox. The creation of groundwater-fed off-channel habitat adjacent to lower Teztan Yeqox was proposed to offset the reduced flows and the subsequent reduction of in-stream habitat in lower Teztan Yeqox.

Taseko submitted a summary of a review by Hartman and Miles (2001) which highlighted the success of projects that constructed spawning habitat and conducted ongoing monitoring programs. Taseko concluded that there were many precedents for constructing and maintaining successful spawning channels. Monitoring and adaptive management would be an integral part in the success of the spawning channel.

The provincial performance measure document indicated that Taseko was obligated to maintain Prosperity Lake for the "life of mine", which was defined as the period of time in which the mine was operational. However, during the public hearing, in response to questioning from the Tsilhqot'in National Government, Taseko stated that the term "life of mine" should be interpreted as meaning its responsibilities would extend until it was released of its obligations from the site by the provincial Ministry of Environment.

In response to questioning during the topic-specific hearing session, Taseko confirmed that it had not submitted a cost estimate for the entire proposed fish and fish habitat compensation plan to the Panel. Taseko indicated that preliminary estimates for lower Teztan Yeqox (Fish Creek) portion of the compensation plan were in the range of \$670,000 to \$700,000.

#### 6.4.3.2: Views of Participants

The Panel heard from several participants that the federal and provincial Fisheries Acts are different in terms of their requirements for fish and fish habitat compensation. In this case, the provincial Ministry of Environment established site specific objectives for the Project. Over a number of years, Taseko corresponded regularly with both the provincial Ministry and Fisheries and Oceans Canada through the provincial review process so that each of the different parties might have a better understanding of the different objectives according to federal and provincial legislative and policy frameworks. However, both levels of government were responsible for making conclusions based on its own legislative and policy framework.

Fisheries and Oceans Canada reported that its “Policy for the Management of Fish Habitat” provided general guidance on the application of the habitat protection provisions of the *Fisheries Act* and applied to all works and undertakings that have the potential to harm fish habitat. That Policy’s long-term objective was to achieve a net gain in the productive capacity of fish habitat by preventing the further loss in productive capacity of existing habitats through habitat management and the application of the principles of No Net Loss of productive capacity. The Policy provided the department with a variety of tools to assist in achieving the principle of No Net Loss. Under this principle, Fisheries and Oceans Canada stated that it worked to achieve No Net Loss by avoiding impacts through the application of mitigation and, failing that, by balancing unavoidable habitat losses through habitat compensation. The department stated that a major consideration in determining the acceptability of compensation measures was the certainty or likelihood of success in achieving the No Net Loss objective. This would include an evaluation of the feasibility, practicality and risks associated with the compensation options, including the extent of monitoring and adaptive management that may be required, in order to ensure the greatest probability of success.

In its submission to the Panel for the public hearing, Fisheries and Oceans Canada noted that the use of compensation to achieve the principle of No Net Loss would only be considered after it was proven impossible or impractical to avoid a harmful alteration, disruption or destruction of fish habitat through relocation, redesign or mitigation. The department noted that when compensation was required to achieve No Net Loss, the Policy for the Management of Fish Habitat includes a Hierarchy of Preferences for compensation proposals, as outlined below:

1. create or increase the productive capacity of like-for-like habitat in the same ecological unit;
2. create or increase the productive capacity of unlike habitat in the same ecological unit;
3. create or increase the productive capacity of habitat in a different ecological unit; and
4. in rare circumstances, use of artificial production techniques to maintain a stock of fish, deferred compensation or restoration of chemically contaminated sites.

Fisheries and Oceans Canada noted that the ecological value of the existing habitat must be considered before moving down the Hierarchy of Preferences. In some situations, the

department reported that it may not be possible to accept anything other than Option I (like-for-like) if the importance of the habitat being compensated was too great. The department also noted that it typically requires a greater than a 1:1 compensation ratio when considering the quantity of new habitat that would be required to replace existing fish habitat that would be lost, particularly when there was uncertainty of success, variation in the quality of the fish habitat being replaced, and in order to account for any lag time required for the new habitat to become functional.

In April 2009, Fisheries and Oceans Canada submitted preliminary comments on Taseko's EIS. Fisheries and Oceans Canada concluded that the compensation works proposed by Taseko were not consistent with its Policy for the Management of Fish Habitat and legislation. Specifically, Fisheries and Oceans Canada noted the following:

- the proposed plan did not include compensation works for the fish species that use lower Teztan Yeqox (Fish Creek);
- a discrepancy existed between the area of proposed spawning and rearing stream habitat and what was currently available;
- uncertainties existed regarding the need to monitor, operate and maintain Prosperity Lake in the long-term;
- a lag time existed between the time existing habitat would be affected and new habitat would become functional; and
- there was a lack of information on the effects of the compensation works on First Nation fisheries.

Fisheries and Oceans Canada also stated that the information provided in the EIS regarding the fish and fish habitat compensation plan did not adequately demonstrate that the plan would be both technically and economically feasible. Therefore, Fisheries and Oceans Canada concluded that the proposed plan would not offset the loss of fish habitat and that Taseko's proposed compensation plan was a high risk proposal with the potential for significant adverse environmental effects.

In response, Taseko submitted a revised fish and fish habitat compensation plan, entitled "Feasibility Design of Fisheries Compensation". Upon review, Fisheries and Oceans Canada concluded that a gap remained between the productive capacity of the existing habitat and that of the proposed fish habitat compensation plan. The department also identified a number of important risks associated with the likelihood of success of the proposed plan, including:

- the proposed compensation plan would not replace a significant portion of the stream habitat that would be lost; this would result in the loss of 60,087 m<sup>2</sup> of spawning and rearing habitat for a variety of life stages; due to the large amount of habitat being lost, the temporal loss of several years before new habitat becomes functional, and the risks associated with the proposed plan, Fisheries and Oceans Canada expected a compensation plan which included a compensation ratio that was greater than 1:1 with respect to the quantity of newly constructed habitat;
- the proposed modelling approach may have underestimated Teztan Biny (Fish Lake) productivity and overestimated the productivity of the proposed Prosperity Lake; several factors associated with Taseko's modeling approach for characterizing the constructed ecosystem may affect the results for predicted water quality, productive capacity and trout rearing conditions for the proposed Prosperity Lake;



- Prosperity Lake would have a lower proportion of littoral habitat (approximately 40%) than existing Teztan Biny (Fish Lake) (approximately 75%); the high proportion of littoral habitat was probably a significant factor in the high productivity of Teztan Biny;
- the proposed spawning channel would only function with regular maintenance, and therefore would not be viable in the long term;
- Taseko had not included the stream and creek network when making habitat productivity and compensation calculations;
- Taseko may not have provided for large enough numbers of spawning pairs in the outplant programs and hatchery programs to maintain the genetic line of Teztan Biny (Fish Lake) rainbow trout; and
- the proposed fish and fish habitat compensation plan would intercept natural flows within the watershed, and convey these flows directly to a headwater retention pond for controlled release to Prosperity Lake through an engineered spawning channel; flows to the lake would be substantially shorter in duration than in the natural ecosystem; the loss of this type of habitat presents a risk that primary productivity would be significantly lower and over a shorter period.

With respect to the estimated cost of the proposed fish and fish habitat compensation plan, Fisheries and Oceans Canada stated during the topic-specific hearing session that while the department did not have a cost estimate from Taseko for the proposed compensation works, it “would expect that it would be a fairly significant expense in the order of many millions of dollars.” Fisheries and Oceans Canada stated that it would require the costs of the proposed fish and fish habitat compensation plan, as well as the associated long-term monitoring to be captured in an irrevocable letter of credit before the waterbodies could be added to Schedule 2 of the *Metal Mining Effluent Regulations*.

On behalf of MiningWatch Canada, Dr. David Levy reviewed the technical merits of Taseko’s compensation plan and its likelihood of achieving No Net Loss. In MiningWatch Canada’s submission for the public hearing, Dr. Levy concluded that there was little reason to have faith in the success of the plan based on inadequacies of the proposed plan and complexity of replacing a whole ecosystem. In addition, Dr. Levy concluded that due to an overall loss of productive habitat there would be a net loss of productive habitat even after mitigation. In order to achieve No Net Loss, MiningWatch Canada concluded that Prosperity Lake would have to be 4-5 times larger than what was being proposed. Dr. Levy noted that he was not able to review the revised fish and fish habitat compensation plan submitted by Taseko during the public hearing.

MiningWatch Canada submitted that the concept of compensation as applied by Taseko was a very narrow view of complex ecosystems. It stated that not only did the concept ignore the social and spiritual values of Teztan Biny (Fish Lake) and immediate surrounding area, but it also ignored all of the ecological services or “natural capital” values that would be provided by the streams and lakes above and beyond the provision of fish. Prosperity Lake would not compensate for the loss of Teztan Biny and Y’anah Biny (Little Fish Lake) in that there was:

- inadequate compensation for littoral habitats;
- no compensation to account for time lags in artificial lake functionality;
- inherently lower trout production in Prosperity Lake; and
- predicted reduction in Prosperity Lake productivity over time.

The Tsilhqot'in National Government retained Dr. Gordon Hartman to review the proposed fish and fish habitat compensation plan. Dr. Hartman raised a number of concerns about the technical feasibility of each of the four components that make up the compensation plan: the headwater diversion channel; the headwater retention pond; the spawning channels; and Prosperity Lake. Dr. Hartman stated that the different component parts were interrelated and depended on each other. Further, he indicated that it was very important that each of the components work, because failure of any one could lead to a failure of the entire system. In Dr. Hartman's view, these components would not likely function on their own, and therefore, would be unlikely to function together as an integrated, sustainable trout ecosystem. He submitted that the likelihood of constructing a multi-component, integrated and durable fish sustaining aquatic system of this scale and complexity would be extremely remote, if not impossible.

Dr. Hartman remarked that due to the low volumes of water in the headwater retention pond, which was estimated to have a depth of 5 to 6 m, it was likely that there would be a degree of warming that would occur. Dr. Harman noted that if the majority of inflows to the headwater diversion channel were to occur during May, the headwater retention pond would fill with water during the early summer months and be drawn down over the course of the summer, releasing water into the proposed spawning and rearing channel. Dr. Hartman expressed concern that warm seasonal temperatures experienced in this period may negatively affect fish survival.

Dr. Hartman commented on the Hartman and Miles (2001) study referenced by Taseko in its revised "Feasibility Design of Fisheries Compensation" report. As one of the authors of that study, Dr. Hartman indicated that there had been misrepresentations between his findings and what was reported by Taseko. The high success rate in new lake construction that was reported in the Hartman and Miles review was based on success in the context of the expectations in the specific projects that were reviewed. The expectation for the success rate of these new lakes was to introduce fish to flooded open pits and grow them on a "put-and-take" basis, meaning that the fish were continually restocked and not expected to create a self-sustaining population. Dr. Hartman stated that the projects studied were not designed for the creation of a functional aquatic system for growth, reproduction and spawning. When asked by Taseko if it were possible to develop a compensation plan for the loss of Teztan Biny (Fish Lake) that was consistent with both the federal No Net Loss objective and met the provincial fisheries management objectives, Dr. Hartman concluded that such a plan could not be developed that would achieve like-for-like habitat. Dr. Hartman also indicated that based on his experience it was likely that the spawning and rearing channels would require ongoing maintenance. As such, he indicated that he did not expect the system would be self-sustaining.

The Panel received information from various participants, outlining a number of concerns and issues with respect to the proposed fish and fish habitat compensation plan, which are summarized below:

- there was a risk that the proposed spawning channel would only function with regular maintenance, and therefore would not be viable in the long term;
- flows to the spawning channel from the headwater retention pond may require constant human intervention;
- the conversion of existing creek and stream habitat to a shorter engineered channel may significantly lower primary productivity;

- the proposed plan may not support enough individuals of rainbow trout to reach the target population in Prosperity Lake;
- irreversible changes may be made to the existing environment before success of the proposed plan would be demonstrated;
- the ability to establish aquatic vegetation in a relatively short time frame may be problematic;
- the temperature of the water in the headwater retention pond may be higher than predicted, resulting in effects to the thermal regime downstream;
- uncertainty regarding whether productive populations of rainbow trout could be established in the headwater diversion channel in the closure period in the absence of spawning channels;
- the potential risk that local fishing opportunities may not be replaced; and
- uncertainty regarding whether First Nations would be able to meet their food, social and ceremonial needs for fish.

In August 2008, the provincial Ministry of Environment developed a benchmark statement identifying its policy respecting fish and fish habitat for Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake). The benchmark statement identified four objectives that Taseko's fish and fish habitat compensation plan should meet in regards to Teztan Biny and Y'anah Biny, and associated stream habitat, as outlined below:

- maintenance of the genetic line exhibited in the trout population of the Teztan Biny system;
- development of lake and stream environments of equivalent productive capacity for trout as provided by the Teztan Biny system now;
- a healthy, self sustaining trout population; and
- a trout fishery for First Nations and the public of at least similar character to what was supported by Teztan Biny under current conditions.

In its Benchmark Statement, the provincial Ministry of Environment outlined a number of mitigation and compensation measures it felt would be appropriate to account for the biological and recreational values associated with the lake and stream habitats in the Teztan Yeqox (Fish Creek) watershed, including but not limited to:

- an initiative to preserve the genetic attributes of Teztan Biny (Fish Lake) rainbow trout;
- re-establishing lake and stream ecosystems to replace the Teztan Biny complex;
- a fund to support work with First Nations on non-anadromous fisheries projects including opportunities for food/ceremonial harvest and public recreation;
- increasing opportunities for First Nations food/ceremonial fisheries and recreational angling/camping opportunities in the Taseko and Chilko watersheds; and
- establishing measures to deliver water quality parameters consistent with re-establishing fish stocks and recreational use of the lake area, and ensuring any discharges to the Taseko watershed pose no risk to fish and fish habitat.

On December 4, 2009, Taseko submitted performance measures for each objective, which were developed in consultation with the provincial Ministry of Environment. These objectives were designed to clearly define Taseko's obligations and responsibilities associated with implementation of plan elements and to aid in the assessment of when and how each of the four objectives has been met.

The provincial Ministry of Environment and Fisheries and Oceans Canada expressed differences of opinion with respect to the value of fish habitat in lower Teztan Yeqox (Fish Creek). In July 2009, the Ministry characterized the habitat in lower Teztan Yeqox as of minimal value, as the area in reach 1 was dry and the only species present were rainbow trout. While the Ministry reported suitable spawning and rearing habitat in reaches two and three, it outlined that further visits may be required to determine if these reaches contained enough water for overwintering.

Taseko's fish and fish habitat compensation plan was determined to be satisfactory by the British Columbia Ministry of Environment and the Ministry of Energy, Mines and Petroleum Resources since it would adequately address Ministry of Environment's relevant policy goals. The environmental assessment conducted by the British Columbia Environmental Assessment Office determined that "the loss of Fish Lake and Little Fish Lake is a one-time, permanent event with a significant adverse effect on fish and fish habitat at that location". The ultimate conclusion of the assessment was that the significant adverse effects to fish and fish habitat were justified in the circumstances.

#### **6.4.4: ARTIFICIAL PROPAGATION**

##### **6.4.4.1: Proponent's Assessment**

In order to maintain a population of Teztan Biny (Fish Lake) genetic stock, Taseko proposed a number of measures, including outplanting fish from Teztan Biny to regional recipient lakes, removal of gametes from Teztan Biny stock for culture in a hatchery, retaining Y'anah Biny (Little Fish Lake) in the short term to optimize gamete supply, and outplanting hatchery reared fry into recipient lakes and Prosperity Lake.

Originally, Taseko put forward the Hanceville Hatchery as the fish culture facility for the Project. It retained the Freshwater Fisheries Society of British Columbia to conduct an initial assessment of the old Hanceville Hatchery as a potential site to conduct the fish culture program. The result of that assessment indicated that serious consideration should be given to having the fish culture services provided from an existing fish culture facility in another location. The study indicated that incorporating the Teztan Biny (Fish Lake) fish culture program into existing operation such at the Clearwater Trout Hatchery would increase the probability of program success and substantially lower the costs of operation and maintenance. During the topic-specific hearing session on fish and fish habitat, Taseko noted that the provincial government had decided that the Clearwater Hatchery was to be used for the Project.

The objective for fish culture at the Clearwater Hatchery would be to seasonally produce 100,000 fall fry using Teztan Biny (Fish Lake) stock to maintain back-up gene pools of Teztan Biny stock in Slim Lake, at an individual lake population size of about 3,000, and for additional fry for outplant to other lakes in support of British Columbia Ministry of Environment small lakes management planning and potential First Nations food fishery needs.

In addition to the fry, Taseko proposed the removal of 12,000 trout from Teztan Biny (Fish Lake) and outplanting these fish to a number of regional lakes identified by the British Columbia Ministry of Environment until such time as monitoring concluded that Prosperity Lake would provide a trout fishery of at least a similar character to what was reported to be supported by Teztan Biny under pre-development conditions. After discussions with the

Ministry of Environment, Taseko determined that a minimum viable population of 2,000 trout of various age classes would be sufficient to ensure the maintenance of the genetic stock of Teztan Biny trout.

Taseko indicated that 14 candidate lakes had been identified by the British Columbia Ministry of Environment that had the characteristics needed for fish transfer. As these lakes had no self sustaining capability due to the lack of inlets or outlets, the proposed annual stocking program using Teztan Biny (Fish Lake) gametes from a hatchery would be a critical component of the plan to keep the lake populations sustainable. Taseko reported that it was working through the list of candidate lakes with input from the British Columbia Freshwater Fisheries Society to confirm the suitability and consistency with provincial policy on stocking fishless lakes versus lakes with fish. As a result, at the time of the public hearing, Taseko indicated that it was not in a position to identify all of the lakes that would be used for outplanting. However, it indicated that it had notionally identified Slim Lake as a potential outplanting site.

Taseko stated that the production of fry would off-set losses from middle and upper Teztan Yeqox (Fish Creek) stream habitats, and provide angling opportunities in the region. Taseko's proposal included funding the operation of the hatchery until the compensation plan objectives had been met and monitoring had confirmed the success of the program.

#### **6.4.4.2: Views of Participants**

As noted in Section 6.4.3, the use of artificial production techniques to maintain a stock of fish was lower down in Fisheries and Oceans Canada's Hierarchy of Preferences for compensation proposals. Therefore, Fisheries and Oceans Canada indicated it would not provide habitat compensation credit for the transfer of fish to a fishless lake. Credit would only be provided for habitat compensation that would increase productivity. As such, Fisheries and Oceans Canada indicated that it was unlikely to consider a hatchery or the stocking of the lakes as compensation, as it would not satisfy Fisheries and Oceans Canada's habitat compensation requirements.

While Taseko's proposal to include a hatchery for the maintenance of the Teztan Biny (Fish Lake) fish population genetic line and for the potential stocking of the proposed Prosperity Lake would contribute to provincial objectives, Fisheries and Oceans Canada identified risks associated with the proposal. In particular, Fisheries and Oceans Canada noted that hatchery production had risks associated with maintaining the long term sustainability of a hatchery operation without constant human intervention, inbreeding and genetic diversity, exposure to disease and the lack of metrics to evaluate how the hatchery would contribute to No Net Loss.

Dr. Gordon Hartman, on behalf of the Tsilhqot'in National Government, raised concerns that through a few generations of hatchery sustained stocks, the genetic characteristics of the fish would be lost. With respect to outplanting of fry into recipient lakes, Dr. Hartman also noted that unless these lakes were already barren of trout, there was no guarantee that the genetic integrity of the stock would be maintained, particularly if the environments provide for reproduction.

With respect to the choice of hatchery for fry production, Mr. Richard Holmes, on behalf of the Tsilhqot'in National Government, questioned the use of the Clearwater Hatchery for the

Project. Mr. Holmes noted that the use of the Clearwater facility would eliminate opportunities for First Nations people to become fish culturists.

The Panel also heard that the Tsilhqot'in historically stocked lakes in the Project area. For instance, Mr. Alex Lulua stated that Jidizay Biny (Big Onion Lake) had been stocked by First Nations prior to being stocked by the Province. He indicated that First Nations "...move our fish around here from here to there too, long before you guys started stocking fish around."

The Panel was made aware that the policy of the British Columbia Ministry of Environment was to give priority to the conservation of wild indigenous species and to support the stocking or transplant of fish into lakes where:

- the stocking was part of an approved management, research or recovery plan; or
- there was an identified demand for additional recreational opportunity or opportunity to reduce angling pressure on wild stocks;
- an evaluation had been completed that assessed the risks to native species that were dependent on the freshwater environment, and that these risks were considered to be acceptable; and
- appropriate consultation had been completed to assess issues surrounding First Nations' rights and title.

In determining if stocking was an appropriate action, Taseko had to identify the predicted benefits to be derived from the proposed stocking, provide an estimate of the angling effort that would be supported, and provide evidence to demonstrate that there would be a demand for a new stocked lake in the vicinity and that the proposal would either generate new angling effort, increase the diversity of angling opportunity, or reduce angling pressure on wild stocks.

The British Columbia Ministry of Environment determined that a key component of the compensation plan was the outplanting of Teztan Biny (Fish Lake) trout to a minimum of two regional priority lakes. In the summer of 2009, the Ministry identified several priority recipient lakes for outplanting based on their location relative to the Project area and their winter oxygen profiles. The recipient lakes identified by the Ministry included Slim Lake, Jidizay Biny (Big Onion Lake), Unnamed Lake, Rosse Lake, Joyce Lake, Koster Lake and Lake 6267. However, as indicated above, Taseko reported that it was still determining the exact lakes that would be used for outplanting and that only Slim Lake had been notionally identified as a potential candidate lake.

#### **6.4.5: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on fish and fish habitat, the Panel considered the following factors to be particularly relevant:

- the Teztan Yeqox (Fish Creek) watershed including Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake), Teztan Yeqox and the surrounding aquatic ecosystem support a monoculture rainbow trout population of 165, 000 rainbow trout;
- other than the 12,000 fish that would be salvaged, approximately 90,000 rainbow trout from Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake) would be lost; additionally, the fish and fish habitat in these lakes and in middle and lower Teztan Yeqox (Fish Creek) would also be lost;
- Teztan Biny (Fish Lake) was reported to be an important First Nation food fishery when salmon stocks were low;

- Teztan Biny (Fish Lake) was stated to be a valued recreational fishery due to the relative ease of catching fish and the pristine surrounding;
- Taseko has proposed a fish and fish habitat compensation plan to replace what would be destroyed by the Project in the Teztan Yeqox (Fish Creek) watershed; the proposed plan included the creation of new spawning and rearing channels, a new replacement lake and the use of both the tailings storage facility and Pit Lake during the post-closure period as additional areas to support fish populations;
- substantial risks and concerns were raised by participants with respect to the fish and fish habitat compensation plan, including:
  - the failure to meet Fisheries and Oceans Canada's "no net loss" policy;
  - uncertainty regarding whether the proposed spawning channel would function without regular maintenance and therefore whether it would be viable in the long term;
  - the loss of primary productivity as a result of the conversion of existing creek and stream habitat to a shorter engineered channel;
  - the lack of outlet spawning habitat in Prosperity Lake;
  - the potential that Taseko may have underestimated Teztan Biny (Fish Lake) productivity and overestimated the productivity of the proposed Prosperity Lake;
  - uncertainty regarding whether Prosperity Lake would support enough individual rainbow trout to reach the target population;
  - irreversible changes would be made to Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and Teztan Yeqox (Fish Creek) before success of the proposed plan has been demonstrated;
  - uncertainty regarding whether aquatic vegetation could be established in a relatively short time frame;
  - the warmer temperature profile of the headwater retention pond may affect the survival of fish in the spawning and rearing channel;
  - uncertainty regarding whether productive populations of rainbow trout could be established in the headwater diversion channel in the absence of spawning channels;
  - local fishing opportunities may not be replaced; and
  - uncertainty regarding the suitability of water quality in the tailings storage facility and Pit Lake to support fish populations in the post-closure period.

Taseko's mine development plan would destroy Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and portions of Teztan Yeqox (Fish Creek). Approximately 90,000 rainbow trout would be lost as a source of food for First Nations and for recreational fishers. While there are other lakes that could be used by recreational fishers, in the Panel's view, they would not have the same fishing experience that was stated to be found at Teztan Biny.

While First Nations indicated that salmon stocks are an important staple in their traditional diet, they also indicated that lake trout are an important source of food when salmon stocks are low. The Panel notes that the permanent loss of Teztan Biny (Fish Lake) would remove an existing First Nation food fishery and that the fish found in Teztan Biny were an important source of fish for their sustenance. While other lakes exist in the area for First Nation's use, the Teztan Biny watershed was considered to be an area of particular importance for the Tsilhqot'in for gathering and for its cultural values. In the Panel's view, fishing in other lakes as an alternative would not have the same meaning.



Taseko has proposed the creation of a new lake with supporting spawning and rearing channels upstream of the tailings storage facility and additional spawning channels at the mouth of Teztan Yeqox (Fish Creek). The Panel notes that while stocking Prosperity Lake with approximately 20,000 trophy-sized rainbow trout would meet provincial fisheries objectives, it would create a different fishing experience, which may not be equivalent to the fishing experience at Teztan Biny (Fish Lake).

The Panel notes that the fish and fish habitat compensation plan, if successful, would not replace the existing fish and fish habitat on a like for like basis nor would it meet Fisheries and Oceans Canada No Net Loss policy. Further, there would be a time lag of approximately 7 years before Prosperity Lake would be completed and stocked with fish. This would place additional pressure on other lakes and may interfere with First Nations fishing in those lakes. Once Prosperity Lake was stocked with fish, there would be no certainty that fishers would return to the new lake to fish. The Panel was informed by First Nations that it was unlikely that they would fish in Prosperity Lake due to fears that the fish would be contaminated.

Many participants stated that the fish and fish habitat compensation plan would not likely be successful. The Panel notes that while there has been some success with stocking lakes and creating spawning and rearing channels individually, there has been no experience with re-creating an ecosystem in which all these components function together on a self-sustaining basis. Based on the information received, the Panel is of the opinion that the proposed fish and fish habitat compensation plan would require ongoing human intervention in the long term. The Panel notes that the schedule of obligations included in the final provincial performance measures (dated December 4, 2009) only require Taseko to operate Prosperity Lake and be responsible for the measures listed in the EIS for the 'life of mine', defined as "the time period in which the mine is operational". The Panel is concerned that the proposed fish and fish habitat compensation works could become a burden to future generations as it would likely require ongoing maintenance and re-stocking of fish on a continuing basis for an undetermined period. Therefore, the Panel notes that performance bonding under the *Fisheries Act* would be particularly important to cover the future costs of ongoing maintenance of the fish and fish habitat compensation works, should the Project proceed.

The Panel also notes the uncertainties regarding whether the proposed aquatic environment for Prosperity Lake would have the productive capacity to support the proposed fishery. Participants noted that Prosperity Lake would have a lower proportion of littoral habitat than Teztan Biny (Fish Lake), which was likely an important contributor to its high productivity. The Panel notes that Prosperity Lake would be a fundamental component of the proposed fish and fish habitat compensation plan and if the lake does not function as intended, the success of the proposed compensation plan would be jeopardized.

In addition to potentially requiring ongoing human intervention, the Panel notes that the fish and fish habitat compensation plan included both the tailings storage facility and Pit Lake as potential habitat. Taseko has indicated that the inclusion of the tailings storage facility and Pit Lake would be necessary to bring the habitat compensation ratio for riparian habitat to 1:1. However, given the concerns noted by participants in Section 5.2, the Panel notes that water quality in Pit Lake, in particular, may not be of sufficient quality to support fish.

The Panel has considered the comments received and concludes that as proposed, the fish and fish habitat compensation plan poses an unacceptable level of risk that raises considerable doubt regarding its ability to meet the requirements of Fisheries and Oceans

Canada's No Net Loss policy and to be a functioning, self-sustaining system in the future. In the Panel's view, the Project's effects on fish and fish habitat would be high magnitude, long-term and irreversible and would include the loss of an area that was stated to be of value as both a First Nation food fishery and recreational fishery.

**The Panel concludes that the Project would result in a significant adverse effect on fish and fish habitat in the Teztan Yeqox (Fish Creek) watershed.**

The Panel cannot recommend any measures that would mitigate the significant adverse effects of the Project on fish and fish habitat in the Teztan Yeqox (Fish Creek) watershed, should the Project be allowed to proceed. The Panel is aware of the many risks and uncertainties raised by the parties with respect to the proposed fish and fish habitat compensation plan. The Panel also notes that the relationship between Taseko and the Tsilhqot'in Nation was strained and that there was little trust between the parties. Further, the Tsilhqot'in Nation consistently expressed opposition to the destruction of Teztan Biny (Fish Lake). As a result of these factors, the Panel is of the opinion that Taseko would be unable to modify the proposed fish and fish habitat compensation plan such that it would be acceptable to all parties. However, if the Project proceeds, First Nations should be given a meaningful opportunity to have input into its design, implementation, monitoring and ongoing maintenance. This is discussed further in Section 10.6.

## **6.5: TERRAIN AND SOIL**

The key issue relating to terrain and soil identified by the Panel was terrain instability and related environmental effects.

### **6.5.1: TERRAIN INSTABILITY AND SOIL EROSION**

#### **6.5.1.1: Proponent's Assessment**

Taseko stated that as the majority of the terrain within the local study area was of low gradient, the terrain was very stable with a low likelihood of mass wasting. The Project activities that would have the greatest contribution to mass wasting events would occur primarily during construction, such as clearing of the transmission line right-of-way and the construction and installation of the transmission line. Project activities could contribute to mass wasting events at post-closure as well.

Taseko outlined several mitigation strategies for terrain mass wasting. These included safety awareness of ground crews during blasting activities, signage for geohazardous areas, and clearing away potentially unstable slopes. Additionally, Taseko noted that proper engineering of the open pit wall and blasting techniques would reduce detrimental vibrations, thus controlling risk. Along the transmission line, Taseko noted the poles would be located to avoid wetlands, steep slopes and shallow or exposed bedrock formations. Taseko noted the Fraser River crossing site and riparian habitat along the transmission line right-of-way would require specific mitigation.

In terms of effects on soil, the Project would result in mixing of the various layers (or horizons) of the soil (referred to as admixing), which could be positive or adverse. Soil could

also be affected by compaction and rutting during the construction period, particularly due to heavy equipment.

Taseko noted that soil erosion could also occur due to the loss of vegetation cover during soil stripping and salvage in the construction phase. Also during construction, soil erosion could occur at the soil stockpiles. During closure, destabilization and sedimentation of the shoreline of Pit Lake and the tailings storage facility could occur as they filled with water. In terms of mitigation, Taseko developed strategies for admixing, soil compaction and rutting, soil erosion, and soil loss, for the mine site, access roads and the transmission line right-of-way.

#### **6.5.1.2: Views of Participants**

The Stswecem'c/Xgat'tem (Canoe Creek Band) expressed concerns regarding terrain and soil instability, erosion and sedimentation. Mr. Gary Runka of GG Runka Land Sense Ltd., on behalf of the Stswecem'c/Xgat'tem, raised concerns about effects to terrain and soils along the transmission line. Mr. Runka indicated that the baseline terrain and soil inventory carried out by Taseko to support its effects assessment was inadequate. Mr. Runka noted that small-scale mapping, such as that carried out by Taseko, could not reflect the variability in the landscape to the degree necessary to predict effects. During the community hearing session in Stswecem'c/Xgat'tem, he stated that:

*at the present time there's a 1:50,000 scale of soil inventory information for the study area which is totally inadequate to reflect landscape variability to the degree necessary to predict impact. I suggest for some sections of the corridor 1:20,000 mapping of terrain and soils would be adequate. Other sections, and the one that we visited this morning in Brigham Creek watershed, just up the valley here, it's going to be 1:10,000 or even 1:5,000 may be necessary to really assess impact.*

The Stswecem'c/Xgat'tem also recommended that a soil erosion and sedimentation plan for the transmission line corridor be required in order to ensure mitigation of effects in locations such as the Fraser River crossing and other sensitive terrain/ecosystems along the transmission line right-of-way and access roads.

#### **6.5.2: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on terrain and soils, the Panel considered the following factors to be particularly relevant:

- changes to terrain and soil resources within the immediate area of the mine site would occur as a result of the Project;
- within the local study area of the mine, the majority of the terrain was reported to be of low gradient and relatively stable, and the likelihood of mass wasting was considered low;
- along the transmission line, there would be some slopes that would require further consideration due to steep gradients;
- the environmental management plans and monitoring set out in the EIS addressed the issue of geotechnical stability;
- the Stswecem'c/Xgat'tem (Canoe Creek Band) expressed concerns regarding terrain and soil instability, erosion and sedimentation;
- the Stswecem'c/Xgat'tem (Canoe Creek Band) indicated that the baseline terrain and soil inventory carried out by Taseko to support its effects assessment was inadequate and suggested that 1:10,000 or 1:5,000 scale mapping would be necessary to adequately assess effects; and

- the Stswecem'c/Xgat'tem (Canoe Creek Band) recommended that a soil erosion and sedimentation plan for the transmission line corridor be established to ensure mitigation of effects in locations such as the Fraser River crossing and other sensitive terrain/ecosystems along the transmission line corridor and access roads.

The Panel notes that while the Project's effects on terrain and soils are long term at the mine site, some effects, such as those along the transmission line right-of-way, are potentially reversible over time. Although the effects cover a linearly extensive area, the effects extend over a relatively narrow geographic area. The Panel also notes that with the prescribed mitigation measures outlined in the EIS, no measurable detrimental effects from soil mixing, compaction, rutting and erosion were predicted as a result of Project activities. Therefore, taking into consideration the mitigation proposed by Taseko, and implementation of the Panel's recommendations, the effects are considered to be moderate overall.

**The Panel concludes that the Project would not result in a significant adverse effect on terrain and soils.**

To assist in further minimizing effects on terrain and soils, the Panel recommends additional measures be undertaken in concert with the pre-construction assessments identified by Taseko.

**RECOMMENDATION 4**

If the Project proceeds, the Panel recommends further detailed terrain hazard and soils mapping should be done by Taseko in areas of the transmission line right-of-way that have been identified as having potentially hazardous terrain and sensitive soils to assist in finalizing the centreline.

**RECOMMENDATION 5**

If the Project proceeds, the Panel recommends Taseko complete an additional assessment of areas of slope instability on the access road at the Tête Angela Creek crossing.

**RECOMMENDATION 6**

If the Project proceeds, the Panel recommends areas identified as unstable undergo a detailed on-site terrain stability assessment by a qualified professional so that appropriate planning and mitigation measures can be undertaken prior to the commencement of construction activities.

**6.6: VEGETATION**

Concerns raised by the participants relative to vegetation focused largely on issues related to loss of old growth forest habitats, effects of invasive plants on grasslands, loss of wetland and riparian habitats, and loss of plants of importance to First Nations. Issues related to old growth forest and grassland ecosystems are discussed in this section. Discussion on wetlands and riparian habitats in relation to the wildlife habitat compensation plan is included in Section 6.7 and plants of importance to First Nations are discussed in Section 8.2.

As Taseko's assessment of forest capability and ecological communities of conservation concern were not raised as key issues during the review, they are therefore not discussed in this report. Also, Taseko indicated that none of the rare plant species identified as potentially occurring in the Project study area were listed on Schedule 1 of the *Species at Risk Act*. Therefore, these matters are not discussed further in this report.

## **6.6.1: OLD GROWTH FORESTS**

### **6.6.1.1: Proponent's Assessment**

In the EIS, Taseko defined old growth forests as forest stands older than 140 years<sup>9</sup>. According to Taseko, old growth forest was primarily concentrated in the western end of the transmission line corridor and at the mine site. The majority (approximately 80%) of the old growth forest stands were lodgepole pine-leading stands and less common spruce-leading stands. Sporadic Douglas-fir-leading stands were also observed along the eastern half of the transmission line corridor. Old growth forest stands were inventoried to be present intermittently along the access road between the mine and Highway 20. Taseko indicated that the loss of most mature and old pine forest was to be expected within the next 5 to 10 years due to the effects of the mountain pine beetle. As a result, Taseko argued that in most instances, pine-dominated old growth forests removed by the Project would not be considered an environmental effect of the Project.

Taseko estimated a maximum potential loss of 1,465 ha of old growth forest at the mine site, and 171 ha along the transmission line corridor. Only selected tree cutting would be expected along the access road. However, Taseko estimated that by considering the loss of pine-leading stands to the mountain pine beetle, the Project would only contribute approximately 226 ha in the mine site (4% of the total loss of old growth forest in the mine site regional study area), and 40 ha along the transmission line corridor (0.9% of old growth forest loss in the transmission line regional study area).

To reduce the Project effects on old growth forest, Taseko proposed mitigation measures such as protecting existing non-pine old and mature forest wherever practicable, reforesting the reclaimed mine site and transmission line corridor and collaborating with provincial government in the control of spruce bark beetle populations. It was further clarified by Taseko during the public hearing that clearing would be minimized where the transmission line crossed through old growth forests.

Along the transmission line, Taseko pointed out that vegetation would be cleared but the soil horizons would remain intact and assumed that environmental effects to old growth forest were expected to be reversible over time with application of standard reforestation practices at closure.

Overall, Taseko concluded that the environmental effect of the Project on old growth forest was a moderate reduction of primarily pine-leading old growth forest. As for non-pine old growth forest stands, Taseko estimated that the overall Project reduction of those stands would be small. With the application of the prescribed mitigation measures and environmental protection measures, Taseko concluded that the environmental effect of the Project on old growth forest was predicted to be not significant.

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<sup>9</sup> In the EIS, Taseko referred to old forests. In the British Columbia Interior regions, stands older than 140 years are also considered as old growth forests. The terms old forests and old growth forests are considered to have similar meaning for the purpose of this report.

### **6.6.1.2: Views of Participants**

During the EIS review phase, a number of participants raised issues regarding the fact that both the mine site and transmission line corridor would be cutting through mature and old growth forest areas, and that more information was required to adequately assess the effect of the Project on mature and old growth forests. However, during the public hearing, most of the issues related to old growth forests were raised by the Esketemc (Alkali Lake Band) as the proposed transmission corridor would cross through their Community Forest. This issue is discussed in Section 7.1 in the context of land and resource uses.

## **6.6.2: GRASSLAND ECOSYSTEMS**

### **6.6.2.1: Proponent's Assessment**

In its EIS, Taseko generally defined grasslands as semi-arid ecosystems dominated by bunchgrasses, shrubs and forbs, occurring in the hottest and driest locations of the landscape. Grasslands were characterized as relatively sensitive to disturbance, having high potential for rare plant occurrence and being relatively uncommon in British Columbia. However, according to Taseko, grassland ecosystems were common ecosystem features throughout the Project area; it mapped more than 20 grassland ecosystems along the transmission line corridor, with the largest and greatest number found close to the Fraser River.

At the mine site, grassland ecosystems were identified mostly west of the mine footprint area, and Taseko estimated that only 7.5 ha of Juniper-Kinnikinnick grassland was expected to be affected by the Project. Along the transmission line corridor, Taseko estimated that the right-of-way would overlap with 88 ha of grassland ecosystems, from which a very small proportion would be expected to be affected.

Taseko indicated that the effects on grassland ecosystems in the transmission line corridor would result from the installation of poles and construction of associated access roads. Indirect environmental effects could also occur as a result of soil disturbance and potential introduction of non-native invasive species. In response to an information request from the Panel, Taseko provided a list of mitigation measures that would be implemented to minimize the Project's effects on grassland ecosystems. Taseko also acknowledged that effects along the transmission line could be minimized because there would be substantial flexibility in determining the placement of poles and access infrastructure to avoid sensitive grassland habitats. Taseko reported that many of the grasslands closest to the Fraser River had already been affected by cattle grazing and forest harvesting activities.

Taseko indicated that it would implement an invasive plant management strategy which would include an inventory of invasive plant occurrence and measures to prevent the introduction of further invasive plants such as minimizing soil disturbance, seeding the ground immediately after it was disturbed, ensuring that the equipment brought to the site was clean and weed-free. Any infestations of invasive plants would be controlled by mechanical, chemical, and biological control measures. Taseko indicated that monitoring would also be undertaken to ensure that the plan was effective.

Taseko assumed that with careful planning and an emphasis on avoidance, losses of grassland ecosystems resulting from the Project could be kept to less than 1% of the baseline area, and that the more sensitive grasslands and those that were most uncommon could be avoided entirely. Therefore, Taseko estimated that the overall environmental effect

of the Project on grassland ecosystems would not be significant with the implementation of the proposed mitigation and environmental protection measures.

#### **6.6.2.2: Views of Participants**

A number of participants raised concerns regarding the routing of the transmission line, through fragile grassland ecosystems, stating that these ecosystem supported rare or endangered plant and animal species.

Many of the comments from participants highlighted concerns regarding the threat of invasive species being transported along the transmission line and access corridors and the use of herbicides to control their spread. The Stswecem'c/Xgat'tem (Canoe Creek Band), Tl'esqox (Toosey), and Esketemc (Alkali Lake Band) pointed out that the spread of invasive plants was already occurring in their territory.

#### **6.6.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on vegetation, the Panel considered the following factors to be particularly relevant:

- the Project would affect 1,465 ha of old growth forest at the mine site, and 171 ha along the transmission line; approximately 80% of old growth forest affected would be lodgepole pine;
- considering the effects of the mountain pine beetle infestation on pine-leading old growth forests, the Project would contribute to the loss of approximately 226 ha of old growth forest at the mine site (4% in the regional study area) and 40 ha along the transmission line (0.9% of the transmission line regional study area);
- Taseko proposed to mitigate the effects on old growth forest by avoiding destruction where possible, reforesting the reclaimed mine site and transmission line corridor and working with the Province to control spruce bark beetle populations;
- grasslands were reported to be relatively sensitive to disturbance, have high potential for rare plant occurrence, and to be uncommon in British Columbia, but relatively common along the proposed transmission line corridor;
- while the transmission line and the mine site would overlap with approximately 88 ha and 7.5 ha of grassland ecosystem, respectively, less than 1% of the baseline area would be lost;
- concerns were raised about the spread of invasive plants and the potential use of herbicides to control their spread; and
- grasslands closest to the Fraser River were reported to have already been affected by cattle grazing and forest harvesting activities.

With respect to old growth forest, the Panel notes that there was no assurance that the pine-leading stands would survive the continued destruction from the mountain pine beetle infestation. It also notes that the total loss of old growth forest would be small at both the mine site and along the transmission line. The Panel notes that the main concern regarding the loss of old growth forest was with respect to the routing of the proposed transmission line through the Esketemc Community Forest (see Section 7.1). Overall, the Panel considers the effects on old growth forest to be small in magnitude.

**The Panel concludes that the Project would not result in a significant adverse effect on old growth forest.**

With respect to grasslands, the main area affected by the Project would be along the proposed transmission line right-of-way. The Panel notes that there would be considerable flexibility in the location of the centreline within the right-of-way and the placement of individual poles. The Panel agrees that the construction of the transmission line would only affect a very small area of grasslands. The Panel has determined that the potential effects on grassland ecosystems are relatively short term and small in areal extent. With the proposed mitigation and environmental management measures, the Panel is of the opinion that the residual effects would be moderate.

Concerns were also raised about invasive plant species and the use of herbicides along the transmission line. The Panel notes that as a component of its environmental management plan (see Section 10.6), Taseko has proposed to develop an Invasive Plant Management Plan to address the matter of invasive plant species. While the Panel considers this mitigation measure to be appropriate to address the concerns, it finds that the proposed plan would benefit from input from interested parties, including First Nations, in its finalization and in monitoring of its effectiveness. This issue is discussed further in Section 10.6.

**The Panel concludes that the Project would not result in a significant adverse effect on grassland ecosystems.**

**6.7: WILDLIFE AND WILDLIFE HABITATS**

Participants in the review process raised a number of issues and concerns related to the potential effects of the Project on wildlife. Among those, the Panel has focused its attention on effects of the Project on grizzly bears, mule deer migration and ungulate winter habitat, increased accessibility to the land, and issues surrounding the wildlife habitat compensation plan to address effects on wetlands and riparian habitats and corresponding effects on waterfowl, migratory birds and species at risk.

**6.7.1: GRIZZLY BEARS**

**6.7.1.1: Proponent’s Assessment**

As part of the baseline inventories conducted for the EIS, Taseko recorded the presence and signs of grizzly bears in and around the mine site area. The mine site, the southern part of the Taseko Lake / Whitewater Road, and the western part of the transmission line corridor would lie within the South Chilcotin Ranges Grizzly Bear Population Unit. The South Chilcotin grizzly bear population was identified as 1 of 9 grizzly bear populations considered threatened by the Province with a population estimate of approximately 100.

Taseko evaluated the potential environmental effects of the Project on grizzly bears against the loss or alteration of habitat at the mine site and along the transmission line corridor, and



the increased direct mortality risk associated with the transmission line and along the access road.

In the EIS, Taseko estimated that at maximum disturbance, 423 to 3,851 ha of moderate and high value seasonal feeding habitats for grizzly bears would be lost as a result of direct and indirect effects of the mine site development. Areas of reduction of habitat value due to sensory disturbance around the mine site were also included in the estimates. Taseko also predicted the permanent loss of 845 ha of upland habitat at the mine site at post-closure, some of which could be grizzly bear feeding habitat. Taseko estimated the potential long-term loss of feeding habitat along the transmission line corridor to be around 264 ha at maximum disturbance.

Taseko indicated that the mine would not substantially affect the availability of core secure habitats for grizzly bears at the regional level, as the area was already influenced to some extent by other human activities.

Taseko concluded that the Project's incremental effect on the cumulative loss of grizzly bear feeding habitat was not predicted to be significant with respect to the sustainability of the South Chilcotin population, primarily because the loss of feeding habitats area at a regional level were estimated to be relatively small.

With regard to increased direct mortality risk for grizzly bears, Taseko estimated that the risk associated with the transmission line was relatively low. However, Taseko also recognized that the transmission line right-of-way itself could become a low use linear access feature accessible to off-road vehicles. This type of access could increase the risk of direct mortality to grizzly bears from poaching in areas that were previously inaccessible.

Taseko considered the increased risk vehicle-related mortality for grizzly bears as a result of increased traffic on the 4500 road and the lower part of Taseko Lake / Whitewater Road. Taseko acknowledged that the increased traffic could be a possible concern for grizzly bears and predicted that there would be a medium magnitude and a medium to long-term residual increase in direct mortality risk along the access roads during the life of the Project.

In addition to the general mitigation measures identified for wildlife in the EIS, Taseko indicated that it would work with the British Columbia Ministry of Transportation to reduce traffic speed along the section of Taseko Lake / Whitewater Road that was within occupied grizzly bear range, in order to reduce the Project's effects on direct mortality risk to grizzly bears.

Given the current threatened state of the South Chilcotin grizzly bear population, Taseko recognized that any mortalities resulting from the Project would have a potential effect on the sustainability of this population and indicated that it would commit to the strict and rigorous implementation of mitigation measures in collaboration with the British Columbia Ministry of Environment and other agencies and stakeholders to eliminate or minimize the risk of direct mortality (Appendix 4, Commitment 10.3). With this commitment, Taseko concluded that the effect of direct mortality risk to grizzly bears from vehicle collisions would be not significant, but recognized that this was absolutely contingent on strict enforcement of the mitigation measures related to traffic and a policy of using non-lethal approach in resolving any incidents involving grizzly bears.

During the public hearing, the Panel requested Taseko to confirm whether it would reconsider its conclusion of no significant effect on grizzly bears, based on information filed by Mr. Wayne McCrory, on behalf of the Friends of the Nemaiah Valley and Tsilhqot'in National Government. Taseko confirmed that it would not reconsider its findings but added that its determination was dependant on the effectiveness and implementation of the identified mitigation measures.

In its closing remarks, Taseko also argued that large protected areas and parks already existed in the immediate region, and that these parks and protected areas were created in part to help protect grizzly bears and other wildlife species.

#### **6.7.1.2: Views of Participants**

Issues and concerns related to the effects of the Project on grizzly bears were originally raised by the British Columbia Ministry of Environment and the Tsilhqot'in National Government during the review of the EIS. During the public hearing, concerns regarding grizzly bears were primarily raised by the First Nations at the community hearing sessions. However, the most critical appraisal of Taseko's approach and assessment of the Project's effect on grizzly bears was presented by Mr. Wayne McCrory, a grizzly bear and wildlife expert who presented on behalf of the Friends of the Nemaiah Valley at the Xenigwet'in (Nemah Band) community hearing session and on behalf of the Tsilhqot'in National Government at the topic-specific hearing session on terrestrial environment.

Mr. McCrory's submission focused mainly on the effect of access roads on grizzly bears and how the upgrading of the roads and increasing traffic between the mine and Lees Corner could affect grizzly bears. He indicated that the access road between the mine site and Lees Corner intersected what appeared to be a wide dispersal corridor for grizzly bears travelling from the area to the east to Dasiqox (Taseko River) and Tsilhqox (Chilco River). Mr. McCrory noted that the current state of the road provided a natural type of speed control that could limit collisions with wildlife, and that road improvements required to accommodate Project vehicles would likely result in increased traffic and increase the risk of mortality of grizzly bears and other wildlife.

Mr. McCrory was also critical of Taseko's approach of determining the significance of effects on grizzly bears. He noted that comparing the amount of habitat lost as a result of the Project to the amount of habitat available in the region was misleading and did not take into account the differences in how wildlife species used different seasonal habitats to a much higher degree than others. For example, he referred to a study in southeast British Columbia that demonstrated that grizzly bears made a much higher proportionate use of wetlands than their relative distribution in the landscape. Therefore, Mr. McCrory indicated that the loss of wetland and riparian habitat as a result of the Project could be more significant to grizzly bears than just losing a small percentage out of the landscape.

With respect to the transmission line, Mr. McCrory indicated that the right-of-way would improve access for motorized all-wheel drive vehicles, all-terrain vehicles and snowmobiles, thereby causing more displacement and increased mortality risk for grizzly bears.

Mr. McCrory concluded that the road and the mine would cause increased bear mortality that in the long term would push this threatened population below the threshold required to sustain recovery of the population. He also cautioned the Panel about Taseko's plan to rely on provincial programs to implement mitigation measures and follow-up programs to

effectively prevent the effects on grizzly bears. In particular, he questioned the effectiveness of the Taseko's proposed Grizzly Bear Mortality Investigation Program in preventing effects on grizzly bears.

Other participants also raised concern about the precarious status of the grizzly bear population in the Chilcotin region. In a number of presentations to the Panel, Chief Marilyn Baptiste mentioned the presence of grizzly bears in the Teztan Biny (Fish Lake) area and the fact that the population was threatened by logging activities and access roads except in the Xení Gwet'in Caretaker Area.

The Cariboo Chilcotin Conservation Society also referred to a study which highlighted the Chilcotin region as of high importance on a continental scale for grizzly bears and for preserving connectivity and viability of carnivore populations over a larger region of Western Canada.

During the EIS review, the provincial Ministry of the Environment also raised a number of concerns related to the potential effects of the Project on the South Chilcotin grizzly bear population. In particular, the Ministry pointed out that this population was identified as threatened and could not sustain additional human induced mortality. As such, the Ministry indicated that it did not agree with Taseko's conclusion of no significant residual effect on grizzly bears in this area due to the permanent loss of habitat at the mine site and the risk that bears would be lost to human-caused mortality related to the mine operations, road use and increased access along the transmission corridor. Moreover, it questioned whether the mitigation measures proposed by Taseko to reduce the risk of mortality would be sufficient given the threatened status of this population, and argued that the proposed mitigation measures be enhanced to address the residual effects on grizzly bears.

To partly respond to the concerns identified by the Ministry of Environment, Taseko submitted a supplemental report on October 2, 2009 that provided further analysis of its conclusions on the effects of the Project on grizzly bears and other wildlife. Despite the additional analysis, Taseko arrived at a similar conclusion of no significant effect with respect to the sustainability of the South Chilcotin grizzly bear population. The British Columbia Environmental Assessment Office thereafter concluded that the Project was not likely to have any significant adverse effect on wildlife in general.

## **6.7.2: MULE DEER MIGRATION AND UNGULATE WINTER HABITAT**

### **6.7.2.1: Proponent's Assessment**

Taseko evaluated the potential environmental effects of the Project on mule deer and moose against the loss or alteration of habitat in the mine site and along the transmission line, and the increased direct mortality risk associated with the transmission line and along the access roads.

In its EIS, Taseko reported that mule deer and moose were widely distributed and relatively common in central British Columbia. Taseko also reported that the mine site and most of the access roads and transmission line corridor were in an area of moderate abundance for mule deer and moose, with mule deer numbers increasing to high along the transmission line corridor closer to the Fraser River. Taseko reported a high abundance of moose along Dediny Qox (Big Creek) and a reduction in abundance towards the east in the drier subzones along the Fraser River and Tsilhqox (Chilcotin River). Taseko also pointed out that the migration of mule deer down from the mountains and out to the plateau in late summer

and fall was well known locally and that the north end of Dasiqox Biny (Taseko Lake) was identified as a mule deer migration corridor.

According to Taseko, mule deer and moose were moderately abundant at the mine site for much of the year, but less common in winter. As such, the mine site was described as having relatively low value for both mule deer and moose winter habitat. Taseko noted that eastern portion of the transmission line corridor on each side of the Fraser River was designated as mule deer Ungulate Winter Ranges.

Taseko estimated that the mine site had the potential to disrupt wildlife movement patterns particularly along Teztan Yeqox (Fish Creek) and across the Teztan Yeqox drainage basin. However, Taseko pointed out that the Teztan Yeqox area had not been specifically identified as a movement corridor for any wildlife key indicator, and that the only movement corridor identified in the area was the mule deer migration corridor at the north end of Dasiqox Biny (Taseko Lake). Taseko argued that this corridor was outside the mine disturbance area and was not expected to be affected directly or indirectly by any Project-related activities.

Taseko predicted that at the mine site, the Project would result in the long term loss of up to 970 ha of mule deer winter shelter habitat and 26 ha of winter feeding habitat. For moose, reduction of winter shelter habitat was estimated at 1,680 ha, whereas loss of winter feeding habitats was estimated at 189 ha. Along the transmission line corridor, Taseko predicted the Project would result in the long-term loss of 264 ha of non-pine leading forest suitable for winter habitat for both mule deer and moose and approximately 239 ha of designated Ungulate Winter Ranges. Taseko also predicted the permanent loss of 845 ha of upland habitat at the mine site at post-closure.

In addition to general mitigation measures identified for wildlife, Taseko proposed two specific mitigation measures to minimize the Project effect on mule deer winter habitat along the transmission corridor:

- right-of-way clearing within designated mule deer Ungulate Winter Ranges would be minimized through Project design; to guide clearing, right-of-way boundaries would be clearly marked; and
- right-of-way clearing within designated mule deer Ungulate Winter Ranges would be avoided during the critical winter period to the extent practical.

No species-specific mitigation measures were identified by Taseko for moose habitat. However, Taseko indicated that it would suggest to the provincial Ministry of Transportation and Ministry of Environment and other road users that roadside vegetation along the access road be managed to discourage moose foraging along the road, thereby reducing direct mortality risk for moose.

In response to concerns raised by the Esketemc (Alkali Lake Band) during the community hearing sessions regarding the straight line right-of-way created by the transmission line and the potential for this right-of-way to upset the predator/prey relationship, Taseko noted that no consideration had been given yet to reducing the sight line, but agreed that this concern would be taken into consideration.

Overall, Taseko concluded that, with the implementation of the proposed mitigation measures, residual environmental effect of the Project on the sustainability of both the regional mule deer and moose populations was predicted to be not significant.

### **6.7.2.2: Views of Participants**

During the public hearing, and particularly during the community hearing sessions in the Tsilhqot'in communities, many participants raised concerns about the mine site being located in what was viewed as an important mule deer migration corridor. They were concerned that the mine site could disrupt the deer from migrating between the Chilcotin Plateau to the east and the Chilcotin Ranges to the west. Similarly, members of the Secwepemc Nation raised concerns about the transmission line cutting across mule deer Ungulate Winter Ranges on each side of the Fraser River. This area was also referred to as a mule deer and moose nursery area by the Secwepemc. Participants from all First Nation communities explained the importance of mule deer and moose as a source of food.

The Esketemc (Alkali Lake Band) also voiced concerns that the transmission line right-of-way would cut through its Community Forest, part of which was also designated as mule deer Ungulate Winter Range. Moreover, some members raised the concern that the straight clearcut line created by the right-of-way could upset the predator/prey relationship, and that it would create access for other non-resident hunters, increase traffic from all-terrain vehicles and introduce invasive plants in their Community Forest. It was argued that all of this could affect the Esketemc's food supply and way of life.

### **6.7.3: INCREASED ACCESSIBILITY TO THE LAND**

#### **6.7.3.1: Proponent's Assessment**

In its EIS, Taseko recognized that the Project could increase or facilitate accessibility to the area of the proposed mine site, and along the access roads and the transmission line right-of-way. Taseko indicated that this would generally result in increased mortality risk to wildlife, and in particular to mule deer and moose as a result of increased hunting pressure and poaching opportunities. Taseko also recognized that increased traffic, particularly along Taseko Lake / Whitewater Road and 4500 road, could result in an increased risk of vehicle-related mortality for wildlife but estimated that this would not result in significant environmental effects on wildlife.

Taseko indicated that the majority of the access roads already existed, and it did not expect that there would be any measurable Project effects on disruption of movement patterns or avoidance of the road corridor due to sensory disturbance or increased human presence.

In relation to the transmission line corridor, Taseko acknowledged that even though it did not anticipate the need to create new access roads associated with the construction and maintenance of the transmission line, the right-of-way along the transmission line could allow increased access for off-road vehicles. This could result in increased mortality risk for some species, mainly deer and moose, due to increased hunter and poacher access into areas not previously accessible. Taseko estimated this risk would be minimal.

In the EIS, Taseko indicated that throughout the Project area, and particularly along the transmission line right-of-way, temporary access roads would be deactivated to deter all-terrain vehicle travel. Taseko also indicated that, as part of the permitting process, it would work with the Ministry of Forests and Range, First Nations, and the Ministry of Environment to assist in the development of a public access plan to protect wildlife and heritage values, and to restrict all-terrain vehicle access. Taseko confirmed this commitment during the public hearing.

### **6.7.3.2: Views of Participants**

During the review of the EIS and public hearing, a number of participants expressed the concern that the Project could increase accessibility to areas not previously accessible and could as a result increase mortality risks to wildlife.

The Esketemc (Alkali Lake Band) voiced concerns with the routing of the transmission line particularly in the Stuclaws area near Esket, where community members hunt, and the negative effects on wildlife from fragmentation and increased access. They expressed concerns that these effects would cause serious disturbance to animal populations, and plants in the area.

Participants from the Stswecem'c/Xgat'tem (Canoe Creek Band) and Esketemc (Alkali Lake Band) shared with the Panel their experience with the current north-south BC Hydro corridor that crossed their territory. They reported that after the line was put in, there was a complete collapse of animal populations in the areas crossed by the corridor because of increased hunting. They also explained that community members noticed a significant reduction in numbers of moose and deer after the BC Hydro transmission line was built. Areas that were once important for hunting no longer had animals. The Panel was told that the moose and deer had disappeared from the area and community members were forced to hunt elsewhere. On that basis, they did not agree with Taseko that the proposed transmission line would not result in significant effects on wildlife.

The Esketemc (Alkali Lake Band) also pointed out that the existing BC Hydro corridor served as a major access route for all-terrain vehicles and snowmobiles, and as a major access point for hunting and poaching. They stated that the proposed transmission line right-of-way would allow for more direct east-west access across the area and that stream crossings along the right-of-way were not considered to pose major access barriers for all terrain vehicles or snowmobiles.

Many participants also questioned Taseko's plan to decommission the transmission line at the end of the Project. The Panel was told that when the BC Hydro transmission line was constructed, the Esketemc (Alkali Lake Band) were told that it would only be 1 line. However, the single line had since been expanded to three. Based on this experience, participants were sceptical that Taseko's transmission line would be decommissioned at the end of the Project.

## **6.7.4: WILDLIFE HABITAT COMPENSATION PLAN**

### **6.7.4.1: Proponent's Assessment**

In its EIS, Taseko did not identify the need to compensate for the loss of wildlife or wildlife habitat other than for the loss of fish and fish habitat. However, in May, 2006, as part of the provincial environmental assessment process, the British Columbia Ministry of Environment clarified that Taseko would be required to compensate for fish, fish habitat, the productive capacity of Teztan Biny (Fish Lake), recreational values, wildlife, wildlife habitat and habitat of species at risk that may be adversely affected, and to design a program of compensation to offset the effect of the proposed mine, should the Project proceed. In light of this, Taseko agreed to a number of commitments on wildlife habitat compensation (Appendix 4, Commitment 11).

During its presentation at the topic-specific hearing sessions, Taseko confirmed that its wildlife habitat compensation plan would include the development and implementation of a wetland compensation plan. However, when asked by Environment Canada to provide more details, Taseko indicated that it had no specific details to provide at that point as the criteria and framework around the wildlife habitat compensation plan would need to be jointly developed.

In response to criticism, mostly from Environment Canada, that the commitments in the provincial Environmental Assessment Certificate were too vague to properly estimate the effectiveness of the wildlife habitat compensation plan or the potential residual effects, Taseko argued that it had made a firm commitment to address the issue and to collaborate with regulatory agencies and other organizations to achieve the objectives. Taseko confirmed that they had already initiated discussions with the Canadian Wildlife Service of Environment Canada and Ducks Unlimited to explore available opportunities for wetland compensation.

In its EIS, Taseko estimated that, based on the maximum disturbance scenario, 659.3 ha of wetland habitat would be lost at the mine site as a result of the Project, and that there would be a permanent residual loss of 403.5 ha of wetlands at post-closure. Along the transmission line corridor, Taseko estimated that 46.6 ha of wetland habitat would be permanently lost at post-closure. Loss of wetland areas along the access roads were considered minor. Similarly, Taseko estimated that the mine site would result in the loss of 352.7 ha of riparian ecosystems at post-closure, and the transmission line corridor would result in changes to the structure and composition of 123.8 ha of riparian habitat.

At a broader regional scale, Taseko noted that wetland habitats similar to those affected by the Project were relatively abundant in the region, particularly in the plateau area at the headwaters of the Tête Angela and Groundhog watersheds immediately to the east of the regional study area. Taseko also stated that there were other large wetlands in the region that were over 25,000 ha. As such, Taseko determined that the loss of wetlands represented a reduction of less than 5% in the region. As for riparian habitats, Taseko predicted that riparian ecosystem loss would occur in the mine site area, but little or no loss was anticipated in the transmission line corridor or along the access roads.

Using Environment Canada's methodology for evaluating breeding waterfowl values in the Project area, Taseko predicted that, using the maximum disturbance scenario, a total of 123 potential individual breeding pairs would be displaced at the mine site. Taseko was of the view Prosperity Lake could provide habitat for 60 individual breeding pairs. In response to the first set of information requests from the Panel, Taseko also indicated that Prosperity Lake could be considered a potential candidate for any future wildlife habitat compensation plan given that the lake would result in the creation of wetlands and a littoral zone along its shoreline.

During its presentation at the topic-specific hearing session on Terrestrial Environment, Taseko clarified that the 659.3 ha of wetlands that were identified as being lost at maximum disturbance represented the worst case projection. Taseko argued that a value of 403.5 ha was more realistic.

Similarly, for riparian habitat Taseko clarified that the predicted maximum disturbance loss of riparian habitat would be approximately 1,000 ha. As this represented the worst case

scenario, Taseko argued that a more realistic value of 352.7 ha of permanent loss of riparian area at post-closure should be used.

Taseko also clarified that the 46.6 ha of wetlands identified to be lost along the transmission line corridor was an overestimation and that actual disturbance within the 30 m to 80 m wide right-of-way would be very minimal, associated only with pole placement and other related activities. As a mitigation measure, the approach would be to avoid wetlands wherever possible. Therefore, Taseko argued that they expected only a very small portion of the 46.6 ha of wetland would actually be disturbed.

#### **6.7.4.2: Views of Participants**

During the EIS review phase, wildlife habitat compensation issues were raised largely by the provincial Ministry of the Environment and Environment Canada. Several comments provided by the Ministry of the Environment referenced the May 2006 Deputy Minister letter which stated that Taseko would be required to compensate for wildlife and wildlife habitat and habitat of species at risk that might be adversely affected by the project, and to design a compensation program to offset the effect of the Project should it proceed.

In many instances during the EIS review, the provincial Ministry indicated that compensation would be required for a number of wildlife and wildlife habitats assessed in the EIS, and that a commitment to compensate for the lost values, as per the Deputy Minister's May 2006 letter, needed to be made and included in the commitments in the Environmental Assessment Certificate (Appendix 4). In some cases, the Ministry questioned why compensation was not proposed by Taseko in the EIS.

Environment Canada expressed concerns regarding the magnitude of permanent wetland loss anticipated in the mine site area, and also identified the need to compensate for the loss of wetland and riparian areas at the mine site that supported migratory birds and species at risk. Specifically, in its review of the EIS, Environment Canada stated:

*The assessment of impacts on migratory bird populations and species at risk, and their habitats, resulting from the project should be refined and a framework for a habitat compensation plan, or similar mitigation strategy, should be prepared and presented. Such an effort should also include a consideration of impacts of the proposed fish habitat compensation strategy on migratory birds, species at risk and wetlands.*

Environment Canada also indicated that even though the permanent loss of wetland and riparian habitats would not be considered significant at the national or provincial scale, these losses would be considered significant at the local scale with respect to migratory bird populations. Therefore, Environment Canada concluded that there was a need to develop and implement a wildlife habitat compensation plan to maintain migratory bird populations at or very close to existing levels in the area.

In reaction to Taseko's response to the Panel's information request on wildlife habitat compensation, Environment Canada indicated in September 2009 that the development of functional wetlands along the Prosperity Lake would represent only one component of a wildlife habitat compensation plan, and that a framework that more fully addressed predicted residual effects to migratory birds and species at risk should be prepared and reviewed before the environmental assessment was completed. In correspondence with Taseko prior to the start of the public hearing, Environment Canada further reiterated that the creation of



Prosperity Lake to compensate for the loss of fish and fish habitat would not be appropriate for consideration as wetland habitat compensation, and that impacts on migratory birds from stocking non-fish bearing lakes would need to be examined in defining any wildlife habitat compensation plan.

At the Panel's request, Environment Canada and Taseko continued discussions during the pre-hearing phase on the development of a mutually acceptable approach for a compensation plan for the loss of wetland and riparian habitats supporting migratory birds and species at risk. During these discussions, Environment Canada completed a preliminary report entitled "Assessment of breeding waterfowl values in the Prosperity mine site regional study area from data collected during the 2008 Waterfowl Breeding Population Survey of the BC Central Interior Plateau", which was submitted to the Panel in November 2009. Based on that analysis, Environment Canada estimated that, in relation to the Chilcotin Plateau Ecosection, the Prosperity mine site regional study area contained 1.1% of the wetland area, 1.3% of the stream length and supported 1.1% of the predicted breeding waterfowl population of the ecosection (i.e. 412 individual breeding pairs). Of these 412 individual breeding pairs, Environment Canada concluded that 90% would use the wetlands, and 10% would use the streams. This analysis suggested that the wetlands and streams in the mine site regional study area supported a waterfowl population proportionally similar or slightly smaller in size than those in the Chilcotin Plateau ecosection as a whole.

Despite the ongoing discussions between Environment Canada and Taseko, Environment Canada indicated in its submission for the public hearing and in its presentation to the Panel at the topic specific hearing sessions that there was still disagreement and discussions on a number of issues, including:

- the type and level of information required to develop the wildlife habitat compensation plan (Appendix 4, Commitment 11);
- the total area of wetland and riparian habitats loss;
- the interpretation of individual breeding pairs values;
- whether to use Prosperity Lake in the calculation of individual breeding pairs and compensation calculations; and
- the approach for addressing the wildlife habitat compensation.

In light of these unresolved issues, Environment Canada was of the view that a more detailed wildlife habitat compensation plan than specified in the commitments of the provincial Environmental Assessment Certificate was still outstanding and required in support of the environmental assessment process. Environment Canada also recommended that the wildlife habitat compensation plan achieve a no-net-loss of wetland functions and that the wildlife habitat compensation plan be implemented at the time the construction activities commence.

Environment Canada concluded that the adverse environmental effects of the Project on wetland and riparian habitats that support migratory birds, and species at risk, would be measurable and long term in nature, and recommended that the Proponent develop a wildlife habitat compensation plan in support of the environmental assessment to address residual adverse environmental effects on wetland and riparian habitats and the migratory birds and species at risk they support.

### 6.7.5: PANEL'S CONCLUSIONS AND RECOMMENDATIONS

In reaching its conclusions on wildlife and wildlife habitat, the Panel considered the following factors to be particularly relevant:

- the mine site, the southern portion of the Taseko Lake / Whitewater Road and the western part of the transmission line would lie within the South Chilcotin Ranges Grizzly Bear Population Unit, which was reported to be threatened and consisted of a population of only approximately 100 bears;
- the Project would result in the reduction in the availability of seasonal feeding habitats for grizzly bears ranging from 423 ha to 3,851 ha at the mine site and a potential long-term reduction of 264 ha along the transmission corridor;
- increased access to the area would be likely to increase the risk of bear mortality from vehicle collisions, poaching, and other human-bear interaction;
- Taseko's proposed measures to mitigate the effects of the Project on grizzly bears included strict enforcement of speed limits and a policy of using a non-lethal approach to resolving any incidents involving bears;
- there were differing opinions expressed regarding the effects of the loss of grizzly bear habitat at the mine site, and the effects of the access road and transmission corridor on bear mortality risks;
- the British Columbia Ministry of the Environment was concerned during the review of the EIS that the grizzly bear population was threatened and could not sustain additional human induced mortality;
- the British Columbia Environmental Assessment Office was satisfied with Taseko's proposed grizzly bear investigation program to record vehicle-caused mortality and near misses and reached a conclusion that the Project would not be likely to result in a significant adverse effect on wildlife;
- the Project would result in the removal of approximately 970 ha of winter shelter habitat and 26 ha of winter feeding habitat for mule deer at the mine site and approximately 264 ha of winter habitat along the transmission line;
- the Project would result in the loss of approximately 1,680 ha and 189 ha of winter shelter and winter feeding habitat for moose, respectively, at the mine site, and 264 ha of winter habitat along the transmission line corridor;
- of the potentially affected habitat along the transmission line, approximately 239 ha would occur within designated Ungulate Winter Ranges, representing 0.8% of the area designated as mule deer Ungulate Winter Ranges;
- there were different views on the mule deer migration patterns in the area of the mine site; First Nations stated that the mine site was part of an important migration corridor, while Taseko argued that the migration corridor was outside the mine disturbance area;
- proposed mitigation measures to reduce effects on mule deer and moose along the transmission corridor included minimizing right-of-way clearing and avoidance of construction in winter in the mule deer Ungulate Winter Ranges; Taseko would also implement an access management plan along the transmission corridor to reduce effects on wildlife from hunting, poaching and other human-wildlife interactions;
- according to the Esketemc (Alkali Lake Band) and the Stswecem'c/Xgat'tem (Canoe Creek Band), the existing BC Hydro transmission line had a significant effect on wildlife as a result of increased human access to the area and expressed scepticism about Taseko's plans to decommission the proposed transmission line at mine closure given their experience with expansion of the BC Hydro transmission line;

- while the Project would result in permanent wetland loss at the mine site, the effects on wetlands and riparian habitat along the transmission line would be minimized due to the flexibility in pole placement;
- through the provincial Environmental Assessment Certificate, Taseko committed to develop and implement a plan for compensation for adverse effects to wildlife habitat provided there was a technically defensible confirmation that there was an adverse effect; and
- there was disagreement between Taseko and Environment Canada on the significance of the loss of wetlands and riparian habitat at the proposed mine site; Taseko concluded effects would not be significant while Environment Canada noted that effects would be measurable and long term.

The Panel heard a range of views regarding the residual effects of the Project on the grizzly bear population, ranging from medium magnitude long-term residual effects to significant adverse effects. The Panel notes that increased access along the transmission line corridor and improved access along the 4500 and Taseko Lake / Whitewater roads would likely result in increased traffic and increased risk of mortality to grizzly bears and other wildlife. While Taseko concluded that the effect of direct mortality of grizzly bears from vehicle collisions would be not significant, this conclusion was contingent on strict enforcement of the mitigation measures related to traffic and a policy of using a non-lethal approach in resolving any incident involving bears. Others, including the British Columbia Ministry of Environment, raised concerns about the adequacy of Taseko's mitigation measures. In the Panel's view, these mitigation measures may be difficult to enforce despite Taseko's good intentions. Further, loss of wetland and riparian habitat as a result of the Project could be more significant to grizzly bears than just losing a small percentage of their overall habitat. The Panel has further examined the implications of the Project in combination with the effects of other activities in the region on the South Chilcotin grizzly bear population and has reached a determination on the significance of the cumulative effects of the Project in Section 6.11.

The Panel understands that mule deer and moose are common in the region, and that although the loss of mule deer and moose winter habitat at the mine site would be relatively large, the mine site was not considered to be a regionally important mule deer or moose winter habitat. The Panel heard that the activities at the mine site could disrupt mule deer migration patterns in the area. However, the Panel is of the opinion that, given the location of the proposed mine site, mule deer would likely still disperse around the mine site to continue their migration.

The Panel notes that the eastern portion of the transmission line would cross through areas known as mule deer and moose winter habitats, designated Ungulate Winter Ranges, and the Esketemc Community Forest. The Panel also heard concerns from First Nations about the transmission line right-of-way disrupting these critical habitats, and the potential effect it could have on mule deer, moose and other wildlife. The Panel recognizes that the proportion of the deer and moose winter habitats disrupted by the transmission line corridor would be relatively small (less than 1%) compared with the availability of these habitats in the region, and therefore agrees with Taseko's findings that the effect of the transmission line corridor on mule deer and moose would not be significant.

The Panel recognizes that the Project and particularly the transmission line right-of-way could allow for increased accessibility to the land and to areas not previously readily accessible. The Panel also recognizes that the entire region supports numerous logging

roads that already provide access to the land in different areas. The Panel understands that Taseko would work with relevant provincial authorities and First Nations to assist in the development and implementation of a public access management plan to protect wildlife and restrict all-terrain vehicle access along the transmission line right-of-way.

**The Panel concludes that the Project would not result in a significant adverse effect on mule deer and moose and their habitat.**

**RECOMMENDATION 7**

If the Project proceeds, the Panel recommends that Taseko construct the transmission corridor right-of-way in such a manner as to avoid long straight-line sight distances to reduce the negative effect of the right-of-way on predator-prey relationships.

**RECOMMENDATION 8**

If the Project proceeds, the Panel recommends that Taseko begin discussions immediately with the British Columbia Ministry of Environment and the affected First Nations to develop a wildlife habitat compensation plan for mule deer.

**RECOMMENDATION 9**

If the Project proceeds, the Panel recommends that Taseko involve the affected First Nations in the development and implementation of the mitigation measures to address the concerns regarding access along the transmission line right-of-way.

The Panel agrees that there would be permanent loss of wetland and riparian habitats at the mine site, and that these provide habitats locally for wildlife, migratory birds and species at risk. The loss of these wetland and riparian habitats would represent a reduction of less than 5% and 11%, respectively during the post-closure period in the mine site regional study area.

The Panel observes that there were still differences of views and unresolved issues between Taseko and Environment Canada at the close of the public hearing on a number of issues surrounding wildlife habitat compensation for the loss of wetland and riparian habitats that support migratory birds and species at risk. The Panel heard that Environment Canada did not consider Taseko's proposed development of functional wetlands along the shoreline of Prosperity Lake to be sufficient. Further, the department stated the wildlife habitat compensation plan should achieve a No Net Loss of wetland functions, and that it be implemented at the time construction activities commence.

The Panel notes that the commitment included in the provincial Environmental Assessment Certificate does not require compensation for wildlife habitat and other values if "there is a technically defensible confirmation that there is no adverse impact". Further, Taseko has committed to consulting with the provincial Ministry of Environment, Environment Canada and First Nations in developing a transparent process for the determination of impacts. This would implicitly require Taseko to ensure that there was sufficient baseline data against which it could accurately determine whether potential effects were Project-related.

The Panel finds that the Project would result in adverse impacts to wetlands and riparian habitat. Further, the Panel is of the opinion that implementing a wildlife compensation plan for the loss of wetland and riparian habitats would be an important component for ensuring that the effects on wildlife, migratory birds and species at risk would be mitigated. The Panel agrees with Environment Canada's findings that the Project could have an important local effect on migratory birds but recognizes that this could be offset with appropriate compensation by creating equivalent wetlands elsewhere in the region.

**The Panel concludes that provided a wildlife habitat compensation plan is developed and implemented, the Project would not result in a significant adverse effect on migratory birds and their habitat.**

#### **RECOMMENDATION 10**

If the Project proceeds, the Panel recommends that Taseko develop and implement a wildlife habitat compensation plan that provides for the creation of additional wetland/riparian habitat beyond that proposed by Taseko at the mine site, in collaboration with Environment Canada, the British Columbia Ministry of Environment, affected First Nations and appropriate environmental organizations such as Ducks Unlimited.

### **6.8: ATMOSPHERIC ENVIRONMENT**

Key issues related to the atmospheric environment identified by the Panel include effects of criteria air contaminants, greenhouse gas emissions and light pollution.

#### **6.8.1: CRITERIA AIR CONTAMINANTS**

##### **6.8.1.1: Proponent's Assessment**

Taseko stated that background air quality in the Project area was considered to be good, with no industrial sources. Most air pollutants were reported to come from traffic. Taseko considered effects relating to criteria air contaminants for the construction, operation and closure phases of the Project. For both the construction and operation phases, Taseko predicted the maximum ground-level concentrations for all criteria air contaminants would occur on the northern extremity of the mine disturbance boundary. For nitrogen dioxide, carbon monoxide, sulphur dioxide and lead, Taseko predicted the maximum ground-level concentrations would be less than the applicable objective. Taseko predicted that the maximum ground-level concentrations for particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), total suspended particulate and dust fall would be greater than the applicable objectives or standards. However, in each instance, the area over which the predicted exceedances would occur would be very small. Only the workers camp was predicted to experience effects from exceedances, such as dust fall.

Taseko's stated in its EIS that there would not be any exceedances of the standards at the receptor locations (for example, the Nemiah Valley). With respect to the workers camp, Taseko stated that occupational health and safety standards would apply to the workers camp rather than the more stringent air quality standards that were used in the assessment.

Notable air quality emissions were not predicted to occur during closure or post-closure. Accounting for the conservative nature of dispersion modelling exercises, and the location and limited areas over which predicted concentrations exceeded the objectives and standards, Taseko concluded that the residual effects for all phases of the Project would not be significant.

In the EIS, Taseko stated that particulate matter from roads would be mitigated through water application. At the general hearing sessions, Taseko indicated they would implement a dust control plan. Although concerns were raised during the review of the EIS, Taseko maintained that the dust from the tailings beaches would not be harmful. Taseko indicated that monitoring and management plans for air quality would be developed and implemented for construction and operation for the different Project components.

Taseko committed to mitigation, monitoring and management of air emissions in the provincial Environmental Assessment Certificate (Appendix 4, Commitment 17.0). This included such things as dust suppression methods and the development of an air quality and emissions monitoring and management plan in conjunction with the British Columbia Ministry of Environment.

Taseko also committed to an air quality and noise management plan, which would address such things as:

- dust control during construction (e.g., revegetation, ventilation system in the plant complex, applying chemicals or water on roads and earthworks);
- dust control during operations (e.g., fugitive dust control);
- use of best available technology economically achievable measures to reduce air emissions (e.g., minimize vehicle emissions, waste management); and
- workplace air quality control (e.g., good ventilation systems, use of scrubbers and protective equipment).

#### **6.8.1.2: Views of Participants**

Health Canada indicated it was satisfied that there would be no significant adverse effects to health related to air quality, provided that mitigation measures and commitments were adhered to.

Presenters at the community hearing session in Xeni Gwet'in (Nemiah Band), such as the Reuters of Taseko Lake Outfitters, noted that the EIS did not include receptors closer than the Nemiah Valley, such as outfitter lodges. For instance, the Reuters informed the Panel that their lodge, Taseko Lake Lodge, was located 3 km from the west embankment of the tailings storage facility, and that there was another homestead at Dediny Qox (Big Creek), approximately 10 km from the site, owned by Roland, Udette and Jessias Class.

During the review of the EIS, concerns were raised about the fact that the assessment did not address the potential for the tailings beaches to dry out and be a source of fine dust (PM<sub>2.5</sub>) which could affect the environment and human health. Taseko stated this would be addressed in an operational deposition plan, which would be developed during the regulatory process.

Concerns about dust from roads were also raised in the community hearing sessions. For example, Alex Lulua raised concerns about dust from the mine site and from roads affecting

traditional foods such as Labrador tea. The Reuters of Taseko Lake Outfitters also raised concerns about dust from the mine site affecting their home and business.

At the public hearing, concerns were raised about air quality effects and dust from the mine site. For instance, former Chief Tommy Billyboy stated he had seen the effects of dust from tailings at the Gibraltar mine and believed the same effects would occur with the Project. Mary William also raised concern about dust affecting wildlife and fish and Councilor Neil Paul from the Esketemc (Alkali Lake Band) raised concerns about dust affecting the health of those at Alkali Lake.

Regarding monitoring and management, the need for an air quality monitoring and management plan was mentioned by participants during the review of the EIS, notably the British Columbia Ministry of Environment, especially with regards to fine dust (PM<sub>2.5</sub>). The Ministry of Environment indicated that it was satisfied given Taseko's commitment in the provincial Environmental Assessment Certificate to develop an air quality and emissions monitoring and management plan (Appendix 4, Commitment 17.3).

## **6.8.2: GREENHOUSE GASES**

### **6.8.2.1: Proponent's Assessment**

Taseko stated in the EIS, that "[a] greenhouse gas is any gas in the atmosphere that absorbs infrared radiation." The assessment focused on the key Project activities and physical works that would emit greenhouse gases during the construction, operation and closure phases. The key activities assessed included:

- site clearing and grubbing, and burning of vegetative debris;
- operation of motor vehicles, construction, and mining equipment; and
- operation of diesel-fired generators (during construction, commissioning and closure phases only).

The total emissions of greenhouse gases for the construction phase were predicted to be 57,408 tons per year of CO<sub>2</sub> equivalents. This would represent 0.007% of the projected Canadian emissions and 0.074% of the projected emissions of British Columbia and the Territories. During operations, emissions were predicted to decrease slightly to 52,636 tons per year of CO<sub>2</sub> equivalents, which would represent 0.006% of projected Canadian emissions and 0.067% of the projected emissions of British Columbia and the Territories. During closure, emissions were predicted to decrease to 31,205 tons per year of CO<sub>2</sub> equivalents, which would be 0.004% of projected Canadian emissions and 0.04% of the projected emissions of British Columbia and the Territories.

The details of the proposed mitigation measures and management of greenhouse gas emissions, including best practices to lower vehicle emissions are outlined in Appendix 4 (Commitment 17.0).

### **6.8.2.2: View of Participants**

During the public hearing, participants raised concerns about the Project's contribution to greenhouse gas emissions and related effects of climate change. Dr. Marvin Shaffer, on behalf of Friends of Nemaiah Valley, noted that the Project would produce approximately 50,000 tonnes per year of greenhouse gases during operations, and somewhat more during construction, which would need to be offset in the future by British Columbians in order to meet provincial emission targets.

Participants also noted that although the emissions were low compared to the provincial totals, Taseko should work towards minimizing emissions. For example, Herb Nakada presented information on greenhouse gas emissions and climate change, and suggested that Taseko should work toward a carbon neutral project.

### **6.8.3: LIGHT POLLUTION**

#### **6.8.3.1: Proponent's Assessment**

Taseko stated in its EIS that artificial light would be dealt with in the Air Quality and Noise Management Plan once detailed design was completed. In response to an undertaking at the public hearing, Taseko indicated that exterior lighting would be installed at the mine site to ensure the safety of its workers. However, it indicated that light would not be directly visible to any local residents as the plant site would be at a higher elevation and on the other side of the mountains, making the line of sight for residents greater than the distance light would travel upwards. Taseko stated the only situation where mine site lights would be visible was if conducive atmospheric conditions, such as low cloud cover, were to occur.

#### **6.8.3.2: View of Participants**

Light pollution was identified as a concern by local residents near the mine site as well as tourism operators in the area, including Taseko Lake Outfitters (located approximately 3 km from the west embankment of the tailings storage facility), Roland Class (located 10 km from the mine site), George Colgate (located 17 km from the mine site), and community of Xeni Gwet'in (Nemiah Band) (located 25 km from the mine site). The owners of Taseko Lake Outfitters expressed concern about light from the Project interfering with the wilderness experience of their visitors, including star gazing activities. At the community hearing session in Xeni Gwet'in, Mr. Colgate raised concern about light pollution and the potential loss of clear night sky views. He also voiced concerns about Taseko's approach to artificial light in their EIS and how concerns would be addressed should there be problems with light pollution in the future.

### **6.8.4: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on the atmospheric environment, the Panel considered the following factors to be particularly relevant:

- maximum ground-level concentrations of particulate matter, PM<sub>2.5</sub>, PM<sub>10</sub>, total suspended particulates, and dust fall were predicted to be within the applicable standards and objectives for identified receptors with the exception of the work camp area;
- the closest residence to the mine site would be Taseko Lake Lodge and the closest community would be Xeni Gwet'in (Nemiah Band); and
- greenhouse gas emissions were predicted to be 0.074% and 0.067% of the combined emissions from British Columbia and the northern territories during construction and operations, respectively.

The Panel notes that due to the close proximity of Taseko Lake Lodge to the tailings storage facility, ground level concentrations of particulate matter could exceed air quality standards at the Lodge. Additionally, construction and operation activities that generate particulate matter, including construction of the west embankment and fine dust from the beaches of the tailings storage facility would be likely to affect Taseko Lake Lodge. The Panel's conclusions with respect to the effects of the Project on Taseko Lake Outfitters are



addressed in Section 7.1. The Panel finds that, with the exception of Taseko Lake Outfitters, the Project's effects on the atmospheric environment would be comparatively minor, limited in geographic extent, of medium term duration, and reversible over time.

**The Panel concludes that emissions of particulate matter from the Project would not result in significant adverse effect.**

With respect to greenhouse gas emissions, the Panel notes that the total contribution of the Project would be very small compared to national and provincial emission totals. Furthermore, the Panel notes that Taseko would apply best management practices and mitigation to minimize greenhouse gas emissions.

**The Panel concludes that the contribution to greenhouse gases from the Project would not result in a significant adverse effect.**

Regarding light pollution, the Panel notes that during low cloud cover, light from the mine site would likely be visible at Taseko Lake Lodge. The Panel's conclusions with respect to the effects of the Project on Taseko Lake Outfitters are addressed in Section 7.1. The Panel finds that, with the exception of Taseko Lake Outfitters, due to factors such as distance and topography, effects from light pollution would not be expected for most receptors.

**The Panel concludes that light pollution from the Project would not result in a significant adverse effect.**

## **6.9: NOISE**

Key issues relating to noise identified by the Panel include the effects of Project-related noise on nearby human receptors and on wildlife.

### **6.9.1: PROPONENT'S ASSESSEMENT**

Taseko considered noise generated during the construction, operation and closure phases of the Project. The effect of the Project on both the general public and wildlife were examined.

In its EIS, Taseko evaluated the effect of noise on the general public based on a number of guidelines available from other provinces, namely the Alberta Energy Resources Conservation Board guidelines, and in particular their Noise Control Directive 38. Taseko indicated that there was no guidance from British Columbia relating to noise effects on the general public outside the mine site. For acceptable construction and blasting noise level limits, Taseko considered guidance obtained from the Environment Canada Code of Practice (1989) and the Ontario Ministry of Environment blasting noise guidelines (1985) respectively.

According to Taseko, the primary sources of noise at the mine site during construction and at closure would be generated by the heavy equipment. During operations, blasting, the operation of ore extraction equipment, ore crushing and hauling, conveyer systems, ore stockpiling and mill ore processing activities would be the primary sources of noise. Noise along the access road would be generated as part of the road upgrade activities, construction traffic, and vehicular traffic during operation and closure. Taseko estimated that the increase of noise at the Gibraltar load-out facility would be minimal compared to the existing use. As for noise generated in relation to the transmission line, Taseko estimated that it would mostly be limited to the construction and decommissioning phases. Noise of short duration was also expected to occur in relation to inspection and maintenance activities during the operation of the transmission line.

In its EIS, Taseko indicated it would develop and implement a comprehensive Noise Management Plan to meet or exceed regulatory specifications or guidelines for noise levels in all phases of the Project in order to ensure the protection of humans and to minimize disturbance to wildlife. In addition, building design and other management and mitigation measures would be used in all phases of the Project to reduce noise effects generated by the Project's activities.

In response to an information request from the Panel, Taseko conducted a constraints analysis along the transmission line and identified a number of mitigation measures and mitigation strategies which included measures to address the issue of sensory disturbance for wildlife that were susceptible to noise. In response to concerns raised during the public hearing relative to impact of noise on Bighorn sheep along the Fraser River, Taseko indicated that mitigation measures would include avoidance of critical times of the year, such as the lambing season, and height restrictions for helicopter use.

In its EIS, Taseko concluded that the effects of the Project on the acoustic environment were predicted to be not significant for the following reasons:

- peak noise levels would not exceed either the Alberta Energy Resources Conservation Board Noise Control Directive 38, Environment Canada Guidelines or the Ontario Blasting Noise Guidelines;
- increased noise generated from vehicular traffic was only estimated to be up to 3 decibels from existing acoustic levels; these values were considered to be unnoticeable to humans and were considered insignificant;
- there were no human dwellings within 1.5 km from the mine site limits or along access road;
- no cumulative effects were expected because there were no other industrial activities planned in the area; and
- construction noise for the transmission line was considered short term and noise from operations was considered sporadic.

#### **6.9.2: VIEWS OF PARTICIPANTS**

Health Canada indicated during its presentation to the Panel that it considered human health effects due to noise related Project activities to be negligible. In response to questioning by the Panel regarding potential noise effects from blasting on human health, Health Canada stated that it would require more information on the blasting duration and frequency in order to determine the need for mitigation of effects on the nearby Taseko Lake Lodge. However, given the relative proximity of Taseko Lake Lodge from the mine site, Health Canada

suggested that, as a precaution, Taseko commit to not carry out blasting if a thermal inversion was anticipated at the time of the blast.

Local residents in the Nemiah Valley voiced concern about noise potentially affecting their health. It was noted that although Taseko assessed noise effects on Xení Gwet'in (Nemíah Band), it did not assess noise effects on lodges which were closer to the proposed mine. Taseko provided additional information during the community hearing sessions, and stated that the average noise level at these receptors was 35 dBA, which was not a level of concern for health effects.

During the review of the EIS and the public hearing, participants also identified noise as a potential issue for key wildlife indicators such as California bighorn sheep, mule deer and moose. In particular, during the public hearing, Ms. Maggie Paquet, on behalf of the Friends of the Nemaiah Valley, noted concern that the use of helicopter and noise generated during the construction of the transmission line in the proximity of the Fraser valley could affect bighorn sheep during the lambing period.

Noise as a general issue was also identified by many participants during the public hearing, mostly related to disturbing wildlife and impacting corresponding hunting, trapping, fishing and other traditional activities near the mine site and as a result of increased traffic along the access road.

### **6.9.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on noise effects, the Panel considered the following factors to be particularly relevant:

- the primary source of noise at the mine site would be from mining operations which would operate continuously for 20 years and from blasting which would occur intermittently;
- increased traffic would also increase noise levels along the roads;
- noise levels were not predicted to exceed existing guidelines; and
- the closest residence was reported to be Taseko Lake Lodge, approximately 3 km from the tailings storage facility and the closest community was Xení Gwet'in (Nemíah Band), approximately 25 km from the mine site.

The Panel recognizes that there would be some sensory disturbance to wildlife during construction and operation of the Project, however, this is considered to be low magnitude and reversible. The Panel notes that the EIS did not specifically assess the effects of noise on lodges that would be in closer proximity to the mine site, such as the Taseko Lake Lodge. Further, Health Canada indicated that it was also unable to assess the effect of blasting noise on the Taseko Lake Lodge. Therefore, the Panel notes that there is some uncertainty regarding the effects of noise on receptors in the immediate area of the Project. However, in the Panel's view, residents and any guests at Taseko Lake Lodge would no longer be able to enjoy a noise-free wilderness experience. The Panel's conclusions with respect to the effects of the Project on Taseko Lake Outfitters are addressed in Section 7.1.

Based on the information provided by Taseko in its EIS and during the public hearing, the Panel finds that, with the exception of Taseko Lake Outfitters, the Project's effects on the acoustic environment would be comparatively minor, limited in geographic extent, of medium term duration, and reversible over time.

**The Panel concludes that Project-related noise would not result in a significant adverse effect.**

**6.10: ARCHEOLOGICAL AND HERITAGE RESOURCES**

This section addresses the tangible aspects of archaeology (e.g. the archaeological finds); intangible and cultural issues (e.g. the values associated with ancestry and historical artifacts) are addressed in Section 8.3.

**6.10.1: PROPONENT’S ASSESSMENT**

Taseko conducted an archeological impact assessment for the proposed mine footprint. This assessment covered an area of 3,476.5 ha and included all components of the proposed mine site with the exception of the lake bed of Teztan Biny (Fish Lake), which, Taseko reported, would be subject to field work after the lake was drained. The Tsilhqot’in Nation collaborated in the design and implementation of the fieldwork of this assessment and recommended the archaeological firm that was chosen to undertake the assessment. Members of the Tsilhqot’in Nation also participated as members of the field crew in conducting the archaeological survey. However, Taseko noted that Tsilhqot’in participation in the survey ended prior to completion of the work and that the Nation did not indicate their acceptance of the report findings.

Taseko, upon request from the Tsilhqot’in, agreed to an extensive field program as part of the archaeological impact assessment which included: a pedestrian survey of the entire mine footprint with grid spacing ranging between 5 m and 25 m apart and augmented by subsurface testing. Approximately 15,882 shovel tests of about 30 cm by 30 cm in size and 5 evaluative units were conducted in areas within the mine footprint thought to be of increased archaeological potential and of limited subsurface exposure. As a result of the assessment, 79 pre-1846 archeological sites and 48 post-1846 sites were also identified. Taseko noted that the archaeological impact assessment undertaken at the mine site was intended to identify physical archaeological evidence of past human activity under the provincial *Heritage Conservation Act* and did not address traditional land use or other heritage concerns of the First Nations people with asserted traditional territory in the study area.

Taseko noted that artifacts dated pre-1846 were protected under the provincial *Heritage Conservation Act*, whereas more recent artifacts were not, including historic sites from post-1846 which would only be protected upon approval of a specific request for protection. The majority of archeological sites that were identified were determined to be used on a temporary or seasonal basis and date back to approximately 5500 BP. Based on the artifacts found, Taseko reported that the area was used for activities that included hunting, fishing and plant gathering and processing.

The sites located within the footprint of the mine were assessed by Taseko according to their scientific value. Thirty-nine (39) of the sites were classified as low scientific value, 29 sites were considered of moderate scientific value and 11 were considered to have high archeological value. Taseko stated that 16 of the sites rated as moderate would require

mitigation. The proposed mitigation measures ranged from further collection of materials for carbon dating purposes to conducting excavations of 1 specific site.

Of the 11 sites rated as having a high value, Taseko stated that 7 of the sites could be avoided by the Project and mitigation would only be required for 4 sites. The mitigation of these sites would include conducting archeological excavations of the sites. Taseko noted that artifacts that were recovered would be held in trust for the First Nations at the repository of the Royal British Columbia Museum.

Taseko also conducted an archeological overview assessment for the portions of the transmission line for which there were potential or established Aboriginal rights. Taseko noted that the archeological overview assessment was not a field study, but rather was an office exercise designed to determine the locations where archaeological finds would be likely.

Taseko reported that there were 31 archeological sites located within 1,500 m of the transmission line right-of-way. Of these sites, only 2 were located within 250 m of the right-of-way. Taseko anticipated that it would be able to design and construct the transmission line so as to avoid these 2 sites.

Taseko noted during the public hearing that a more detailed archeological impact assessment had yet to be conducted for the transmission line right-of-way. However, it indicated that the completion of an archeological impact assessment was a requirement of its provincial Environmental Assessment Certificate and would be completed prior to construction of the transmission line, if the Project proceeds.

At the topic-specific hearing sessions, upon questioning by the Panel and by Beth Bedard, Taseko clarified that the archaeological impact assessment would only find evidence of past activity if physical evidence remained. Some sites, including sacred sites or cremation sites, would not necessarily leave physical evidence that could be found during field surveys.

#### **6.10.2: VIEWS OF PARTICIPANTS**

During the course of the public hearing, many First Nation people informed the Panel that they had concerns regarding the acceptability of the archaeological work. In the topic-specific session, Chief Marilyn Baptiste expressed the view that method of protection provided by the provincial *Heritage Conservation Act* did not constitute protection or mitigation from the Tsilhqot'in point of view. Former Chief Roger William expressed similar views and also made it clear that removal of the evidence of their ancestors would not mitigate the cultural impact on the Tsilhqot'in. In the community hearing session, Ms. Shawnee Palmatier indicated that excavating artifacts and storing them in a repository was not acceptable to the Tsilhqot'in, stating:

*The Arc Branch cannot adequately protect our sites with the legislation that they have. They don't provide enough resources to manage the Heritage Conservation Act or to enforce it. It doesn't recognize our Aboriginal Title and Rights. It doesn't address our needs and interests when it comes to our sites.*

Ms. Palmatier also spoke of her concerns related to archaeological overview assessments and the practice of using low, medium, or high as classifications of archaeological potential. This was a concern for her, as the Tsilhqot'in were not involved in the overview assessments and did not necessarily agree with the classification. She stated that every site, including lithic scatters, was significant to the Tsilhqot'in.

During the public hearing, more than one First Nation participant noted that the archaeology impact assessment missed some sites or artifacts. Ms. Linda Smith stated that there were a dozen to two dozen graves in the mine footprint area. Chief Marilyn Baptiste stated that the archaeological impact assessment missed a pit house on the island in Teztan Biny (Fish Lake), as well as additional graves at the proposed mine site. During the public hearing, Ms. Molly Hink presented a map from the provincial Archaeology Branch of archaeological sites around Teztan Biny, which was not included in Taseko's EIS. Chief Baptiste noted that Taseko's assessment had missed the information that Ms. Hink presented on this map.

In the topic-specific hearing sessions, Ms. Patt Larcombe, on behalf of the Tsilhqot'in National Government, observed that the areas of the proposed fish and fish habitat compensation works and the 2.8 km mine site access road had not been surveyed for archaeological resources.

Many participants made comments regarding the importance of archeological finds. At the topic-specific session, Ms. Linda Smith raised concerns about the lack of protection under provincial legislation for historic sites from post-1846. At the general hearing sessions, she described the significant archaeological finds at Teztan Biny (Fish Lake) and stated that these sites should not be ignored or destroyed. Specifically, regarding the burial site found there, she stated "[t]he destruction and/or removal of the grave would be extremely appalling and would greatly distress [the] Tsilhqot'in." Chief Joe Alphonse raised concerns about the effects of the Project on spiritual sites, including cremation sites. At the community hearing session in Tl'esqox (Toosey Band), David Stiemann spoke of being on the archaeological field crew, the importance of finding a stone pipe, the meaning of ancestral connections and the loss of the land that would occur with the Project.

Many participants raised concerns about archaeological resources along the transmission line. Chief Laceese expressed concern about IR Wilson being hired to do the archaeological impact assessment along the transmission line right-of-way, stating that his community had conflicts with this company and therefore had no faith in the consulting firm. During the closing remarks for the public hearing, Chief Baptiste also stated that the use of IR Wilson for archeological studies was not acceptable to the Tsilhqot'in Nation.

At the community session, Dr. Andie Palmer, on behalf of the Esketemc (Alkali Lake Band) expressed concern about the archaeological impact assessment along the transmission line right-of-way not having been done during the environmental assessment, and indicated that the work done to date should be given very little weight by the Panel. She described the effects to archaeology as the "potential for interference with spiritual practice, potential for interference with intergenerational transmission of culture". Further information on the intangible aspects of cultural heritage is presented in Section 8.3.

During the community hearing session with the Stswecem'c/Xgat'tem (Canoe Creek Band), Councillor Harry also showed maps of archaeological sites in the vicinity of the transmission line. He observed that the highest potential for archaeological sites was near water, and that the transmission line would cross 125 streams. He emphasized the need for an archaeological impact assessment to be completed before the location of the right-of-way was chosen. In his closing remarks, Bruce Stadfeld, legal counsel for Stswecem'c/Xgat'tem, stated that the archaeological assessment for the transmission line should be done on the 500 m wide route, not only the 30 m to 80 m right-of-way. He also stated that the archaeological studies done in 1993 were insufficient.

At the community hearing session with the Stswecem'c/Xgat'tem (Canoe Creek Band), Harold Harry spoke of burial grounds along the transmission line right-of-way, the value of these sites, the importance of looking after ancestors and how they have a tradition of not moving ancestors from the place they were buried. Councillor Patrick Harry expressed concern about effects to archaeological sites due to recreational use and trampling by cattle. He stated that the destruction of archaeological sites would result in the loss of a "part of our history that we're never going to get back". At the topic-specific session, Ms. Beth Bedard also raised concerns about all-terrain vehicles and cattle along the transmission line right-of-way affecting archaeological sites.

In a letter of May 22, 2009, the Archaeology Branch of the British Columbia Ministry of Tourism, Culture and the Arts indicated that a number of actions needed to be taken in order to avoid effects on archaeology at the mine site. In particular, the Branch stated that systematic data recovery (excavation) needs to be undertaken for the sites found to be of moderate and high importance, that further study of cultural depressions was required, that a survey of the Teztan Biny (Fish Lake) bottom should be completed and that exhumation of burial features should not occur unless they were believed to be from the historic period.

### **6.10.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on archaeology and heritage resources, the Panel considered the following factors to be particularly relevant:

- Taseko conducted an extensive archaeological impact assessment of the mine site; although the survey was developed in collaboration with the Tsilhqot'in, the final stages of the assessment, including the assessment and discussion of the final report, were not completed collaboratively between the two parties;
- during the public hearing, the Tsilhqot'in identified additional sites of archaeological importance that they indicated were not identified by the survey (e.g. a pit house on the island in Teztan Biny (Fish Lake));
- concern was expressed by the Tsilhqot'in that sites of importance dating from post-1846 were not protected under the provincial *Heritage Conservation Act*;
- concerns were expressed by the Tsilhqot'in that the practice of excavation and storage of artifacts at a different location as a mitigation measure did not account for the cultural values the Tsilhqot'in attributed to the artifact and severed the spiritual connection they had with the location of the find;
- the Tsilhqot'in also expressed concerns with the classification of artifacts, noting that due to the importance of artifacts in defining their cultural identity and connection to the land, a weighting system should not be applied;
- the Secwepemc noted that the area of the proposed transmission line had high archaeological potential and expressed concerns regarding the absence of an archaeological impact assessment for the transmission line right-of-way as a component of the environmental assessment; and
- Taseko committed to undertake a comprehensive archaeological survey along the transmission line as part of the information it would use to locate the centreline within the right-of-way.

The Panel notes that there were discrepancies between the findings of the archeological impact assessment conducted by Taseko at the mine site and observations made by the Tsilhqot'in during the public hearing. The Panel recognizes that if the Project proceeds, artifacts would be excavated and preserved off site. In the absence of an appropriate facility

operated by the Tsilhqot'in, accepted practice under the provincial *Heritage Conservation Act* would involve excavation and removal to the Royal British Columbia Museum in Victoria. The Panel recognizes that provided care was taken during construction activities to identify and collect artifacts, artifacts could be preserved, albeit in a manner that would not be in accordance with First Nation culture. However, involvement of First Nations in this process would assist in developing an approach that might be acceptable to them, should the Project proceed.

**The Panel concludes that, provided the recommendation identified by the Panel is implemented, the Project would not result in a significant adverse effect on physical heritage and sites of archaeological importance.**

#### **RECOMMENDATION 11**

If the Project proceeds, the Panel recommends that local First Nations, the Province and Taseko develop an agreement outlining mitigation measures to avoid or minimize damage to archaeological finds, as well as how found artifacts would be preserved. The agreement should incorporate traditional values of First Nations and be completed prior to the start of construction. In particular, the Panel recommends that as a component of such an agreement Taseko consider the development and implementation of a chance find procedure in collaboration with First Nations and the Province to address all artifacts found during construction of mine site infrastructure and the transmission line right-of-way, including a process of communication with First Nations to address chance finds and employ a trained archaeological monitor to evaluate effects during construction activity.

#### **6.11: CUMULATIVE ENVIRONMENTAL EFFECTS**

Under Section 16(1)(a) of the *Canadian Environmental Assessment Act*, the Panel was required to consider any cumulative environmental effects that were likely to result from the Project in combination with other projects or activities that have been or are likely to be carried out. The EIS Guidelines stated that Taseko must consider the effects of the Project in combination with other future projects that are either "certain" or "reasonably foreseeable" as defined in the Canadian Environmental Assessment Agency's Operational Policy Statement "*Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act*". That document in turn refers to the Canadian Environmental Assessment Agency's "*Cumulative Effects Assessment Practitioner's Guide*", which defined a "reasonably foreseeable" future action as being one that "may proceed, but there is some uncertainty about this conclusion".

This section addresses the cumulative effects of the Project in combination with other past, present or reasonably foreseeable future projects, including the possible 13 year mine life extension as a result of Taseko's November 2009 announcement of increased mineral resources at the Project.

As previously indicated in Section 1.6, on November 2, 2009, Taseko issued a news release in which it announced a 70% increase in mineral reserves at the Project. The news release stated that the increase in recoverable metal, under present mine design criteria, would extend the life of the Project from 20 years to 33 years.



The Panel found that Taseko's announced increase in mineral reserves raised questions regarding the temporal and spatial boundaries of the Project, and the potential incremental environmental effects of extending mine operations by 13 years. In its letter of November 30, 2009, the Panel stated its opinion that while the potential extension of the mine life should not be considered part of the Project under review, it was a reasonably foreseeable future action as defined by the Canadian Environmental Assessment Agency's guidance. As such, the Panel determined that the potential 13 year extension of the mine life was to be included in the assessment of cumulative effects in Taseko's environmental assessment.

Similar to the approach taken throughout the report, this section focuses on those issues which the Panel considered most important, based on the views raised by participants during the course of the review. In order to determine if the Project, in combination with any other projects that have been or are likely to be carried out, would result in cumulative effects, the Panel focussed its examination on valued ecosystem components that it has determined may be adversely affected by the Project.

#### **6.11.1: PROPONENT'S ASSESSMENT**

In conducting its cumulative effects assessments with other past, present or reasonably foreseeable future projects and activities, Taseko developed a list of projects that could potentially interact spatially and temporally with the predicted residual environmental effects of the Project. This list included various forestry projects, 12 mining projects and the Tsilhqot'in joint venture biofuel project. Taseko stated the list of projects was developed through consultation with a wide variety of information sources, including guidance from the British Columbia Environmental Assessment Office, federal and provincial departments and ministries, local governments, and private businesses.

With respect to the potential future mine life extension, Taseko noted that any decision to undertake future expansion of the mine would consider a number of risk factors, including metal prices at the time of the decision. As an example, Taseko indicated that the long term forecast for metal prices was higher at the time of the public hearing than when Taseko had submitted its EIS in 2009.

Taseko submitted that the potential addition of 13 years to the life of the Project would, with only a few exceptions, not change the facilities or mine site infrastructure in any material way. In addition, the nature of activities associated with the Project, including the transportation corridor, transmission line and load-out facility, would not change other than to increase the duration of the associated effects. Taseko indicated that there would be a need to process additional ore, store additional tailings and store additional waste and that these changes would lead to a larger open pit and a larger and higher tailings storage facility.

Taseko identified the following changes in the design and operation of the Project should the 13 year mine life extension occur:

- the open pit would be larger and approximately 800 m deep when completed;
- 2.0 billion tonnes of material would be mined from the open pit, including;
  - 831 million tonnes of ore;
  - 858 million tonnes of potentially acid-generating waste rock; and
  - 358 million tonnes of non-potentially acid-generating waste rock.

Taseko submitted that the quantity of potentially acid-generating waste rock could be accommodated within the footprint of the presently proposed tailings storage facility, while non-potentially acid-generating waste rock would be used for construction purposes and incorporated into the embankments of the tailings storage facility and Prosperity Lake. Taseko indicated that no additional requirement for ore stockpiling was expected.

Taseko noted that the design and operation of the initially proposed tailings storage facility could be modified to provide secure storage for tailings and potentially acid-generating waste rock. The final crest elevations of the earthworks could reach 1,590 m, an increase of approximately 18 m from the initial proposal. Taseko anticipated that any changes that did occur would be accommodated within the environmental management plans and that the final reclamation plan would follow the same closure principles as outlined in the EIS.

Cumulative environmental effects were only assessed by Taseko if all of the following conditions were met for the environmental effect under consideration:

- the Project would result in a measurable, demonstrable or reasonably-expected residual environmental effect on a component of the biophysical or human environment;
- the Project-specific residual environmental effect on that component would, or would be likely to, act in a cumulative fashion with the environmental effects of other past or future projects and activities that are likely to occur; and
- there was a reasonable expectation that the Project's contribution to cumulative environmental effects would affect the viability or sustainability of the resource or value.

### **Vegetation**

Taseko submitted that the most substantive and persistent environmental effects of the Project on vegetation would occur within the mine footprint, while most potential environmental effects in the transmission line corridor and along access roads could be avoided through environmentally sensitive Project design. Taseko also noted that the Project's largest potential cumulative effect was in relation to old growth forest. However, given the predominance of pine-leading forest in the Project area and the anticipated loss of these stands to the mountain pine beetle infestation and associated salvage logging, Taseko was of the opinion that the Project's contribution would be limited to losses of non-pine old growth forest.

Based on this, Taseko estimated that the Project would only contribute 4% of the total loss of old growth forest in the mine site regional study area, and approximately 1% of old growth forest loss in the transmission corridor regional study area. In total, Taseko estimated that the Project's contribution to cumulative environmental effects on old growth forest was predicted to be very small (0.36%), and considered to be not significant.

For plants of importance to First Nations, Taseko indicated that most of the effects would be in relation to the mine site. Taseko also pointed out that the mountain pine beetle infestation was expected to result in considerable cumulative effects on traditional use since the majority of the Project's forest areas were dominated by pine forest. As such, Taseko explained that the destruction of pine forests by the mountain pine beetle would result in the destruction of wildlife habitats and plants relied upon by First Nation community members. From a cumulative effect perspective, Taseko argued that the effect of the mountain pine beetle would be much more adverse and potentially devastating than those that were expected to result from the Project.

### **Mule Deer and Moose**

According to Taseko, logging was the primary human activity that would act cumulatively with the Project's effect on wildlife habitat availability, and in particular on mule deer and moose. These logging activities would be primarily related to the salvage of tree stands affected by the mountain pine beetle. Taseko anticipated that all pine-leading stands in the mine and transmission line study areas would be dead or logged within 5 to 10 years. Taseko submitted that the effect of logging on the future availability of mule deer and moose winter habitat was recognized as a concern in the region, and would be addressed directly through a regional management strategy. Taseko predicted that initially, the loss of higher value mule deer ungulate winter habitat (i.e., Douglas-fir dominated stands) would be relatively limited, given the focus on pine. However, Taseko stated that in the future, logging would also likely include non-pine forest types.

Taseko was of the opinion that the residual cumulative loss of mule deer and moose winter habitat could have a significant effect on the sustainability on those populations in the region. However, Taseko concluded that the Project's incremental contribution to this effect was not predicted to be significant because:

- loss of moose winter shelter habitat and mule deer ungulate winter habitat due to right-of-way clearing would be small (<1%) to negligible with respect to the transmission line, and that the losses of habitat would be reversible upon decommissioning of the transmission line; and
- while loss of winter habitat in the mine site regional study area at maximum disturbance would be relatively high (approximately 30%) with respect to the mine site regional study area, and included some permanent loss, Taseko submitted that this would not be an issue as the mine site had not been identified as regionally important winter habitat for mule deer or moose.

Taseko noted that within the regional area, the current primary contributors to direct mortality of mule deer and moose were hunting and vehicle collisions. Taseko submitted that the residual cumulative increase in direct mortality risk was not expected to have a significant cumulative effect on the sustainability of these two populations, primarily because hunting, as the largest source of mortality, would continue to be actively managed by the Province. Taseko predicted that the Project's relatively small incremental contribution to this effect would not be significant.

### **Grizzly Bears**

Taseko reported that the majority of the regional study area had low or no value as grizzly bear feeding habitat. Spring habitat was noted as the most limited in availability, and fall habitat as the most common. Taseko found that while suitable feeding habitat was located in the western third of the regional area, the suitability had been markedly reduced by disturbances associated with roads and other linear access features, timber harvesting, and ranching. Thirty-seven percent (37%) of the regional study area was considered to be non-core secure habitat and, of the remaining area, almost all was in the largest patch size category.

As identified in Section 6.7, Taseko stated the effects of the Project on grizzly bears included the loss of feeding and upland habitat. Within the regional study area, Taseko predicted the residual loss of grizzly bear feeding habitat from the Project would combine with similar environmental effects from logging and, to a lesser extent, mining and ranching. Taseko noted that any activities that affect habitat in the regional study area would be a

concern with respect to the viability of the South Chilcotin grizzly bear population, which was reported to be threatened.

Taseko concluded that the cumulative loss of grizzly bear feeding habitat in the regional study area had already had a significant effect, in conjunction with human-caused mortality, on the sustainability of the South Chilcotin grizzly bear population. Taseko was of the opinion that the Project's incremental contribution to this effect would not be significant for the following reasons:

- grizzly bears were unlikely to rely on the Teztan Biny (Fish Lake) area for all their life requisites;
- residual loss of regional feeding habitats due to mine site clearing and clearing of transmission line right-of-way would be small (<3% and <1% respectively);
- the regional study area had a low density of grizzly bears; and
- there would only be a small reduction in the availability of core secure habitat.

Taseko predicted that with the minimization of clearing area, reforestation of reclaimed areas and avoidance of non-pine forest types and wetlands, the residual loss of grizzly bear feeding habitat as a result of the Project would not be significant with respect to the sustainability of the South Chilcotin grizzly bear population.

### **Surface Water**

With respect to surface water hydrology, Taseko indicated that no change was anticipated to the predicted environmental effects as a result of the proposed mine life extension. Taseko noted that as proposed in its EIS, beyond Year 7, the mine site would be managed to ensure that site water requirements were balanced. Taseko submitted that the addition of 13 years to the mine life would not change this. Taseko noted that the longer duration required to fill a larger open pit at closure would provide additional time to monitor, evaluate and if necessary, mitigate water quality conditions before discharging to the environment.

Taseko noted that while no work had been undertaken to investigate water management aspects of a potential mine life extension, a number of hypothetical provisions could be employed. These included:

- raising the water level of Prosperity Lake to exceed that of the tailings storage facility by confining the lake with additional embankments, as required;
- keeping the Prosperity Lake water elevation that was stated in the EIS, and demonstrating during the first 20 years of operation of the tailings storage facility that, with a hydraulic gradient towards Prosperity Lake, the water quality in Prosperity Lake would remain suitable; or
- raising the water level in Prosperity Lake to some elevation greater than what was stated in the EIS, but less than the ultimate elevation of the tailings storage facility, should a decreased hydraulic gradient towards Prosperity Lake be required to maintain suitable water quality.

Taseko's noted its preferred approach was to keep the water elevation in Prosperity Lake at the same level as stated in the EIS, and to demonstrate that additional measures would not be needed to maintain water quality.

Regarding surface water quality, Taseko noted that the prolonged operation period of 13 years beyond the proposed 20 year mine life, a larger pit and the increased height of tailings storage facility would lead to extended effects on water quality and could lead to changes in

seepage characteristics. Taseko planned to collect additional data and to complete additional modelling at some time in the future, if appropriate. Taseko indicated there may be a need to implement additional mitigation measures but the extent and nature of such measures would be unknown until some point in the future.

Taseko stated that it would be inappropriate to draw conclusions on the significance of the effects that might arise as a result of a 13 year mine life extension on surface water quality at the mine site. Taseko indicated that there was a great deal of value in the additional proposed monitoring that would be conducted during the 20 year operation period of the Project and that it would be prudent to have the benefit of this data and an understanding of the success of the actual mitigation measures before it reached any conclusions regarding the significance of effects that might arise as a result of a mine life extension.

### **Groundwater**

Regarding groundwater quality and quantity, Taseko stated that it would be inappropriate to draw conclusions on the significance of the cumulative effects that might arise as a result of a 13 year mine life extension. Similar to the effects of the potential mine life extension on surface water quality at the mine site, Taseko indicated that this approach was appropriate as it would allow the additional proposed monitoring data that would be conducted during the 20 year operation period of the Project to be taken into consideration in determining the potential effects. Taseko noted that further modelling may be appropriate at some time in the future to help assist with predicting any environment effects. It also stated that there may be a need to implement additional mitigation measures, but that the extent and nature of such measures was not known at the time of the public hearing.

### **Fish and Fish Habitat Compensation**

With respect to the potential mine life extension, Taseko suggested that the potential changes in the height of the main embankment may require modifications to the south embankment, which was designed to contain Prosperity Lake. Taseko indicated that even if the 13 year mine life extension occurred, the changes to the height of the tailings storage facility would not likely change the proposed fish and fish habitat compensation plan.

In response to concerns raised by Environment Canada regarding the level of Prosperity Lake under the 13 year expansion scenario, Taseko noted that it would not consider raising the level of Prosperity Lake to such an extent that it would extend into other drainages or to an elevation that would require additional embankments to contain the south-western portion, near Wasp Lake. Taseko noted that if a decision was taken to proceed with the extended mine life scenario, regulatory regimes would still apply and any Fisheries and Oceans Canada policies with respect to fish and fish habitat compensation would be met. Taseko indicated that the concerns raised by Environment Canada were still being examined so that the hydraulic gradient between the tailings storage facility and Prosperity Lake could be maintained. Taseko noted that the possible mine life extension was still in conceptual stages and that if a decision was taken to proceed with the mine life extension scenario it would work to address these issues and avoid potential effects.

### **Transmission Line**

Taseko submitted that there would be no potential incremental effects if the transmission line were to remain for an additional 13 years, other than the extended duration of the effects that would already have occurred. Taseko predicted that this would not result in any significant cumulative effects.

## 6.11.2: VIEWS OF PARTICIPANTS

### Vegetation

A number of participants expressed the concern that the Project would result in the loss of old growth forests and that the protection of non-pine forests was becoming more important as the pine-dominated forests were being lost to the mountain pine beetle infestation. Along the eastern portion of the proposed transmission line corridor, the Esketemc (Alkali Lake Band) expressed concerns that the location of the transmission line right-of-way through their Community Forest would also provide a pathway for invasive plants to enter their Community Forest.

Members of the Tsilhqot'in communities pointed out that as logging and other land disturbances were increasing in the region, they would rely more heavily on the plants and berries growing in the Teztan Biny (Fish Lake) area, as this area was considered one of the few remaining pristine areas east of Dasiqox (Taseko River). They also raised the concern of increasing public access into wilderness areas, and the effect this and the potential introduction of invasive plants could have on food and medicinal plant gathered by First Nations members.

The Esketemc (Alkali Lake Band) submitted that their traditional territory was already affected by logging roads and forestry harvest blocks, mining sites and exploration activity, the existing north-south BC Hydro transmission line, grazing on ranch lands and invasive plants. Over the years, this had made it increasingly difficult for the Esketemc to carry out traditional activities such as gathering berries, plants, and medicine within their territory. The Esketemc expressed its concern that the Project, and in particular the transmission line, would further contribute to these difficulties.

### Mule Deer and Moose

A number of participants, mostly from the Secwepemc Nation, expressed concern about the prospect that the transmission line would be cutting across critical mule deer and moose winter habitat on each side of the Fraser River. This, combined with logging activities and the potential increased access to critical winter habitat, could disrupt and affect the mule deer and moose population on which the local First Nation members stated to be dependant upon as a food supply.

During the community hearing session in Esketemc (Alkali Lake), Patricia Chelsea explained that in 1963 the Esketemc had entered into an agreement with the Province of British Columbia to allow 1 power line to be constructed through two of the community's reserve lands in return for financial compensation. Many community members referred to this agreement and noted that, although no subsequent agreements were made, there were now 3 power lines going through their territory. The Esketemc noted that the conditions of the 1963 agreement provided monetary compensation to the community for the loss of the area along the transmission line.

Several members of the Esketemc (Alkali Lake Band) referred to the declining numbers of moose and deer, and the difficulty in finding these important species. This was attributed directly to the presence of the 3 BC Hydro transmission lines and the presence of roads in the area. In addition, members noted that the building of fences for ranches had limited their movements and ability to follow wild game as needed. The Esketemc were extremely concerned that the effects of the Project, in combination with these other factors, would

further reduce their hunting opportunities, which they stated sustain their culture, traditions, identity, spirituality and Aboriginal rights.

### **Grizzly Bears**

Mr. Wayne McCrory, on behalf of the Tsilhqot'in National Government, was of the opinion that Taseko had significantly undervalued the cumulative environmental effects of the mine development on grizzly bears.

Mr. McCrory suggested the habitat area-based approach used by Taseko to conclude that the Project would have no significant impact on grizzly bears was misleading. Alternatively, Mr. McCrory utilized what he considered to be a more comprehensive cumulative effects approach and concluded that the mine development in combination with other activities would have a significant effect on the threatened South Chilcotin Ranges Grizzly Bear Population Unit.

The Province of British Columbia had listed the grizzly bear population in the mine site area as "threatened", which Mr. McCrory believed to be, by definition, an indicator that the species had already undergone significant adverse effects due to human development. He noted particularly that existing structures and activities such as roads and forestry clearcuts, human settlement, extensive mining exploration activities, over-grazing, mortality from collisions, illegal killing, climate change and other factors had resulted in the population decline.

Mr. McCrory noted that habitat fragmentation presented the greatest impact on grizzly bears, and that the existing Taseko / Whitewater road acted as a partial barrier to movements across the Chilcotin Plateau. He reported that additional traffic could alter movements of grizzly bears within their home range and, as a result, could affect fitness and survival.

Mr. McCrory presented that grizzly bear populations generally could not sustain mortality rates higher than 4% annually, if recovery was desired. Further, he stated that even the loss of one breeding-age female could have serious consequences to maintaining a viable population. Mr. McCrory noted that the Province estimated the South Chilcotin Grizzly Bear population unit to be approximately 100 animals. Mortality data presented for the period of 2001-2009 indicated that at least 7 grizzlies were reported killed in conflict-related incidences, and he estimated that, when considering unreported kills, at least 17 grizzly bears could have been killed by humans during that time.

Mr. McCrory expressed the opinion that the South Chilcotin grizzly population could not sustain further habitat losses or increased human-induced mortality expected to result from the Project. He concluded that the combined effects of the Project with the other human infrastructure and activities in the region would push the Chilcotin grizzly bear population over the threshold of extinction.

### **Surface Water**

Environment Canada noted that Taseko's proposal for the mine life extension would see the embankments raised by 36 m compared to the Project as proposed, increasing the maximum height of the main embankment from 96 m to 132 m, and increasing the maximum height of the south embankment from about 25 m to approximately 61 m. Environment Canada indicated that this would also require the embankments to be lengthened in order to

adjust to the local topography. Lengthening the embankments would result in an increase in the footprint of the tailings storage facility.

Environment Canada noted its concern that an increase in embankment height could have implications for Prosperity Lake, in particular:

- increasing the height of the south embankment between the tailings storage facility and Prosperity Lake could increase the risk of seepage of contaminated water from the tailings storage facility into Prosperity Lake, which could lead to a degradation of water quality in Prosperity Lake; and
- increasing the height of the embankments could have implications with respect to the site water balance and the proposed water management plan, including the maintenance of appropriate water levels in the tailings storage facility and Prosperity Lake.

Environment Canada noted that if there was a need to increase the height of the tailings embankments by 36 m there would be water management implications. The department highlighted that maintaining the appropriate water levels within Prosperity Lake and the tailings storage facility could result in the need to relocate the headwater diversion channel to a higher elevation, which would reduce the size of the catchment area for Prosperity Lake. Environment Canada was also concerned that, if the mine life were to be extended and the height of the south embankment was increased by 36 m after Prosperity Lake had already been established, construction related activities could increase concentrations of suspended solids in the lake unless appropriate mitigation measures were implemented.

Environment Canada was of the view that the information provided by Taseko was not sufficient to permit an assessment of whether the proposed measures would prevent seepage from the tailings storage facility into Prosperity Lake under the mine life extension scenario. Consequently, Environment Canada indicated that more detailed information would be needed before such an assessment could be undertaken. Environment Canada indicated that it was premature to disregard any of the options proposed by Taseko to minimize or avoid seepage from the tailings storage facility to Prosperity Lake under the extended mine life scenario.

Environment Canada noted Taseko's commitment to mitigate water quality effects, if necessary, and recognized that the suite of mitigation measures were available to Taseko to support its conclusion that there would likely be no increased effect on the Dasiqox (Taseko River) if water quality objectives were attained.

Natural Resources Canada noted that under the potential mine life extension scenario, the greater size of the pit wall area and the longer duration that it would be exposed prior to flooding would result in increased sulphide oxidation on the pit walls and therefore, degraded water quality in Pit Lake.

The Esketemc (Alkali Lake Band) were also concerned that an increase in the height of the tailings embankments could result in increased risk of catastrophic dam failure and the subsequent contamination of the Taseko and Fraser River systems.

Dr. Kevin Morin, on behalf of the Tsilhqot'in National Government, noted that a major expansion of the mine would lead to much higher levels of solids and liquids inside the tailings storage facility. He expected that these higher levels would drive more seepage in the direction of Prosperity Lake.



With respect to the water balance, Dr. Morin also was concerned that under an extended mine life scenario, the volume of water required to maintain a water cover over the potentially acid-generating waste rock and tailings would be greater. He further noted that problems at mine sites typically result not from average conditions that were expected, but from the degree to which conditions vary from the average. He noted that the increased amount of potentially acid-generating waste that would require storage under the mine life extension scenario could result in difficulty storing all of the material under water, particularly in dry years.

### **Groundwater**

Environment Canada indicated that the larger tailings storage facility resulting from the proposed 13 year extension would increase uncertainty regarding seepage rates and consequently selenium in groundwater, and could result in greater effects on Jidizay Biny (Big Onion Lake).

Natural Resources Canada commented that based on the hydrogeologic data available for the expanded open pit under the extended mine life scenario, there could be a doubling of groundwater inflows to the open pit under the mine life extension scenario. The potential environmental effects of this would be a deeper and wider draw-down of groundwater, which would report to the open pit, rather than to lower Teztan Yeqox (Fish Creek), as predicted in the EIS.

With respect to the tailings storage facility, Natural Resources Canada commented that the extended mine life scenario would result in higher embankments, more supernatant fluid and thus more hydraulic pressure, leading to increased groundwater flows moving in the direction of Jidizay Biny (Big Onion Lake). The department also indicated this could result in increased surface seepage along the west ridge over the long term. In addition, the increased volume of tailings pore water could increase the amount of contaminants that would be transported in the groundwater.

The view of Natural Resources Canada was that “non-trivial changes” to the groundwater flow regime and seepage characteristics would result from an extended mine life scenario and that these effects could be readily investigated by modifying the current numerical flow model. Baseline hydrogeological data presented in the EIS in support of the model were considered by the department to be sufficient to support groundwater flow modelling of an extended mine life scenario and a quantitative investigation of the incremental effects to the hydrogeology.

The Esketemc (Alkali Lake Band) raised concerns that, while the increase in mineral resources would be contained within the initially proposed mine footprint, Taseko had not calculated the increased movement of contaminated groundwater flows from the larger tailings storage facility and other ancillary features. The Esketemc felt that this was an information gap that resulted in uncertainty of the effects of a larger tailings storage facility.

### **Fish and Fish Habitat**

Fisheries and Oceans Canada reported concerns that, in the event of a future mine life extension, increases in the tailings storage facility level without a corresponding increase in the level of Prosperity Lake could result in contamination of Prosperity Lake. Contamination of Prosperity Lake could have many effects upon the flora and fauna within the lake, and consequently, upon the survival, productivity and taste of rainbow trout within the lake.

Fisheries and Oceans Canada also noted that if the depth of Prosperity Lake were to change as a result of raising the embankment height, the overall percentage of littoral zone within the lake would drastically decrease, as would the expected productivity. Additionally, established riparian areas would be lost, and any flora and fauna communities that had been established along the shoreline would be submerged, potentially affecting dissolved oxygen concentrations in the water column due to decomposition of organic matter. This in turn could affect Taseko's compensation plan and fish production estimates. Additionally, the department also noted that increasing the overall size of the footprint of Prosperity Lake could eliminate a large section of the spawning channel, which was designed to support a specific number of spawning fish, and was an element for the fish and fish habitat compensation plan required by Fisheries and Oceans Canada.

### **Transmission Line**

The Esketemc (Alkali Lake Band) were of the opinion that Taseko had not adequately addressed how the existence of the transmission line for an additional 13 years might affect First Nations along the right-of-way.

### **6.11.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on cumulative effects, the Panel considered the following factors to be particularly relevant:

- cumulative environmental effects to vegetation, wildlife, surface and groundwater and fish and fish habitat could arise from the effects of the Project in combination with the effects of past, present and reasonably foreseeable future forestry harvesting activities in response to the mountain pine beetle infestation and a possible mine life extension;
- a future mine life extension could involve increasing the height of the embankments by 36 m for the tailings storage facility and possibly Prosperity Lake, and increasing the size of the open pit and the non-acid generating waste rock storage areas; no other changes were predicted to occur at the mine site other than the mine operating for 33 years instead of 20 years;
- Taseko estimated that the Project would result in a reduction of non-pine old growth forest of 0.36%;
- there would be little potential for the loss of wetlands, riparian areas and grasslands from other existing or reasonably foreseeable future projects in the area;
- previous forestry activities had reduced the area available for the gathering of plants by First Nations and had reduced wildlife habitat;
- mule deer and moose populations were considered to be sustainable by the Province but concerns existed about the loss of winter habitat due to past, present and reasonably foreseeable future forest harvesting associated with the mountain pine beetle infestation;
- the sustainability of the grizzly bear population in the South Chilcotin region was reported to be threatened;
- a future mine life extension could affect surface and groundwater by modifying the site water balance, increasing seepage rates from the tailings storage facility and increasing the rate of seepage flow into Jidizay Biny (Big Onion Lake);
- Taseko would have the benefit of 20 years of monitoring data to assist it with accurately assessing the potential effects of a future mine life extension on surface and groundwater; and

- a future mine life extension could affect the fish and fish habitat compensation works; water quality in Prosperity Lake could be negatively affected, which could affect the survival, productivity and palatability of rainbow trout within the lake; the riparian habitat that would be established along the perimeter of Prosperity Lake could also be negatively affected by increasing the size of the lake.

The Panel observes that cumulative effects on vegetation would most likely arise from the interaction of the Project with the effects of the mountain pine beetle infestation and logging to remove the salvageable trees. A possible mine extension would result in a very small increase in the footprint of the tailings storage facility and possibly Prosperity Lake but this would be in an area already affected by the present Project. Other past, present or reasonably foreseeable future projects would have little effect on wetlands and riparian areas and on grasslands. The Panel has therefore focussed its attention on the matter of cumulative effects on vegetation to the loss of old growth forest and the loss of plants of importance to First Nations.

The mountain pine beetle infestation was expected to result in the destruction of most of the pine forests including the forest at the mine site and along the transmission line. This in itself would result in a significant environmental effect. More than 88% of the old growth forest in the mine site regional study area was reported as pine and it was expected to be lost due to the mountain pine beetle infestation. Therefore, the Panel notes it is increasingly important to protect the non-pine old and mature forest and to replant forests to retain and recreate habitat for wildlife and plant species in the region. The Panel heard that the Ministry of Forests and Range was actively overseeing reforestation in the region.

Most of the non-pine (spruce) old growth forest was located to the north and east of the mine footprint and only a small amount would be affected by the Project. Taseko proposed to avoid removing non-pine old growth forests to the extent possible. It was estimated that the total reduction of non-pine old growth forest in the mine site, transmission line and access road regional study areas would be 0.36%. The Panel considers this to be a relatively small loss of non-pine forest and accepts Taseko's conclusions that most of the old growth pine in the Project area would be lost due to the mountain pine beetle infestation even if the Project did not proceed.

The Panel heard that First Nations gather plants for food, medicinal and spiritual uses in the area of the mine site and along the proposed transmission line corridor. Past forest harvesting had reduced the undisturbed areas for this practice. The Panel recognizes that the mine site and the proposed transmission line right-of-way would further reduce the available area for these traditional purposes. The Panel also recognizes the importance of this activity to First Nations, but notes that other areas, while increasingly limited, do remain for this purpose. On its own, the loss of these plants for traditional purposes would not appear to be significant, but their loss would be one of a number of effects of the Project on First Nations. The overall effect of the Project on the totality of the current use of lands and resources for traditional purposes by First Nations is discussed in Section 8.2.

**The Panel concludes that the Project would not result in a significant adverse cumulative effect on vegetation.**

The Panel observes that cumulative effects on wildlife would most likely arise from the interaction of the Project with the effects of the mountain pine beetle infestation and associated logging. The Panel notes that forestry activities, including timber harvesting and the construction of forestry access roads, have already had an effect on wildlife in the area. Habitats have been disturbed, fragmented or lost, and increased access allowed greater hunting and poaching opportunities into areas not previously accessible. Traffic to the mine site, together with existing traffic along the routes that would be used by the mine employees, would increase the likelihood of direct wildlife mortality along the roads.

The key factor for mule deer would be the extent of the loss of winter habitat caused by the removal of forests, in particular non-pine forests. The Province indicated that it considered the mule deer population to be sustainable in the region but the effects of logging on the future availability of winter habitat was recognized as a concern. The loss of winter habitat along the transmission line was less than 1% of the regional study area. The loss of habitat at the mine site was higher but this area was not considered regionally important as winter habitat. The Panel agrees with Taseko's findings that the cumulative effects of the Project together with past, present and reasonably foreseeable future forestry harvesting activities would be not significant.

Moose populations, similar to mule deer, were considered to be sustainable in the region but the effects of logging on the future availability of moose winter habitat were of concern. There would be a loss of winter shelter and winter feeding habitats at the mine site (approximately 1,680 ha and 189 ha respectively) but this was considered to be low value winter habitat. Along the transmission line, there would be an estimated loss of 264 ha of high potential moose winter shelter habitat but this would represent less than 1% of available habitat. The Panel agrees with Taseko's conclusion that the cumulative effects of the Project together with past, present and reasonably foreseeable future forestry harvesting activities would be low.

As noted in Section 6.7, the population of grizzly bears in the region was stated to be approaching the endangered level. The past effects of logging and other activities such as ranching had resulted in a significant effect on the sustainability of the South Chilcotin grizzly bear population, as indicated by its classification by the Province as threatened. While the Project would result in a relatively small loss in habitat, it would contribute to a further decline of the present situation. Logging is expected to continue to affect habitat in the area due to the increased harvesting in response to the mountain pine beetle infestation. This would place even greater pressure on the remaining bear habitat in the South Chilcotin region.

Taseko recognized that any mortalities arising from the Project would have the potential to result in a significant incremental effect on the sustainability of grizzly bears in the region. Taseko's proposed mitigation measures included strict enforcement of speed limits to minimize bear-vehicle collisions and a policy of using a non-lethal approach in resolving any incident involving bears. Other participants, including the British Columbia Ministry of the Environment, expressed concerns about the adequacy of Taseko's proposed mitigation measures. These mitigation measures would not replace lost habitat, nor would they reduce fragmentation of the landscape. Further, speed limits for vehicles may be difficult to enforce. Given this situation, the increased road traffic and further loss and fragmentation of habitat caused by the Project, in combination with reasonably foreseeable future forestry activities, would be likely to result in high magnitude, long-term effects on the South Chilcotin grizzly bear population.

**The Panel concludes that the Project, together with past, present and reasonably foreseeable future forestry activities in the area, would result in a significant adverse cumulative effect on the South Chilcotin grizzly bear population but would not result in a significant adverse cumulative effect on deer, moose, and other wildlife.**

The Panel observes that cumulative effects on surface and groundwater and fish and fish habitat would most likely arise from the interaction of the Project with a future mine extension.

The Panel recognizes that mine life extension is not assured, as it would be dependent on the future value of gold and copper and approvals from the various regulatory authorities. An extension would not affect the mine footprint in any significant manner. The Project appears to have been designed in a manner that would not be adversely affected by an extension. However, an extension of the life of the mine would have environmental implications.

The Panel notes that extending the life of the mine from 20 years to 33 years could have implications for the site water balance and the proposed water management plan. The Panel assumes that the water management plan may have to be adjusted to take into account the higher elevation of the tailings storage facility. However, the Panel notes that the overall water requirements for the site on an annual basis would not likely change. With respect to discharge quality, an extension of the mine life would add a greater total volume of contaminants to the tailings storage facility, but concentrations of contaminants would likely remain the same. Regardless, Taseko would be able to treat the water to meet surface discharge requirements as discussed in Section 6.2. The Panel finds that given the proposed mitigation measures, cumulative effects on surface water would be unlikely.

With respect to groundwater seepage from the tailings storage facility, the Panel recognizes that Taseko's proposed mitigation measures of installing seepage collection ponds and interception wells (if necessary) below the west embankment to capture seepage and to continue to monitor the groundwater quality would allow for predicted groundwater flow and contaminant levels to be verified. This would allow sufficient time for corrective action to be taken if any problems arise. Taseko would also be able to provide more accurate data to enable a higher degree of confidence in the predicted effects on groundwater of a future mine life extension.

**The Panel concludes that the Project, in combination with an extended mine life proposal, would not result in a significant adverse cumulative effect on surface water and groundwater.**

A future mine life extension would affect the facilities associated with the Project's fish and fish habitat compensation plan. An increase in elevation of the tailings storage facility would likely result in seepage through the south embankment into Prosperity Lake, which could affect water quality and possibly the survival of fish populations in the lake. Construction of the enlarged embankments would likely create additional sedimentation in Prosperity Lake.

Raising the height of the embankments could result in additional water being impounded, likely requiring modifications to the water management regime and possibly affecting the proposed spawning channels. The Panel is of the opinion that a future mine life expansion would place further stress on the likelihood of success of the fish and fish habitat compensation plan proposed for this Project.

**The Panel concludes that the Project, in combination with an extended mine life proposal would further increase the likelihood of failure of the fish and fish habitat compensation plan and thus result in a significant adverse cumulative effect on fish and fish habitat.**

## SECTION 7: SOCIO-ECONOMIC EFFECTS

The Panel's Terms of Reference required it to include in its report information regarding the assessment of the effects of any change that the Project may cause in the environment, including any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by Aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

In determining whether the Project would be likely to result in significant adverse environmental effects, the consideration of effects on socio-economic conditions under the *Canadian Environmental Assessment Act* was limited to those effects resulting from changes in the environment. An effect on socio-economic conditions attributable to changes in the environment must be considered in the environmental assessment as per paragraph 16(1)(a) of the *Canadian Environmental Assessment Act*. The Panel has reached conclusions on those aspects resulting from a change in the environment as a result of the Project.

Changes in socio-economic conditions not resulting from a change in the environment were not considered by the Panel in determining whether the proposed Project was likely to cause significant adverse environmental effects. Nevertheless, the Panel has included in this section information presented by Taseko, various participants and observations by the Panel on these matters. The issues on justifiability are also summarized in Section 12.

Similar to the approach taken in Section 6, the Panel has focused its assessment of socio-economic issues on those issues which in its opinion were important. Issues specifically relating to socio-economic conditions for First Nations are addressed Section 8.4.

### 7.1: LAND AND RESOURCE USES

Key issues relating to land and resource uses identified by the Panel include potential effects on forestry, agriculture and ranching, hunting and trapping, and recreation and tourism activities. The potential effects on the Project on the current use of land and resources for traditional purposes by First Nations are addressed in Section 8.2.

#### 7.1.1: PROPONENT'S ASSESSMENT

Taseko reported that the Cariboo-Chilcotin Region covered an area of 8 million ha. The total Project area accounted for 56,252 ha, most of which was located on Crown land. The mineral tenures associated with the mine site were 100% owned by Taseko.

The mine site, transmission line right-of-way and the access roads would directly impact and displace non-compatible uses of the land such as forestry, grazing, hunting and trapping and recreation and tourism activities for the life of the Project and possibly longer. The direct influence of non-compatible uses of the land was predicted to depend on the nature of the activity. In post-closure, some of the land was predicted to become available for uses other than mining.

Tenures within the Project footprint under provincial legislation included:

- licence to cut;

- wood lot licence;
- community forest;
- range grazing licences and permits;
- range hay cutting licences;
- mineral claims and titles for both minerals and placer;
- *Land Act* tenures and tenure applications;
- guide outfitter licences; and
- trapper licences.

### **Forestry**

The mine site was reported to have a total forested area of 3,525 ha. In the first 5 years, it was expected 744 ha of forests would be cleared from the mine site and an additional 860 ha of forest land would be removed from the transmission line right-of-way. This would result in a 0.6% reduction of the designated “no-harvest” zone and 1.5% reduction of the “extended-harvest” zone. In addition, the Project would encroach on a total of 250 ha of existing old growth management areas. Taseko noted that these lands had a “no-harvest” management designation and were delineated as part of the Sustainable Resource Management Plan process that was approved by legislation. Taseko further stated that mineral exploration and development was an accepted use of land in the three development zones established by the Cariboo-Chilcotin Land Use Plan.

Mine site clearing would affect the reforestation of tracts of forest that were recently harvested or planned to be harvested. In addition, during operations, the forest land occupied by the Project would not contribute to the regional timber supply. This would generate a reduction of some 4,300 ha, representing a reduction of 0.12% of the current acceptable allowable cut.

In its EIS, Taseko reported that there were 2 area-based forest tenures in the transmission line right-of-way: a 20 ha woodlot license issued to an individual; and the 26,000 ha Community Forest license held the Esketemc (Alkali Lake Band). The area of the Community Forest that would be cleared as a result of the transmission line right-of-way was estimated at 34 ha, assuming an average right-of-way width of 50 m. Taseko indicated that together with the Ministry of Forest and Range, it would work with the Esketemc to address issues related to harvesting of commercial timber in a section of the right-of-way that overlapped with the Community Forest, and to discuss options in terms of accommodation for the timber loss or finding an alternate location for the transmission line.

### **Agriculture and Ranching**

The main effect of the Project on range tenures administered by the Ministry of Forest and Range would be the availability of forage for livestock, the effects on cattle movement, and the spread of noxious weeds, particularly along the transmission right-of-way where the loss of natural barriers would result. The measurable parameters used to assess the Project’s effects included land capability, agricultural production, range tenures and range use.

Taseko stated that 16% of the land area within the Project components was Agricultural Land Reserve. While the mine site and mine buffer would not include any Agricultural Land Reserve, the transmission line right-of-way and new mine site access road would account for 1,948 ha of Agricultural Land Reserve. Taseko reported that because the right-of-way would not change the underlying use of the land, it did not predict any effects on Agricultural Land Reserve. Approximately one half of the transmission line right-of-way and over two



thirds of the new access road footprint would be considered suitable for forage crop improvement practices.

The transmission line right-of-way was predicted, however, to have both positive and negative effects on range use. In particular, Taseko stated that beneficial effects could be expected as a result of seeding the disturbed areas along the right-of-way using domestic grasses. Domestic grasses were expected to be more palatable for livestock grazing than the current Pinegrass.

The Project components would intersect a total of 32 grazing tenures, which represented approximately 14% of all tenures in the local area. Taseko reported that the area in which the Project would be located was used by a Xeni Gwet'in (Nemiah Band) rancher, and Siegfried Reuter of Taseko Lake Outfitters.

Taseko stated that the loss of natural barriers as a result of clearing along the right-of-way could result in:

- livestock drift by creating an easy egress corridor;
- increased public access by recreational users, primarily hunters;
- the spread of noxious weeds;
- increased risk of rustling, poaching or unintentional killing of livestock;
- noise and associated disturbances to cattle and wildlife; and
- illegal dumping of garbage and littering.

Taseko predicted that the mine site would have a minimal effect on forage availability, and that existing licensees would have to alter their grazing patterns. However, in such a circumstance, Taseko stated the effects to grazing and haying lands would be reversible, as much of this lost range would be restored post-closure.

### **Hunting and Trapping**

Taseko reported in its EIS that the number of hunters in the region and the local area remained virtually unchanged from 1996 to 2005. Total expenditures from resident and non-resident hunters in the region were \$6.6 million in 2005. Major changes to wildlife habitat were anticipated because of the loss of pine forest from the mountain pine beetle infestation, increasing the value of the remaining non-pine areas of the Cariboo-Chilcotin region. Taseko noted that the mine site was predominately spruce forest so its value as habitat could increase.

Taseko indicated that there were 47 registered guide outfitters in the Chilcotin region. Of the 8 provincial management regions, the Chilcotin region had the third-most outfitters. The proposed mine site would effect 4, 419 ha of land licensed for use by 3 registered guide-outfitters. Four (4) additional guide outfitters would be affected by the mine site buffer zone and the mine site access road would overlap with 3 guide outfitter licenses. The proposed transmission line would overlap another 5 guide outfitter licenses. However, Taseko indicated that access to or the ability to work in the tenure along the right-of-way would not be restricted. However, Taseko proposed a no-hunting ban be established around the mine site for mine employees. Moreover, Taseko proposed to develop an Access Management Plan in consultation with First Nations to limit additional access to the transmission line right-of-way.

Taseko stated that the land area lost to the no-hunting zone at the mine site represented approximately 0.3% of the regional land area and 1% of the total area licensed to guide operators in British Columbia. Taseko indicated it would consult with all 8 guide outfitters whose outfitting areas are overlapped by the Project to discuss areas of conflict and develop measures to minimize detrimental effects.

Taseko reported that Project components would overlap with 8 existing trap line holder areas, comprising 25,000 ha. The mine site and buffer was stated to be situated within provincially known trap lines totalling 13,602 ha. On behalf of the Xení Gwet'in (Nemiah Band), Sonny Lulua was reported to hold a trap line at the mine site. The mine site would occupy 2,782 ha of that trap line with an additional 3,349 ha eliminated within the mine site buffer, totalling a loss of 8,913 ha. Another trap line, registered to a Heidi Gutfrucht of Williams Lake, would be affected by the mine site and mine site buffer area, effecting over 5,000 ha. Taseko noted that trap line areas at the mine site would be lost and that trap line areas within the mine buffer would be negatively affected from a possible decline in fur bearing animal populations.

Trap lines reported to be affected by the transmission line and buffer included 7,748 ha of the Stswecem'c/Xgat'tem (Canoe Creek Band) trap line, 11,994 ha of the Tl'esqox (Toosey Band) trap line and 501 ha of the Esketemc (Alkali Lake Band) trap line. Taseko reported that trap lines in and near the transmission line right-of-way would not be affected and that the right-of-way could enhance harvest potential due to improved access for some fur bearing species.

Between 1999 and 2005, Taseko reported that trapping was assessed as having an annual average value of \$102,150 within the regional study area. It was reported that the majority of fur-bearer species collected included marten, lynx, beaver and otter. In the local study area, trapping was assessed to produce approximately \$2,060 per year in revenue. While the economic value from trapping in the local and regional area was reported to be small, Taseko noted that it represented an important recreational activity for those involved in the sector.

Taseko indicated it would pursue measures to mitigate potential negative effects to trappers affected by the Project. In its EIS, Taseko indicated it would be willing to explore settlement and compensation agreements such as relocation or other management strategies that would maintain trapping potential without incurring costs to Taseko. General mitigation measures to wildlife species are discussed in Section 6.7.

### **Tourism and Recreation**

The total tourism revenue for the Cariboo-Chilcotin region was reported as \$198 million in 1996, representing 2% of all of British Columbia's tourism revenue. Taseko stated that the Project would affect tourism activity within the immediate area, but that no effect on regional tourism activities was anticipated. Taseko noted that construction and operation of the mine would have a positive effect on accommodation, food, beverage and miscellaneous services such as rentals due to business travel locally and in the region.

Taseko reported that the region had a total of 168 outdoor adventure companies. Taseko noted 13 commercial recreation tenures that overlapped with Project components. Taseko indicated that the Project would displace licensed commercial backcountry recreation operators and create some inconvenience (such as traffic, noise and access to land) for clients of lodges and accommodation facilities.

There was no reported commercial recreation tenure at Teztan Biny (Fish Lake). However, Taseko noted in the EIS that the guided fishing and lodge sector were important components of the local tourism industry. Taseko reported that there were 22 individuals listed as freshwater angling guides for the Cariboo-Chilcotin in 2005. In the Chilcotin region, \$1.46 million annually was generated in guide services revenue, and \$4.6 million was generated annually in lodge revenue.

Taseko reported that recreational opportunities for hiking, camping, aesthetic appreciation and wildlife viewing existed in the Cariboo-Chilcotin region due to the proximity to and abundance of natural settings. Taseko indicated that there were 39 recreation sites with over 1,740 campsites in the Cariboo-Chilcotin region. In the local study area, there were a total of 7 recreation sites (including Teztan Biny (Fish Lake)) with 23 campsites available. Taseko noted that about 2.5 million user days for outdoor recreation activities (other than hunting and fishing) were estimated to occur in the region. The net economic value of recreational activities in the region (excluding fishing, hunting and nature study) was calculated to be \$6.2 million.

Taseko noted that the Project would have a direct effect on public recreation at the mine site due to the direct loss of land, Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and Teztan Yeqox (Fish Creek). The mine and associated infrastructure could affect the quality of the recreational experience for some users by affecting visual quality, noise levels and remoteness. Taseko noted that the tailings storage facility would not be visible from the large majority of recreation use sites.

Taseko noted that except for fishing and hunting, the Teztan Biny (Fish Lake) area was limited with respect to recreational value as it was remote and had poor access.

To offset the losses of recreational opportunities at Teztan Biny (Fish Lake), Taseko proposed to build a new campsite at Prosperity Lake and, under the advisement of the British Columbia Ministry of Environment, at other lakes in the region. A new access road would also need to be built to access Prosperity Lake, although Taseko had not determined its final routing.

#### **7.1.2: VIEWS OF PARTICIPANTS**

The Panel heard from a number of interested parties concerning the potential effects the Project may have on the various uses of the lands and resources in the region. In particular, participants were concerned about effects to forestry, grazing, hunting and trapping, as well as future and existing tourism operations.

##### **Forestry**

The Esketemc (Alkali Lake Band) reported that it owned and operated Alkali Resource Management, which managed the forest tenures owned by the Nation including 3 forest licences, 1 Community Forest and 1 woodlot. Mr. Chipman, Community Forester for the Esketemc, indicated that of the 26,000 ha in the Community Forest, over half was designated by the provincial government for both mule deer winter habitat and old growth management areas. He explained that the Community Forest was subject to many harvesting restrictions. Mr. Chipman highlighted that select logging was the predominant silviculture system used and noted the absence of clearcuts in this forest. Given the many restrictions on the harvesting and the relatively small area of the Community Forest, Mr.

Chipman expressed concern for the viability of the Forest as a means for the Esketemc to continue to extract value. He also pointed out that constructing the transmission line through the Community Forest would go against all the restrictions that were imposed on the Esketemc for harvesting trees in the mule deer winter range. He further indicated that the transmission line right-of-way would be the largest cut block in the Forest, and would provide the means for the introduction of invasive plants into the Community Forest area.

### **Agriculture and Ranching**

During the public hearing, Ms. Patt Larcombe, on behalf of the Tsilhqot'in National Government, reported that the Solomon Family held grazing rights in the Y'anah Biny (Little Fish Lake) and Jidizay Biny (Big Onion Lake) area. Mr. Solomon submitted that both Wilfred Williams and Mabel Solomon continued to range their cattle in the area. He reported that they grazed about 40 head of cattle in this area, largely using Jidizay Biny (Big Onion Lake), Teztan Biny (Fish Lake), and Y'anah Biny.

Taseko Lake Outfitters also reported that it held a grazing tenure for their animals and grazed its animals in the grass meadows at Teztan Biny (Fish Lake), along Teztan Yeqox (Fish Creek), Y'anah Biny (Little Fish Lake), the area known as Nabas, and the creek and the meadows around Wasp Lake and Wolf Trap Lake. Taseko Lake Outfitters reported that their horses spend summers grazing in these areas in preparation for pack trips. They indicated that the sedge grass grows abundantly in the Teztan Yeqox valley, reaching 3 feet tall and that they used the grasses to make hay. In correspondence with Taseko, Taseko Lake Outfitters proposed mitigation for losses of grazing lands estimated to total over \$1,000,000 over the 20 year life of mine. Furthermore, they expressed frustration that Taseko had dismissed their rights to graze and make hay. In their view, the Project would significantly impact their rights to graze in the Teztan Biny and Nabas areas.

### **Hunting and Trapping**

During the review period, the Tsilhqot'in National Government expressed concerns that the Xenii Gwet'in (Nemiah Band) trap line (registered to the Xenii Gwet'in/Sonny Lulua) was not fully assessed by Taseko. In particular, community members noted that Taseko did not take into account the harvest levels and value for trappers from that trap line. They questioned why Taseko did not present spatial data pertaining to trapping, indicating that most of the data used to assess the potential effects on trappers in the mine site area was based on historical data and did not include publically available data such as those used in the *William* case. Therefore, the Tsilhqot'in National Government concluded that Taseko's baseline information was deficient. To this end, they stated "[t]here is no assessment of the direct environmental effect of the removal of lands available for trapping and/or changes in access to and within trapline areas" and "[d]espite this lack of effects analysis, the proponent has made a determination that the effects of the project on trapping are expected to be minimal."

Notwithstanding the Tsilhqot'in National Government's concerns that Taseko had not adequately characterized their current use of the land for traditional purposes (see Section 8.2) as well as their Aboriginal right to hunt (see Section 9), the Tsilhqot'in National Government submitted comments on the use of lands and resources in the Project area. In particular, the Tsilhqot'in National Government noted Taseko had failed to identify hunting areas potentially effected by the Project. Furthermore, they were concerned that throughout the review, Taseko had not described the area proposed as a "no-hunt" zone around the mine site.

During the public hearing, both the Tsilhqot'in and Secwepemc communities often expressed concern for the potential adverse effects the Project would have on hunting as a means for sustenance. First Nations noted their reliance on traditional activities to sustain their economy. That is, they relied on traditional foods for a number of purposes, including as an economic necessity. Additional information on First Nations traditional economy is provided in Section 8.4.

The views of First Nations participants on hunting and trapping for traditional purposes can be found in Section 8.2.

MiningWatch Canada submitted that “[t]he three major hunting issues will be the loss of the mine site to hunting activity, disturbance of animal movements or productivity as a result of the Project, and the potential for increased hunting pressure by employees and contractors.” In their view, Taseko did not give adequate consideration to the potential affects the Project would have on First Nations’ reliance on hunting as an economic activity. It was also noted by MiningWatch Canada that Taseko did not assess the number of First Nations people employed as hunting guides, but rather, concentrated solely on the potential affects to lodges and wilderness outfitters who provide hunting opportunities.

### **Tourism and Recreation**

With respect to tourism and recreational activities, the Teztan Yeqox (Fish Creek) watershed was described by participants as a pristine, untouched ecosystem with exceptional vistas, clear glacier fed lakes and streams, relative remoteness and abundant wildlife. Teztan Biny (Fish Lake) was also described as sacred ground that had been used by First Nations for generations.

Taseko Lake Lodge, owned and operated by Taseko Lake Outfitters, was located approximately 3 km from the west embankment of the tailings storage facility, and included guest cabins, camp, working areas and a main cabin and home. Taseko Lake Outfitters specialized in ranch vacations, hunting expeditions, horseback riding, pack trips, and general recreational use including hiking, wildlife viewing, and canoeing.

The Reuters, owners of Taseko Lake Outfitters, noted that they took guests up surrounding T’ox T’ad (Vic’s Mountain), Gwetex Natel?as (Red Mountain), Nabas Dzelh (Anvil Mountain), and Taseko Mountain; from these points they reported they would be able to see the entire mine, devaluing the "exclusive wilderness" lodge setting. They also indicated that they used the trails to bring guests to Teztan Biny (Fish Lake) and Nabas. The mine, in their view, would represent a large loss in terms of available lodge trails, working, and grazing areas in addition to the potential adverse effects to wildlife and health.

With respect to the quality of their tourism operations, the Reuters expressed concern about light and noise pollution from the Project. In response to concerns regarding light pollution, Taseko indicated at the public hearing that light from the mine site would only be visible during specific atmospheric conditions, such as low-level cloud cover. Similarly, in response to concerns for noise, Taseko indicated that noise would not be heard as there were no residents within 1.5 km of the mine site. Additional information on light and noise pollution is provided in Sections 6.8 and 6.9.

The Reuters noted their concerns regarding the loss of opportunities and revenues for themselves as well as other tourism operators. Taseko Lake Outfitters proposed that if the mine was approved, Taseko should compensate them for their losses. Taseko Lake

Outfitters estimated the value of the lodge-based work that would be lost as a result of the mine site, based on estimated annual net profits, to be over \$2.7 million per year. Taseko Lake Outfitters also suggested that an appropriate value of compensation to buy-out the Lodge and their partners was estimated between \$47 and \$100 million, based on gross revenue that would be lost over the life of the mine. They noted several times their intention to expand the Lodge, making it a larger economic contributor to the region. However, if the mine was approved, they expected the Lodge may go out of business with little chance of selling it to another buyer.

Mr. Gordon Høglund of the Lower Bridge Creek Water Stewardship Society presented the Panel with postcards featuring Teztan Biny (Fish Lake) stating “we find it ironic that GoBC, the unofficial BC Travel and Tourism Guide, has printed postcards of wilderness sites they view as must-sees by visitors to our province.” The Panel also received many of these postcards with public comments from interested parties during the course of the review.

All potentially affected First Nations communities as well as other interveners repeatedly expressed concern that the transmission line would create increased access for non-native hunters and recreational vehicle users that would adversely affect their rights to hunt and trap. In Stswecem'c/Xgat'tem (Canoe Creek Band), community members and Elders reported taking youth on camping trips on the land where they taught traditional practices and culture. First Nations noted that it was becoming increasingly difficult to find places that were isolated for such trips. Members of the Stswecem'c/Xgat'tem (Canoe Creek Band) also expressed concern for their safety and the safety of their children as a result of increased access by non-native hunters and all-terrain vehicle users along existing transmission lines in their traditional territory.

First Nations expressed concerns that the potential effects of increased access as a result of the transmission line were unmitigatable. Taseko also noted the great difficulty in mitigating access and noted they had not yet determined a detailed management plan for this issue. Some participants suggested the installation of gates to limit access to the maintenance road within the transmission line right-of-way; however, no commitments were made by Taseko. The Stswecem'c/Xgat'tem (Canoe Creek Band) also noted that Taseko had not taken the opportunity to consult with them regarding their concerns about increased access during the past 17 years, and that this had resulted in a lack of trust between parties. First Nations expressed concerns that Taseko would not live up to their commitments should the Project proceed.

A number of First Nations communities shared with the Panel the work that had been done to develop a First Nation tourist sector in the communities. In general, First Nations suggested there was a strong demand for First Nation tourism. Both cultural and wilderness experiences could be provided by First Nations in the vicinity of the mine site and along the transmission line corridor. First Nation tourism was reported to be developed purposefully and intentionally to fulfil multiple purposes; they viewed the development of tourism as not only a means for economic development, but also as a way to assert control over their traditional territory, and to share, retain and revitalize their culture in a way that was commensurate with their cultural values as well as work-life preferences.

The Xeni Gwet'in (Nemiah Band) stated that it was aggressively pursuing the development of the Xeni Gwet'in Caretaker Area as the basis for their tourism sector. Through the Xeni Gwet'in Cultural Tourism Partnership program, the Xeni Gwet'in stated they had conducted a Feasibility Study for Cultural Tourism from 2000-2003 and signed a Sustainable Tourism

Protocol Agreement in 2003. Signatories of the Protocol Agreement were existing businesses who recognized the opportunity to work with the Xeni Gwet'in in developing tourism opportunities and would be willing to share their experience and mentor community members in order to build capacity. In their view, healthy ecosystems translated to a healthy culture and successful tourism economy.

The Xeni Gwet'in (Nemiah Band) also reported they were building a visitor Information Centre as well as Traditional Village to share their culture. They stated they wanted to attract tourists for hunting, camping, fishing, and wildlife viewing. The Xeni indicated they were concerned about noise and light pollution as a result of the Project. They emphasized the need to maintain the region from an ecosystem perspective so as to maintain the viewscape as well as wildlife and the fishery. The Xeni Gwet'in also noted that Tsilhqox Biny (Chilko Lake) was used as a backdrop for the Hello BC Tourism commercial aired during the Vancouver 2010 Olympics.

An existing adventure tourism business, Cariboo Chilcotin Jetboat Adventures, owned and operated by a Tl'esqox (Toosey Band) member, which ran scenic river tours along the Fraser River at the proposed aerial crossing, submitted during the EIS review that the proposed transmission line was going to significantly impact the aesthetics of the area and subsequently the attraction that draws tourists. He also noted that there were no major industries or roads visible along that portion of the Fraser River, which contributed to the pristine wilderness experience.

Similarly, the Stswecem'c/Xgat'tem (Canoe Creek Band) also stated they have been actively pursuing First Nation tourism opportunities since 2005 with the development of the Community Tourism Input Report which built upon previous work done at the Tribal Council level. Ms. Racelle Kooy and Ms. Phyllis Jack identified multiple opportunities in and around the proposed transmission line that stemmed from both cultural practices and local geography, and indicated that these could be interrupted should the Project proceed. Examples included river rafting, mountain biking, rock climbing, ranching, berry picking, wagon rides, sweats, archaeology tours and arts and handicrafts. The Stswecem'c/Xgat'tem showed interest in pursuing all aspects of First Nation tourism and were in the process of developing business plans.

In Stswecem'c/Xgat'tem (Canoe Creek Band), Mr. Gary Runka expressed the view that Taseko paid inadequate attention to the impacts on visual quality from the proposed transmission line corridor. He proposed Taseko conduct a more detailed analysis focusing on rivers, streams, and established tourism travel routes. In support of their concern for the aesthetics of the Fraser River, the Panel was shown one of two documentaries shot in the area: one by Wings Over Canada, and one by Simon Fraser University.

### **7.1.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on land and resource uses, the Panel considered the following factors to be particularly relevant:

- harvesting of trees for the Project would result in a 0.6% reduction of the designated "no-harvest" zone and a 1.5% reduction of the "extended-harvest" zone in the Project footprint;
- lands used by the Project would not be available for forest regeneration during operations;

- the Project would affect the reforestation of tracts of recently harvested forest and those planned to be harvested;
- the transmission line would remove approximately 34 ha of the Esketemc Community Forest;
- ranchers who used forage areas within the proposed mine site for their livestock and horses would have to find other forage areas; however, it was noted that all local meadows are being used for grazing at a sustainable level at present;
- mitigation along the transmission line would involve seeding along the right-of-way;
- there would be a loss of some natural barriers to cattle along the transmission line;
- the mine site and its buffer zone would reduce the area available for hunting;
- the Tsilhqo'tin stated that the minesite would affect a wildlife migration corridor for mule deer;
- there would likely be an increase in hunters due to the influx of people working at the mine and increased access into the region as a result of the transmission line right-of-way; however, no hunting would be allowed by any workers at the mine site;
- ten (10) guide outfitters would lose access to part of their registered territories as a result of the mine site, buffer zone and mine site access road and the transmission line would also cut through 5 guiding territories;
- the Project would overlap the area of 8 existing registered trapping licenses;
- little commercial trapping was reported to have taken place in recent years due to low fur prices but fur was still obtained for traditional uses;
- Taseko indicated that it would explore settlement and compensation agreements such as relocation or other management strategies that would maintain trapping potential without incurring costs;
- thirteen (13) commercial recreation tenures overlap the Project area;
- the campground at Teztan Biny (Fish Lake) would be lost, but a new campground would be built at Prosperity Lake;
- components of the mine site would be located within 3 km of Taseko Lake Lodge; and
- future aboriginal tourism opportunities were being considered in the Project area.

The Panel notes that on the matter of the Project's effects on the forest industry, a relatively small area would not be available for forestry in the future. Further, some of this area would be in the "no-harvest" zone and would normally not be available for harvesting by the forest industry.

**The Panel concludes that the Project would not result in a significant adverse effect on the forest industry.**

The transmission line would run through the Esketemc Community Forest, an area that was reported to be important to the Esketemc for its sustainable forestry potential and wildlife and plant habitat. Restrictions were reported to be in place regarding harvesting in the forest, since over half of it has been designated as mule deer winter range and an old growth management area by the Province. The transmission line corridor would become one of the largest clear cuts within the Community Forest. The Panel recognizes that the mountain pine beetle infestation would affect the forest; however, in the Panel's view, efforts should be made to avoid this area given its importance to the Esketemc.



**RECOMMENDATION 12**

If the Project proceeds, the Panel recommends that Taseko consider relocating the transmission line outside the Esketemc Community Forest, or consider options mutually agreeable to all parties involved to minimize or compensate for the effects on the Community Forest.

While Taseko concluded that the mine site would have little effect on forage availability, the Panel was informed that forage in sedge and upland meadows, which would be lost within the mine site footprint, was heavily used by owners of livestock and horses (including the Lulua and Solomon families and Taseko Lake Outfitters) under either formal grazing leases or as traditionally used areas. The Panel heard that Taseko Lake Outfitters' horses feed in this area preferentially 7 or 8 months of the year. The effects of the Project on Taseko Lake Lodge are addressed below. While there are other grazing areas that are used seasonally, the Panel understands that all the local meadows are already being used at a sustainable level. No mitigation was proposed by Taseko to offset these losses. The Panel is of the view that the effect on these local users would be of high magnitude and irreversible and it would be unlikely that their grazing areas could be replaced given the extensive use elsewhere.

**The Panel concludes that the proposed mine site would result in a locally significant adverse effect on the users of the meadows within the Teztan Yeqox (Fish Creek) watershed due to the loss of grazing lands.**

For the transmission line corridor, Taseko considered the effects on range use as a result of the Project to be both positive and negative. Taseko stated that its proposed mitigation to seed disturbed areas with domestic grass species after removal of trees from the transmission line right-of-way would be beneficial. Negative effects would include the loss of natural barriers as a result of clearing along the right-of-way, as well as potential mortality of livestock due to collisions with increased traffic on the 4500 and access roads.

The Panel understands that Taseko intends to enter into discussions with ranchers and grazing lease holders only if it receives permission to proceed with the Project. The Panel views that effects on ranching and grazing can be minimized along the transmission line.

**The Panel concludes that the Project would not result in a significant adverse effect on ranching and grazing along the transmission line corridor.**

The Project would affect resident hunters as well as registered guide outfitters due to the loss of the mine site and buffer area for hunting activity, disturbance of animal movements and productivity, and the potential for increased hunting pressure by employees and contractors. The Panel notes that effects of the Project on hunting could extend beyond the mine's operating life if the no-hunting zone were to remain in force around the mine site and the associated buffer zone into the closure period. Increased resident hunting pressure may be perceived as competition for game by licensed guide outfitters who cater to non-resident hunters. While the mine footprint would only remove a relatively small area from hunting

use, the presence of the mine and the transmission line right-of-way would affect the wilderness character of the area, which was part of the attraction for non-resident hunters. Therefore, the Panel finds that the Project would have a moderate long-term adverse effect on hunting by both resident and non-resident hunters.

**The Panel concludes that the Project would not result in a significant adverse effect on hunting in the region.**

All of the Project footprint, including the mine site, transmission line right-of-way and new access road overlap existing trapline areas. The trapline area at the mine site would be lost as the mine was developed, and trapline areas within the mine buffer would also be negatively affected. Taseko's assessment focused on the trappers' ability to continue to engage in trapping as a commercial activity and a lifestyle. Taseko concluded that trap lines in and near the transmission line corridor would not be affected and could in fact experience an increase in harvest potential due to improved fur-bearer habitat.

First Nation participants explained to the Panel that while First Nations' members might hold the registered trapping licenses, the license was actually held in trust for and could be used by other members of the First Nation. It was acknowledged that little commercial trapping activity had been taking place in recent years because of low fur prices but that fur was still being taken for traditional uses.

**The Panel concludes that the Project would not result in a significant adverse effect on trapping in the region, but would result in a significant adverse effect on the Xeni Gwet'in (Nemiah Band)/Sonny Lulua trapline that would be most affected by the mine site footprint.**

The Project would have an effect on public recreation in the area due to the direct loss of land, Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and Teztan Yeqox (Fish Creek), including the campsite at Teztan Biny. The mine and associated infrastructure could affect the quality of the recreational experience in the surrounding area for some users by affecting visual quality, noise levels and loss of a sense of remoteness.

With respect to tourism in the Cariboo-Chilcotin region, the Project area was not reported to be an area of high tourist demand. However, the Panel heard that the transmission line could reduce the wilderness experience of rafters on the Fraser River. The loss of the campground at Teztan Biny (Fish Lake) would also likely have a negative effect on tourism in the region. First Nation tourism initiatives planned in the Teztan Biny watershed, such as the tourism ventures being planned for the Y'anah Biny area, would not be able to proceed. However, in the region as a whole, it is the Panel's view that tourism would not be adversely affected.

The Panel is of the opinion that Taseko Lake Outfitters would likely be forced to close if the Project proceeds because of its proximity to the mine. The Panel heard that Taseko Lake Outfitters relied on the exclusive wilderness setting in which the Taseko Lake Lodge was

situated for their business. The presence of the proposed mine site would devalue this setting and adversely affect their tourism operations. Further, the Panel heard that Taseko Lake Outfitters utilized the meadows in the Nabas region to graze their horses. The Panel also notes that Taseko did not assess the effects of noise pollution or air quality at Taseko Lake Lodge, despite it being the closest receptor to the mine site. Further, the Panel notes that Taseko had not yet engaged in any discussion with tourism operators with respect to mitigation or compensation. Therefore, the Panel finds that the effects of the Project on Taseko Lake Outfitters would be high in magnitude and long-term. While the effects would likely be reversible in the post-closure period, it is unlikely that Taseko Lake Outfitters would be able to stay in business for the 44 years it would take for the landscape to return to a semi-natural state.

**The Panel concludes that the Project would not result in a significant adverse effect on tourism and recreation in the region, but would result in a significant adverse effect on Taseko Lake Outfitters tourism business.**

**RECOMMENDATION 13**

If the Project proceeds, the Panel recommends that Taseko meet with the affected tourism business owners to discuss compensation for lost business as a form of mitigation.

**RECOMMENDATION 14**

If the Project proceeds, the Panel recommends that Taseko monitor ground level concentrations of particulate matter at the Taseko Lake Lodge.

**7.2: NAVIGATION**

**7.2.1: PROPONENT'S ASSESSEMENT**

Taseko listed the specific water bodies that would be directly affected by the Project as Teztan Biny (Fish Lake), and Y'anah Biny (Little Fish Lake), while the waterways that would be directly affected were Teztan Yeqox (Fish Creek), the Fraser River, Dediny Qox (Big Creek), and roughly 125 smaller stream crossings.

The construction of the mine and its operation would mean that Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and Teztan Yeqox (Fish Creek) would no longer be available for navigation. Taseko reported that the area was used primarily for angling and fishing. Baseline information related to the use of Teztan Biny for fishing is presented in Section 6.4.

Taseko reported that in 2006 and 2007, aerial boat counts were conducted on Teztan Biny (Fish Lake) and 21 and 9 boats observed, respectively. Overall, fishing effort on the surveyed lakes declined by 36% between 2006 (479 boats observed) and 2007 (308 boats observed). During both years, Jidizay Biny (Big Onion Lake) was identified as one of the lakes that supported the most boats.

The Fraser River, Dediny Qox (Big Creek), and the approximately 125 smaller stream crossings would be within the transmission line right-of-way. Taseko anticipated that the transmission line would not directly affect navigable waters as the line would span all

crossing sites of Dediny Qox (Big Creek) and the unnamed stream crossings. For the Fraser River crossing, Taseko observed that during the final design phase, the crossing would need to be reviewed by Transport Canada to determine if lighting or marking of transmission line structures would be required to meet safety standards.

Taseko noted that the Prosperity Lake would provide 122 ha for navigation and would support a fishery as soon as the lake was established.

Taseko did not reach a specific conclusion on the significance of the loss of navigation due to the mine site itself.

In response to Transport Canada's position that the effects of the Project on navigation would be significant and adverse, it was Taseko's view that Transport Canada came to that conclusion without considering the proposed mitigation measure of Prosperity Lake. In addition, Taseko suggested that Transport Canada's position was based on the acceptability of Taseko's proposed mitigation measures rather than specifically on the interference to navigation.

### **7.2.2: VIEWS OF PARTICIPANTS**

Under the *Navigable Waters Protection Act*, Transport Canada required specific information of the potential effects of the Project on navigable waters. This information included the attributes of waterways and water bodies that would be directly affected by the Project, the direct and indirect effects of Project components on waterways and water bodies, and the current and/or historic use of directly affected waterways and water bodies.

Transport Canada indicated that the Project, in addition to extinguishing boating activity, would eliminate all fishing and recreation activities at the mine site. These activities were so closely tied to the enjoyment of navigation at Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and Teztan Yeqox (Fish Creek) that any mitigation measures for navigation would need to take these factors into account. Transport Canada noted that the number of recreational users at Teztan Biny ranged from 188 to 247 in 1995 and 1996, and of these users, roughly 80% were boaters. It also stated that it was unusual to find a project where boating was so strongly linked to fishing and recreation.

Transport Canada indicated that it was highly unusual for it to consider the creation of a new lake as a form of mitigation for the loss of navigation. The department indicated that it had limited discussion with Taseko on matters of mitigation for impacts on navigation. At a minimum, Transport Canada would expect Taseko to:

- create Prosperity Lake in a way that would mitigate for the loss of navigation and associated activities in Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and portions of Teztan Yeqox (Fish Creek); and
- develop additional or enhanced access to other navigable lakes in the area to mitigate this loss in the interim until access to Prosperity Lake would be possible and it would be functioning as predicted.

Transport Canada stated that, in addition to accommodating a successful fish and fish habitat compensation plan, Prosperity Lake should include fishing success rates comparable to those experienced at Teztan Biny (Fish Lake), recreational facilities to allow for overnight stays, accessibility by way of an ungated road and a boat launch site, and a pristine remote setting that was screened from the active mine site.

Transport Canada identified a number of risks to the success of measures proposed by Taseko to mitigate the effects to navigation. It echoed the concerns of Fisheries and Oceans Canada on the technical feasibility of achieving a viable trout fishery in Prosperity Lake. Transport Canada noted that a viable trout fishery was a central strategy to minimize the effects on the character of navigation currently found in Teztan Biny (Fish Lake) as it related to fishing activities. In addition, it raised concerns that the plan to stock the lake with less than 25% of the existing trout population would be too low to offset the loss of fishing opportunities currently available in Teztan Biny. Transport Canada was concerned that this would lead to a less successful fishery and less enjoyable boating/fishing experience, and that potentially, the public and First Nations would avoid Prosperity Lake altogether. Transport Canada was also concerned that, if the Project was approved and built, there would be potential for contamination of the fish in Prosperity Lake.

Transport Canada also expressed concerns that First Nations would no longer be able to access the island in Teztan Biny (Fish Lake) by boat as it would be covered by mine waste rock. Transport Canada noted that this island was a sacred site for First Nations. The department also noted that First Nations would likely avoid fishing in the lake due to the perception that fish in Prosperity Lake would be contaminated.

On the matter of developing or enhancing interim access to other lakes, Transport Canada initially requested that Taseko commit to actively take advantage of other lakes and water bodies to provide navigation opportunities while Prosperity Lake was under construction. However, after hearing the concerns of First Nations regarding the effects of increased access as a result of the Project, Transport Canada indicated that, if the Project were to be approved and built, that it would need to consult with First Nations and Taseko to find an acceptable plan to mitigate for the loss of Teztan Biny (Fish Lake), prior to access being given to Prosperity Lake.

Transport Canada concluded that the Project would cause significant adverse effects on navigation unless Taseko provided technically and economically feasible measures to mitigate these effects. Transport Canada stated in its written submission that at the time of the public hearing Taseko had not offered any proposals to mitigate interferences to navigation.

The Tsilhqot'in National Government highlighted that both Taseko and Transport Canada had suggested that access to Prosperity Lake and possibly other lakes in the region would mitigate the navigation losses in the Teztan Yeqox (Fish Creek) watershed. The Tsilhqot'in National Government was concerned that new or enhanced access routes within the territory would increase use in the area. The Tsilhqot'in National Government indicated that this would result in further problems due to encroachment and additional harvesting pressures within the areas used by the Tsilhqot'in.

The Tsilhqot'in indicated that, if approved and constructed, they did not expect that they would ever use Prosperity Lake as a replacement for the activities they currently undertook at Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake) including fishing and navigation. The Tsilhqot'in stated that even if navigation were to be re-established by way of Prosperity Lake, it would be meaningless to them. In addition, Catherine Haller indicated how she had built a raft to cross Teztan Biny to visit spiritual sites on the island. Navigation for this purpose would be completely lost as the spiritual and cultural elements of the island were irreplaceable, and could not be compensated by an artificial lake.

Overall, it was the view of the Tsilhqot'in that Taseko had not offered technically feasible mitigation for the issue of navigation, and therefore had not adequately addressed one of the key issues that had triggered the *Canadian Environmental Assessment Act*.

**7.2.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on the effects of the Project on navigation, the Panel considered the following factors to be particularly relevant:

- navigation would no longer be possible in Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and portions of Teztan Yeqox (Fish Creek);
- navigation in the Fraser River, Dediny Qox (Big Creek) and some 125 small stream crossings were not predicted to be impeded by the transmission line;
- Taseko proposed to mitigate the loss of navigation in the Teztan Yeqox (Fish Creek) watershed with navigation in the Prosperity Lake and to enhance access to other navigable lakes in the area as an interim measure until Prosperity Lake was constructed; and
- Transport Canada indicated that the Project would cause significant adverse effects on navigation.

The Panel notes Transport Canada's concerns about how the Project would interfere with navigation and the lack of suitable mitigation to compensate for these losses. The Panel also notes Transport Canada's assertion that Prosperity Lake would not adequately mitigate the losses of the fishing and recreational experience and the use by First Nations of the area. Transport Canada linked these issues to navigation. The Panel notes that the Project's effects on navigation in the absence of effective mitigation measures would be high magnitude and irreversible. Therefore, the Panel agrees with Transport Canada's conclusion that the Project would have a significant adverse effect on navigation.

The Panel notes that should the Project proceed, Transport Canada would require mitigation for the loss of navigation to the extent possible and that this would need to take into consideration matters related to navigation, including the fishing experience and the spiritual and cultural uses of Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and portions of Teztan Yeqox (Fish Creek) that would be lost. The Panel is of the view that while the recreational fishing experience cannot be replaced, it could be mitigated by the provision of increased access to other lakes as an interim measure and the ultimate development of Prosperity Lake. However, the Panel also recognizes that this would create additional pressure on other lakes that are also used by First Nations.

**The Panel concludes that the Project would result in a significant adverse effect on navigation.**

**RECOMMENDATION 15**

If the Project proceeds, the Panel recommends that Transport Canada hold further discussion with Taseko, First Nations and recreational users to determine whether interim access to other lakes would be desirable and if so, appropriate measures be developed to minimize the environmental effects of creating increased access to navigation and related fishing opportunities elsewhere.

**RECOMMENDATION 16**

If the Project proceeds, the Panel recommends that Taseko provide access to Prosperity Lake within the same season that the lake becomes available as a compensation fishery – in approximately Year 7 of the operations phase.

**RECOMMENDATION 17**

If the Project proceeds, the Panel recommends that Taseko establish access to Prosperity Lake to allow for boat launching, camping and fishing to replicate as much as possible the water bodies it would replace.

**7.3: TRAFFIC**

The key issue relating to traffic identified by the Panel was the increased risk of traffic accidents as a result of the Project.

**7.3.1: PROPONENT'S ASSESSMENT**

Taseko reported that the total distance from the proposed mine site to Williams Lake would be approximately 194 km. Vehicles hauling concentrate from the mine site would travel through Williams Lake to the Macalister load-out facility. It was expected that most of the increase in traffic would be on the route from the mine site to Williams Lake. The proposed route from the mine site to the Macalister facility was:

- a new 2.8 km gravel mine access road to connect the mine site to the 4500 logging road;
- a distance of 19.4 km along the gravelled 4500 road to connect to the road known as the Taseko Lake / Whitewater Road;
- a distance of 68.4 km along the gravelled Taseko Lake / Whitewater road to connect with provincial Highway 20 at Lees Corner;
- a distance of 90 km along paved Highway 20 from Lees Corners to the junction of Highway 97 in Williams Lake; and
- a distance of 54 km along paved Highway 97 to the Macalister load-out facility, to the north of Williams Lake.

Taseko estimated the Project would add an annual average of approximately 250 vehicles per day during construction and about 100 vehicles per day during operations (round trip) to local area highways. This would increase annual average daily traffic on rural sections of Highway 20 by approximately 15% during construction and 6% during operations. The percent increase in annual average daily traffic on the urban sections of both Highway 20 and Highway 97 was predicted to be considerably less. Taseko asserted that current traffic volumes on Highways 20 and 97 were well below their respective capacity and incremental increases and would not have an effect on the present level of service.

Regarding traffic levels on rural roads, Taseko reported that the Taseko Lake / Whitewater road passed through the community of Yunesit'in (Stone Band). Taseko proposed to upgrade an existing by-pass around the community so as to avoid traffic effects through the community. Taseko predicted traffic on the Taseko Lake / Whitewater road would double to approximately 150 vehicles per day. Taseko stated that the increase in traffic may require the need for maintenance and rehabilitation expenditures by the provincial Ministry of Transportation and Highways.

In response to concerns raised during the community hearing sessions, Taseko noted that all bridges along the proposed haul route were under the jurisdiction of the provincial Ministry of Transportation and Highways. Taseko noted it had contacted the Ministry during the planning of the Project and confirmed that all the existing bridges along the route conformed to necessary safety standards.

Taseko reported that the area along the Taseko Lake / Whitewater road included open range. Taseko indicated that the increase in daily vehicle traffic could result in increased mortality of cattle from collision and disturbance to cattle and wildlife from noise and associated disturbances.

Taseko expected that the Project's traffic volume could be accommodated within the existing capacity and performance levels on the roadways. However, to mitigate the effects that might arise, Taseko proposed a traffic management strategy which would:

- bus employees to/from a central point (e.g., Williams Lake);
- minimize on-site parking;
- schedule Project traffic movements to avoid peak traffic periods, when possible;
- work with Ministry of Transportation and Highways to ensure that the Province posts proper signage advising the travelling public of industrial traffic;
- control trucks and busses by radio;
- monitor the condition of the road, and the performance of the highways with the Ministry of Transportation and implement corrective strategies if deteriorating performance was detected;
- ensure its drivers adhered to the posted speed limits;
- provide regular road report to drivers regarding general road use, peak traffic times, congestion, road conditions and road hazards; and
- expect drivers to maintain a safe driving record, and utilize professional drivers to transport the concentrate.

Taseko predicted these measures would reduce the effects of Project traffic volume, and where possible, divert it to off-peak periods of the day. In addition, the Taseko Lake / Whitewater road by-pass around the Yunesit'in (Stone Band) community was expected to minimize the effect of increased traffic on the community.

Taseko also noted that an increase in traffic would likely increase the frequency of accidents along the Taseko Lake / Whitewater road, although it did not report any baseline rates or projected increases.

### **7.3.2: VIEWS OF PARTICIPANTS**

During the public hearing, many of the participants expressed concerns regarding additional traffic on the roadways. Some of these concerns related to the potential effects to wildlife - particularly avoidance of the areas, effects of dust, and collisions. These issues are discussed in Section 6.7.

Shannon Stump-William of the Tsilhqot'in Nation noted that the 1989 Nemiah Declaration indicated there would be no commercial road building in the Caretaker area, and expressed the opinion that the roads as they existed were satisfactory and that expansion would result in more traffic in Xení Gwet'in (Nemíah Band), and have an additional effect on the pristine, cultural areas.



Numerous participants raised safety concerns related to the increased traffic, particularly with respect to the Taseko Lake / Whitewater road. Chief Marilyn Baptiste and Linda Smith were of the opinion that the single lane bridge over the Tsilhqox (Chilcotin River), just after the Highway 20 turn off from Lees Corner, would be inadequate to accommodate the B-Train concentrate trucks coming from the mine site to the load-out facility in Macalister.

Linda Smith identified that the proposed bypass around Yunesit'in (Stone Band) and the Taseko Lake / Whitewater road were not fenced and that cattle and horses ranged freely across the roads. She expressed concern that the additional trucks on the road would pose problems for these animals and other people travelling on the road.

George Colgate noted that the Taseko Lake / Whitewater road began to be used for industrial logging in the 1980's. Mr. Colgate indicated that, as a result of safety concerns, two re-alignments of the road had occurred to accommodate industrial and local traffic, although he noted that the surfaces in some places remained soft. Mr. Colgate recounted that several logging trucks had overturned as a result of soft road shoulders and was concerned that this might occur with the concentrate trucks that Taseko would use.

Susan Carleson, a resident along the proposed bypass road, raised concerns that increased traffic would make it more dangerous for cars to pull out of driveways onto the haul roads used by the concentrate trucks, and in addition that it would pose a safety risk to her grandchildren playing near the road area. She also noted that if the road were to be widened some of the pasture land would also be lost.

### 7.3.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS

In reaching its conclusions on the effects of the Project on traffic, the Panel considered the following factors to be particularly relevant:

- Taseko estimated the Project would add an annual average of approximately 250 vehicles/day during construction and about 100 vehicles/day during operations (round trip) to local area roads;
- Taseko stated that traffic on the Taseko Lake / Whitewater Road would double to approximately 150 vehicles/day and that the increase in traffic may require the need for maintenance and rehabilitation expenditures by the provincial Ministry of Transportation and Highways; and
- concerns were expressed by local people that increased traffic would result in increased vehicular accidents and vehicle-truck collisions.

Traffic on the road south of Lees Corner to the 4500 road would increase but was not predicted to reach the road capacity. The 4500 road would require upgrading by Taseko and the Taseko Lake / Whitewater road would likely require additional maintenance costs by the Ministry of Transportation. While traffic was expected to decrease from logging activities, mine-related traffic would increase volumes above existing levels. Mitigation measures would involve strict enforcement of speed limits and radio monitoring for the concentrate truck traffic.

**The Panel concludes that increased traffic from the Project would not result in a significant adverse effect.**

## 7.4: HEALTH

This section focuses on human health and on those issues specifically related to chemical releases to the environment affecting both fish tissue and moose meat as part of the food chain and drinking water, and on health and social services. The effects of the Project on health issues relating to air quality and noise are discussed in Sections 6.8 and 6.9. The effects of the Project on the health issues for First Nations, specifically related to traditional foods and mental health, are discussed in Section 8.5.

### 7.4.1: PHYSICAL HEALTH

#### 7.4.1.1: Proponent's Assessment

In its EIS, Taseko focused its assessment on Project components which would have the potential to release contaminants into the environment (i.e. air, drinking water and foods). Taseko examined the human health effects related to ingesting wild game which could contain contaminants from the Project.

Taseko reported that baseline concentrations of arsenic and methyl mercury were above standards for fish muscle (rainbow trout, bull trout and mountain whitefish) in the Dasiqox (Taseko River). For arsenic, Taseko noted this would result in a hazard quotient of 0.78 (95<sup>th</sup> percentile) for toddlers<sup>10</sup> which exceeded the hazard quotient of 0.2 recommended by the Health Canada. For methyl mercury, Taseko noted this would result in a hazard quotient of 0.93 for toddlers, which also exceeded the hazard quotient of 0.2 recommended by Health Canada.

With respect to moose meat, Taseko noted that it did not conduct destructive sampling to undertake sampling and testing of metal levels in moose meat; rather, the baseline levels of contaminants in moose. Taseko reported that modeled baseline concentrations of chromium were above standards for moose in the local study area, resulting in a hazard quotient of 0.62 for toddlers (95<sup>th</sup> percentile).

As a result of the Project, Taseko predicted arsenic levels in fish tissue would exceed guidelines, resulting in a hazard quotient of 1.14 for toddlers. There were also predicted exceedances of chromium in moose meat (resulting in a hazard quotient of 0.41 for toddlers (95<sup>th</sup> percentile)). However, due to small changes from baseline and conservative assumptions in the risk assessment, Taseko concluded that there would be no significant risk to human health from the consumption of wild game.

Taseko noted that it based its traditional foods consumption rates on data from outside the Project area. In response to questioning from the Panel, Taseko committed to undertaking a consumption survey to verify if the assumptions and estimates used to determine health risk for First Nations were correct.

With respect to drinking water quality, Taseko predicted antimony concentrations in lower Teztan Yeqox (Fish Creek) of 0.027 mg/L during the post-closure phase, which would exceed the guideline level of 0.006 mg/L. Antimony concentrations in the Dasiqox (Taseko

<sup>10</sup> A hazard quotient is a measure of the chronic daily intake of contaminants divided by the tolerable daily intake of contaminants; in other words, it is a measure of the amount of contaminants a person is exposed to divided by the guideline, which gives the risk to the person. The risk to toddlers is reported here since they were the most sensitive sub-population in the risk assessment.

River) were predicted to be lower than the guideline. Therefore, Taseko concluded that the effect on drinking water would not be significant. Taseko also indicated that there were no intakes for drinking water in proximity to the proposed mine site. It modelled water quality from all activities associated with the mine at downstream points. The predicted water quality downstream of the mine site was below applicable guidelines, and therefore Taseko concluded the Project would not result in significant adverse effects to drinking water quality.

#### **7.4.1.2: Views of Participants**

In Health Canada's presentation to the Panel, it commented on four aspects of physical health: traditional foods, air quality, noise, and water quality. Health Canada's comments on air quality and noise can be found in Sections 6.8 and 6.9.

Health Canada stated that information was lacking with respect to traditional foods. Specifically, Health Canada indicated that there was not enough information on the actual types and amounts of traditional foods eaten by the Xeni Gwet'in (Nemiah Band), and the data used in the EIS may not have been an accurate reflection of the high levels of consumption of traditional foods by the local First Nations. Health Canada recommended that Taseko carry out a consumption survey to verify if the assumptions and estimates used to determine health risk were correct. If it was found that the assumptions in the EIS were not correct, Health Canada recommended that Taseko collect data on the levels of contaminants in those traditional foods found to be appropriate for the Xeni Gwet'in and analyze the human health risks based on the appropriate traditional food species, and correct consumption rates. Health Canada also advised that the levels of arsenic and mercury in fish tissue be monitored for an initial period of time during Project operation as a precautionary measure and to verify model predictions.

Concerns expressed by First Nations related to seepage of contaminants from the tailings storage facility and the potential contamination of salmon in the Dasiqox (Taseko River). First Nations highlighted the importance of salmon both as a staple food and a cultural value. At the topic-specific hearing sessions, Dr. Jeff Morris, on behalf of the Tsilhqot'in National Government, presented that contaminants such as cadmium would be higher in water and fish downstream of the Project than predicted by Taseko. In questioning of Dr. Morris, it was made clear that cadmium could also present a risk to human health. Further information on the effects of the Project on fish health is presented in Section 6.2.

During the public hearing, the Panel heard that residents hunt in the Project area. For instance, the Panel heard that Taseko Lake Outfitters was licensed to guide big game hunting. First Nation participants also informed the Panel that the area was often inundated with resident hunters.

With respect to drinking water, Health Canada indicated during the public hearing that it was satisfied with Taseko's conclusion that there would be no significant adverse effects to health related to drinking water, as Taseko reported that there were no sources for treated drinking water nearby that would be affected by the Project. Questions were raised about drinking raw water, and Health Canada recommended that people not drink raw water, as this carried a risk (e.g. from microbiological factors) even when there was no industrial activity in the area.

The Reuters of Taseko Lake Outfitters informed the Panel that their family used raw water from Bisqox (Beece Creek), downstream of the mine site, as their drinking water source, and they raised concerns about effects to drinking water for their family and visitors.

#### **7.4.2: HEALTH AND SOCIAL SERVICES**

Health and social services were described by Taseko in its EIS and mentioned by a few participants in the public hearing, but were not described in detail. Health practitioners who presented at the community hearing sessions focused on a holistic view of health and the potential effects of the Project on the health of community members, rather than on the specific health services.

##### **7.4.2.1: Proponent's Assessment**

Taseko reported that most of the communities in the local study area had small populations and basic community services. Community health services for all residents in the Cariboo-Chilcotin region, including First Nations', were reported to be the responsibility of the Interior Health Authority. In addition, Taseko indicated that the federal government provided funding to First Nation communities for a range of locally-delivered health programs.

Taseko stated that the Cariboo-Chilcotin region ranked poorly against the other local health areas of British Columbia with respect to health, social and economic conditions. Taseko noted that First Nations did not have the same level of health as the surrounding non-First Nation population in the region. For instance, First Nations were reported to experience a shorter life expectancy, higher infant mortality rates, lower birth weights and higher overall mortality rates than other populations in the Cariboo-Chilcotin region.

In the Cariboo-Chilcotin region, Taseko indicated that education and children at risk were areas of notable concern. Taseko noted in its EIS that the region experienced high levels of unemployment (12.2% compared to 8.5% in British Columbia in 2001), above-average crime rates (while provincial rates decline) and poor educational attainment. Overall enrolment in school in Williams Lake and surrounding area was stated to have declined by 10% between 2002/03 and 2006/07.

Taseko predicted that the Project would result in an increase in the demand for health and social services in proportion to expected population growth in the region. It was expected that population levels would increase by 5-6% above baseline conditions during peak operations, resulting in a 3.5% increase in demand for community services. Taseko noted that effects would be most evident in the outlying rural areas (e.g. ambulance response times to emergency situations).

Taseko predicted that upon commencement of Project construction, the Interior Health Authority would be in the position to resize services to meet the increased demand and maintain health service levels in concordance with provincial standards. Taseko asserted that while the Project would create a surge in demand for health care services, the increased demand would effectively be offset by the potential decline in population from the effects of the mountain pine beetle and associated downturn of the forestry industry. Taseko also stated that the Project would require labour inputs that were substantial relative to the local and regional labour force, suggesting that a large portion of the potential labour force would relocate to the area, which would maintain population and community services. Taseko predicted that overall access to primary health care services and residential care would remain unchanged.

In order to minimize the demand on community health services, on-site Project activities would be subject to requirements regarding the protection of human health and safety.

#### **7.4.2.2: Views of Participants**

Presenters for the Tsilhqot'in National Government stated that the population of the Tsilhqot'in Nation was growing rapidly and that their birth rate was higher than non-First Nations communities. Therefore, there would be a growing need for health and social services. This in turn would manifest in a greater need for traditional foods to support a healthy community. It was expressed that the Project would negatively affect these services and needs.

Participants at general hearing sessions reported that people were migrating out of the region due to unemployment, and therefore the population was in decline. While some individuals stated that schools were closing for this reason, this position was countered by a submission that indicated that unemployment was not the cause of school closures. Supporters of the Project, such as the Williams Lake and Area District Chamber of Commerce, provided information regarding the hard economic and social conditions the City of Williams was experiencing, and stated that the social conditions in Williams Lake would improve with new jobs from the mine.

Mayor Kerry Cook raised concerns about social health issues in Williams lake, including crime rates being high, as well as high unemployment and declining school enrollment. She presented that the city needed the Project and the social situation would improve with the Project. Councillor Mingo in 100 Mile House presented similar views regarding social risk factors and the community's need for the Project.

#### **7.4.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In reaching its conclusions on effects to human health, the Panel considered the following factors to be particularly relevant:

- Taseko reported that while concentrations of arsenic and methyl mercury in fish and chromium in moose meat would exceed guidelines, baseline levels of some of these parameters already exceeded guidelines;
- Taseko reported that while antimony would exceed drinking water quality guidelines during post closure, there were no drinking water intakes in the vicinity of the mine;
- Health Canada recommended that people not drink water from any untreated source including the pristine streams in the Project area; however, First Nations and the residents of Taseko Lake Lodge reported that they drink water directly from streams in the area;
- Health Canada concluded that there would be no significant effects on health at the concentration levels predicted by Taseko from contaminants released from the mine; as a precautionary measure, Health Canada recommended that levels of arsenic and mercury in fish tissue be monitored to verify predictions; and
- First Nations noted that due to their high birth rate, there would be a greater need for traditional foods to support a healthy community.

The Panel notes that there are no sources of drinking water in the vicinity of the mine site other than the use of Bisqox (Beece Creek) by the Taseko Lake Lodge. However, water diverted into Bisqox would be upstream of the mine and would not contain any contaminants. The Panel was informed that visitors to the area occasionally drink directly

from streams in the area. As was noted by Health Canada, such a practice was not recommended. The Panel finds that drinking water in the area is not likely to be affected by the Project.

With respect to the consumption of fish and moose, the Panel notes the commitment made by Taseko during the public hearing to undertake a traditional foods consumption survey to address concerns raised by First Nations and Health Canada. The Panel recognizes that such a study would require the trust of First Nations and notes that it should have been conducted earlier in the environmental assessment process. The Panel agrees with the findings of Taseko and Health Canada regarding the effects of the Project on health as a result of the consumption of fish and moose from the Project area. Nevertheless, if the Project proceeds and given the concerns of First Nations, the Panel considers it appropriate that interested parties, including First Nations, have a role in monitoring the effects of the Project on fish tissue. This is discussed further in Section 10.6.

**The Panel concludes that the Project would not result in a significant adverse effect on human health from consuming fish, moose meat and drinking water.**

**RECOMMENDATION 18**

If the Project proceeds, the Panel recommends that Taseko monitor arsenic and mercury in fish tissue as a precautionary matter to verify predictions and the results of the monitoring be provided to appropriate federal and provincial authorities.

With respect to social services, the Panel did not reach any specific conclusions on changes to social services not resulting from a change in the environment. However, the Panel is of the opinion that some changes in the environment would result in a change in social services. For instance, the loss of the Teztan Biny (Fish Lake) and Nabas areas for harvesting would result in the reduction in the availability of traditional foods, which could result in negative effects to human health. This could lead to an increase in demand for community health services if First Nation members supplement their diet with less nutritious alternatives. Similarly, the Panel was informed that First Nations would be unlikely to harvest traditional foods along the proposed transmission line due to the perception of contamination. This could also result in increased demand on community services such as food banks if community members are unable to meet their dietary needs through traditional foods. The effects of these issues on First Nation health are discussed in Section 8.5. Nevertheless, the Panel agrees with Taseko's conclusion that while the demand on health services may increase, any such increase in pressure on health services would be offset by the surplus of service availability that existed due to the population declines that have accompanied the downturn in the forest industry in the region.

**The Panel concludes that the Project would not result in a significant adverse effect on community health services.**

## **7.5: EMPLOYMENT AND ECONOMIC BENEFITS**

Key issues relating to employment and economic benefits identified by the Panel include potential economic benefits to the local and regional economy, and opportunities for education and training. Issues relating to employment and economic benefits for First Nations are addressed in Section 8.4.

### **7.5.1: PROPONENT'S ASSESSMENT**

In order to examine the economic benefits of the Project, Taseko examined the Project effects on the labour market, income, government revenue and economic development at the local and regional scale during construction, operations and closure. Taseko also provided information with respect to education and training.

The economic effects of the Project were predicted to be beneficial, as mine spending would stimulate both employment and business development, which in turn would generate incremental income streams for government. Taseko asserted that residents, businesses and First Nations' members in Williams Lake and the rural areas in the Central Cariboo would benefit from the Project.

Taseko reported that the Cariboo-Chilcotin region was highly reliant on the resource sector for employment and income and was particularly dependent on the forestry sector. The public sector was stated to be the second largest economic contributor to local incomes and the biggest employer and contributor to community income among First Nations. Tourism, agriculture and mining were reported to only contribute a small portion to the total community income.

Due to the mountain pine beetle infestation in British Columbia, future employment declines were expected and could result in a fundamental shift in the region's economic base and social conditions. Unemployment values from the 2006 Census showed that the Cariboo-Chilcotin region had higher unemployment rates (12.2%) than British Columbia (8.5%). Off-reserve First Nation labour force in the local study area had a slightly higher unemployment rate (14.2%) than exhibited by the region as a whole.

Taseko indicated the Project would increase labour demand and reduce unemployment in the region during construction and operation. Taseko predicted that, over the life of the Project, it would generate approximately 378 direct jobs annually during construction (Years -1 through 1), 377 direct jobs annually during operations (Years 1 through 20) and approximately 10 jobs annually during closure (Years 21 through 44) (see Table 4). Of these, local hiring would include approximately 94 jobs during construction, 354 jobs during operations and all of the estimated 10 jobs during closure. In addition, Taseko estimated that locally, an additional 153 jobs would result from construction, 228 from operations and 6 during closure as a result of indirect employment (workers employed at businesses supplying goods or services to Taseko), and induced employment (workers employed by businesses benefiting from the re-spending of direct and indirect income). For British Columbia, Taseko estimated that the mine would generate 321, 614, and 17 indirect and induced jobs during construction, operation and closure respectively.

**Table 4: Average Direct, Indirect and Induced Employment\***

<b>Project Phase</b>	<b>Direct Employment</b>	<b>Indirect Employment</b>	<b>Induced Employment</b>	<b>Total Employment</b>
<b>RSA (Central Cariboo)</b>				
Construction (average year)	94	124	29	248
Operations (average Year 2-20)	354	110	118	582
Closure (Year 21 +)	10	3	3	16
<b>Total British Columbia (includes RSA)</b>				
Construction (average year)	378	238	83	699
Operations (average Year 2-20)	377	324	290	991
Closure (Year 21 +)	10	9	8	26

\*adapted from Volume 6, Table 2-7 of EIS

Taseko stated that the capacity of the local market to satisfy the Project's requirements was dependent on the availability of persons with the required skills and experience. Its expectation was that the provincial and national labour markets would need to be accessed to satisfy Project requirements, with some technical positions requiring workers to be brought in from further afield. Taseko predicted that roughly 1.7% (582 persons) of the total regional experienced labour force was expected to be employed at the mine during an average operating year.

During operation, Taseko predicted that the Project's annual payroll would be \$30 million, with approximately \$29 million paid locally. At mine closure, the direct employment income would decline to \$0.8 million annually. Employment income for the mine workforce during an average operating year would represent 2.7% of total regional income.

Taseko estimated that it would spend into the regional and provincial economy approximately \$200 million annually, for a total of \$5 billion over the 20 year operating life of the mine, with taxes payable to all levels of government. Regional businesses would be expected to supply \$55 million annually in goods and supplies over the 2.5 year construction period and it was estimated that during the construction phase, about \$32.7 million in goods and services would be purchased locally.

Taseko also noted that the Project would generate average annual government revenues of \$30 million over its life.

Taseko also noted during the topic specific hearing sessions that the EIS Guidelines required it to conduct an assessment of the economic impacts of the Project and not a cost benefit analysis which would have shown the net benefits of the Project in British Columbia.

In its EIS, Taseko noted that a properly qualified and trained workforce would be essential to a safe and productive workplace. Taseko recognized that the more training and experience an employee gained, the greater their degree of care, safe conduct and efficiency in their performance. Taseko stated that it intended to maximize local employment opportunities for residents of the Cariboo-Chilcotin.



To underscore Taseko's commitment to maximize local benefits and give first preference to local hires, it stated in its EIS that it would establish and implement policies to help potential candidates gain the required skills and qualifications. Taseko also committed to implementing an education and training initiative called *Mining: Your Future*. Through this program, Taseko stated it would ensure that motivated individuals had the opportunity for further training for career advancement.

Taseko stated that the goal of the *Mining: Your Future* program was to help qualify local people to work at Taseko's operations. The program was stated to have the following goals:

- to assist Taseko in meeting its existing and future employment needs;
- to help address the projected shortage of local skilled workers that Taseko would need in the coming years;
- to create local awareness of opportunities and skill requirements in the mining industry; and
- to demonstrate a corporate commitment to maximizing local employment opportunity.

The specific targets and tasks of the *Mining: Your Future* program outlined by Taseko in the EIS included:

- increasing the hiring of local people in all departments at Taseko's operations without compromising its need to hire the best available talent;
- increasing the number of high school graduates in the region who pursued formal education and training for a career in mining to specifically fill employment needs at Taseko's operations; and
- increasing college-level student interest in mining by raising the focus on mining at the local colleges; this would include educating local college and high school career counsellors on the specific career areas that are challenging for the mining industry to fill, such as instrumentation, heavy duty mechanics, and engineering.

Taseko indicated that not all First Nation individuals who would be willing to work at the Project would have the necessary experience or qualifications. Therefore, while the *Mining: Your Future* program was designed to be an education and training program for all people of the Cariboo-Chilcotin, Taseko stated that special effort would be made to communicate the opportunities through this program to First Nations communities and individuals.

During the public hearing, Taseko clearly indicated that the *Mining: Your Future* program would rely on interested parties identifying themselves to Taseko. During the public hearing, Mr. Battison stated:

*The first thing you need to do is to identify some willing candidates, some people who are interested in a career in mining and want to learn more about the industry and are prepared to step forward. Once you have those individuals who are keen and interested, then what can we do to help them qualify for work, to nurture them, educate them and prepare them for a career in mining?...Now, mindful that we are a mining company, and that's where our expertise lies is in mine-site operations and we have experience in B.C. and Canada. We are not a social service agency. We are a mining company.*

The Panel heard that the program was designed to provide guidance to interested parties who approached Taseko regarding the types of programs and training available through other organizations, to promote mining as a career option and to help answer questions regarding the types of jobs available in mining.

Regarding the types of jobs available at the Project, Taseko stated during the public hearing that the Project would require people with a wide variety of skills, from those with advanced education and training to entry level positions. Taseko noted that many of the entry level jobs associated with the camp could be well suited to individuals who are just starting out and have limited training or education.

#### **7.5.2: VIEWS OF PARTICIPANTS**

The participants were strongly divided regarding the potential employment and economic benefits of the Project. A discussion on this polarization of views is provided in Section 3.2.

The Friends of the Nemaiah Valley retained Dr. Marvin Shaffer to conduct a review of the predicted economic benefits of the Project. Dr. Shaffer concluded that there would be economic benefits from this Project, including incremental income from the employment generated and incremental tax revenues. However, in Dr. Shaffer's opinion, the economic benefits were likely to be relatively small. He estimated the Project would result in approximately \$18 million of benefits annually during operation that would come in part because of the incremental income afforded by the incremental job opportunities and in part by the mineral taxes and incremental income taxes that would not otherwise be paid.

Dr. Shaffer also concluded that there was no evidence of significant positive net benefits for society as a whole and no evidence to suggest that such benefits were of a magnitude that would offset the adverse environmental and social effects of the Project. He stated that the costs of the Project were greater than the benefits estimated from the employment and taxes generated by the Project.

In addition, Dr. Shaffer suggested that the positive effect of employment and associated income was simply an indication that there was a demand for labour, not an indication of whether there was a benefit. In his view, the jobs that would be generated by the Project would not likely employ persons who would otherwise be unemployed. Taseko would likely attract skilled workers who are already employed elsewhere.

Dr. Shaffer also noted that Taseko would not pay the full rate for electricity to power the mine site. He argued that subsidies in the provision of hydroelectric power, estimated at approximately \$35 million per year, would be offset by BC Hydro and ultimately its customers.

Similar arguments on the rate of electricity to power the mine were provided by Ms. Joan Kuyek on behalf of MiningWatch Canada during the public hearing. In addition, Ms. Kuyek questioned the economic viability of the mine and the long-term economic benefits predicted by Taseko. She argued that, in terms of economic viability, the proposed mine was considered a low grade mine, and its viability depended on factors such as currency exchange rates, commodity prices, affordable financing and subject to boom and bust cycles and to smelter penalties due to the presence of antimony, arsenic and mercury in the ore concentrate. She explained that this mine could face shut-down if copper or gold prices were to decline, the exchange rate varied from Taseko's projections, or fuel costs soared.

Ms. Kuyek also identified problems with the feasibility studies provided by Taseko, and pointed out that some of the costs and contingencies were not included in the cost estimates. In terms of economic benefits, she was of the view that benefits would accrue to

Taseko and its major shareholders, in mining taxes to the provincial government and to the local workers who would find employment at the mine. She indicated that it was unlikely that the mine would generate much in federal and provincial income taxes, municipal revenues or new employment.

Mayor Kerry Cook stated that Williams Lake was a community in need that required new opportunities. Mayor Cook presented a variety of statistics outlining the status of the economy in Williams Lake in 2009, as summarized below:

- a third of the workforce lost their jobs which resulted in a loss of \$1 million per week to the local economy;
- the unemployment rate increased from 6.5 to 12%, almost double the provincial average;
- consumer bankruptcies increased by 70%;
- vacancy rates increased by 700%, from 1.7% to 13.6%; and
- there was a 500% to 600% increase in the number of families accessing the local food bank; this need represented a cost of over \$30,000/month.

Mayor Cook also indicated that addictions and violence increased in times of economic strife. She reported that there was an increase of 20% over the last year in spousal assaults in Williams Lake.

According to the British Columbia Chamber of Commerce, the Project would provide significant economic benefit to British Columbia, to the communities and to Canada as a whole, and in particular to the diversification of the Cariboo-Chilcotin region that had been devastated by the mountain pine beetle infestation.

The British Columbia Chamber of Commerce also voiced concerns relative to the uncertainty created by the environmental assessment process to which this and other major projects were subject, and to the risk that the Project could be turned down as a result of the review process. According to the British Columbia Chamber of Commerce, the opening of the Project would provide confidence to the existing provincial business community and improve their ability to attract investment into British Columbia. The Chamber of Commerce stated that that refusal of the Project would have devastating consequences for the region, the sector and would have serious negative effects on British Columbia's already poor reputation as an investment destination.

The Mining Association of British Columbia echoed many of the same concerns raised by the British Columbia Chamber of Commerce. It pointed out that mines were huge economic drivers, and that new mines were essential for replacing rapidly declining mineral reserves in British Columbia and Canada. The Mining Association of British Columbia also reported that the mining industry in Canada was the largest employer of First Nation people in Canada, and that major mines like the Project offered the greatest opportunities available to First Nations for employment training, business procurement and poverty alleviation. Examples provided from diamonds mines in Northwest Territories showed significant increase in First Nation business revenues, increase in secondary school graduation, and a decline in income assistance after 12 years operation.

The Share the Cariboo-Chilcotin Resources Society submitted a report on the feasibility of unemployed forest workers transitioning from the forest industry to the mining industry. Based on the study, the Share the Cariboo-Chilcotin Resources Society estimated that up to

250 workers could be employed directly at the mine and another 400 to 500 could be employed in various indirect jobs that would be created as a result of this Project.

With respect to Taseko's *Mining: Your Future* program, the Panel heard from various participants during the public hearing that they disagreed with Taseko's approach of putting the onus on First Nations to initiate discussions. In reference to the role of Mr. Jerry Price, Coordinator of the *Mining: Your Future* program, Ms. Audrey King stated:

*I'm wondering why anyone has to approach him. Why isn't he, as the coordinator, approaching the people? And showing us what there is in line of schooling and training?... I think the steps in this opportunity need to be very clearly laid out in the event that the mine does go ahead.*

The Panel also heard from participants that they doubted Taseko's claims that First Nation people would be provided with jobs at the Project due to a lack of education and training. Education and training were seen as key factors in assisting individuals who wanted to work. The 2007 Tsilhqot'in National Strategy prepared to address the impact of mountain pine beetle reported that there was a severe lack of capacity building initiatives in the Tsilhqot'in communities and that there was a need for basic adult upgrading as well as for training and skill development in a number of economic sectors. Moreover, Ms. Titi Kunkle submitted that without training or mining experience, local First Nation people living on reserves would be unlikely to get jobs at the mine site. She indicated that less than 10% of the people with apprenticeship or trades certificate in the Cariboo region were First Nation people. She also pointed out that fundamental skills and upgrading courses would be required before the delivery of mining and trades-related training as suggested by Taseko.

Participants also noted that First Nation people would want more than just basic jobs in food services and housekeeping. Education and training were seen as key factors in assisting individuals who wanted to work. Patt Larcombe indicated that although First Nation participation in mining had been increasing in recent years, the numbers remained low and the majority continued to be employed in low-paying jobs.

### **7.5.3: PANEL'S OBSERVATIONS**

The Panel notes that its mandate was limited to assessing the effects of the Project on socio-economic conditions that resulted from a change in the environment. Further, the directions provided by the EIS Guidelines clearly indicated that the Panel would be unable to assess the full spectrum of socio-economic issues. As such, the Panel did not reach any specific conclusions on changes in socio-economic conditions (such as employment, income, government finances and economic and regional development) or on education and training that would not result from a change in the environment.

However, since the Panel has reached conclusions that the Project would result in significant adverse effects, it was clearly mandated to ensure that information with respect to the justifiability of any significant adverse environmental effects was obtained. Therefore, the Panel has summarized the information provided on employment and economic benefits and education and training in order to fulfill its mandate to provide information to decision makers on the matter of justifiability. This information is further considered in Section 12.

The number of jobs expected to be created by the Project and the annual payroll was not contested during the course of the review. The Panel heard that there was a high expectation of increased employment in Williams Lake and the surrounding area as a result

of the Project, which would replace past and expected future losses in employment in the forestry sector. However, Taseko noted that most of the skilled workers would be hired from outside the Williams Lake area since the unemployed pool of workers would likely not have the skill requirements. This in turn would result in an influx of workers to the Williams Lake area. Nevertheless, Taseko indicated there would be spin-off benefits to local suppliers, contractors, and service providers, all of which would benefit from the Project and the influx of workers. Taseko stated it expected that some of the currently unemployed residents would have opportunities at the Project or possibly in local businesses that would capitalize on spin-off benefits. Many people in Williams Lake were of the view that the mine would create an economic stimulus in an area that was reported to be economically depressed.

The Panel heard arguments about the net economic benefit of the Project to British Columbia and that overall benefits to British Columbia would be considerably less than the projected positive impacts. This was largely based on the alleged subsidy that Taseko would receive from BC Hydro, thereby reducing the net economic benefit to British Columbia as a result of the Project.

The Panel heard that few First Nations people who are currently unemployed would have the skills necessary to work at the mine. Taseko indicated that entry-level jobs such as janitorial work at the work camp on site would be available. However, there were no commitments by Taseko to either hire First Nation people or to train them for specific skilled positions at the mine. The Panel notes that the provincial Environmental Assessment Certificate includes commitments to provide opportunities for training and career advancement for employees and for employment for First Nations (see Appendix 4). However, the Panel heard that Taseko intended to rely on the *Mining: Your Future* program to fulfil these commitments. While potentially beneficial, this program appeared to be more of a career counselling program and did not appear to offer any assurance that local people and in particular, First Nations, would be trained by Taseko for positions at the Project. The Panel notes that the initiative would rest with First Nation's people to identify an interest and then, through the *Mining: Your Future* program, Taseko would assist them in identifying training opportunities that exist in various training institutions in British Columbia. The Panel heard from First Nations that without a very proactive training program for them and a clear commitment to employ First Nations people, there may be little opportunity for employment at the mine for First Nations people.

Additionally, the Panel also notes that, as outlined in Section 6.4, Taseko was directed by the Province to use the Clearwater Hatchery rather than the Hanceville Hatchery for fry production in relation to the fish and fish habitat compensation plan. The Panel notes that the use of this hatchery would eliminate any potential benefits to the local economy, including First Nations. The Panel is of the opinion that the use of the Hanceville Hatchery could have provided opportunities for training and employment for area residents. As noted by the consultants for the Tsilhqot'in National Government, this decision highlights the lack of opportunities presented by the Project for education and training for First Nations.

The Panel heard concerns by First Nations in particular about the negative social impacts that would be created by the influx of workers to the mine site and to Williams Lake. The Panel also heard that Williams Lake has had to cope with such influxes before and would likely be able to adapt again to any such effects. The Panel also noted that the mine workers would be housed in a hotel-like complex at the mine site and would be bussed to and from work on a rotational basis. The mine site would be located some distance from the nearest community of Xenigwet'in (Nemiah Band).

## SECTION 8: FIRST NATION ISSUES

The Panel's Terms of Reference mandated it to conduct an assessment of the environmental effects of the Project, including any effect of any change that the Project may cause in the environment on, among other matters, cultural heritage and the current use of lands and resources for traditional purposes by Aboriginal peoples. This section provides a brief historical context of the First Nations within the Project area, and includes the views of the parties who appeared before the Panel with respect to the current use of land and resources for traditional purposes by First Nation people, physical and cultural heritage, First Nation health as well as First Nation socio-economic issues.

The EIS Guidelines required Taseko to:

*describe land use at the site and within the local and regional study areas. The EIS must identify the lands, waters and resources of specific social, economic, archaeological, cultural or spiritual value to Aboriginal people, including Métis, which assert Aboriginal rights or title or treaty rights, or in relation to which Aboriginal rights or title or treaty rights have been established and that may be affected by the Project. The EIS must include, where available, information concerning traditional activities, including activities for food, social, ceremonial and other cultural purposes, in relation to such lands, waters and resources with a focus on the current use of lands, waters and resources for traditional purposes. Traditional land use may include areas where traditional activities such as camping, travel on traditional routes, gathering of country foods (hunting, fishing, trapping, planting and harvesting) activities were carried out. Spiritual sites must also be considered as a traditional use activity of significance to Aboriginal people.*

Prior to the public hearing, Taseko made several attempts to gather information with respect to the current use of lands for traditional purposes by First Nations. The Panel found that, while some information was available in the EIS and the information review stages of the assessment, the majority of the information related to current use and cultural heritage was received during the public hearing process. This information was extremely valuable for all participants to understand how the Project would impact the current use of the region by First Nations people.

The Panel notes that British Columbia reached conclusions of non-significance with regards to First Nations. British Columbia completed its review process in December 2009 and therefore, did not have the benefit of information collected during the federal Panel review process from January to May 2010. As noted above, the Panel received the majority of information concerning current use of lands and resources for traditional purposes, and concerning cultural heritage, during this period.

### 8.1: OVERVIEW

In order to provide the necessary context to situate readers, the Panel provides the following overview of historical information provided by Taseko, First Nations and other participants during the course of the review. As the information was provided by both Taseko and First Nations, the Panel accepts that there was no dispute regarding this information.

The traditional land use of the Tsilhqot'in and Secwepemc peoples was reported to have continually adapted from pre-contact to modern times with a number of factors influencing their culture and activities. Contact with Euro-Canadians, the smallpox epidemic, the Chilcotin War, the establishment of the reserve system, the adoption of ranching, residential school experiences, and the building of a road into the Xení Gwet'in (Nemíah Band) community, were all stated to have affected the Tsilhqot'in and Secwepemc people.

The first Euro-Canadian contact with the Secwepemc was likely with Alexander Mackenzie, who travelled to the upper reaches of the Fraser River in 1793, and then with Simon Fraser, who travelled along the Fraser River in 1808. Sustained contact began around 1816 through involvement in the fur trade and by 1858 the traditional culture of the Secwepemc was reported to have changed due to the heavy inflow of settlers in the area and the subsequent smallpox epidemic.

In the 1850s and 1860s Sir James Douglas, on behalf of the British Crown, began the process of establishing reserves in British Columbia. His successor, Joseph Trutch, altered the provincial policy when British Columbia joined Confederation in 1871, and in doing so no longer recognized Aboriginal title to the land, providing reserves for the First Nation people.

In 1863, Alfred Waddington began building a road that would have passed through the Nemíah Valley, as a faster route to the Cariboo goldfields. In 1864, as retribution for the mistreatment of Tsilhqot'in women, the Tsilhqot'in attacked the road crew and killed 12 of the 16 men. The Chilcotin War was considered to be the greatest act of violence in First Nations history west of the Rocky Mountains. In the end, the road was not built and the Tsilhqot'in declared victory. However, as a result of the violence, 5 warriors were convicted of murder and hung in Quesnel. During the public hearing, many of the Tsilhqot'in indicated their belief that these warriors were unjustly convicted and executed, maintaining that the attack on Waddington's men was an act of war, and not a criminal act.

In 1863 and 1864 the Tsilhqot'in suffered from smallpox epidemics that decimated the coastal and interior First Nations. An estimated 70% of the Tsilhqot'in Nation died during the epidemic. During the community hearing sessions, many of the First Nation people discussed their suspicions that smallpox was deliberately spread by white settlers as a means of eradicating their ancestors from the area. Many considered the smallpox epidemic to have been a contributor to the Chilcotin War.

The Secwepemc people also suffered from smallpox epidemics, and the Canyon Secwepemc were devastated by it. The Esketemc (Alkali Lake Band) reported that smallpox wiped out entire villages. The Esketemc related stories to the Panel of how entire families died in their pit houses, which would then collapse overtop of them, or be burned. During the public hearing the Panel heard many people speak of how the impact of the smallpox epidemic and the Chilcotin War continued to shape current Tsilhqot'in and Secwepemc culture.

Prior to contact with Euro-Canadian explorers and settlers, First Nations in Canada were self-governing bodies. However, when Canada became a country in 1867, the Government assumed responsibility for "Indians and lands reserved for Indians". In 1876, the *Indian Act* came into effect and imposed regulations on First Nation peoples' lives. The *Indian Act* governed the day-to-day life of First Nation people residing on Indian reserves in Canada. The *Indian Act* defined who could be registered as an "Indian", and defined the bands and reserve system used in Canada. Parliament amended the *Indian Act* in 1985 with Bill C-31,

and changed the meaning of “status” to allow for the reinstatement of Indians who were denied or had lost their status due to previous versions of that Act.

In 1864, the first reserve for the Esketemc (Alkali Lake Band) was established, and later expanded in 1881. In 1887 three Tsilhqot'in reserves were established and are known today as Tl'etinqox (Anaham Band), Tl'esqox (Toosey Band), and Yunesit'in (Stone Band). In 1909, Tsi Del Del (Redstone Band) and Xení Gwet'in (Nemíah Band) reserves were established. The implementation of the reserves led to changes in traditional land use as the Tsilhqot'in and Secwepemc began to shift from solely a traditional economy to a mix of ranching and traditional subsistence.

In the late 1800s, the Indian residential school system was established, and eventually, 16 schools operated in British Columbia. Children were taken from their homes and confined in schools operated by the Government of Canada, the United, Anglican and Roman Catholic Churches. Students were isolated from their families and cultures, and instructed in Christianity, mathematics, and farming and ranching. In the 1960's, as many as 10,000 First Nation children were attending residential schools.

During the public hearing, many individuals from all of the First Nations recounted stories of their experiences in the residential school systems. The Esketemc (Alkali Lake Band) noted that the trauma from residential school had left a deep imprint on most former students, and that it had been described as being similar to Post Traumatic Stress Disorder in terms of the impact on individuals. Many also noted that the residential school experience also had a negative effect on the traditional family structure as children were removed from the community for the school year and taught that their traditional practices were not acceptable, and even considered evil. The Esketemc asserted that retraumatization could occur when similar situations arose, such as interactions with authority figures, or the need to act within a rigid process such as the public hearing. During the hearing session in Esketemc, councillors were on hand in the event that any individuals experienced retraumatization.

In the 1960s, the Chilcotin area became popular with hunters, fishermen, homesteaders and ranchers. Subsistence and economic activities were largely carried out on the public lands where the Tsilhqot'in asserted Aboriginal rights, including the right to occupancy. However, continued development in the 1950s and 1960s led to an increased displacement of Tsilhqot'in from their asserted traditional lands and a decreased availability in the resources that the Tsilhqot'in depended upon.

In 1973, a road was built into the Nemíah Valley, which resulted in changes to traditional land use activities, culture, and the way of life for the Xení Gwet'in (Nemíah Band). Prior to the completion of the road, the community members ran cattle and trapped through the winter, harvested vegetation, hunted, and fished in the summer months in a manner similar to their ancestors. However, the Panel heard that after construction of the road, members of Xení Gwet'in would travel to Williams Lake for supplies an average of once a week, where previously such a trip would take over a week each way, and occur only once a year.

As introduced in Section 2.1, the Xení Gwet'in (Nemíah Band) issued a declaration in 1989 that established the Nemíah Aboriginal Wilderness Preserve in the area of Tachelach'ed (Brittany Triangle), within which the Project would be located. This declaration provided direction on what activities might occur in the area. The declaration noted that this area was the “spiritual and economic homeland” of the Tsilhqot'in.



In 1990 the Tsilhqot'in Nation began a court action that sought declarations of Aboriginal title and Aboriginal rights in the area of Tachelach'ed (Brittany Triangle) and the trapline Territories. In November 2007, the Court released its decision on the case and found that the Tsilhqot'in had Aboriginal rights throughout the Claim Area, but that Aboriginal title had not been awarded. Section 9 provides for further information on Aboriginal rights and title and other matters related to court cases of the Tsilhqot'in.

In the period from 1993 to 1994, the Northern Shuswap Tribal Council and the Esketemc entered treaty negotiations through the British Columbia Treaty process. Both groups were reported to be seeking Aboriginal rights and title in their traditional territories. Further information on the Secwepemc treaty negotiations is provided in Section 9.

More recently, increased levels of industrial activity, such as logging and forestry, non-timber forest products, agriculture and mining have become commonplace in the territories of the Tsilhqot'in and Secwepemc. The increased activity was the result of the areas being designated for multiple uses within the Cariboo-Chilcotin Land Use Plan. This has resulted in additional stresses to their culture and traditional life style. However, throughout these changes, many forms of traditional land use activities within their traditional territories have continued.

## **8.2: CURRENT USE OF LANDS AND RESOURCES BY FIRST NATIONS PEOPLE**

The Panel notes that the current use of lands and resources by First Nations are often linked to potential or established Aboriginal rights, pursuant to section 35 of the *Constitution Act, 1982*. The following section discusses the current use of land and resources by First Nations people and how the Project might affect those uses. Section 9, further examines how those effects of the Project on the current use of lands and resources might, in turn, affect potential or established Aboriginal rights.

This section provides a general overview of the understanding of the various participants on current use, followed by a discussion on fishing, hunting and trapping, and gathering as current uses of the land and resources by the Tsilhqot'in and Secwepemc Nations.

### **8.2.1: CURRENT USE**

#### **8.2.1.1: Proponent's Assessment**

Taseko interpreted the meaning of "current use" of lands and resources to mean how the land and resources were being used at the time of the assessment. For clarification, Taseko noted this would mean the current modern day use of lands in question and not a historical account, or what was considered to be "in living memory" – a definition used by the review panel for the Voisey's Bay environmental assessment. Taseko supported its interpretation of the definition of "current use" in its closing remarks by referring to guidance provided in the Canadian Law Annals:

*This definition is also designed to capture any changes to the environment caused by the project that result in changes to the modern day use that aboriginal people make of the land, flora, fauna and other natural resources for traditional purposes such as fishing, hunting, trapping, gathering and ceremony. This part of the definition has been crafted to focus on any changes in the current use of the land and natural resources resulting from the environmental effects of the project, and not on whether the land and natural*

*resources were in fact historically used for traditional purposes by aboriginal people.*

Taseko noted that it had made a number of efforts to gather information related to the current use of lands and resources by the Tsilhqot'in and Secwepemc. While Taseko had made initial arrangements to carry out a community impact assessment for the Tsilhqot'in, and a Traditional Use Study for the Secwepemc, due to a variety of circumstances these studies were never completed.

As a result, Taseko based its assessment of how the Project would affect current use of the lands by First Nations on information from several primary sources:

- 2007 *William* case documents (Tsilhqot'in Nation);
- the *Heritage Significance of the Fish Lake Study Area: Ethnography* (Xeni Gwet'in [Nemiah] and Yunesit'in [Stone]) and *An Overview of the Heritage Significance of the Proposed Power and Transportation Corridors Servicing the Fish Lake Project* (Stswecem'c [Canoe Creek/Dog Creek], Esketemc [Alkali Lake], and Yunesit'in [Stone]);
- First and Second Interim reports from the Esketemc on Traditional Use; and
- information package submitted by the Tsilhqot'in National Government in November 2009.

Taseko reported that the Tsilhqot'in considered Nabas to be a significant site of continuous Tsilhqot'in occupation from historical times to the present era. Taseko noted that the Supreme Court of British Columbia decision in the *William* case identified that some Tsilhqot'in had lived at the cabins at Nabas until the 1970s, and that Tsilhqot'in people were likely buried there. In the 20th century, Teztan Biny (Fish Lake) and Nabas were reported to have been important fishing and hunting camps for the Tsilhqot'in, and there have been Xeni Gwet'in gatherings there in recent years. Beyond recent use, Taseko noted that ethnographic records demonstrated that historical settlement at Y'anah Biny (Little Fish Lake) dated back to the 1920s, while other records suggested the area had been used since 1860's or earlier. Taseko noted that the William family and others who heavily used the Y'anah Biny area had a strong spiritual attachment to specific locations, such as the area where the cabins provided a home base for their cultural and economic lifestyle.

The road to the Nemiah Valley was constructed in 1973, and Taseko reported that this had affected the culture of the Xeni Gwet'in (Nemiah Band) community and the land use patterns for traditional purposes. Taseko indicated that subsistence livelihoods were no longer a matter of survival. In addition, the road had led to increased access into the area for industry, primarily logging.

Taseko submitted that the frequency of consumption and portion size for the locally consumed traditional foods were largely unknown for the Project area as a dietary survey of local First Nation food use was not completed at the time of the assessment. To determine the baseline daily intake rates for the Taseko baseline country foods assessment, Taseko primarily utilized data from the country foods assessment for the Galore Creek Copper-Gold Mine project. Taseko submitted that this use was appropriate due to the proximity and nature of the Galore Creek project compared to Prosperity.

Taseko was of the opinion that modern day uses of Teztan Biny (Fish Lake) and Nabas, located in the proposed mine site area, were primarily for camping and family fishing trips.

Taseko reported that the area was recently used for an organized event where traditional values were taught, and that the area was also used for organized outings to allow children to experience nature. Furthermore, the area was used by some people to gather plants and to gain spiritual powers, and for hunting. Taseko was of the view that the area appeared to not be currently used for trapping, given that the activity was relatively uneconomic. Taseko suggested that there were many other areas nearby, such as Jidizay Biny (Big Onion Lake), which have similar values for the Tsilhqot'in.

Taseko's overall conclusion provided at the public hearing noted that none of the information presented during the community hearing sessions had changed its original conclusions regarding the significance of the Project's effects on the current use of land for traditional purposes by the First Nations.

#### **8.2.1.2: Views of Participants**

The Panel heard from First Nations people ranging in age from 7 to almost 90 years old regarding their current use of the Teztan Biny (Fish Lake) and Nabas area, particularly the Xení Gwet'in (Nemiah Band). Over the course of the public hearing, the Panel heard a substantial volume of information regarding how much of the Tsilhqot'in population continue to use the Project area for activities such as hunting, fishing, gathering of berries, plants and medicines, as well as for various cultural and spiritual ceremonies and activities. A summary of these experiences is provided in the following sections of the report, and has been considered throughout this report.

The Tsilhqot'in National Government encouraged the Panel to utilize the definition of "current use" that was used in the Voisey's Bay panel review and to include the "living memory" of the Tsilhqot'in people. The Tsilhqot'in noted that current use of areas was connected to past uses of the area and therefore justified the use of this approach. It submitted that Taseko's own Ehrhart-English study emphasized the consistency of Tsilhqot'in land use patterns over time, and therefore Taseko should not be permitted to narrowly define current use as meaning only what specific activities occur presently.

The Esketemc (Alkali Lake Band) submitted that the unique variation in the natural environment found in their traditional territory – which ranged from dry sage brush desert, rare grasslands and Douglas-fir, as well as lodgepole pine forests and alpine areas - was a crucial aspect in shaping the nature, character and essential identity of the Esketemc culture. It suggested that their world view, belief systems, social organization, spirituality, language and culture all flow from the land and that governance structures, customs, and natural laws which form the basis of jurisdiction in their traditional territory were intrinsically tied to their relationship to the land.

### **8.2.2: FISHING**

#### **8.2.2.1: Proponent's Assessment**

Taseko reported that, based on its understanding of current use information, the Tsilhqot'in fished opportunistically for rainbow trout at Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and Wasp Lake, though the bulk of their annual catch likely came from salmon fishing elsewhere in the Daisqox (Taseko River) and Tsilhqox (Chilko River) drainages.

Taseko predicted that the loss of Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake), as well as the associated inlet and outlet spawning habitat and fish populations would

temporarily eliminate this area as a source of fish for harvest. Taseko estimated the loss of these sources for fish to be no more than 7 years until the proposed Prosperity Lake would be fully functional and supporting a viable population of fish. The fish compensation plan, including Prosperity Lake is further described in Section 6.4 of this report.

Taseko found that, historically, the amount of activity in the area was related to who was living in the area, which was largely dependent on the presence of game or fish at that time. The Y'anah Biny (Little Fish Lake) area was reported as being used heavily by individuals at the cabin sites. The other areas in the mine development zone were used for hunting, trapping or fishing, mostly by the Solomon and William families.

Taseko noted that fishing in the Project area occurred year round in various locations. In winter, ice fishing was a core part of the Tsilhqot'in diet and the primary types of fish caught in winter were whitefish, suckers, trout and sturgeon. Taseko noted that Teztan Biny (Fish Lake) was noted as a historic winter fishing site for the Tsilhqot'in since pre-crown sovereignty. For the Tsilhqot'in, less predictable and less prolific salmon runs resulted in greater dependence on other resources including lake fishing, particularly for trout, and hunting and gathering of plants to off-set the loss of salmon in their diet.

Taseko noted that the two interim current use reports provided by Esketemc (Alkali Lake Band) contained little discussion on information related to fish and fishing by the Esketemc. Taseko was of the opinion that there was no specific information on the locations of fishing areas, species harvested, the purpose, frequency or timing of the harvest of the Esketemc.

In response to a request from the Tsilhqot'in National Government, Taseko described an Aboriginal food fishery as meaning the Aboriginal right to fish. In support of this position, Taseko expected that the tests used by the Supreme Court of Canada in its previous decisions would apply in determining whether an Aboriginal food fishery (i.e. right to fish) exists at Teztan Biny (Fish Lake).

Taseko noted that the Supreme Court of Canada considered a multi-tiered analysis for considering the existence of an Aboriginal right, which involved:

- characterizing the claimed Aboriginal right;
- establishing the existence of the ancestral practice, custom, or tradition advanced as supporting that claimed right;
- determining whether the ancestral practices, customs, or traditions were integral to the distinctive culture of the claimant's pre-contact society; and
- determining whether reasonable continuity exists between the pre-contact practice and the contemporary claim.

In a subsequent decision, the Court held that practices undertaken for survival purposes may be integral to the distinctive culture of an Aboriginal people, and that these practices must be allowed to evolve, so that those rights would not be frozen in their pre-contact form.

Taseko noted that these two tests were recently used by the Supreme Court of British Columbia in the decision *Ahousaht Indian Band and Nation v. Canada*, Attorney General 2009, B.C.S.C., 1494.

#### **8.2.2.2: Views of Participants**

Fisheries and Oceans Canada noted the use of Teztan Biny (Fish Lake) by the Tsilhqot'in as a reserve food supply in the event of poor salmon runs. The department noted that the

Tsilhqot'in could net large numbers of fish on an annual basis and that the lake could support food requirements for at least two to three years without impacting the long-term population success in the lake. Fisheries and Oceans Canada stated it was unable to determine if the proposed fish and fish habitat compensation plan would provide a sufficient replacement fishery for First Nations.

Throughout the public hearing, the Panel heard of the importance of fish to the diet and culture of the Tsilhqot'in and Secwepemc. Lake fisheries were identified by participants as being an extremely important food source for the Tsilhqot'in in times when salmon runs were low. Fishing was identified as a year-round activity, and that fish could be canned, smoked, dried, baked or frozen in order to preserve it. Mr. Alex Lulua noted that approximately 80% of the fish he consumed were salmon, while lake fishing accounted for the remaining 20%.

Many of the Tsilhqot'in indicated that they had gone, and continue to go to Teztan Biny (Fish Lake) to fish. The Tsilhqot'in submitted that Teztan Biny as well as Y'anah Biny (Little Fish Lake) and upper and lower reaches of Teztan Yeqox (Fish Creek) were important fishing locations. Fish species harvested in these areas included trout, suckers, Dolly Varden, mountain whitefish, steelhead and salmon. Sean Nixon, legal counsel for the Tsilhqot'in, submitted that members from all Tsilhqot'in communities had identified past and current fishing activities within the Project area. The Tsilhqot'in were of the opinion that the Project would eliminate food harvesting activities in the area due to the complete destruction of Teztan Biny, Y'anah Biny and Teztan Yeqox.

The Panel heard presentations from several Tsilhqot'in who told stories of how their grandparents and parents had travelled to Teztan Biny (Fish Lake) to fish in the past, but also that many people continued to use the area. While fishing for food purposes in the lake was identified as an important activity, it was also strongly connected to other cultural practices that occurred there, such as gatherings of Elders and youth. These cultural activities are presented further in Section 8.3.

Teztan Biny (Fish Lake) was also noted as being an important "fall-back" resource for the Tsilhqot'in, should the salmon runs be low or insufficient. Chief Joe Alphonse indicated that when salmon returns were low, the people would go to the lakes for trout. The Panel heard that the Tsilhqot'in performed their own stocking of fish in lakes prior to non-First Nation people coming to the area, which ensured a resource would be available in times of need.

The Tsilhqot'in stated repeatedly that even if Prosperity Lake was technically successful, it would not mitigate the loss of the Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and Teztan Yeqox (Fish Creek) fisheries. Many members recognized that the fish proposed for Prosperity Lake would be larger but less numerous than those currently in Teztan Biny and that it would take substantially more time and effort to catch the same amount of food.

During the public hearing, the Panel heard many Tsilhqot'in express their opinion that the fish in Prosperity Lake would be contaminated from the nearby mining activities. Participants stated that they would avoid fishing in Prosperity Lake, resulting in a complete loss of the use of the area for fishing. Some individuals noted concerns regarding contamination to Jidizay Biny (Big Onion Lake) as a result of seepage from the tailings storage facility, which would also lead to avoidance of that lake. Harvesting and consumption of salmon from the Dasiqox (Taseko River) would likely also be avoided, given the presence of the mine in the headwaters of that important salmon river.

The Tsilhqot'in noted that they used other lakes in the region for fishing as well, and expressed the concern that if Teztan Biny (Fish Lake) was not available there would be increased competition for resources in those other lakes. The Tsilhqot'in expressed concerns regarding Transport Canada's initial recommendation that Taseko increase access to other fishing lakes as mitigation for navigation impacts and how that would further increase competition for fish and decrease the harvest (see Section 7.2 for information on the effects of the Project on navigation).

In addition to the perceived contamination of the fish, the Tsilhqot'in indicated that they would not likely use Prosperity Lake for a number of reasons. Fishing in an artificial lake that overlooked a tailings storage facility and an open pit mine would be aesthetically unappealing and incompatible with their cultural values. Some individuals expressed that Prosperity Lake would only remind them of what had been lost when Teztan Biny (Fish Lake) was destroyed to enable the mine.

During the community hearing sessions, fishing was also identified as an important cultural activity. Lake fishing was repeatedly identified as a method to teach the youth how to fish and practice traditional net and gaff fishing techniques before children were ready to fish for salmon in the rivers. The Panel heard from educators in many of the communities that Teztan Biny (Fish Lake) was identified as an important teaching environment and that many trips were made to the area to teach the Tsilhqot'in language and cultural practices to Tsilhqot'in youth. Many children identified how their families had taken them to Teztan Biny and Y'anah Biny (Little Fish Lake), and adults and elders indicated that this was what had occurred when they were young as well.

The Tsilhqot'in National Government retained Patt Larcombe of Symbion Consulting, who indicated that Prosperity Lake would have no cultural importance to the Tsilhqot'in as their history and connection to the area would be lost if the mine was built and the landscape changed. She noted that important components of a First Nations food fishery included cultural, spiritual and social values and the ability to teach and transmit culture from one generation to the next. The sense of connection, history and identity to the Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake) fisheries would not be replaced by an artificial lake, or simply by going to other lakes in the territory.

### **8.2.3: HUNTING AND TRAPPING**

#### **8.2.3.1: Proponent's Assessment**

The area of Teztan Biny (Fish Lake), Jidizay Biny (Big Onion Lake) and Y'anah Biny (Little Fish Lake) was identified by Taseko as a winter hunting and trapping ground dating back to pre-European contact times and was used until the mid-20th century. Taseko noted that all species of wildlife used by the Tsilhqot'in were present in this area. Deer from the nearby "snow mountains" migrate into this corridor, and rabbit, lynx, muskrat, beaver, squirrel and other furbearing animals were also present.

Taseko reported that uses of wildlife by the Tsilhqot'in and Secwepemc, other than for sustenance, were numerous and included making of blankets, mattresses, gloves, moccasins, and other items for trade. Wildlife used for these purposes included rabbit, snowshoe hare, groundhog (marmot), bear, lynx, beaver, wolf, deer, mountain goat, mountain sheep, and marten. Taseko noted that only a few Tsilhqot'in had traplines and fur trapping had never been a dominant feature of their economy. A steep decline in the fur

trade occurred in the 1860s once the Canyon Secwepemc, who were important trading partners, were decimated by smallpox.

In addition to the detailed effects assessments for mule deer, porcupine, moose, grizzly bear, black bear, waterfowl (mallard and Barrow's goldeneye), and sharp-tailed grouse, Taseko developed a species assessment matrix that identified and assessed the potential environmental effects of the Project on all 23 wildlife species specifically identified in the *William* case. Taseko noted that, in cooperation with the British Columbia Ministry of Environment, it had prepared a framework to identify and quantify Project effects at a local level on a scale that would enable the identification of appropriate mitigation measures for participating First Nation individuals and/or communities.

#### **8.2.3.2: Views of Participants**

Hunters in the Tsilhqot'in communities indicated that the area surrounding Teztan Biny (Fish Lake) and in Nabas were excellent hunting territories. Species reported to be hunted for sustenance included moose, deer, caribou, elk, squirrel, beaver, duck, geese, swans, grouse, and wild chickens. It was repeatedly expressed that First Nations hunted to provide sustenance to their families as taught to them by their Elders. First Nations people did not hunt for sport. If a hunt was successful it was important to ensure every part of the animal was used and that nothing was wasted. In addition, gifts of tobacco or other medicines would be given as thanks for a successful hunt.

The Secwepemc Nation also reported that there were areas frequented by Secwepemc hunters along the proposed transmission line corridor. Mildred Kalelest noted during the Stswecem'c/Xgat'tem (Canoe Creek Band) community hearing session that wildlife populations were decreasing, including deer, moose and endangered species such as badger and porcupine. The Stswecem'c/Xgat'tem expressed concern that the Project, and in particular the transmission line, would negatively contribute to the population decline in species of importance to the community.

The Panel heard descriptions of the wildlife that were found in the Nabas area, and in particular how the deer migration routes come up from the mouth of Dasiqox Biny (Taseko Lake) and through the Project area. Many of the Tsilhqot'in expressed their opinion that the animals would become scarce as a result of the Project, and those that were not displaced by the mine might become contaminated and therefore unfit for consumption.

The Tsilhqot'in expressed concerns that the transmission line would increase access to non-First Nations hunters, and all-terrain vehicles. Former Chief Roger William noted "if you put that transmission line through, there's going to be a road that's actually going to [connect the territory] – I can come from here, go to the transmission line, and drive all the way to Xenii... that whole country opens up."

Members of the Tsilhqot'in and Secwepemc indicated that they continued to hunt and trap to supply their diet with meat that would otherwise be too expensive to purchase. To preserve the resources in the areas used, harvest areas were used on a rotating basis to allow for recovery.

Shari Hughson highlighted the importance of these traditional foods for the Xenii Gwet'in (Nemiah Band) community and estimated that traditional foods made up 50% of the diet, and up to 75% for elders. At least one community member in Xenii Gwet'in, Mr. Alex Lulua,

noted that he lived completely off the land, only purchasing a minimal number of items from grocery stores.

Hunting and trapping were also noted as having a crucial role in maintaining the culture of the Tsilhqot'in and Secwepemc nations. Hunters were noted to play an important social role in the communities, providing food for elders or others who were unable to hunt for themselves. Christian Stump, a 12 year old Tsilhqot'in hunter noted the importance of this, stating:

*In our culture there's a law that you have to give your first kill to an Elder in the community. I gave (my first moose) to my Elder in Xenj. When you give it to an Elder you get luck and it teaches you respect and you become a provider for your people, just like I did.*

The Panel heard, during the community hearing sessions in the Secwepemc communities, how the community organized youth camping trips to not only teach young people how to hunt, but also to learn about their territory and culture. Young hunters in Esketemc (Alkali Lake Band) identified that they often hunted for elders who were no longer able to hunt for themselves. The second interim report on current use activities submitted by Esketemc noted one hunter obtained moose from the transmission line area and used it to feed an extended family of approximately 20 people.

The Panel also heard that the transfer of intergenerational knowledge occurs through hunting and trapping activities out on the land. Many of the youth who presented to the Panel conveyed stories of how their parents, uncles or other community members had taken them onto the land to learn to hunt. During these times stories would be told and lessons given, thereby transferring knowledge of the cultural practices and language between generations.

The Tsilhqot'in submitted that the loss of Nabas and the loss of their current use activities exercised in the area could not be mitigated. They noted Taseko's position that there would be no or minimal effects on Tsilhqot'in current use activities and indicated that this was not accurate. It was reported that Taseko had not considered the importance of the Nabas area to the Tsilhqot'in, and that going to other areas in the territory to hunt or trap was not sufficient as mitigation.

The Secwepemc communities indicated that they had traplines and family areas where traditional practices and hunting for subsistence purposes were carried out on both sides of the Fraser River and that the transmission line would affect these sites.

During the review of the EIS and public hearing, participants from the Esketemc (Alkali Lake Band) in particular raised concerns regarding the potential effect of the transmission line right-of-way on the wildlife (mainly mule deer and moose) as a result of increased accessibility to hunters. During the public hearing, participants from the Esketemc and Stswecem'c/Xgat'tem (Canoe Creek) shared their experience with the current north-south BC Hydro transmission line that crossed their territory. The Esketemc reported that after the line was put in, there was a complete collapse of animal populations in the areas crossed by the corridor because of increased hunting. The Panel was told that areas once important for hunting no longer had animals, which forced community members to hunt in areas that were further from their traditional hunting areas. On that basis, the Esketemc did not agree with Taseko that the proposed transmission line would not result in significant effects on wildlife.



The Esketemc (Alkali Lake Band) also pointed out that the existing BC Hydro transmission line served as a major access route for all-terrain vehicles and snowmobiles, and therefore, for hunting and poaching. From the point of view of many participants who made presentations at the public hearing, the proposed transmission line right-of-way would allow for more direct east-west access across the area, and allow access into an area that would otherwise not be readily accessible. For most cases, stream crossings along the right-of-way were not considered to pose major access barriers for all-terrain vehicles or snowmobiles.

## **8.2.4: PLANT GATHERING**

### **8.2.4.1: Proponent's Assessment**

In the EIS, Project effects on plants of importance to First Nations were discussed in the context of traditional and current land and resources uses, and in two supporting traditional knowledge studies completed by Ehrhart-English (1993 and 1994). Taseko also undertook additional analysis on 52 plant species of importance to the Tsilhqot'in, as outlined in the *William* case.

Taseko indicated that the Tsilhqot'in traditional land use was historically based on subsistence activities that were determined by the seasons, and that the use of plants for food had traditionally been very important in the Tsilhqot'in diet. In early summer, Taseko reported that plants harvested by the Tsilhqot'in people would include: mountain potato; corm; tubers; tiger lily; wild onion; mountain carrots; and beartooth. In late summer, berry harvesting and plant gathering would include: Saskatoon berries; raspberries; blueberries; huckleberries; chokecherries; and soapberries. Other plants were also harvested during this time included: willow wood; hay; silverweed; wild rice; wild celery; wild rhubarb; and sulh. In fall, remaining berries would be collected along with white bark pine, kinnikinnick, Tiger Lily and silverweed.

Taseko indicated that vegetation was also used for many other purposes. Throughout the year, particularly in winter, fire wood of various tree species would be collected. Lodgepole pine, Douglas-fir, spruce, birch, silverberry, false dogbane bush, juniper and Saskatoon, and their roots would also be used for various construction needs. Pine gum was used to seal containers.

For the 52 plant species of interest identified by the Tsilhqot'in National Government during the EIS review, Taseko undertook an evaluation of the Project's effects on these species by associating them with the vegetation key indicators assessed in detail in the EIS, and by inferring the effects of the Project on each species from the effects assessment of the corresponding key indicators. The vegetation key indicators included several ecosystem types such as wetlands, riparian, old growth forest and grasslands, which could support the plant species of interest. Taseko concluded that the effect of the Project on those plant species would not be significant as no significant residual effects were identified for any of the vegetation key indicators.

For the Secwepemc Nation, Taseko pointed out that over 200 indigenous species of plants were known to the Secwepemc, from which approximately 50 species were used as food. Berries, in particular, were reported as being very important and appreciated by the Secwepemc. Other plants and foliage such as wild onions and potatoes would be collected for food and medicinal purposes. Roots would be gathered in early spring to be eaten raw, dried or cooked. Roots from cedar, spruce, or birch would also be used to make baskets and

roots from cherry, for decoration. Trees such as Douglas fir would be used for making structures.

Taseko explained that a number of plants, such as Labrador tea and juniper, would also be used for traditional medicines as preventative tonics and purgatives. Other examples would include balsam bark, soap berry sticks, and fir pitch. Taseko reported that until changes were made to the *Indian Act* in 1951, community members from Esketemc (Alkali Lake Band) relied solely on traditional medicines except in the case of tuberculosis. Taseko pointed out that traditional medicines remain an important part of the culture of the Secwepemc.

According to Taseko, Project effects on vegetation at the mine site and transmission and access corridors could affect First Nations both through loss of vegetation species of interest or value and through the loss or alteration of vegetation communities that provide habitat for a range of wildlife species of interest. However, Taseko pointed out that a number of plants of interest identified by First Nations in their traditional use studies did not occur in the study area (e.g. mountain potato, pine nuts) and were not expected to be affected by the Project. Some species such as rice, bear tooth, wild rhubarb, mountain carrots were not identifiable without genus/species information or at least additional context/habitat information. Other species such as lodgepole pine were considered very common and therefore unlikely to be of special concern to local First Nations. Taseko also noted that for some species, site-specific information was not provided and that it was difficult to determine whether they were within the Project disturbance areas. Nonetheless, Taseko assumed that this would most likely not change their conclusion on the effects of the Project.

Taseko stated that Project effects on vegetation may affect First Nations both through loss of vegetation species of importance and through the loss or alteration of vegetation that provide habitat for wildlife species of importance to First Nations. Taseko noted that plant gathering was the cultural activity least likely to be affected by the Project, as most species collected also existed outside of the mine buffer area, or there were other equally suitable sites for collection. However, the Ehrhart-English study, commissioned by Taseko, indicated that crowberries and thimbleberries appeared to be the only berries that were picked exclusively in the Project area.

Taseko indicated that strategies to minimize the Project's effect on vegetation would be implemented. Relevant mitigation and environmental management strategies included:

- development of a Vegetation and Wildlife Management Plan to minimize the Project's footprint and disturbance of valued ecosystems adjacent to and accessible from the Project site;
- development of an Air Quality and Noise Management Plan to minimize the dust impacts on traditional foods;
- application of general reclamation practices, including a soil handling plan, to enable the re-establishment of productive opens, meadows and forested areas for traditional species of interest; and
- avoidance of sensitive ecosystems, including disturbance in grasslands, during final alignment of the transmission right-of-way.

With respect to potential effect of dust on medicinal plants, berries and other food sources, Taseko indicated in its EIS that particular attention was paid to this issue, and that the

Project was not anticipated to cause adverse effects to medicinal plants, berries and other food sources resulting from dust generated by the mine and traffic.

As a mitigation measure, Taseko committed to include berry species identified in the Traditional Use studies submitted by the Tsilhqot'in National Government and the Esketemc (Alkali Lake Band) as part of the ongoing monitoring program defined within its reclamation plan.

Overall, based on the analysis in the EIS and the supplementary material, Taseko concluded that no residual significant effects were predicted on vegetation and plants of importance to First Nations. Taseko also confirmed that their determination of no significant effects did not change as a result of the additional information received during the public hearing.

#### **8.2.4.2: Views of Participants**

During the review of the EIS, the Tsilhqot'in National Government identified a list of 52 plant species of importance to the Tsilhqot'in likely to be present within the Project area for which it argued the EIS failed to properly address. The Tsilhqot'in National Government also raised concerns related to the potential introduction of invasive plants in the area and the potential effects of increasing public access into wilderness areas, and the effect this could have on food and medicinal plant gathering by the Tsilhqot'in.

During the community hearing sessions, numerous participants from both the Tsilhqot'in and Secwepemc Nations confirmed past and current plant gathering activities in or around the Project area. In the Teztan Biny (Fish Lake) area, many Tsilhqot'in members, especially members from the Xenigwet'in (Nemiah Band) reported the use of the Teztan Yeqox (Fish Creek) watershed for plant gathering, including:

- berry picking (blueberries, chokecherries, crowberries, frog berries, huckleberries, raspberries, Saskatoon berries, soap berries, strawberries);
- medicine gathering (Indian Hellebore, Pine pitch, Dark willow, scrub birch or dwarf birch, alder, juniper and aspen, Fireweed root); and
- other harvesting (Balsam fir, bear tooth, kinnikinnick, Labrador tea, pine mushrooms, wild onion and wild potatoes).

In the area of the proposed transmission line, the Secwepemc identified areas for berry-picking (huckleberries, blueberries, soap berries) and for gathering medicinal plants (pitch). Soapberry and choke cherry picking areas were also reported just north of the transmission line corridor on the east side of the Fraser River. Members of the communities noted that the harvests would vary from year to year according to the weather and other factors.

During the public hearing, the Tsilhqot'in National Government also pointed out that as logging and land disturbance increased in the region, First Nations would rely more heavily on the plants and berries growing in the Teztan Biny (Fish Lake) area, as this area was considered one of the few remaining pristine areas east of Dasiqox (Taseko River).

Members from Tsilhqot'in communities other than Xenigwet'in (Nemiah Band) explained to the Panel that, because of the development around their communities, they felt that medicines in the areas around their communities were contaminated. As a result, they would travel to Teztan Biny (Fish Lake) and the surrounding mountains where they felt the medicines were healthier and had more strength. The Panel heard that the loss of the Teztan Biny area could not be replaced by going somewhere else. Furthermore, the

Tsilhqot'in National Government pointed out that Taseko did not provide any analysis on how accessible other areas were and what additional cost would be incurred by First Nations to access them.

The Tsilhqot'in were of the opinion that the construction and operation of an open pit mine would end the use of the Teztan Biny (Fish Lake) and Nabas area as a cultural hub for gathering. Tsilhqot'in members and participants predicted that if the mine were to go ahead, their people would avoid traditionally harvested plants in the Project area and surrounding region due to a fear of potential contamination by the Project.

During the review of the EIS, the Tsilhqot'in National Government commented on Taseko's assessment of the Project's effect on vegetation and on its interpretation of the cultural importance Tsilhqot'in placed on their traditional lands and resources uses and gathering practices. In particular, the Tsilhqot'in National Government was critical of the Ehrhart-English supporting studies and conclusion that plant gathering would likely not be greatly affected by the Project, that species found in the proposed mine development area could also be found in other areas, and that some very common species such as lodgepole pine would not be of concern to local First Nations. The Tsilhqot'in National Government argued that Taseko had misrepresented and undervalued the cultural importance of the Teztan Biny (Fish Lake) area to the Tsilhqot'in and their traditional plant resources and gathering practices.

A common concern raised by the Esketemc (Alkali Lake Band) and the Stswecem'c/Xgat'tem (Canoe Creek Band) members was that they had access to fewer berries and medicine every year due to land disturbances such as ranching, clearcut logging, increased access, invasive plants, and drier site conditions as a result of climate change. In particular, some participants indicated that logging had interfered with their plant and berry gathering activities and that logging had resulted in a reduction of the availability of berries and medicinal plants. Additionally, the Panel heard that the medicines and berries along the existing transmission lines had already been affected by the use of pesticides and herbicides. They were concerned that the proposed transmission line would exacerbate this trend and would further reduce their access to berries and traditional medicines.

### **8.3: CULTURAL HERITAGE**

#### **8.3.1: ARCHAEOLOGY**

Archaeology often refers to the search for, and preservation of physical artifacts from historical civilizations. For the Tsilhqot'in and Secwepemc, cultural heritage was more than physical artifacts that were evidence of traditional use and occupancy in the area. There was also an intangible cultural aspect to their historical traditional use and existence that related to how current generations of First Nation people experience their culture in that area. Section 6.10 of this report discusses the specific issues related to physical artifacts identified through archaeological impact assessments and archaeological overview assessments completed by Taseko, while this section focuses on the cultural impacts of those issues to the First Nations that might experience the effects of the Project.

##### **8.3.1.1: Proponent's Assessment**

As discussed in Section 6.10, Taseko noted that archaeological and cultural heritage values for both the Tsilhqot'in and Secwepemc Nations existed at the proposed the mine site and

along the transmission line corridor. Taseko stated that an archaeological impact assessment was completed for the mine site. In accordance with the Environmental Assessment Certificate issued by the Province, Taseko also committed to conduct an archaeological impact assessment prior to permitting of the 30 m to 80 m transmission line right-of-way. To mitigate the effects to cultural heritage sites, Taseko noted that First Nations would be invited to provide input to mitigation plans.

Taseko noted that its archaeological impact assessment of the mine site area, which included the island in Teztan Biny (Fish Lake), showed no evidence of cremation sites that were of concern to the Tsilhqot'in. During the public hearing, Kevin Twohig of Terra Archaeology, Taseko's archaeology consultant, noted that important sites for spiritual activities, such as cremation sites, would not necessarily leave physical archaeological evidence, and that it was possible that evidence had been removed or obscured. In this manner, sites of cultural importance may not have appeared in the results of the archaeological study. However, Mr. Twohig was of the opinion that the intensity of the archaeological impact assessment, which included subsurface testing, was sufficient to have a high level of confidence in the results.

Taseko stated that cultural sites such as the remnants of the homesteads of the William family and Solomon family at Y'anah Biny (Little Fish Lake), as well as archaeological and spiritual sites, would be covered by the waste rock stockpiles, or inundated by the tailings storage facility.

According to the Ehrhart-English ethnographic report commissioned by Taseko, spiritual significance was seen as a measure of the depth of emotion people feel for an area, and the report noted that such areas existed in the Y'anah Biny (Little Fish Lake) area, including a potential burial site. Taseko stated that the best means to mitigate effects to culturally important places, such as grave sites or artifacts, would be to avoid disturbing the site altogether, and noted that for the suspected grave site in the mine disturbance area that would likely be possible. In instances where that was not the case, collection of the artifacts and related information from the sites, and storage of those items would be necessary. Taseko admitted that there were undoubtedly a number of sites that would not be mitigated in the sense of avoidance or collection, and would ultimately be lost as a result of the Project.

During the community hearing sessions, Taseko noted that many presenters discussed the spiritual significance of the area around Teztan Biny (Fish Lake), including the island within the lake. Taseko examined comments made by the presenters during the public hearing and also sought clarification on whether the Nabas region had any greater value or significance compared to the rest of the area contained in the 1989 Nemiah Declaration. Taseko noted in its closing remarks that the Tsilhqot'in had indicated that it was not within their cultural belief system to call one place more important than another.

Taseko noted that from its perspective, it had consulted with the First Nations for much of the past 17 years and expressed its opinion that there had been many opportunities offered for engagement but that some of these opportunities had not been taken up by either the First Nations or their governments.

### 8.3.1.2: Views of Participants

The Tsilhqot'in were of the opinion that if the mine was approved and built, the loss of tangible, physical artifacts, and intangible cultural heritage sites and values would result from the flooding of burial sites or other activities related to the Project. Many participants noted that this would result in a complete severing of ancestral and cultural connections that the Tsilhqot'in reported having with Teztan Biny (Fish Lake) and the Nabas area and that for them the loss would be unquantifiable and beyond comprehension.

The Tsilhqot'in Nation repeatedly referred to the presence of a pit house that was located on the island in Teztan Biny (Fish Lake), which had not been recorded in the archaeological impact assessment of the area. Chief Marilyn Baptiste estimated that it was be roughly 10 m across. The Secwepemc also stated that there were numerous archaeological sites, including burial grounds and pit houses, located in close proximity to the proposed transmission line. The Panel heard of the importance of these areas for the transfer of intergenerational knowledge. The Panel heard that oral stories encompass place, space, and time; therefore, if the archaeological sites were to be affected, participants indicated that this would also affect the Secwepemc's ability to preserve and continue their culture.

Former Chief Roger William expressed concern that archaeological sites and artifacts found on the island and the mine site would be removed so that they would be "protected" under the *Heritage Resources Conservation Act*. He questioned how removal of the artifacts and evidence of Tsilhqot'in ancestors would mitigate the cultural impact of the mine. Patt Larcombe, on behalf of the Tsilhqot'in National Government, also noted that the disturbance or relocation of burial sites would not be an acceptable practice to the Tsilhqot'in. She indicated that landscape sites that were considered sacred or spiritual, or the historic and ancestral connection to that land would be lost if the Project were to be built. Ms. Larcombe was of the opinion that these effects could not be mitigated by any means proposed by Taseko.

During the community hearing session, the Panel heard participants speak of a strong spiritual and cultural connection to the Teztan Biny (Fish Lake) and Nabas area. This connection was, in some part, due to the belief that many of their ancestors have been buried or cremated there. The Tsilhqot'in repeatedly indicated that the destruction or desecration of the ancestral spiritual and sacred places or values could not be mitigated. Similarly, several Secwepemc community members discussed how burial sites close to the Fraser River included large small pox cemeteries which contained thousands of Esketemc (Alkali Lake Band) members. These individuals noted the importance of the area remaining as it was and not being disturbed so that the ancestors could rest. Chief Ivor Myers noted his view that the provincial environmental assessment placed no significance upon flooding of Tsilhqot'in burial sites, ceremonial sites, and spiritual places. He expressed his opinion that if the Project was built, the Tsilhqot'in would be destroyed culturally.

During the community hearing sessions with the Esketemc (Alkali Lake Band) and Stswecem'c/Xgat'tem (Canoe Creek Band), participants noted that previous disturbances of archaeological sites, including human remains, had a deep effect on the community. On occasion, these items were ceremonially relocated to ensure their long-term protection, and so that they would remain undisturbed in the future.

### 8.3.2: CULTURAL CONTINUITY

#### 8.3.2.1: Proponent's Assessment

Taseko noted in the EIS that the cultural and spiritual value of the Teztan Biny (Fish Lake) area had been expressed by First Nations. Taseko predicted that the cultural heritage effects of the Project would be felt mainly by the Xeni Gwet'in (Nemiah Band) since they had used the mine site area relatively continuously for at least the last 150 years. Taseko also noted the semi-nomadic nature of the Tsilhqot'in, particularly the Yunesit'in (Stone Band) and Xeni Gwet'in, where various families from these bands roamed the entire region, with the timing, frequency and duration of use dictated by game and fish availability at any one time. Taseko noted that its mitigation measures, and the spatial extent of disturbances to the land, were likely to minimize effects on traditional uses of the land. However, Taseko noted that "in the absence of direct impact statements from First Nations, we are unable to determine the significance of Project effects on cultural heritage values".

Taseko recognized that the Teztan Biny (Fish Lake) area had important cultural meaning for many Tsilhqot'in and determined that disturbances within the mine footprint would result in the loss of the area for those cultural practices, including fishing, trapping, and hunting. In addition, the cabins and other traditional sites and experiences that had attracted people to this area over time would also be lost.

It was Taseko's conclusion that the Teztan Biny (Fish Lake) area had fond memories and spiritual significance to many Tsilhqot'in people, but taking into account the assessment in the *William* case, that area may not have had any more or less spiritual significance than other land throughout the area described in the Nemiah Declaration of 1989.

In its EIS, Taseko noted that prior to 1973, 90% of community members were fluent speakers of the Tsilhqot'in language, making the Tsilhqot'in language the most preserved First Nation language in British Columbia. At the time it made its application, Taseko reported that less than half of the members under the age of 20 spoke the language.

Taseko acknowledged that the Project would have an adverse effect on cultural heritage values for the Tsilhqot'in people; however, Taseko stated the magnitude of the effect was difficult to characterize, and as such it was unable to determine the significance of those effects. In its EIS, Taseko noted that this was due in part to the absence of direct impact statements from First Nations. However, in its closing submission Taseko stated that:

*In the area of First Nations Cultural and Heritage Values we heard a lot of very valuable new information during the 17 days of Community Hearings. Unfortunately even with this additional information we submit that there is no basis by which the Panel can reach a different determination of significance of effects than that reached previously by Taseko and the Province. This determination was reached using quantifiable information characterizing the effect in terms of spatial extent of disturbances to the land and resource base and this remains the only available sound and defensible approach.*

Taseko noted that the transmission line was also likely to affect current use and cultural heritage, not only for the Tsilhqot'in but also the Secwepemc. It noted that the line would traverse a traditional travel route and as it proceeded east, would move through gradually more intensive traditional use zones from montane forest, grasslands, and high use river terraces and valleys.

Taseko noted that while the density of cultural sites in the grasslands was low, the river valleys of the Fraser and Chilcotin were very important for fishing camps, hunting and butchering spots as well as for traditional and social activities.

### 8.3.2.2: Views of Participants

The central position put forward by the Tsilhqot'in National Government was that the permanent destruction of Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and Nabas would constitute a significant cultural loss for the Tsilhqot'in. From its perspective, this loss could not be adequately mitigated with an artificial fish reservoir or simply by utilizing other areas within their territory.

During the public hearing, the Panel heard extensive information on the deep ancestral connection that the Tsilhqot'in had to Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake), and to Nabas. Chief Percy Guichon told the Panel:

*Once the last of our Elders has passed on, what do we have left to carry on our cultural beliefs? And more importantly, what do we have left to teach our children? What is left is the land itself, the water, the trees, the fish, the animals, and the stories that connect them. This is why we strongly oppose the destruction of important lakes such as Teztan Biny, as it represents our spiritual and cultural connection to our ancestors.*

One of the significant cultural heritage sites that could be affected was the island in Teztan Biny (Fish Lake). The Panel was informed that this island was a site of spiritual power where present-day and past generations of Tsilhqot'in conducted ceremonies to receive their spiritual powers. In addition to this, the Tsilhqot'in noted the presence of a cache pit and a pit house on the island as evidence of the island's historic and cultural importance. During the community hearing sessions, some members of the Tsilhqot'in shared personal stories of visions or spiritual events they had experienced at Teztan Biny, and on the island. Sean Nixon, on behalf of the Tsilhqot'in National Government, stated during the public hearing:

*The loss of that connection to places that are of spiritual and historical significance can't be fully mitigated. It's hard to think of how you would mitigate the loss of that connection to a place where your ancestors lived, to a place where your ancestors did the same kinds of activities that you're doing...*

Patt Larcombe, on behalf of the Tsilhqot'in National Government, summarized the Tsilhqot'in connection to the Teztan Yeqox (Fish Creek) watershed as a place where the intergenerational transmission of traditional knowledge and traditional skills would occur. As described in sections 8.2, Teztan Biny (Fish Lake) and Nabas were reported to be used currently for this purpose through fishing, hunting, trapping and gathering activities. In addition, social gatherings were also identified as a means to transmit cultural information. Shari Hughson noted that for at least the past 2 years, the daycare program at Xenigwet'in (Nemiah Band) took the children to Teztan Biny to gather with the Elders who use the area as a teaching place. Bonnie Myers reiterated this position during the public hearing and noted "Fish Lake offers a luxurious view, relaxation, freedom, a place where our people can teach our children and future generations our culture, our traditions, our values and our legends."



During the community hearing sessions, the Panel heard many Tsilhqot'in describe the importance of the Teztan Biny (Fish Lake) area for cultural gatherings. Many people described Elders gatherings, and how adults would work with the youth to teach values, culture and language. Family and social gatherings, including camping trips, fishing trips and recreational use were also identified. Catherine Haller noted that Elders Gatherings, food gathering ceremonies, youth ceremonies, and bathing ceremonies all occurred at Teztan Biny. She stated:

*[It is] important that we have gatherings because those gatherings are our traditional values. Spiritual values. It's where we are teaching the youth, teaching parental skills, how to survive, how to live from the Earth, how to get back to hunting and fishing. It is important to have the gatherings where the ancestors and Elders lived. We had our Elders' Gatherings in July on Jidizay, Onion Lake, and Teztan Biny, because those are some of our most traditional grounds.*

*We get more help from our ancestors when we pray where they used to live and do our ceremonies there. We understand better where we, as Tsilhqot'in People, come from, our history, our situation, when we go to where our ancestors lived. We will lose all the gatherings there. What are we going to do? Who are we going to teach? The mine will take away the best of us. The best of us is what we have up there.*

Others described the use of the lake for weddings, anniversaries, and birthday parties.

Tsilhqot'in presented evidence throughout the public hearing that highlighted the ancestral connection and continued use of that area, and noted that this continued use of the site resulted in its being significant to the people. The cabins at Y'anah Biny (Little Fish Lake) were noted as both evidence of that continued use, and also as an important cultural and historical link for the people to that area.

The Tsilhqot'in noted that although it did not fully agree with the findings of the Ehrhart-English ethnographic study Taseko had commissioned, the report recognized the economic and cultural importance of Teztan Biny (Fish Lake) and Nabas area, and that importance was placed on this area even if individuals live elsewhere.

The Tsilhqot'in submitted that the Teztan Biny (Fish Lake) and Nabas area formed an important cultural hub in seasonal Tsilhqot'in land use, and that the seasonally nomadic lifestyle made key harvesting areas such as Teztan Biny of critical importance to their cultural survival. The Tsilhqot'in noted that in his decision, Justice Vickers found that ancestral trails in the area were still used and indicated that this illustrated a strong historical and cultural connection to the Nabas area. In response to a suggestion by Taseko that the Tsilhqot'in could simply go elsewhere, the Tsilhqot'in pointed out that in recent years the Teztan Biny area has become more culturally important than other areas in the Tsilhqot'in territory as those areas became developed through third parties for activities such as logging, mining and private land ownership.

Former Chief Roger William noted that historically the Teztan Biny (Fish Lake) and Nabas areas were also used as a refuge for the people. He noted that during the Spanish Influenza epidemic in 1918, many of the Tsilhqot'in people went to Teztan Biny to avoid exposure to "the big flu". Many of the people in Xení Gwet'in (Nemiah Band) who did not go there to escape the illness eventually died after becoming ill. The history of the Tsilhqot'in people contained consecutive disturbances to the Tsilhqot'in culture from the time of first contact

and colonization to the present day which resulted in a loss of several generations of cultural development and teaching, and that the effects of that cultural loss still exist today.

The Panel heard repeatedly that if the mine was approved and built, the Tsilhqot'in believed that this would result in yet another stress to their cultural heritage and would result in significant adverse environmental effects, and that there was no possible way that these effects could be mitigated.

The Esketemc (Alkali Lake Band) noted repeatedly that the transmission line would result in a cultural loss, which would prohibit their particular way of life and the cultural values of living off the land. The inability to use traditional resources and maintain traditional aspects of their lifestyle were seen as being central to the Esketemc culture. The Esketemc submitted that the Project would result in an alteration of traditional patterns of land use, and that this would not only threaten the continuation of the specific activities, but also the associated cultural knowledge.

The Esketemc (Alkali Lake Band) elders and community members stated that their natural wealth stemmed from the land, and the resources it provided for their sustenance. The relationship with the land formed the basis for their spirituality and cultural identity. The Esketemc submitted that along with the degradation of the environment and resources as a result of development, "invisible losses" would occur as well. These losses would be less tangible or measurable, but would be considered significant cultural and lifestyle losses. These losses would include the loss of identity, health losses, loss of self-determination and influence, emotional and psychological losses, loss of order in the world, knowledge losses, indirect economic losses and lost opportunities.

One cultural activity described by the Esketemc (Alkali Lake Band) was the tradition of fasting as a means of cleansing oneself and reconnecting with spiritual values. Chief Fred Robbins noted that he and other Esketemc used the area of the proposed transmission line corridor for a ceremony whereby for 4 years, individuals would go into the wilderness and fast for 4 days at a time. Remoteness was identified as an important aspect of this activity and for many other cultural practices. Many Secwepemc expressed the belief that if the transmission line was built, it would decrease the quality of these important cultural experiences.

## **8.4: EMPLOYMENT AND ECONOMIC EFFECTS**

### **8.4.1: PROPONENT'S ASSESSMENT**

In the absence of provincial representation at the public hearing, Taseko presented its interpretation of British Columbia's revenue sharing policy, and indicated it would result in a percentage of the provincial mineral tax paid by Taseko being transferred to the First Nations. Taseko noted there would need to be a desire by the First Nation to see the Project proceed. Taseko noted that discussions were underway with the Province and First Nations on other projects, but that no revenue sharing agreements had been completed to date.

Taseko observed that throughout the public hearing that a number of participants commented on the fact that Taseko had not entered into an Impact Benefit Agreement with First Nations. It noted that early in the review process, Taseko had raised the subject of Impact Benefit Agreements with the Tsilhqot'in National Government. Taseko submitted that

the position of the Tsilhqot'in National Government at that time was that it did not wish to have such a discussion until after the environmental assessment process was concluded.

Taseko also noted that there was no legal requirement or even a legal definition in British Columbia of what would constitute an Impact Benefit Agreement. However, the policy of the Province concerning benefit sharing agreements, as outlined by the British Columbia Environmental Assessment Office, encouraged proponents to explore benefit-sharing agreements with First Nations where the parties considered that to be in their mutual interest. Finally, impact benefit agreements would not be considered by the Province to be pre-conditions to the completion of an environmental assessment or decisions by responsible ministers.

Taseko reported that the Province had required certain legal commitments of Taseko in the Environmental Assessment Certificate (Appendix 4, Commitments 2.0, 19.0, 20.0, 21.0). These commitments included subject matters that would frequently be considered as key components of an impact benefit agreement, including preferential provisions for First Nations for jobs, job notifications, contracting opportunities, training, and input on certain environmental considerations.

With respect to First Nation participation in its education and training programs, Taseko stated that:

*Taseko will do everything it can, reasonably, to provide information, to provide opportunities, and provide assistance in the form of Mining Your Future and other to-be-developed type activities, perhaps. But all of which will go for nought and mean nothing if on the other hand, First Nations, which we're talking about here, don't themselves wish to take advantage of these opportunities and to step up to the plate, as it were, and participate.*

In its response to communities during the public hearing, Taseko repeatedly indicated that the First Nation communities needed to approach the company to request that the program be brought to their community and that Taseko would only go to those communities where it was invited.

#### **8.4.2: VIEWS OF PARTICIPANTS**

The Tsilhqot'in indicated that the Teztan Biny (Fish Lake) and Nabas area was a "one-stop shop" for them – essentially, an area where they could obtain fish, meat, and plants for their diet, medicines, and cultural use. During the community hearing sessions it was repeatedly noted that the "one-stop shop" did not occur elsewhere in the territory in the same abundance as in the Teztan Biny area. The Tsilhqot'in noted that should the Project proceed, the level of effort to harvest the same amount of traditional food and medicines would increase, resulting in additional economic burden to the Tsilhqot'in.

During the public hearing, the Panel heard repeatedly that the average annual income in the Tsilhqot'in and Secwepemc communities was extremely low, and that those on income assistance received approximately \$200 per month. Patt Larcombe, on behalf of the Tsilhqot'in National Government, noted that as a means to compensate for the traditional foods that would be lost as a result of the Project, income-poor families would likely need to shift to less nutritious foods that were more affordable. She noted that for the Tsilhqot'in to replace one kilogram of berries harvested from the land with the equivalent of a store-bought substitute would cost approximately \$6.00 to \$7.00. The appropriate replacement value for

one deer would be \$950 to \$1,000, while replacement food for a moose would cost approximately \$3,800. Based on Ms. Hughson's estimate that the average family of 6 consumed approximately 200 salmon per year, Ms. Larcombe estimated that to replace this source of food would cost each family over \$6,000 if the resource base were to be lost.

In addition to the replacement costs of food, Ms. Larcombe noted that those Tsilhqot'in who were still able to obtain food through hunting, fishing, and gathering of plants would experience additional costs as well. Prosperity Lake, as a replacement for Teztan Biny (Fish Lake) would be less accessible to the Xení Gwet'in (Nemíah Band) community. She noted that currently, Teztan Biny was approximately 57 km from the community, whereas the proposed route from the community to Prosperity Lake would be approximately 77 km. Additionally, due to the proposed no-hunting policies in and around the mine-site, hunting, trapping and harvesting activities would occur elsewhere in the territory, and likely further away from the community than the Teztan Biny and Nabas area.

The Tsilhqot'in indicated the importance of Nabas and the contribution the area made to the overall quality of their lifestyle which was largely based on a reliance of traditional activities needed to sustain their economy. The Nabas area provided for the Tsilhqot'in, and particularly the Xení Gwet'in (Nemíah Band), moose, deer, waterfowl, small animals, and a diversity of food and medicinal plants. The Panel heard that the loss of this area would affect the ability of the communities to maintain their traditional lifestyles which continued to be sustained by their traditional economy. Chief Francis Laceese indicated that the Tsilhqot'in were "no different than another country, like a small country. We have our own system, our own language, our own way of life that's been there for a long time. So when you get back to, I think that goes back to the land and what's out there... that's what we look at as wealth."

Shari Hughson noted that Xení Gwet'in (Nemíah Band) was a model First Nation community, and that they had been more successful in their cultural and economic recovery efforts than many others. She identified the community plan for food self-sufficiency would result in 75% of the community diet coming from locally grown and harvested foods. The reliance on traditional foods was identified as a key cornerstone of this plan.

The Xení Gwet'in (Nemíah Band) also reported to the Panel that it signed a sustainable tourism protocol agreement in 2003, and had developed ecotourism infrastructure to support this type of business development opportunities. This work included developing partnerships with local resorts and outfitters, the development of visitor information services centres, and a traditional village site. The development of the tourism capacity in the area included training of guides for trail riding, big game hunting, interpretive skills, and first aid.

The Dasiqox Biny (Taseko Lake) and Nabas areas were identified as being a high quality land base for cultural and wilderness tourism. During the public hearing, a number of presenters identified ecotourism as a culturally appropriate economic development activity that was in line with their view of being caretakers of the land. The Tsilhqot'in noted a desire for business opportunities that were not only culturally appropriate, but also businesses that could be considered sustainable as well. Tourism was noted as one industry that would enable employees to work in a field that they have both interest and expertise in, and could further support cultural restoration efforts in the communities.

The Stswecem'c/Xgat'tem (Canoe Creek Band) also noted that the region along the proposed transmission line had inherent recreational attributes and informed the Panel of its

plan to develop river-oriented wilderness tourism as a part of its economy. It submitted that Taseko had not given enough attention to the effect the proposed transmission line corridor would have on the visual landscape. Stswecem'c/Xgat'tem requested that a more detailed visual analysis be required throughout the area that would be effected, particularly along rivers, streams and established tourism travel routes.

During the public hearing, Linda Smith noted that Teztan Biny (Fish Lake) had the potential to become a hub for Tsilhqot'in cultural interpretation. Linda Smith noted that the site would be ideal for the creation of a pre-1846 typical Tsilhqot'in village with pit houses, seasonal activities, recreation, eco-tourism and a health resort or healing centre.

Patt Larcombe, on behalf of the Tsilhqot'in National Government, noted that the Tsilhqot'in would bear the majority of the adverse impacts associated with the Project, including the lost opportunity to develop their own businesses that would be in line with Tsilhqot'in values. She suggested that the benefits that might flow to the communities may not justify the adverse effects that would be experienced as a result of the Project's development. She further indicated that First Nation employment in the mining sector remained low, with First Nations people typically employed in low-paying jobs, despite improvement in training and skill opportunities and development in recent years. However, she pointed out that even with the right conditions, people tended to only work for a short period of time, as there was a strong desire to come back to their family, their community and to the land. She also observed that few Tsilhqot'in indicated any interest in working in a mine during the public hearing and that other Tsilhqot'in members would prefer to work in jobs that would contribute to the protection and sustainability of their lands and their culture.

The Esketemc (Alkali Lake Band) and Stswecem'c/Xgat'tem (Canoe Creek Band) raised concerns that their traditional livelihood would be significantly affected if the transmission line were to be built through their traditional territory. The Esketemc expressed that Taseko had not consulted them or considered the impacts to Esketemc lands. During the public hearing, the Panel heard about the spiritual importance of the area and of the proposed transmission line corridor to the Esketemc and that many Esketemc members felt this area was sacred to them.

With respect to employment, Ms. Kuyek, on behalf of MiningWatch Canada, identified inequities that First Nations and women generally faced with respect to income and job types in the mining industry in British Columbia and in Canada. She predicted that a similar scenario would be expected for the Project unless Taseko took steps to avoid that outcome.

Ms. Titi Kunkel reported that within the Cariboo region, First Nation people living on reserves faced higher than average unemployment. Of the 9,000 First Nation peoples in the Cariboo region, approximately 2,600 were reported to not be in the labour force. The on-reserve female population was stated to be about 991, of which more than 30% were reported to be unemployed. Ms. Kunkel stated that individuals who did not participate in the labour force relied upon the hunting, fishing, trapping and gathering activities for their subsistence.

According to Ms. Kunkel, First Nation women in particular would be unlikely to have the means to get the training or experience necessary to qualify for highly skilled or specialized mining jobs. She reported that, First Nations women were generally reported to face significant challenges in terms of building their capacity, including:

- childcare issues;
- emotional wellness;

- major care givers;
- transportation from reserves to attend classes; and
- legacy of residential school.

Ms. Kunkel noted the effects of mining operations on women typically included changes to health and wellbeing, traditional cultural roles, and inequalities in the distribution of economic benefits between men and women. Ms. Kunkel concluded that First Nation women had a higher dependence on the traditional economy and activities and this would result in increased adverse effects for First Nations' women.

## **8.5: HEALTH**

This section of the report deals with First Nations health issues, specifically related to nutritional aspects of traditional foods and mental health. The potential contamination of traditional foods was discussed in Section 7.4.

### **8.5.1: PROPONENT'S ASSESSMENT**

At the public hearing, Taseko discussed overall health of the communities that would be affected by the Project by referring to the Indian and Northern Affairs Canada index of well being. Taseko referred to this index as being one measure of success in a First Nation community. This index was reported to include health indicators such as income, education, labour force and housing, and Taseko predicted that the Project would result in positive effects in these areas.

### **8.5.2: VIEWS OF PARTICIPANTS**

Taseko committed to undertake a country food consumption study during the public hearing. However, during her presentation on behalf of the Tsilhqot'in National Government, Patt Larcombe indicated that "[f]ood consumption surveys require an enormous amount of trust on the part of the people and the researcher that's doing the work. There isn't that trust with the communities and Taseko, or government." She further noted that the recommended food consumption survey, in collaboration with the Tsilhqot'in, to evaluate and monitor contaminant risk was not likely a feasible measure. She indicated that it was likely too late for such a baseline study to be undertaken.

It was noted by Ms. Hughson and members of the communities the importance of traditional foods to health, in terms of fitness, nutritional, cultural and social values. It was noted there was a health risk associated with a shift in diet to store bought foods, which was due to numerous factors, including that store bought foods were not as high in nutritional value. Health Canada in their presentation at the public hearing noted that a switch to store bought foods could cause health problems such as an increased prevalence of diabetes.

The Esketemc (Alkali Lake Band) submitted the results of academic studies that noted that the shift from local Indigenous diets to a market-based diet was connected with a rise in nutrition-related diseases (such as diabetes) as well as increased household expenditures among income-poor families. Community members, such as Irvine Johnson, shared their personal stories of this struggle during the public hearing.

Shari Hughson spoke about the potential impacts of the Project on mental health. She emphasized that the Project could affect the mental, cultural, spiritual and emotional well-being of the community. She emphasized that the Indian and Northern Affairs Canada index

of well-being referred to by Taseko was not a measure of overall health but rather only of economic well being.

Ms. Hughson, as well as members of the community, spoke about past trauma, including colonization, residential schools and substance abuse. During the public hearing, she stated:

*This legacy of loss and change has left long-term mental health challenges for them. They struggle with issues such as self-esteem, identity, confidence, apathy, and emotional challenges, such as depression and anger that have created social issues such as addictions, difficulty with relationships and personal inner struggles.*

Ms. Hughson indicated that the Xeni Gwet'in (Nemiah Band) were using a holistic approach to health, using traditional healing in combination with western medicine. The community of Xeni Gwet'in was presented as having the potential to be a model for other First Nations in this recovery process and approach to health care. The health program that was being implemented in the community also included a traditional medicine camp and promotion of the collection and use of traditional medicines.

Ms. Hughson spoke of food self sufficiency as being a key element in the cultural healing process. Harvesting traditional foods was stated to provide exercise and cultural connection to the land. Traditional foods were reported as being shared within the community, thereby providing social and cultural benefits. Ms. Hughson presented information on the nutritional benefits of traditional foods and the important economic value they provided compared to the direct and indirect costs of purchasing groceries from Williams Lake. It was noted that should the Project proceed, it would have negative effects on the community's food self sufficiency goals and overall healing path.

Ms Hughson described the effects she foresaw if the mine should proceed, such as the "overwhelming" mental health problems resulting from loss of land and loss of self-determination. Ms Hughson and community members also described the physical and psychological reactions to the perception of contamination of their foods and water. Ms. Hughson referred to a Health Canada study which demonstrated that a perception of contamination could result in physical health problems including increased risk of heart attacks, and mental health problems such as feelings of helplessness, hopelessness, despair and an increase in alcohol and drug abuse.

The Esketemc (Alkali Lake Band) community shared with the Panel that it had a well known record of community activism including assistance to other Indigenous and non-indigenous groups. The Esketemc's community battle against alcoholism was the subject of the movie, "The Honour of All", and a book entitled "Sharing, Caring, and Consequences: A study of sobriety and healing at Alkali Lake Reserve". Patrick Haggerson of the Betty Ford Institute noted in a letter that the sobriety movement in Alkali Lake was a provincial as well as national treasure, which should be carefully preserved.

The Panel heard from many First Nations presenters that they believed the Project would result in contamination of traditional foods and medicinal plants. This perception of contamination could have health effects as the First Nations members would stop harvesting from the area surrounding the Project, which would have implications for nutritional, cultural, spiritual and mental health. In response to questions raised at the public hearing, Health Canada noted that it had witnessed First Nations communities where a perception of contamination had resulted in complete avoidance of traditional foods from a certain area,

and the resultant substitution of less nutritious food from the supermarket, which could have health effects such as increased prevalence of diabetes.

Ms. Hughson stated that if the mine were to proceed against the community's wishes, this would result in feeling of powerlessness which would lead to "depression, anger and sometimes rage". Ms. Hughson also detailed how the Xeni Gwet'in (Nemiah Band) community was fragile but on the road to recovery. She stated that the mental health impacts of the Project would be devastating and that it could turn around the recovery from trauma that the community has recently made.

Regarding the traumas that the First Nations community members have experienced, many spoke of the effects of residential schools and colonization. Mrs. Maryann William in Xeni Gwet'in (Nemiah Band) spoke of the effects of broken promises from government related to residential schools and colonialism. Mr. Lloyd Myers in Yunesit'in (Stone Band) spoke of how the people there still suffered from the residential school experience. Mrs. Agnes Haller in Yunesit'in spoke of how the residential school experience created a lot of anger for her. Ms. Shirley Johnny in Tl'esqox (Toosey Band) spoke of the trauma to parents of having their children taken away. Mr. David Stiemann in Toosey spoke of the trauma of loss of culture and language. Former Chief Cecil Grinder spoke in Tl'etinqox (Anaham Band) about the abuse that occurred in residential schools. Chief Camille in Stswecem'c/Xgat'tem (Canoe Creek Band) spoke about how children sent to residential schools had much less opportunity to learn from their elders. The Panel also heard how the residential schools took away the culture, language and traditions of the people.

Kendra Rogers-Calabrese, Mental Health Councilor for the Tsi Del Del (Redstone Band) First Nation, presented to the Panel about the process of healing in the First Nations communities, and recovery from trauma such as colonization, the residential schools experience and addictions. The Panel heard that the First Nations communities were on the road to recovery. Ms. Rogers-Calabrese stated:

*Although I agree that unemployment is a significant factor in many First Nations mental health challenges, I do not feel a mine in the Tsilhqot'in area would address the health and wellness of its Aboriginal employees. The isolation, separation from family, detachment from cultural practice, sudden influx of money and access to drugs and alcohol would contribute to the problem rather than fix it.*

Many community members in Esketemc (Alkali Lake Band) spoke of the impacts of colonialism, residential schools and substance abuse, especially alcoholism. Mr. Francis Johnson Jr. spoke of how cycles of alcoholism and abuse were passed from generation to generation. Ms. Jerita Elkins spoke of the residential school experience and of growing up with the negative effects of alcohol. Councillor Joyce Johnson spoke of trauma, alcoholism and suicides. Individuals in Esketemc spoke of the history of trauma and alcoholism in the community. The Panel heard that the Esketemc had developed a relationship with the Betty Ford Clinic as a result of the many traumas experienced by the community. In a letter from Patrick Haggerson of the Betty Ford clinic, the Panel heard that the community of Alkali had been a positive example to other First Nations for their recovery from alcoholism, and that the mine would re-traumatize the community.

During the public hearing, Beth Bedard, speaking on behalf of the Esketemc (Alkali Lake Band), described the trauma from residential schools and stated that the Project would result in further trauma. She also noted the importance of traditional foods for health and the



mental health impacts of the loss of those foods, which community members stated would result from the transmission line.

## 8.6: PANEL'S CONCLUSIONS AND RECOMMENDATIONS

In reaching its conclusions on the effects of the Project on the current use of lands and resources for traditional purposes and on cultural heritage resources, the Panel considered the following factors to be particularly relevant:

- First Nations spoke about spiritual balance, their natural laws, including the importance of sustainability for seven generations, and their role in protecting the land as environmental stewards and provided information on steps they have taken to support this role (e.g. the Nemiah Declaration);
- First Nations indicated a strong reliance on their traditional subsistence activities, identified as Aboriginal rights, as the sustenance gained from these current uses of the land and resources made a significant contribution to the average family's overall economic well-being; many First Nations stated that their average income was low and that harvesting of traditional foods was a necessity for their survival;
- First Nations described their family lineage, typically up to 4 generations, to illustrate how they continuously maintained their traditional use and occupancy of the land and how that continuous use strengthened their connection to those areas;
- First Nations current use of the lands and resources within the Teztan Biny (Fish Lake) and Nabas areas, and along the transmission line for traditional purposes included fishing, hunting, gathering berries and traditional medicinal plants, as well as ceremonial and spiritual activities, and intergenerational teaching of traditional values including language and place names;
- First Nations indicated the proposed mitigation measures and economic benefits presented by Taseko would not replace benefits First Nations received from their current use of the Project area;
- Taseko recognized the Teztan Biny (Fish Lake) area as being culturally important to the Tsilhqot'in but did not offer any specific means to mitigate effects on cultural heritage nor did it reach a specific conclusion on the significance of those effects;
- the Tsilhqot'in referred to the Teztan Biny (Fish Lake) area as one of the few remaining areas of cultural and spiritual importance for their people that was intact and not affected by other industrial development activities such as logging; the Fish Lake area was reported to be an important cultural hub in seasonal Tsilhqot'in use of the land;
- the Tsilhqot'in described the mine site area, and in particular Teztan Biny (Fish Lake) island, as a significant place of power, where Tsilhqot'in people, including traditional healers have held traditional and cultural ceremonies for spiritual healing; these traditional practices were indicated to be important to the Tsilhqot'in culture and to have assisted them in healing from past traumas such as colonization and residential schools;
- First Nations spoke about their reliance on traditional foods to maintain and improve their physical and cultural well-being; the loss of Fish Lake (Teztan Biny) for this purpose could negatively affect the health of the Tsilhqot'in, particularly in the communities of Xeni Gwet'in (Nemiah Band) and Tl'esqox (Toosey Band);
- the proposed transmission line would provide increased access to areas that were reported to be important hunting and gathering areas and would stress wildlife resources of importance to First Nations;

- Secwepemc communities described the effects of the existing north-south BC Hydro transmission line and how they anticipated the proposed transmission line would negatively affect their current use for traditional purposes and cultural heritage;
- the proposed location for the Fraser River crossing of the transmission line was identified as an important fishing area for the Secwepemc communities and an area of unique cultural and archaeological heritage with extensive evidence of past occupation; and
- the Tsilhqot'in and Secwepemc spoke about how the effects of the Project on their current use of the land for traditional purposes would be significant and unmitigable.

The community hearing sessions were a key source of information for the Panel on current use of lands and resources for traditional purposes and cultural heritage. Many individuals presented the Panel with examples of why the Project area was important to them, how it was currently being used for traditional purposes including harvesting of traditional foods and its importance culturally for teaching and ceremonies. While information on the cultural and spiritual use of the Project area could not be quantified in the same way that some environmental effects were quantified, the Panel found this information to be very useful in understanding the importance of the Project area to First Nations.

The Panel heard that the land and resources of the Teztan Biny (Fish Lake) and Nabas areas were still being used by the Tsilhqot'in for traditional purposes. The Panel heard substantial information regarding the significant number of Tsilhqot'in members who continued to use the area of the proposed mine site for activities such as hunting, fishing, gathering of berries, plants and medicines, as well as for cultural and spiritual ceremonies and activities. Additionally, the Panel heard that the Teztan Biny area had substantial cultural value due to its pristine environment and inherent spirituality. The Panel heard, for instance, that medicines from this area were more powerful and the area was ideal for cultural ceremonies.

The Panel acknowledges that the Tsilhqot'in used different areas in their territory depending on the season and the subsistence resources available to support their current use activities, and that many of the resources in these areas may be under increasing pressure from other activities such as forestry, grazing and private land ownership. Further, the Panel notes that while the Tsilhqot'in may utilize other areas in their territory to support their current use activities, these areas may not necessarily have the same connection expressed for the Teztan Biny (Fish Lake) and Nabas areas.

The Panel heard that the Project may have a negative impact on the personal and community healing processes that were ongoing in the First Nation communities. The Panel acknowledges the importance of being able to practice current use activities for the physical and mental well-being of the Tsilhqot'in communities. Further, the Panel notes that due to the perception of contamination, it is likely that the mine site area would be avoided even after closure and reclamation. Given the reliance on traditional foods and the communities' commitment to improved health and traditional well-being, the Panel finds that the Project's impacts on the physical and mental health of the Tsilhqot'in communities would be long term.

The Panel notes that while Taseko recognized that the Project would have adverse effects on the cultural heritage of the Tsilhqot'in, it offered no specific mitigation measures for cultural heritage, and was unable to come to a determination on the significance of those effects. Further, the Panel finds that the landscape itself would be substantially altered by

the Project, and as a result, even after closure and reclamation, the spiritual and cultural connection to the Teztan Biny (Fish Lake) area would likely be irreversibly lost. A new cultural connection to the area could require thousands of years to develop to a level similar to that currently experienced by the Tsilhqot'in at Teztan Biny.

The Panel has considered the information presented with respect to physical and cultural heritage resources and notes that archaeological and cultural heritage resources have been identified that are of importance to the Tsilhqot'in. For instance, the Tsilhqot'in indicated that there are spiritual sites, cremation sites, burial sites and pit houses in the area of the proposed mine site. The Panel finds that while the archaeological work completed at the proposed mine site was extensive, there was uncertainty regarding whether all sites were identified, including sites such as cremation sites and unmarked graves which may not leave markers or physical evidence that identify their locations. The Panel recognizes that these physical and cultural heritage resources are an important component of Tsilhqot'in culture and connection to their ancestors and the land.

The Panel also notes that First Nations did not indicate substantial interest in monetary compensation for the loss of the Teztan Biny (Fish Lake) and Nabas areas, or for the proposed provincial revenue sharing agreement. To the Panel, this was a clear indication that financial compensation would not replace the loss of Teztan Biny and Nabas areas for the Tsilhqot'in. The Panel heard from participants that they were not opposed to development, but were only interested in sustainable, culturally appropriate development opportunities that would sustain the local economy for future generations.

Based on the information received during the public hearing, the Panel is convinced that the Teztan Biny (Fish Lake) and Nabas areas are unique and of special significance to the Tsilhqot'in. The Panel heard from the Tsilhqot'in that the loss of the area for practicing their current use, spiritual and cultural activities would be significant and unmitigable. Additionally, the island in Teztan Biny, which has spiritual importance and the Nabas area, which has been occupied for generations and continues to be used, would be permanently lost as a result of the Project.

The Panel has determined that the loss of the Teztan Biny (Fish Lake) and Nabas areas for current use activities, ceremonies, teaching, and cultural and spiritual practices would be irreversible, of high magnitude and have a long-term effect on the Tsilhqot'in.

**The Panel concludes that the Project would have a significant adverse effect on the Tsilhqot'in Nation regarding their current use of lands and resources for traditional purposes and on cultural heritage resources.**

The Panel finds that given the substantial value of the Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and Nabas areas to the Tsilhqot'in, it cannot recommend any measures that would mitigate the significant adverse effects of the Project on the current use of lands and resources for traditional purposes and cultural heritage by the Tsilhqot'in Nation at the proposed mine site, should the Project be allowed to proceed.

The Panel has considered the proposed routing for the transmission line and the concerns raised by participants regarding the potential effects and notes that the issue of access was

important for the Esketemc (Alkali Lake Band) and Stswecem'c/Xgat'tem (Canoe Creek Band). Further, the Panel notes the effects the Secwepemc Nation have experienced in the area from similar linear developments.

The Panel notes that the Secwepemc people indicated they used the area of the proposed transmission line corridor for traditional purposes and that the transmission line may affect their ability to continue their current use practices due to increased access, loss of cultural connectivity with the land, and direct impacts to wildlife. The Panel also notes that the area of the proposed transmission line crossing over the Fraser River has been identified as an area that is rich in archaeological and burial sites.

However, the Panel also notes that the centerline for the transmission line right-of-way was not chosen at the time of the public hearing and that Taseko had committed to further studies and to work with First Nations to identify areas of importance and to adjust the centerline location to minimize potential environmental effects. Therefore, the Panel is of the opinion that the potential effects from the transmission line could be minimized. The Panel finds that in order to ensure that the potential adverse effects on the current use of the lands and resources and cultural heritage by the Secwepemc Nation do not become significant, Taseko must ensure that every effort is made to implement mitigation measures as proposed and to work with the Secwepemc Nation in implementing these measures to ensure that their current use activities are considered in determining the final alignment of the transmission line centerline. In particular, the Panel notes that Recommendation 12 relating to locating the transmission line right-of-way outside of the Esketemc Community Forest would assist in mitigating effects on the current use of lands and resources for traditional purposes by the Esketemc (Alkali Lake Band).

**The Panel concludes that the Project would not result in significant adverse effects on the Secwepemc Nation's current use of land and resources for traditional purposes and on cultural heritage.**

**RECOMMENDATION 19**

If the Project proceeds, the Panel recommends that Taseko collaborate with the Secwepemc when determining the final alignment of the transmission line centreline in order to minimize disturbance resulting from the Project to areas of importance to the Esketemc (Alkali Lake Band) and Stswecem'c/Xgat'tem (Canoe Creek Band).

## SECTION 9: ABORIGINAL RIGHTS AND TITLE

The Panel's Terms of Reference required it to include in its report information provided by First Nations on the manner in which the Project may adversely affect potential or established Aboriginal rights or title. Where First Nations have asserted Aboriginal rights or title, but those rights or title have not yet been proven, the Panel was directed to include information provided on the strength of the claim in this report. However, the Panel does not have the mandate to make any determinations with respect to the validity of rights or title claimed by First Nations, or the strength of those claims. Information regarding the Panel's Terms of Reference and its interpretation of its mandate can be found in Section 4.

In the letter dated March 28, 2010, the Panel stated that, based on its interpretation of its Terms of Reference, it would undertake an assessment of the effects of the Project on Aboriginal right and title, as in its opinion, there was no difference between "considering" and "assessing". Further, the Panel noted that its assessment of the environmental effects of the Project would include, as per the definition of environmental effect under the *Canadian Environmental Assessment Act*, an assessment of the current use of lands and resources for traditional purposes by Aboriginal persons and of physical and cultural heritage. The Panel believes that in many cases, there is a direct relationship between the current use of lands and resources for traditional purposes, cultural heritage and potential or established Aboriginal rights and title.

In accordance with its mandate, the Panel invited First Nations to submit information related to the nature and scope of potential or established Aboriginal rights or title in the Project area, as well as information on the potential adverse impacts or potential infringement that the Project may have on these rights. Partial information was provided by the Tsilhqot'in National Government in November 2009, and the by Esketemc (Alkali Lake Band) in June 2009 and November 2009. During the public hearing, the information from the Tsilhqot'in and Esketemc was supplemented and information was also received from the Stswecem'c/Xgat'tem (Canoe Creek Band) and the T'exelc (Williams Lake Band).

During the public hearing, the Panel heard information from First Nation members regarding their current use of lands and resources for traditional purposes and regarding physical and cultural heritage in the Project area. First Nations people spoke at length about the importance of the land and their relationship to the lands as an integral connection that has existed for them since time immemorial. A summary of the information received is provided in Sections 8.2 and 8.3.

The Panel also received considerable information from participants in the public hearing regarding Aboriginal rights and title and has examined how the proposed Project would affect these rights and title and has made determinations on the significance of those effects in Section 9.3. As per its Terms of Reference, the Panel acknowledges that its assessment has been undertaken based on the evidence specifically provided by participants regarding those Aboriginal rights and title and that other rights may potentially exist that have not been presented to the Panel.

With respect to strength of claim, the Panel received little, if any, information that could be specifically referenced as 'strength of claim' information. Similarly, parties did not present information regarding whether the Project would affect the strength of their claims to Aboriginal rights and/or title. Rather, the Panel heard information regarding how First

Nations continue to use the Project area, their historical and familial connection to the land, traditional place names that have been given to specific areas and the importance of certain areas for hunting, trapping, and gathering for food, social and ceremonial purposes. First Nations also spoke about the importance of the land to their identities as First Nations people and the importance of the land to the continuance of their cultural identity through teaching their traditional practices to the youth of their Nations. The Panel is of the opinion that this information provides insight into the distinct practices, traditions and cultures of both the Tsilhqot'in and Secwepemc on land that they have occupied since time immemorial and that this information can be considered as having bearing on a First Nation's strength of claim. This information is summarized in detail in Section 8 and was also a factor considered by the Panel in its significance determinations throughout this report.

During the course of the review, the Panel was referred to a number of court cases, which were presented to provide context to the issue of Aboriginal rights and title. The Panel has reviewed these cases and a short summary is provided below.

With respect to the Crown's duty to consult and, where appropriate, accommodate First Nations, participants referred to *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73, *Taku River Tlingit First Nation v. British Columbia (Project Assessment Director)*, 2004 SCC 74 and *Mikisew Cree First Nation v. Canada (Minister of Canadian Heritage)*, 2005 SCC 69. *Mikisew Cree* was also referenced in terms of the need for reconciliation with First Nations. In reference to the Taku River case, participants noted that in *Kwikwetlem First Nation v. British Columbia (Utilities Commission)*, 2008 BCCA 208, the Court indicated that the British Columbia environmental review process assessed by the Supreme Court of Canada in the 2004 *Taku River* decision was not the review process in place as of 2009. With respect to the existence of Aboriginal rights and title, participants referred to *R. v. Sparrow*, [1990] 1 S.C.R. 1075 and *Delgamuukw v. British Columbia*, [1997] 3 S.C.R. 1010. These judgements helped to form the context in which the Crown and First Nations operate with respect to Aboriginal rights and title.

During the course of the review, participants also referenced the 2007 United Nations "Declaration on the Rights of Indigenous Peoples". The Declaration set out individual and collective rights of indigenous peoples, as well as their rights to culture, identity, language, employment, health, education and other issues. The Declaration promoted control by indigenous peoples over developments affecting them and their lands, territories and resources to enable them to maintain and strengthen their institutions, cultures and traditions, and to promote their development in accordance with their aspirations and needs. Article 19 of the Declaration indicated that States shall consult and cooperate in good faith with the indigenous peoples concerned in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them.

Canada was one of several nations that voted against the adoption of the Declaration at the United Nations, stating it had significant concerns with respect to the wording of the Declaration, including, among other issues, the provisions related to: lands, territories and resources; free, prior and informed consent when used as a veto; and self-government without recognition of the importance of negotiations.

## 9.1: PROPONENT'S ASSESSMENT

Where Taseko's assessment of the Project's effects on valued ecosystem components could be related to Aboriginal rights, the Panel has provided an overview of Taseko's assessment in the applicable section of this report. Section 8 of this report discusses the Project's effects on First Nations' current use activities, cultural heritage, intangible archaeology resources, employment and economics and health.

Taseko was directed by the British Columbia Environmental Assessment Office to consult and engage with seven Tsilhqot'in communities and four Northern Secwepemc communities. Taseko included a map in its EIS which provided an overview of the traditional territories and approximate rights and title area of First Nations in relation to the components of the Project (see Figure 8).

During the public hearing, Taseko indicated that through the provincial Environmental Assessment Certificate, it was legally obligated to implement various commitments relating to First Nations. These commitments included measures that may help to mitigate the effects of the Project on Aboriginal rights (see Appendix 4, including Commitments 2.1, 2.2, 2.3, 2.4, 2.8 and 24.3)

In the EIS, Taseko provided an overview of its understanding of the potential or asserted rights and title in the Project area, based on its understanding of case law (i.e. *William* case) and ongoing treaty negotiations. A summary of this information is presented below.

### Tsilhqot'in Nation

Taseko provided an overview of the judgement of Mr. Justice Vickers with respect to the *William* case. In Taseko's view, this decision determined that the Tsilhqot'in Nation had an Aboriginal right to hunt and trap birds and animals as described in the judgement. On this issue, Mr. Justice Vickers stated:

*Tsilhqot'in people have an Aboriginal right to hunt and trap birds and animals throughout the Claim Area for the purposes of securing animals for work and transportation, food, clothing, shelter, mats, blankets and crafts, as well as for spiritual, ceremonial, and cultural uses. This right is inclusive of a right to capture and use horses for transportation and work.*

*Tsilhqot'in people have an Aboriginal right to trade in skins and pelts as a means of securing a moderate livelihood.*

*These rights have been continuous since pre-contact time which the Court determines was 1793.<sup>11</sup>*

However, with respect to the claim of Aboriginal title, Taseko reported that Mr. Justice Vickers concluded that Aboriginal title could not be granted due to the all or nothing plea from the Tsilhqot'in. Taseko stated that Mr. Justice Vickers expressed his opinion that, had the lawsuit been pleaded differently then he probably would have found Aboriginal title for the Tsilhqot'in to over almost half of the Claim Area. A map of the area in which Mr. Justice Vickers found Aboriginal rights and would have found Aboriginal title is provided in Figure 9. Taseko noted that the proposed mine site would be located in the Eastern Trapline area,

<sup>11</sup> *Tsilhqot'in Nation vs. British Columbia*, 2007 BSCS 1700, Executive Summary, page iv-v



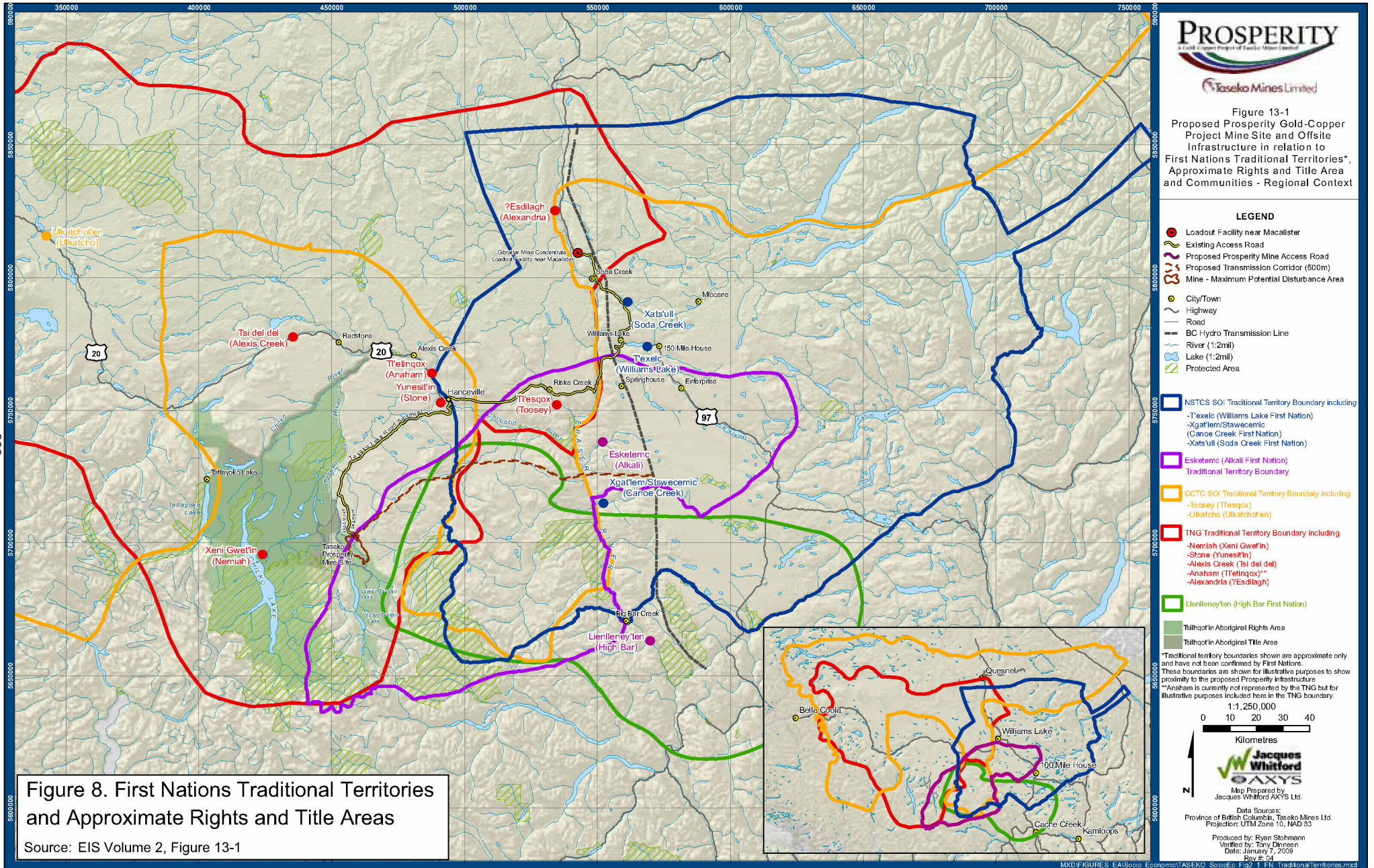


Figure 8. First Nations Traditional Territories and Approximate Rights and Title Areas

Source: EIS Volume 2, Figure 13-1



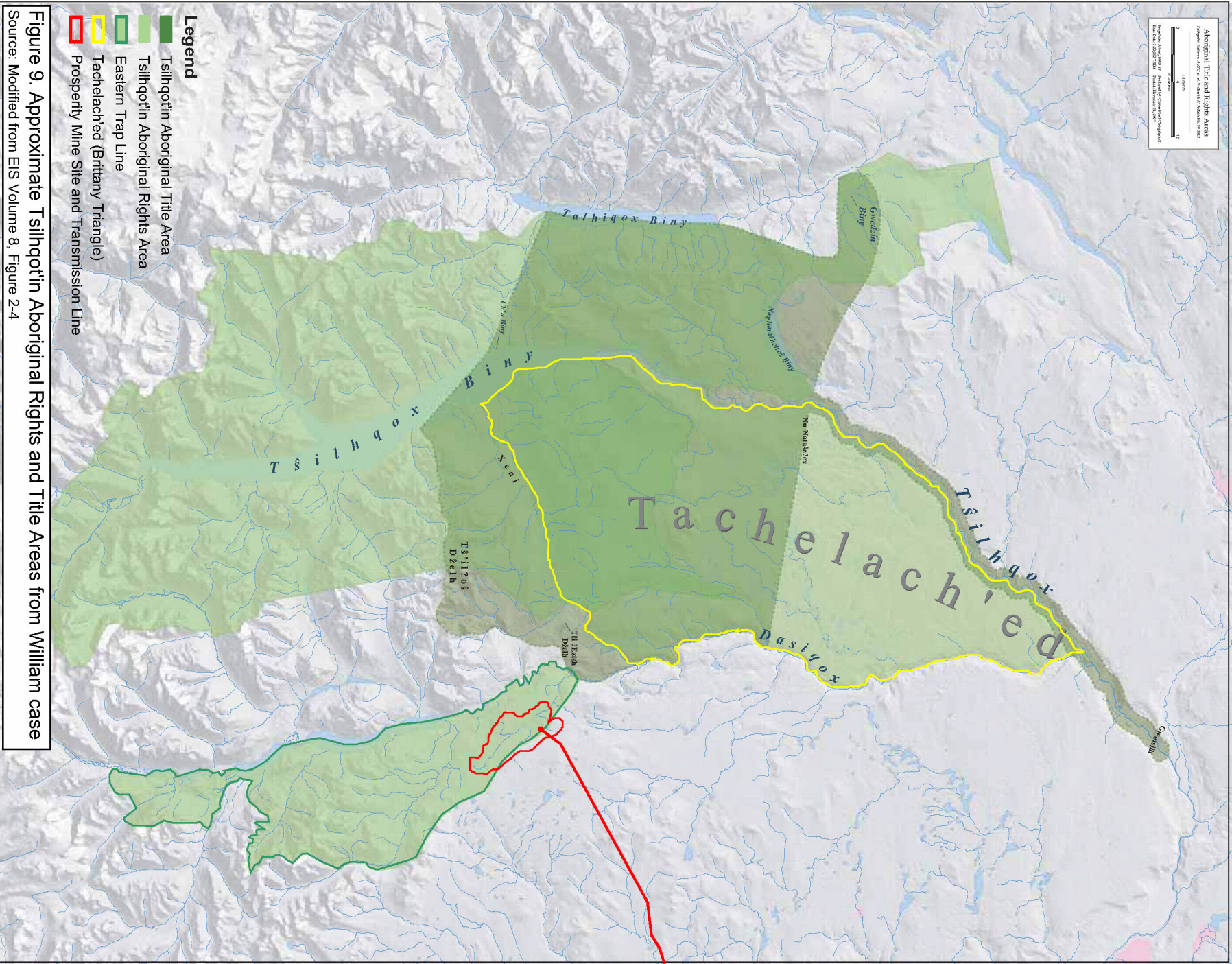


Figure 9. Approximate Tsilhqot'in Aboriginal Rights and Title Areas from William case  
 Source: Modified from EIS Volume 8, Figure 2-4

which was located outside of the area in which Mr. Justice Vickers would have been prepared to find Aboriginal title.

In a submission to the Panel providing comments on the current use of lands and resources for traditional purposes in the Project area, Taseko noted that it was also Mr. Justice Vickers' opinion that none of the Eastern Trapline Territory was used by the Tsilhqot'in people sufficiently to justify a finding of Aboriginal title, although the Court was of the opinion that it was used sufficiently to justify a finding of Aboriginal rights relating to hunting and trapping. In its closing remarks, Taseko further stated that "[t]he Court determined that no portion of the Eastern Trapline Territory, which is where Fish Lake is located, was subject to Aboriginal title because the Tsilhqot'in people did not have a sufficient connection with the land." Taseko went further to indicate that in their opinion, by finding that the Teztan Biny area was not subject to aboriginal title, the Court was implicitly concluding that the area was of lesser ceremonial and cultural significance to the Tsilhqot'in people than the Tachelach'ed (Brittany Triangle) area where the Court would have been prepared to find Aboriginal title.

Regarding the Tsilhqot'in Nation's potential right to fish in Teztan Biny (Fish Lake) asserted in *Baptiste et al. vs. Taseko Mines Ltd*, HMTQ BC and AGC, Taseko filed a statement of defence to the claim on April 24, 2009. In response to the claim that the Project would result in the extinguishment of the Aboriginal right to fish in Teztan Biny, Taseko stated that whatever right to fish that may exist would not be of such a nature as to prevent the Project from proceeding. In addition, in response to the claim that the Project would result in an unjustified infringement on the Aboriginal right to fish in Teztan Biny, Taseko stated that any infringement would be justified in the circumstances as a result of the process, including consultation, that would have to be followed before any authorizations would be granted.

While Taseko assessed the effects of the Project on various valued ecosystem components, and in some instances, took into consideration information provided by First Nations regarding how the Project would affect their current use of lands and resources for traditional purposes, Taseko did not form any specific conclusions regarding the significance of the effects of the Project on established or asserted rights or title. Rather, Taseko reiterated its understanding of the *William* case. With respect to potential Aboriginal title, Taseko stated during the public hearing that the Project was "[i]n essence... borrowing the land for a period of time to extract this ore. The time that we are utilizing the land and returning it is less time than it would take a commercially harvested tree, in all these cut blocks that you see around your territory, to regrow."

With respect to accommodation, in response to questioning from the Panel, Taseko indicated that it raised the subject of Impact Benefit Agreements with the Tsilhqot'in National Government at an early stage. Taseko stated that:

*...several years ago, we discussed that, the idea of an impact benefit agreement with the TNG. And we were told at the time that the TNG's preference was to have a discussion around an IBM [sic] after the environmental assessment process had concluded, that they were not ready, or that they did not think it was the right time to have those discussions.*

Taseko further stated that there was no legal requirement or even a legal definition in British Columbia of what constituted a benefit sharing agreement / impact benefit agreement. Taseko reported that the British Columbia Environmental Assessment Office service policy also stated that while proponents were encouraged to explore benefit sharing agreements

with First Nations, such agreements were not considered pre-conditions to completion of the environmental assessment or a decision by the responsible ministers.

### **Secwepemc Nation**

The British Columbia Treaty Process was described by Taseko as a process of political negotiations between some First Nations communities and the Crown. The main goal of the treaty process was to provide certainty of jurisdiction over land and resources. Through a treaty, the rights and obligations of all parties would be set out, thereby resolving conflicting land ownership between the Crown and First Nation peoples. The British Columbia treaty process was reported to involve a 6-stage process which made up the framework in which modern treaty negotiations in British Columbia would take place.

First Nations in the regional study area involved in the British Columbia treaty process included the members of the Northern Shuswap Tribal Council and Esketemc (Alkali Lake Band). None of the 7 Tsilhq'atin communities or Llenlney'ten (High Bar) were reported to be part of the British Columbia Treaty Process.

#### *Northern Shuswap Tribal Council*

In the EIS, Taseko indicated that the Northern Shuswap Tribal Council represented the Northern Secwepemc te Qulmucw, which comprised the Tsq'escen' (Canim Lake Band), Xat'sull/Cm'etem (Soda Creek/Deep Creek Band), Stswecem'c/Xgat'tem (Canoe Creek Band) and T'exelc (Williams Lake Band). The Northern Shuswap Tribal Council represented the collective interests of these Bands in treaty negotiations with government. Taseko stated that the Northern Shuswap Tribal Council officially declared its statement of intent on January 6, 1994 and its Treaty Framework Agreement on December 10, 1997. The Northern Shuswap Tribal Council was stated to be in Stage 4 of treaty negotiations, meaning parties were involved in negotiating an agreement-in-principle.

Taseko indicated that the Northern Shuswap Tribal Council had made significant progress over the past years and that agreement-in-principle negotiations were scheduled for the near future.

#### *Esketemc (Alkali Lake Band)*

Taseko reported in the EIS that the Esketemc (Alkali Lake Band) was in Stage 4 of treaty negotiations with the Crown. According to Taseko, the Esketemc entered treaty negotiations in 1993. Taseko stated that the Esketemc have asserted that they are descendants of the Secwepemc Nation, that they have Aboriginal title and rights to all land and water resources in their traditional territory, and that they have never surrendered, ceded or sold all or any of their aboriginal title or rights to the Federal or Provincial Crowns.

In response to comments received during the public hearing that Taseko should have considered putting its Project on hold pending resolution of treaty negotiations with the Esketemc (Alkali Lake Band) and Stswecem'c/Xgat'tem (Canoe Creek Band), Taseko stated during its closing comments that there was no legal basis for such a proposition. Taseko stated that during ongoing treaty negotiations, the Crown continues to manage the resources in question, pending resolution of the claim. Taseko cited the *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73 decision in support of this position; reading from the judgement, Taseko stated

*The Crown, acting honourably, cannot cavalierly run roughshod over Aboriginal interests where claims affecting these interests are being seriously pursued in the process of treaty negotiation and proof. It must respect these potential, but yet*



*unproven, interests. The Crown is not rendered impotent. It may continue to manage the resource in question pending claims resolution. But, depending on the circumstances, discussed more fully below, the honour of the Crown may require it to consult with and reasonably accommodate Aboriginal interests pending resolution of the claim.*

Taseko was clear that, in its opinion, the process of consultation and ongoing treaty negotiations did not give First Nations a veto right over whether or not the Project should proceed.

## **9.2: VIEWS OF PARTICIPANTS**

During the public hearing, the Panel heard First Nation members stress the significance of the land to them through the information provided regarding the current use of lands and resources for traditional purposes and regarding physical and cultural heritage in the Project area. A summary of the information received on these issues is provided in Sections 8.2 and 8.3. The Panel recognizes that many of these uses relate to potential or established Aboriginal rights, including fishing, hunting, trapping, gathering medicines, gathering plants and berries, and ceremonial and social uses. The Panel also recognizes that the information provided by First Nations regarding their continued use and occupancy of the area was also related to their connection with the land.

### **Tsilhqot'in Nation**

The Panel heard extensive information from members of the Tsilhqot'in Nation regarding their Aboriginal rights and how their rights were exercised. The Panel was informed that the Tsilhqot'in Nation hold proven Aboriginal rights as defined by the *William* case.

Chief Marilyn Baptiste stated that while the *William* case did not include a finding of Aboriginal title, the decision was under appeal by the Tsilhqot'in, and by both the provincial and federal governments. Further, during the public hearing she indicated that if the proceedings had continued, it was possible that the Court would have granted Aboriginal title to not only the entire Claim Area, but also areas beyond, stating:

*And with our Title and Rights case, I would like to just, again, clarify. As we've been questioned, is this our territory. This is our territory, the Tsilhqot'in territory. And we have proven that time and time again. And, further, Justice Vickers has, yes, he's drawn a boundary to half of the claim area, but he has also clearly drawn that boundary outside the claim area and has advised that it is clear that there is proven title beyond the line, the boundary that he drew. And if we had sat for another 300 to 500 days in court, perhaps at that point he would have been able to give a Declaration of Title to the entire court case claim area, including that area outside the claim.*

During the course of the review, the Panel was also made aware of a statement of claim filed by Chief Marilyn Baptiste (*Baptiste et al. vs. Taseko Mines Ltd, HMTQ BC and AGC*, 2009) asserting an Aboriginal right to fish specifically at Teztan Biny (Fish Lake), on her own behalf, and on behalf of the Xení Gwet'in (Nemíah Band) and all members of the Tsilhqot'in Nation. This asserted right was in addition to the proven rights to hunt and trap in Teztan Biny area. The statement of claim indicated that the members of the Xení Gwet'in and the Tsilhqot'in Nation had a deep and abiding connection to Teztan Biny, as evidenced by the continued fishing at Teztan Biny for sustenance, social and ceremonial purposes. The statement of claim further stated that fishing at Teztan Biny was "as an integral and defining

element of their distinctive culture”. Further, the Tsilhqot’in asserted that the Aboriginal right to fish included the right to the protection and conservation of the cultural, ecological and spiritual integrity of the lands, waters and resources in and around Teztan Biny, as required to sustain the meaningful exercise of the asserted right.

During the course of the public hearing, the Tsilhqot’in Nation provided specific information on how the Project would infringe on its established or potential Aboriginal rights. Sean Nixon, legal council for the Tsilhqot’in National Government, stated during the closing remarks that the established and potential rights of the Tsilhqot’in Nation could be adversely effected and infringed in a number of ways as a result of the Project, including through:

- loss of access to key cultural hunting and trapping areas in Nabas and the surrounding areas, including Nabas Dzelh (Anvil Mountain), Nadilin Yex (mouth of the Taseko River at the north end of Taseko Lake), Gwetex Natel?as (Red Mountain), Cheetah Meadows, Jidizay Biny (Big Onion Lake) and Bisqox (Beece Creek);
- impacts on the populations and habitats of birds, wildlife, fish and plants that support the exercise of Tsilhqot’in rights, such as wild horses, deer, moose, grizzly bears and migratory birds;
- displacement of the Tsilhqot’in people from the area around Teztan Biny (Fish Lake), Y’anah Biny (Little Fish Lake), and Nabas (during mine construction, operation and decommissioning) for decades and eventual permanent displacement from these same areas due to the permanent loss of lakes, streams and wetlands;
- Tsilhqot’in avoidance of areas potentially affected by the Project, including the Dasiqox (Taseko River), due to serious concerns about ongoing contamination; and
- Taseko’s general failure to identify feasible mitigation measures that would address impacts on Aboriginal rights and title, and on Tsilhqot’in current use and cultural heritage in the mine area.

The Panel heard that it was not possible for Tsilhqot’in members to simply ‘go elsewhere’ to practice their Aboriginal rights. In her presentation to the Panel, Shawnee Palmatier noted:

*In my surveys of logging cut blocks for our community of Tl'esqox, we raised time and time again areas of traditional use, areas where we exercised our Aboriginal Rights. The reply from both MoF [Ministry of Forests and Range] and licensees was, "You can practice elsewhere." ... It sounds like that we have a large land base and that there are plenty of areas for us to practice Aboriginal Rights. There are not. The Fish Lake area in Xení Gwet'in territory is the last that's left of our Nation's territory that doesn't have quite the development footprint that the rest of us have. It can't be put to us that we can practice our Aboriginal Rights elsewhere... It cannot be put to us that there are protected areas and parks for us to practice Aboriginal Rights.*

### **Secwepemc Nation**

*Stswecem'c/Xgat'tem (Canoe Creek Band)*

The Stswecem'c/Xgat'tem (Canoe Creek Band) told the Panel that it was a part of the larger Secwepemc Nation, and part of the Northern Secwepemc te Qulmucw. During the public hearing, the Panel received information from the Stswecem'c/Xgat'tem regarding its potential and established Aboriginal rights and title. Dr. Bruce Stadfeld, legal council for the Stswecem'c/Xgat'tem, stated that Stswecem'c/Xgat'tem's Aboriginal rights include a recognized right to hunt and a recognized right to fish, and uncontested rights to trap and harvest plants. It was also made clear that this list did not comprise all of

Stswecem'c/Xgat'tem's Aboriginal rights, but would be the focus for discussions with the Panel.

With respect to Stswecem'c/Xgat'tem (Canoe Creek Band)'s Aboriginal right to fish, Dr. Stadfeld referred to the Supreme Court decisions in *Sparrow* and in *Kapp*, as well as the Government of Canada "Aboriginal Fishing Strategy". The Stswecem'c/Xgat'tem stated:

*(this) sets the context for the fact is that there's an accepted right for Aboriginal people in B.C. to fish. It's accepted by the Federal Government. They don't have to go off to court to prove that right. If they want a commercial right to fish, yes, they do. But this is a right to fish for food, social and ceremonial purposes. It's uncontested.*

Regarding Stswecem'c/Xgat'tem's (Canoe Creek Band) Aboriginal right to hunt, Dr. Stadfeld referred to the British Columbia Court of Appeal decision in *Regina v. Alphonse* [1993] 4 C.N.L.R. 19 (the *Alphonse* case). In that decision, the Court decided that Mr. Alphonse was exercising his unextinguished Aboriginal right to hunt when he shot a deer. While Mr. Alphonse was a member of the T'exelc (Williams Lake Band), Dr. Stadfeld stated that, as per Mr. Justice Vickers decision in the *William* case, Aboriginal rights rest with the Nation and not the Band. Therefore, Stswecem'c/Xgat'tem concluded that the *Alphonse* case decision confirmed the right to hunt for the Secwepemc Nation, not just the T'exelc. Dr. Stadfeld also referred to the provincial government "Hunting and Trapping Synopsis 2009/2010". This document stated "The Ministry also recognizes that Indian people have Aboriginal rights to harvest wildlife for sustenance, that's food, social, and ceremonial purposes, in their traditional areas." The Stswecem'c/Xgat'tem indicated that this was evidence that they, and all First Nations in British Columbia, have a recognized right to hunt.

With respect to Stswecem'c/Xgat'tem's (Canoe Creek Band) treaty negotiations and related asserted Aboriginal title, the Panel heard that Canoe Creek, as part of the Northern Shuswap Tribal Council, were in stage 4 of the treaty process and were negotiating an Agreement-in-Principle. The Stswecem'c/Xgat'tem submitted that this in itself established a strong *prima facie* case for Aboriginal title.

The Stswecem'c/Xgat'tem (Canoe Creek Band) stated that its proven and asserted rights could be adversely effected and infringed as a result of the Project, including:

- increased access as a result of the transmission line would result in significant adverse effects and would interfere with the exercise of Stswecem'c/Xgat'tem 's Aboriginal rights and title; and
- the construction of the transmission line would devalue the economic component of Stswecem'c/Xgat'tem's Aboriginal title.

Stswecem'c/Xgat'tem also stated that they also had serious concerns about how the Project would interfere with their treaty negotiations, including treaty land selections.

*Esketemc (Alkali Lake Band)*

During the public hearing, the Panel heard that the Esketemc (Alkali Lake Band) were engaged in treaty negotiations. The Esketemc traditional area, as filed with the British Columbia Treaty Commission, covered the area from Spout Lake in the northeast to Monmouth Mountain in the southwest (see Figure 8). The Esketemc stated that the lands and resources within this territory had never been surrendered or ceded. The Esketemc territory as defined by the community for treaty negotiation purposes covered an area of approximately 13,458 km<sup>2</sup>, while Esketemc reserve lands comprised about 9,385 acres. The Panel heard that the area used by the Esketemc encompassed a much larger area than that filed for treaty purposes.

During the course of the community hearing sessions with the Esketemc (Alkali Lake Band) and during the closing remarks session, the Panel heard that the Esketemc asserted the following Aboriginal rights:

- the right to travel and to collect foods, medicines and materials as they require;
- the right to hunt and fish and use water resources as needed;
- the rights to gather in sacred areas;
- the right to self-determination and the right to govern themselves and to choose their own preferred way of life;
- the right to a traditional diet and to eat preferred foods;
- the right to health; and
- the right to use these rights to make a livelihood.

The Panel heard that these rights relate to the Esketemc's (Alkali Lake Band) relationship to the land as a steward and that it had a responsibility to protect the land for current and future generations. As such, these rights of access, use and care were described to be self evident to the Esketemc. The Esketemc relationship to the land was also stated to have cultural, sacred and spiritual and historic dimensions.

The Panel heard that the treaty process was progressing, but that the Esketemc (Alkali Lake Band) had a number of unresolved issues relating to land use in its traditional territory. During the *in camera* session held with the Esketemc, the Panel was presented with information that had been tabled in the treaty process, indicating the location of several areas classified as being essential to the future of Esketemc. It was further stated that these parcels of land were under threat of immediate disposition and/or development for the provincial government or other developers. Ms. Norma Sure, Chief Negotiator for the Esketemc, stated "[t]hese areas are seriously impacted by present non-Esketemc uses and it is unknown the extreme impact this mine would cause our already inability to properly exercise our rights."

The Panel heard from the Esketemc (Alkali Lake Band) that it was concerned about the cumulative impacts of the Project on their asserted Aboriginal rights and title from activities taking place within all areas of their traditional territory.

The Esketemc (Alkali Lake Band) stated that the funding provided by the Canadian Environmental Assessment Agency, coupled with the lack of funding provided by Taseko, had resulted in insufficient resources for it to conduct a comprehensive traditional use study and had significantly impaired its ability to participate in the panel review process.

*Northern Shuswap Tribal Council*

The Northern Shuswap Tribal Council submitted that there was overlapping territory between the Tsilhqot'in Nation and the Northern Secwepemc te Qulmuw. The Northern Shuswap Tribal Council stated that the Tsilhqot'in National Government and/or the Tsilhqot'in Nation, had sometimes asserted rights and interests within the traditional territory of the Northern Secwepemc te Qulmuw, including territory to which the Northern Secwepemc claimed its right to exclusivity was strong.

During the public hearing, various Secwepemc chiefs presented to the Panel and spoke of the existence of Aboriginal rights and title in their traditional territory. The chiefs spoke of the Project affecting the Secwepemc right to hunt and fish. Chief Nelson Leon of the Sexqeltqin

First Nation (Adams Lake Band) stated that the Canadian Government has denied Aboriginal title. He stated

*For as long as we've been here, they have denied our Title. Because, to recognize it, is to recognize the responsibility to reconcile it. And that Title has various components, including ownership, the economic component, and the right and authority to decide what that land is used for. The government has denied our Title; said it doesn't exist. And, yet, they set up a treaty process. As part of that treaty process, we'll extinguish a title that doesn't exist. We'll grant you modified Rights to a limited land base. So I would propose that title exists. I know it in my heart, in my mind, in my spirit. This I know.*

The various chiefs of the Shuswap Nation also submitted that the First Nations Energy and Mining Council had developed Impact Benefit Agreement guidelines and policies for communities to engage in a process that would facilitate communities, industry and government working together in allowing interests to be fairly represented.

*T'exelc (Williams Lake Band)*

The T'exelc (Williams Lake Band) were reported to be part of the larger Secwepemc Nation and the Northern Secwepemc te Qulmucw. While the T'exelc participated in the panel review process, it did not participate in the public hearing as a result of capacity issues which were communicated to the Panel in a letter on March 13, 2010. In the same letter, the T'exelc provided the Panel with information outlining its potential and established Aboriginal rights and title.

As outlined in its written submission, the T'exelc (Williams Lake Band) asserted constitutionally protected Aboriginal title to its territory, as well as Aboriginal rights throughout its territory. The traditional territory of the T'exelc is outlined in Figure 8. Within this territory, the T'exelc stated that they hold Aboriginal rights to hunt, fish, trap, pick berries and medicines, harvest timber and engage in spiritual and ceremonial practices. The T'exelc stated that its Aboriginal rights have been recognized and upheld by the British Columbia Court of Appeal as a result of the *Alphonse* case, and that the provincial Crown had recognized the Band's right to hunt throughout its territory.

The T'exelc (Williams Lake Band) indicated that the Project, and in particular, the transmission line and the transportation of concentrate to the load-out facility, would infringe on its ability to practice its Aboriginal rights and on its Aboriginal title. In particular, the following potential impacts were highlighted:

- negative impacts on birds and wildlife that are hunted and trapped by community members, including:
  - fragmenting wildlife habitat by disrupting migration patterns of birds and wildlife that are hunted and trapped by community members;
  - increased wildlife mortality from increased motor vehicle traffic; and
  - increased bird mortality from collisions with the transmission line;
- negative impacts on water quality and quantity;
- increased access into the region for non-First Nation hunters, thus increasing the competition for and pressure on bird and wildlife populations;
- potential deterioration and destruction of fishing activity where Band members like to fish; and
- disruption to cultural and spiritual activities along the transmission line route, which would pass through or near sacred areas.



The T'exelc (Williams Lake Band) stated that Taseko and the Canadian Environmental Assessment Agency had not provided sufficient funding to conduct a traditional use study and that this had significantly impaired its ability to participate in the review panel process. As such, the T'exelc stated that the effects of the Project on the exercise of its community rights would not be adequately considered in the assessment.

### 9.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS

During the course of the public hearing, the Panel heard reference to three different categories of Aboriginal rights: those that have been proven by the Court ("established rights"), those that had not been challenged by government ("uncontested rights"), and those that had not yet been proven in the Court ("asserted" or "potential" rights). The Panel notes that its Terms of Reference were very clear that it has no mandate to make determinations regarding the validity of Aboriginal rights or title claims asserted by First Nations. Therefore, as it has no mandate to determine the validity of Aboriginal rights, the Panel finds that it must accept these rights as presented and has considered the effects of the Project on all categories of rights.

In reaching its conclusions on the effects of the Project on Aboriginal rights and title, the Panel considered the following factors to be particularly relevant:

- in general, First Nations stated that section 35 of the *Constitution Act, 1982* provides protection for their Aboriginal rights;
- First Nations stated that they were being displaced from the land and this was affecting their ability to practice their Aboriginal rights;
- in the *William* case, the Tsilhqot'in were granted the right to hunt and trap birds and animals throughout the Claim area; with respect to title, Justice Vickers ruled that had the lawsuit been pleaded differently, he probably would have found Aboriginal title for over almost half of the Claim Area;
- the proposed mine site would be located within the Claim Area with respect to Tsilhqot'in Aboriginal rights to hunt and trap, but would be located within the Eastern Trapline area which was outside of the potential title area;
- in the claim *Baptiste et al. vs. Taseko Mines Ltd, HMTQ BC and AGC*, the Tsilhqot'in asserted the right to fish in Teztan Biny (Fish Lake) and to the protection and conservation of the cultural, ecological and spiritual integrity of the lands, waters and resources in and around Teztan Biny, as required to sustain the meaningful exercise of the asserted right;
- the Esketemc (Alkali Lake Band) and the Stswecem'c/Xgat'tem (Canoe Creek Band), members of the Secwepemc Nation, reported that they were in stage 4 of the 6-stage British Columbia Treaty Process;
- the Secwepemc stated they had a proven Aboriginal right to hunt in accordance with the *Alphonse* case and a proven Aboriginal right to fish in accordance with Supreme Court of Canada decisions in *Sparrow* and *Kapp*; and
- the Stswecem'c/Xgat'tem (Canoe Creek Band) also stated they had uncontested Aboriginal rights to trap and harvest plants.

#### **Tsilhqot'in Nation**

The Panel notes that the established Tsilhqot'in rights to hunt and trap in the mine site area would be directly affected as they would no longer be able to exercise those rights until after the mine closed and the land was reclaimed. Even then, the restored landscape would be

permanently altered. The Panel also heard that it is unlikely that the Tsilhqot'in would use the area to exercise their Aboriginal rights due to the perception of contamination. The Tsilhqot'in consistently reiterated their spiritual connection with the land, the relationship between the land and current use activities for traditional purposes and how Project related changes would negatively affect this spiritual connection. Based on this information, the Panel has determined that the effect of the Project on the established Tsilhqot'in Aboriginal rights would be irreversible.

The Panel has also considered Taseko's proposed mitigation measures including the establishment of a no hunting zone for the Project area. The Panel believes that this proposed mitigation would limit the ability of First Nations to practice their established Aboriginal right to hunt and trap in the Project area and may impact their Aboriginal rights to hunt and trap in other areas within the territory due to increased pressures on wildlife populations elsewhere. The Panel also notes that no compensation has been offered by Taseko other than a reference to the recently announced British Columbia revenue sharing policy with First Nations.

**The Panel concludes that the Project would result in a significant adverse effect on established Tsilhqot'in Aboriginal rights as defined in the *William* case.**

On the matter of the potential right to fish in Teztan Biny (Fish Lake), the Panel notes that the lake would be destroyed by the mine and therefore the right to fish could no longer be exercised. If successful, the proposed replacement lake, Prosperity Lake, would not represent like for like replacement. Additionally, the Panel heard that the Tsilhqot'in would be unlikely to fish there due to the fear that the fish would be contaminated.

**The Panel concludes that the Project would result in a significant adverse effect on the potential Tsilhqot'in Aboriginal right to fish in Teztan Biny (Fish Lake).**

As a result of the *William* case, the Tsilhqot'in have established Aboriginal rights, but do not have established Aboriginal title. However, the Panel notes the Tsilhqot'in are appealing the decision of Mr. Justice Vickers and have indicated that they have potential Aboriginal title to the Teztan Biny (Fish Lake) area. Therefore, the Panel has considered and assessed the effects of the Project on the potential Aboriginal title.

Until the start of the closure period, the Project would displace the Tsilhqot'in from land that they asserted to be part of their traditional territory. Even with reclamation, the landscape at the proposed mine site would be permanently altered. Many of the values that First Nations associate with the Teztan Biny (Fish Lake) area would be lost and the effects would be irreversible. In the Panel's view, the values of the land to the Tsilhqot'in would be considerably diminished. Further, if the Project proceeds, it could result in the loss of evidence of continuous occupation and could therefore potentially affect their claim to Aboriginal title. Archeological artifacts not protected under the provisions of the provincial *Heritage Conservation Act* or by mitigation measures proposed by Taseko would be particularly at risk.

**The Panel concludes that the Project would result in a significant adverse effect on Tsilhqot'in Aboriginal title that could be granted.**

**Secwepemc Nation**

Members of the Secwepemc Nation stressed the importance of the land, current use practices and spiritual connections with geographical areas within the proposed transmission line routing. Members spoke about the significance of the Fraser River for fishing and ceremonial purposes. They spoke about past uses of the land and evidence of those uses including potential village sites on both sides of the Fraser River where the proposed transmission line would cross.

The proposed transmission line, which would cross the asserted territory of the Secwepemc Nation, would have a negative effect on Secwepemc Aboriginal rights to hunt and harvest plants and could potentially negatively affect areas of cultural importance to the Secwepemc. It would be unlikely to affect the right to fish because the transmission line poles could be located in areas outside of water bodies.

Given that the Secwepemc people have continued to exercise their Aboriginal rights in the area and that the development may affect their ability to continue exercising their Aboriginal rights due to increased access, loss of cultural connectivity with the land, and direct impacts to wildlife, the Panel finds that the effects of the transmission line on the Secwepemc may be long-term and potentially irreversible. The Panel also notes that, similar to the Tsilhqot'in, Taseko has not proposed any compensation to offset these losses.

However, the Panel also notes that the centerline for the transmission line was not chosen at the time of the public hearing. Given Taseko's commitment to undertake further studies in the area of the centreline and to work with First Nations to identify areas of importance and to adjust the centerline routing to minimize potential environmental effects (Appendix 4, Commitment 24.3), the Panel finds that the potential effects from the transmission line can be minimized. The Panel finds that in order to minimize the potential for significant adverse effects to the Secwepemc Nations' Aboriginal rights, Taseko must ensure that every effort is made to implement mitigation measures as proposed and to work with the Secwepemc Nation in implementing these measures to ensure that their ability to practice their Aboriginal rights is maintained when considering the final placement of the transmission line.

**The Panel concludes that, provided the planned mitigation to avoid construction in sensitive locations would be applied in cooperation with the Secwepemc, the Project would not result in a significant adverse effect on established or potential Secwepemc rights.**

The transmission line would create a 30 m to 80 m wide right-of-way through the Esketemc (Alkali Lake Band) and Stswecem'c/Xgat'tem (Canoe Creek Band) asserted traditional territories, as presented to the British Columbia treaty process. Given that the treaty process has not yet reached the stage of land designation, it is difficult for the Panel to determine

how the development of a transmission line through the asserted traditional territories of Esketemc and Stswecem'c/Xgat'tem might affect their discussions as well as the selection of land that would be designated as treaty lands for each Nation. However, the Panel is also aware that there is potential for the loss of evidence regarding continued use of the land and historical resources from the development of the proposed transmission line right-of-way and notes that the development of the line may potentially affect treaty discussions if the land in question was no longer being utilized by these Nations.

With respect to the Esketemc (Alkali Lake Band) and the Stswecem'c/Xgat'tem (Canoe Creek Band), the Project would have a direct effect on their Aboriginal title claim as the transmission line would reduce the availability of land for selection during the treaty process. Depending on the size of the land settlement through the treaty process, the Project may result in a significant adverse effect on Esketemc and the Stswecem'c/Xgat'tem title.

**The Panel concludes that, depending on the size of the land settlement through the treaty process, the Project may result in a significant adverse effect on any such title that could be granted to the Esketemc (Alkali Lake Band) and the Stswecem'c/Xgat'tem (Canoe Creek Band).**

## SECTION 10: OTHER ISSUES

Under the scope of the assessment in the Panel’s Terms of Reference identified a number of factors that the Panel must consider in accordance with the definition of “environmental effect” and subsections 16(1)(a) to (e) and 16(2) of the *Canadian Environmental Assessment Act*. While many of these issues have been addressed in the preceding sections of this report, this section focuses on the following:

- capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future;
- extent to which biological diversity (e.g. ecosystems and/or species diversity) would be affected by the Project;
- any change to the Project that may be caused by the environment;
- measures to enhance any beneficial environmental effects; and
- proposal for contingency plans to address malfunctions or accidents that may occur in connection with the Project.

Further, as required by the EIS Guidelines, this section also includes a consideration of environmental management plans.

### 10.1: CAPACITY OF RENEWABLE RESOURCES

The Panel has reviewed the effects of the Project on each of the renewable resources in previous sections of this report. It has concluded that there would be significant adverse effects on fish and fish habitat (Section 6.4) and that there would be a significant adverse cumulative effect on the South Chilcotin grizzly bear population and fish and fish habitat (Section 6.11). Therefore it has focussed its discussion on the capacity of these renewable resources to meet the needs of the present and those of the future.

#### 10.1.1: PROPONENT’S ASSESSEMENT

Taseko determined that there would be no significant adverse effects to renewable resources as a result of the Project.

Taseko was of the opinion that with the implementation of the fish and fish habitat compensation plan, the Project would not have a significant adverse affect. Taseko concluded that the fish and fish habitat compensation plan would have a net positive benefit by contributing more lake habitat. Taseko’s fish and fish habitat compensation plan was designed to maximize recreational fishing values for anglers in compliance with British Columbia Ministry of Environment policy and guidance.

While it was acknowledged that the mine would have a negative impact on the use of resources at the mine site, Taseko proposed that reclamation in the closure and post-closure phases would promote the return of wildlife and habitat features to the reclaimed mine site, thus contributing to the capacity of renewable resources to support the needs of the present and those of the future.

#### 10.1.2: VIEWS OF PARTICIPANTS

The views of participants on the subjects of fish and fish habitat and on grizzly bears are presented in Sections 6.4, 6.7 and 6.11 and are not repeated here.

**10.1.3: PANEL’S CONCLUSIONS AND RECOMMENDATIONS**

The Panel notes that the Project would result in the loss of approximately 90,000 rainbow trout in the Teztan Yeqox (Fish Creek) watershed. The fish and fish habitat compensation plan, if successful, would result in a replacement of approximately 20,000 rainbow trout in Prosperity Lake. First Nations catch fish in the Teztan Biny (Fish Lake) area for sustenance and for ceremonial purposes and indicated that they would not likely fish in Prosperity Lake due to fear that the fish would be contaminated. There was considerable uncertainty about the sustainability of the fish and fish habitat compensation plan in that it would likely require ongoing maintenance and would not replace the fish that would be lost. First Nations stated they fished in the area lakes to supplement their food when the salmon fishery was low. Given the concerns brought before the Panel about the sustainability of the salmon fishery in the Fraser River system, there was likely to be more demand for lake fish for sustenance.

With respect to grizzly bears, the Panel has concluded that the South Chilcotin population, which is already threatened in the region from past activities, is not likely to be sustainable in the future due to the cumulative effects of the Project in combination with reasonably foreseeable future forestry activities. The grizzly bear is an important species for its intrinsic value, its spiritual value to First Nations and its value to tourism in the area. A further reduction in the population would mean that it may no longer be present for future generations to enjoy.

**The Panel concludes that Project would result in the inability of the fisheries resource in the Teztan Yeqox (Fish Creek) watershed and the South Chilcotin grizzly bear population to meet the needs of present and future generations.**

**10.2: BIODIVERSITY**

**10.2.1: PROPONENT’S ASSESSEMENT**

Taseko assessed potential impacts to biodiversity by studying individual valued ecosystem components (see Section 6) using existing legislation, and local land use and environmental management plans as guidance.

Taseko predicted that the potential effects to biodiversity would be minimal as it predicted no significant adverse affects as a result of the Project. In the context of habitat fragmentation and disturbance at the mine site, effects were predicted to be considerable. However, when assessed at the regional level, biodiversity would not be substantially affected.

Taseko recognized the importance of rare plants as key components of species-level biodiversity. Taseko concluded that the rare moss *Schistidium heterophyllum*, which was stated as being critically vulnerable, would be directly and detrimentally affected by the Project. By way of mitigation, Taseko planned to relocate the basalt boulders hosting populations of *S.heterophyllum* to suitable sites outside the mine footprint. As a result of mitigation, Taseko proposed to maintain the population of this rare plant.

Taseko reached the conclusion that there would be no significant adverse effects from the Project following mitigation and therefore, biodiversity would not be affected.

## 10.2.2: VIEWS OF PARTICIPANTS

Fisheries and Oceans Canada expressed concern in its submission to the Panel that Taseko may have underestimated the number of spawning pairs needed from the hatchery and outlet program to maintain the genetic line of Teztan Biny (Fish Lake) rainbow trout. The strength or resiliency to avoid disease in the trout in Teztan Biny was largely dependent on the genetic diversity of that population. That is, genetic diversity would contribute to the overall biological diversity of the system. However, Fisheries and Oceans Canada noted in its written submission to the Panel for the public hearing that “it is not possible to measure...how well the Fish Lake population will perform in a different environment” as the fish in Teztan Biny may have developed unique characteristics adapted to the Teztan Biny environment. Therefore, Fisheries and Oceans Canada expressed uncertainty as to the success of Taseko’s plan with respect to the maintenance of biodiversity.

Similarly, the Panel heard from Environment Canada concerning the wildlife habitat compensation plan. In response to questioning by the Panel concerning the level of habitat compensation necessary to ensure the protection of biological diversity, Environment Canada noted that the goal of a proposed wildlife habitat compensation plan should be to sustain the populations that had been identified and were predicted to be affected by the proposed mine. However, Environment Canada noted at the topic specific hearing sessions that at the environmental assessment stage, there was uncertainty regarding what species could be effected, and at what level. Therefore, it indicated that it could not assess or recommend what level or ratio the wildlife habitat compensation plan should strive for in offsetting potential adverse impacts.

With regards to the genetic diversity of the rainbow trout in Teztan Biny (Fish Lake), a professor of zoology at the University of British Columbia submitted a manuscript to the Panel indicating that there may be more evidence than previously thought that the fish in Teztan Biny were genetically and morphologically distinct. Overall, the report indicated that Teztan Biny ranked fourth out of 27 populations in British Columbia in terms of a combined score of genetic and morphological diversity and distinctiveness.

Dr. Gordon Hartman, on behalf of the Tsilhqot’in National Government, indicated that there was uncertainty as to the potential viability of the proposed fish and fish habitat compensation plan to sustain the rainbow trout found in Teztan Biny (Fish Lake). Greater detail on his views can be found in Section 6.4.

Wayne McCrory, on behalf of the Friends of the Nemaiah Valley, submitted a report on the conservation of grizzly bear habitat within the Xení Gwet’in Caretaker Area. He stated that grizzly bears should be used as an indicator species for the health of the ecosystem in light of climate change. In his view, the most effective way to maintain biodiversity was to maintain large tracts of intact land. Furthermore, during the public hearing, he stated that the largest threats to wilderness values would come from the Project. The maintenance of grizzly bear habitat would serve to protect almost all other species within it.

The Tsilhqot’in Nation expressed concern that the proposed mine would further exacerbate declining biodiversity in the region. The cause of a loss in biodiversity values was believed to be mainly from the forest industry, recent large forest fires in the Tachelach’ed (Brittany Triangle) area, and climate change. The Tsilhqot’in stated that the preservation of Teztan Biny (Fish Lake) and Nabas was, therefore, all the more important as wildlife would seek refuge there.

In a paper submitted by MiningWatch Canada as part of its submission for the topic-specific hearing sessions entitled "Why Bartering Biodiversity Fails" (2009), the authors offered the opinion that the idea of compensation for losses in biodiversity was a technically unrealistic, symbolic policy. In the authors' opinion, the proliferation of no net loss policies, therefore, could not be relied upon to deliver promises of sustainable development. Furthermore they noted that management of biodiversity values should take into account "traditional ecological knowledge and/or spiritual or ceremonial requirements for the resource."

Bruce Barry, on behalf of the Esketemc (Alkali Lake Band), addressed the issue of biodiversity and its importance to the well-being of First Nations communities. He noted that the lands where the proposed transmission line would be installed were being used for traditional purposes, and that First Nations intended to continue to use these areas. To this end he stated during the public hearing session in Alkali Lake "[t]he evidence of the importance of this community's right to maintain and protect its language, culture, and traditional practices, is intimately tied to its ability to utilize its traditional places of hunting, gathering, and fishing."

### 10.2.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS

Biological diversity was described in the Canadian Environmental Assessment Agency's "Guide on Biodiversity and Environmental Assessment" as "the variety of species, the genetic composition of species and communities, ecosystems and ecological structures, functions and processes at all levels."<sup>12</sup> The Panel has focussed its consideration of the Project's effects on biodiversity by examining the implications of effects on Teztan Biny (Fish Lake) rainbow trout, the South Chilcotin grizzly bear population and an endangered moss, *S. heterophyllum*.

In reaching its conclusions on biodiversity, the Panel considered the following factors to be particularly relevant:

- there was uncertainty regarding the genetic distinctiveness of the rainbow trout in Teztan Biny (Fish Lake);
- rainbow trout were reported to be a common species in the Cariboo-Chilcotin region;
- there was disagreement on the potential effects of the Project on wildlife species, including those considered threatened, such as the grizzly bear; Taseko concluded that habitat fragmentation and disturbance at the mine site would be considerable; however, at the regional level, biodiversity would not be substantially affected;
- Taseko concluded that the effects of the project on most selected key indicator species would likely be negligible following post-closure reclamation; and
- Taseko recognized the potential effects to the endangered moss *S. heterophyllum* and proposed to relocate the boulders hosting populations to suitable sites outside the mine footprint.

Questions were raised about whether the trout in Teztan Biny (Fish Lake) were genetically distinct. Fisheries and Oceans Canada and Dr. Gordon Hartman noted that it was uncertain how the trout salvaged from Teztan Biny would perform in the new environment provided by Prosperity Lake, as they may have developed unique characteristics in Teztan Biny. The Panel has concluded that the Project would have a significant adverse effect on the fish in

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<sup>12</sup> This reference guide is available on the Canadian Environmental Assessment Agency's website at: [http://www.ceaa-acee.gc.ca/Content/D/A/C/DACB19EE-468E-422F-8EF6-29A6D84695FC/CEAA\\_19E.pdf](http://www.ceaa-acee.gc.ca/Content/D/A/C/DACB19EE-468E-422F-8EF6-29A6D84695FC/CEAA_19E.pdf)



Teztan Biny and that the Project, in combination with the potential future mine life expansion, would also have a significant adverse cumulative effect on fish and fish habitat. Nevertheless, the Panel notes that rainbow trout are a common species in the Cariboo-Chilcotin region and a loss of the Teztan Biny population would not have an overall significant adverse effect on the biodiversity in the region.

With respect to grizzly bears, the Panel notes that participants expressed the importance of maintaining grizzly bear habitat in the Project area. It was noted that maintaining large tracts of intact land would protect grizzly bears and all other species. The Panel notes that there was some uncertainty about the Project's effects on grizzly bears and has concluded that the effects of the Project in combination with other past, present and reasonably foreseeable future forestry harvesting activities would result in a significant adverse cumulative effect on the South Chilcotin grizzly population. However, the Panel also notes that at a broader regional scale, the total affected area would be relatively small. Further, the Panel notes that while the South Chilcotin grizzly population is nearing the endangered level, the population of grizzly bears at the provincial level is more stable. Consequently, the Panel finds that the overall effects on biodiversity due to a possible further reduction in the South Chilcotin grizzly bear population would not be considered significant.

The Panel heard that the moss, *S. heterophyllum*, was considered to be at the limit of its range, as it was represented by only a few specimens; for these reasons, it was considered to be endangered in the region. The Panel notes that Taseko has proposed to move the boulders hosting the moss and considers this to be an acceptable mitigation measure to protect this species.

**The Panel concludes that the Project would not result in a significant adverse effect on biodiversity.**

#### **RECOMMENDATION 20**

If the Project proceeds, the Panel recommends that Taseko commit to monitoring the transplanted *Schistidium heterophyllum* populations and the implementation of appropriate adaptive management measures to ensure its survival.

### **10.3: EFFECTS OF THE ENVIRONMENT ON THE PROJECT**

#### **10.3.1: PROPONENT'S ASSESSEMENT**

Taseko considered 5 types of natural environmental issues or events that could have an effect on the Project: climate change; extreme weather; forest fires; the potential amplifying effect of the mountain pine beetle; and seismic activity.

Climate change was taken into consideration in Taseko's assessment of the site water balance. Taseko stated that the Project design included built in mitigation measures to maintain the site water balance in both extreme wet and dry years. Taseko noted that predictions for changes in climate were not conclusive; therefore, it incorporated flexibility in its mitigation measures. More details of the sensitivity analysis and mitigation measures proposed for the site water balance can be found in Section 6.2. Climate change was not predicted to have a significant effect on the Project.

Taseko proposed to mitigate the effects of severe rainstorms and related surface runoff in three ways:

- by designing the tailings storage facility to contain a flood volume of a 72-hour storm event;
- by constructing water management structures designed to manage a return-period event longer than the duration of mine operation; and
- by working with the Ministry of Transportation and Infrastructure and any applicable lease holders, as necessary, to address impacts on small bridges and culverts.

Severe rainstorms were also considered in Taseko's assessment of dam safety, as outlined in Section 10.5. In the event of flooding of Prosperity Lake during construction and operations, water would be released via a spillway to Wasp Lake and ultimately into Bisqox (Beece Creek). Taseko indicated that the diverted water into Bisqox would equate to approximately 4% of the mean annual discharge, which was considered to be insignificant. As the spillway would be designed for operational and emergency measures, Taseko proposed to decommission it at closure, when water would flow through a spillway into the tailings storage facility, which in turn would flow to Pit Lake for eventual discharge to lower Teztan Yeqox (Fish Creek).

High levels of snowfall could impede the movement of equipment on the access road and at the mine site, and could reduce vehicle traction and visibility. Additionally, buildings experiencing large accumulations of snow could have structural damage or collapse. Taseko proposed to mitigate these impacts in the following ways:

- by following Part 4 of the Building Code;
- by working with Ministry of Transportation and Infrastructure and any applicable lease holders to remove excess snow on roadways and active mining areas by:
  - spreading crushed aggregate on roads for improved traction;
  - developing operating protocols to ensure safety during periods of reduced visibility;
  - using cable stands to elevate pit equipment electrical cable from snow and ice; and
- designing buildings to meet building code requirements to withstand roof loading from snow and rain.

Taseko noted that high-velocity winds could create large waves in the tailings storage facility and damage structures and power lines. Taseko stated it would mitigate these effects by following Part 4 of the Building Code and by developing the tailings storage facility with large tailings beaches to keep waves at a distance from the embankments in addition to maintaining a minimum 1 m wave-run-up protection above the supernatant pond in the tailings storage facility.

Droughts and periods of significant reductions in the accumulated annual rain and snowfall would decrease the dilution of mine discharge waters into the receiving environment in the post closure, as well as increasing the risk of experiencing low-level effects to aquatic receptors due to changes in water quality. Taseko stated it would mitigate these effects by:

- designing the tailings storage facility to have a minimum pond volume with an operating buffer;
- diverting excess water from the eastern part of the Teztan Yeqox (Fish Creek) catchment during consecutive dry years; and

- anticipating when to conduct water quality monitoring to provide opportunities to develop and implement appropriate treatment strategies prior to releasing discharge water.

A forest fire could affect the mine site area in terms of loss of infrastructure and operating delays, as well as potentially damaging or destroying bridges along the access roads. Taseko also noted that extensive dead timber due to the mountain pine beetle could increase the risk and intensity of fire. Taseko proposed several mitigation strategies for these effects. The proposed health and safety system for the mine would include fire-fighting equipment as well as employee awareness training. Further mitigation would include having water pumps and fire-fighting equipment on site, removing vegetation around infrastructure, building bridges with steel sub-structures, having backup generators, and having a spare transmission line conductor.

### 10.3.2: VIEWS OF PARTICIPANTS

In its comments during the review of the EIS, Fisheries and Oceans Canada stated that Taseko did not account for climate change and potential impacts to the proposed fish and fish habitat compensation plan, particularly the spawning channels to Prosperity Lake. Transport Canada also noted during the public hearing that should an event related to climate change occur, Prosperity Lake could evaporate at a faster rate than its inflows, thereby affecting the water levels in the lake.

Throughout the review, including the public hearing, Natural Resources Canada provided comments on earthquakes and seismic hazards in the Project area. Key issues raised included regional seismic hazards and ensuring the embankments were appropriately designed for earthquakes. With respect to the seismic hazard classification, Natural Resources Canada was of the opinion that Taseko had underplayed the potential regional seismic hazard. While Taseko had predicted the Project area to be seismically stable, Natural Resources Canada classified the region as moderate to moderately high seismic hazard based on the 2005 National Building Code of Canada. Natural Resources Canada also stated that the methodology used in the assessment of Project component infrastructure was inadequate and should be updated. However, following further discussions with Taseko, Natural Resources Canada was satisfied that the issues raised during its review of seismic hazards were satisfactorily addressed by Taseko.

First Nations also expressed concern about earthquakes in the region. One individual recounted a story from the elders who experienced 2 tremors in the area around the mine site. More frequently, however, the Panel heard about fear of potential contamination of the Dasiqox (Taseko River) should an earthquake cause a failure of the main embankment.

The Panel also heard from potentially affected First Nations about the effects of climate change on the rivers and forests and subsequently the fish and wildlife. First Nations Chiefs and elders recounted first-hand experiences of declines in the quantity of berries available for harvest, particularly along the proposed transmission line corridor. In general, First Nations expressed concerns that climate change was already beginning to impact their way of life. In relation to the Project, the First Nations indicated that they did not understand how Taseko planned to mitigate for climate change.

During the public hearing, the Panel heard about recent wildfires in 2003 and 2009 that destroyed much of the Tachelach'ed (Brittany Triangle) area, north-west of the proposed

mine site. These examples were brought forward as information of the impacts of climate change and mountain pine beetle that were occurring in the Project area. Furthermore, First Nations reported their efforts to protect their traditional territories, in particular the Xení Gwet'in Caretaker Area, and noted that one of the best ways to protect the land, the wildlife, and the water from the potential impacts to climate change was to leave large, intact forested areas undisturbed. The greater the fragmentation, they stated, the larger the impacts climate change would have. The Project would contribute, in their view, to fragmentation and ultimately, climate change.

### **10.3.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

With respect to climate change, the Panel has examined the effects of extreme precipitation events in Section 6.2 and has concluded that Taseko's water management plan includes provision for various scenarios. Climate change and its effects are widely known to introduce variable changes to weather patterns that are often difficult to predict. The Panel finds that while uncertainties with regard to variations in weather patterns brought about by climate change would make the implementation of mitigation measures more challenging, the mitigation measures and commitments to adaptive management proposed by Taseko would be sufficient to ensure that effects of climate change on the Project would be minimal.

With regards to forest fires, the Panel finds that the conclusions reached by Taseko, including proposed mitigation measures, are reasonable to minimize the potential effects of forest fires on the Project. The Panel feels that given the degree of impact from logging activity and the mountain pine beetle infestation, the area is still at an increased risk for forest fires. Should the Project proceed, the Panel notes the importance of mitigation measures and the implementation of strict environmental management procedures to ensure that the potential effects of forest fires on the Project are minimized.

On the matter of embankment failure caused by earthquakes, the Panel notes that Taseko has committed to construct the embankments according to the Canadian Dam Association Guidelines and Part 4 of the Canada Building Code. Natural Resources Canada has agreed with Taseko's earthquake design basis and the seismic hazard classification for the area. The Panel concludes that Taseko has adequately addressed the matter of earthquakes and seismic hazards in its proposed embankment design.

**Panel concludes that the effects of the environment on the Project would not be significant.**

## **10.4: MEASURES TO ENHANCE ANY BENEFICIAL ENVIRONMENTAL EFFECTS**

### **10.4.1: PROPONENT'S ASSESSEMENT**

Taseko concluded that there would be beneficial environmental effects from the Project following mitigation measures. In particular, Taseko indicated that the fish and fish habitat compensation plan and the wildlife habitat compensation plan, which are discussed in Sections 6.4 and 6.7 of this report respectively, would result in beneficial effects.

In discussing its proposed plan to enhance beneficial environmental effects, Taseko reiterated its commitment in the provincial Environmental Assessment Certificate, which stated "Taseko is committed to ensuring the entire project makes a net positive contribution to sustainability of lands, communities, resources, and ecosystems over the long-term" (see Appendix 4, Commitment 1.0). Taseko indicated that it intends to monitor how the Project would meet this commitment through its environmental management system.

Taseko expected the clearing of the transmission line to have a minor, but positive impact to ranchers with respect to foraging, as the right-of-way would open up more land for grasslands. To this effect, Taseko stated in the EIS "[t]he greatest benefit will be the seeding of disturbed areas to domestic grass species after removal of trees from the right-of-way."

Taseko also proposed that the Project would have a beneficial effect by aiding in forest management practices to control potential forest fires. Taseko considered the mine site and transmission line right-of-way a fire break. Additionally clearing the mine site and right-of-way would accelerate the salvage of dead wood and loose debris on the forest floor, thereby reducing the potential risk of forest fire.

In the fish and fish habitat compensation plan, Taseko proposed that the stocking of 5 small lakes in the region with rainbow trout for put-and-take fisheries would create measurable benefits associated with recreational fishing opportunities. It was noted, however, that the exact lakes to be stocked would be subject to provincial Ministry of Environment approval. Moreover, Taseko did not know whether these lakes would be able to sustain fish populations.

#### **10.4.2: VIEWS OF PARTICIPANTS**

As outlined in its submission for the public hearing, Fisheries and Oceans Canada did not agree with Taseko's assessment that the fish and fish habitat compensation plan would contribute a net positive benefit to fish and fish habitat. Fisheries and Oceans Canada and Environment Canada noted that Taseko did not take into account the productive capacity of the Teztan Yeqox (Fish Creek) ecosystem; rather it focused solely on an area-based assessment. Fisheries and Oceans Canada, therefore, noted that the proposed fish and fish habitat compensation measures would not even meet a 1:1 ratio.

#### **10.4.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

In considering whether Taseko's application included measures to enhance any beneficial effects of the Project, the Panel had to differentiate between mitigation measures proposed to offset negative effects of the Project and any potential beneficial environmental effects.

The Panel notes that Taseko reported that some of its mitigation measures would result in beneficial environmental effects. However, the Panel is of the opinion that these mitigation measures do not constitute measures to enhance beneficial environmental effects but rather are simply methods to mitigate the potential adverse effects of the Project.

The Panel acknowledges that there may be potential benefits to the environment if the proposed mitigation measures succeed in doing more than simply compensating for the Project's negative effects.

**The Panel concludes that the proposed mitigation measures would not result in an enhancement of beneficial environmental effects.**

## **10.5: ACCIDENTS AND MALFUNCTIONS**

### **10.5.1: PROPONENT'S ASSESSEMENT**

The approach used by Taseko in its EIS was to identify all possible accidents and malfunctions and then determine whether such events could result in a release of contaminants to the environment. Taseko identified 6 types of accidents, malfunctions, or unplanned events in the EIS that could potentially occur during the life of the Project: fuel spills; failures or major leakages from tailings or the reclaim pipeline; concentrate haul spills; road culvert failures; excessive water in the tailings storage facility; and loss of power to the tailings storage facility seepage recovery system. In the EIS, Taseko outlined the potential interactions of these scenarios with valued ecosystem components, followed by an assessment of potential environmental effects. A breach of the tailings storage facility embankments was not examined as Taseko concluded that such a breach would result in a release of water to the open pit and not to the receiving environment. Nevertheless, this potential accident is discussed in this section as concerns about embankment failures were raised during the public hearing.

A fuel spill could occur on land or in water as a result of a fuel truck overturning, and releasing fuel onto land or into a water body. To minimize this occurrence, Taseko would ensure proper construction and maintenance of access roads, enforce speed limits, ensure appropriate driver training and radio contact, provide haul monitoring and supervision, and ensure appropriate emergency response and spill contingency training. In the event of a fuel spill, Taseko would engage an emergency response protocol which would involve notification of all agencies and responders, and activation and implementation of spill handling procedures.

Taseko determined that the environmental effects of an on-land fuel spill would be low for all valued ecosystem components, as impacts were expected to be short in duration and localized. An on-land fuel spill could, however, be locally significant in terms of hydrogeology and soil quality. Taseko stated there would be a possibility of residual gasoline or diesel contamination remaining in the groundwater for extended periods of time. Taseko was confident, however, that with mitigation and emergency response measures, the residual effect on groundwater quality would not be significant. An on-land fuel spill could also potentially affect soil quality due to contamination. The emergency response for such an occurrence would be to remove contaminated soil and replace it with equivalent soil. Taseko was also confident that with the proposed mitigation and emergency response measures, the residual effects on soil quality would be short term, reversible, sporadic, and site-specific.

In the event of a fuel spill in water, the valued ecosystem components most likely affected would be water quality and aquatic ecosystems, fish and fish habitat, wildlife, human and ecological health, and traditional use. For water quality and aquatic ecosystems, a fuel spill in water could have significant short-term negative effects. Taseko was confident however

that appropriate mitigation and emergency response would result in no significant residual effects. A similar conclusion was reached on the effects on fish and fish habitat and wildlife where the effects were predicted to be temporary and reversible. In terms of human health, ecological risk and traditional use, Taseko concluded that with the proposed mitigation measures and emergency response plans, the effects would not be significant.

A failure or major leakage from tailings or reclaim pipelines could occur during the life of the Project. Taseko was confident that the design of the Project would minimize the risk associated with such an occurrence. The pipelines would be situated to ensure any accidental release would flow into the open pit, tailings storage facility, or seepage collection channels. Further, Taseko would install ditches, berms and emergency tailings containment ponds, ensure proper maintenance and training, and conduct routine inspections. In the event of a leakage, Taseko would initiate an emergency response protocol which would involve shutting down the source of the spill, activating emergency response groups, determining whether the effects were internal or external, and notifying appropriate authorities. As Taseko determined that leaks would likely be contained in the open pit, tailings storage facility, or collection channels, the environmental effect on all valued ecosystem components was predicted to be minimal.

A concentrate haul spill could occur on land or in water, as a result of a concentrate truck overturning and releasing concentrate. To minimize this occurrence, Taseko stated it would take precautions similar to those proposed for a fuel spill. Also, in the event of a concentrate haul spill, Taseko would engage an emergency response protocol similar to that proposed for a fuel spill.

Taseko determined that the potential environmental effects of a concentrate haul spill on land would be low for all valued ecosystem components as effects would be localized and short in duration. In terms of a concentrate haul spill in water, Taseko noted that the released concentrate would affect water quality and hence affect aquatic organisms, including mortality of sensitive species. Effects on water quality would be difficult to mitigate and therefore a short-term local to regional effect could result. Taseko stated that the impact on aquatic ecosystems would be not significant as benthic communities could recover in a short period of time. The immediate effect would include a localized (0-4 years) smothering of benthic habitat. Taseko stated that the effects of increased copper and total suspended solids would be significant in the short term, but reversible with appropriate mitigation during spill clean-up and the implementation of a follow-up and monitoring program. Although there were no mitigation measures proposed for wildlife, Taseko stated that monitoring and follow-up programs for fish and fish habitat and water quality were considered adequate to address wildlife concerns. In terms of human health and ecological risk, Taseko stated that monitoring would occur in the event of an accident, and that a risk assessment could be undertaken if there were elevated levels of metal concentrations in water or fish.

A road culvert failure could occur, resulting in bank erosion and increased sedimentation. Mitigation measures identified were regular road maintenance, weekly monitoring, assessing culvert conditions during and after storm events, and designing culverts to accommodate frequent storm events. In the event of a culvert failure, Taseko would initiate an emergency response protocol which would include initial response and notification. The valued ecosystem component most likely to be affected by the accident would be terrain stability and soil. The potential effects would be non-reversible, however Taseko indicated that terrain stability could be re-established.

In the event of storm events, excessive water would accumulate in the tailings storage facility. This occurrence would be minimized by several measures including maintaining a water treatment contingency plan, and conducting an annual review of the tailings hydrological model. In the event of this accident, Taseko would implement its emergency response plan which would include initial response and notification, monitoring of the tailings storage facility, and discharge if necessary. Discharge would occur to lower Teztan Yeqox (Fish Creek) only if the water quality was suitable for release, or to the open pit if the water quality was not suitable. Taseko indicated that none of the valued ecosystem components were expected to be detrimentally affected if this scenario were to arise.

The final accident Taseko assessed was loss of power to the tailings storage facility seepage recovery system. This malfunction could result in potential overflow of the seepage collection wells into the emergency settling ponds. To minimize this risk, Taseko indicated it intended to implement a variety of measures including conducting annual reviews of the tailings hydrological model, ensuring sufficient reserve capacity in the seepage collection and emergency settling ponds, ensuring access to backup power generation and pumps, and directing excess water in a controlled manner. In the event of this malfunction, Taseko would implement its emergency response plan which would involve initial response and notification and an immediate assessment of potential health and safety effects. Taseko indicated that none of the valued ecosystem components were expected to be detrimentally affected if this scenario were to arise.

On the matter of the possible failure of the earthen embankments, Taseko examined stability under both static and seismic conditions during operations and post closure. The analysis conducted by Taseko indicated that the tailings embankments would be constructed according to the Canadian Dam Association "Dam Safety Guidelines" and concluded that the proposed design would be adequate to maintain both short-term (operational) and long-term (post-closure) stability. The seismic analysis indicated that any embankment deformations during earthquake loading would be minor and would not have a significant effect on embankment freeboard or result in any loss of embankment integrity. Geotechnical instrumentation would be installed in several locations along the main and west embankments and foundations and over the life of the Project. The instrumentation would be monitored during construction and operation of the tailings storage facility to assess embankment performance and to identify any conditions different from those assumed during design. Taseko noted that amendments to the ongoing design and or remediation work could be implemented to respond to any changing conditions, should the need arise.

#### **10.5.2: VIEWS OF PARTICIPANTS**

Participants raised few concerns regarding the 6 types of accidents identified by Taseko. Instead, concerns focused on a possible embankment failure and on the potential for increased traffic accidents caused by additional vehicles on the road from Highway 20 to the mine site. The latter concern was more related to safety aspects than spills caused by accidents, but it was recognized that such events could result in both fuel and concentrate spills onto land and or water.

With respect to possible embankment failures, many First Nations members raised concerns about an embankment failure and the fear that if such an event occurred, it could have a catastrophic effect on the fishery in the Dasiqox (Taseko River), Tsihqox (Chilco and Chilcotin River) and the Fraser River. Dr. Anne Maest, an expert engaged by the Tsihqot'in National Government, provided a number of examples of embankment failures at mines



from various locations in North America and in Europe. She also noted that one open pit mine, the Berkley Pit mine in Montana, USA had experienced pit wall failure after it had filled with water. Others raised concerns that should the mine life be extended an extra 13 years, the resulting increase in dam height by 36 m would further increase the risk of a failure.

Natural Resources Canada, which possessed expertise in earthquakes and seismic hazards, reviewed Taseko's proposed design analysis and concluded that its initial concerns raised during the review of the EIS had been addressed, as outlined in Section 10.3.

### 10.5.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS

The Panel has reviewed the 6 types of accidents and malfunctions identified by Taseko. It considers Taseko's plans to respond to these events appropriate, should they occur. The Panel also notes Taseko's commitments with respect to emergency response included in the provincial Environmental Assessment Certificate (Appendix 4, Commitment 23.0) are also appropriate to address such events during construction, operation and closure.

**The Panel concludes that the proposed mitigation measures, emergency plans and commitments to address the possibility of accidents and malfunctions are adequate.**

With respect to a possible embankment failure, the Panel notes that for the operating life of the mine, in the event of a failure, water from the tailings storage facility would flow into the open pit. Also, the geotechnical instrumentation that would be installed in the embankments should alert Taseko if any changes occur from design predictions and allow corrective action to be taken. At some point during closure, as the open pit fills with water, a point of equilibrium would be reached after which the open pit would no longer be able to contain the volume of water from the tailings storage facility. Once the mine was closed, however, Taseko predicted that water quality in the tailings storage facility would gradually improve. Nevertheless, if a failure were to occur after closure, and certainly once the open pit was filled with water, approximately 47 years after the mine would begin operating, a large volume of water would be released into Teztan Yeqox (Fish Creek) and hence the Dasiqox (Taseko River). Also, in the event of a pit wall failure once the open pit was filled, the stability of Pit Lake would be disrupted and water from the bottom of the open pit, which would be higher in contaminants, would be brought to the surface and released into Teztan Yeqox and the Dasiqox. While these would appear to be unlikely events, consideration needs to be given to future emergency response planning when the open pit would start to fill with water after closure of the mine.

#### RECOMMENDATION 21

If the Project proceeds, the Panel recommends that Taseko investigate pit wall stability prior to closure to minimize any post-closure stability problems.

#### RECOMMENDATION 22

If the Project proceeds, the Panel recommends that Taseko develop a revised emergency response plan before mine closure to address a possible embankment failure.

## 10.6: ENVIRONMENTAL MANAGEMENT

### 10.6.1: PROPONENT'S ASSESSMENT

Taseko has committed to developing an environmental management system. The provincial Environmental Assessment Certificate includes commitments by Taseko to develop an environmental management system for continual improvement in sustainability, and the establishment of goals which would be agreed to with First Nations, communities and regulatory agencies (Appendix 4, Commitments 4.1 and 4.2). The environmental management system would be an overarching program designed to ensure the commitments of Taseko regarding environmental management were implemented.

With respect to the environmental management system, Taseko identified the priority objectives of the environmental management program as follows:

- with regards to surface water and groundwater, preventing downstream changes in quality due to mining activity;
- with regards to fish and fish habitat, implementing a successful compensation plan;
- with regards to air emissions, achieving or surpassing target air emissions objectives; and
- with regards to wildlife and habitat, minimizing land disturbance and practicing progressive reclamation.

Environmental management plans were proposed at a conceptual level for all of the Project stages, for all Project components and included emergency preparedness plans to address accidents and malfunctions. The purpose of the environmental management plans was to provide guidance on all environmental aspects during all phases of the Project, to convert proposed mitigation into actions and minimize or eliminate environmental effects of the Project. Taseko developed the plans listed below at a conceptual level only, and indicated that it intended to finalize the plans during the permitting phase.

- Construction phase plan;
- Emergency response plan;
- Air quality and noise management plan;
- Erosion and sediment control plan;
- Vegetation management plan;
- Wildlife management plan;
- Fish and fish habitat compensation plan;
- Cultural and heritage protection plan;
- Occupational health and safety plan;
- Transmission line corridor management plan;
- Transportation and access management plan;
- Mine materials handling plan;
- Tailings impoundment operating plan;
- Geotechnical stability monitoring plan;
- Concentrate load-out operating plan;
- Materials handling and waste management plan;
- Emergency response plan;
- Water management plan; and
- Reclamation and decommissioning plan.

Taseko committed to further develop these environmental management plans in the provincial Environmental Assessment Certificate (see Appendix 4).

During the public hearing, Taseko proposed having environmental monitors onsite to ensure the environmental management plans were implemented. The provincial Environmental Assessment Certificate also required Taseko to ensure that environmental monitoring would be undertaken properly and that adaptive management was used where needed (Appendix 4, Commitment 6.3).

#### **10.6.2: VIEWS OF PARTICIPANTS**

Some federal government departments provided views on monitoring and management plans related to their responsibilities and expertise. For example, details on Fisheries and Oceans Canada's comments on the fish and fish habitat compensation plan can be found in Section 6.4, and comments on monitoring and management of effects on wildlife by Environment Canada can be found in Section 6.7.

Dr. Bruce Stadfeld, legal counsel for the Stswecem'c/Xgat'tem (Canoe Creek Band), was critical in his closing remarks at the public hearing of the fact that many environmental management plans had not been submitted as part of the environmental assessment process.

Regarding environmental management, Chief Shane Gottfriedson, Chief of the Tk'emlups (Kamloops Band), spoke at the community hearing session in Alkali Lake regarding the Tk'emlups joint venture with New Gold Inc., a copper mine in their territory. Chief Gottfriedson noted that the joint venture was a result of 5 years of dialogue between their Nation and the proponent. This agreement gave the First Nation a strong role in environmental management, including monitoring. Chief Gottfriedson reported that the agreement included the right of the First Nation "[t]o have access to monitoring locations within the project area for the purpose of making measurements of observation or taking samples of water, air or soil, or for gathering other environmental-related data." The First Nation hired its own environmental consultants to do this work. Chief Gottfriedson suggested that the First Nations affected by the Project needed the same process, should the Project proceed.

Mr. Sean Nixon, legal counsel for the Tsilhqot'in National Government, commented in his closing remarks that adaptive management was not mitigation, and that "where it would not be appropriate to use adaptive management is where there is uncertainty about significant adverse environmental effects."

#### **10.6.3: PANEL'S CONCLUSIONS AND RECOMMENDATIONS**

The Panel considers Taseko's conceptual environmental management plans to be consistent with good management practices to ensure that the effects of construction, operations, closure and decommissioning would be minimized and that its commitments would be followed. In the Panel's view, it is reasonable to address environmental management plans at a conceptual level during the environmental assessment stage and to commit to their detailed development following the environmental assessment, during the future permitting stage, should the Project proceed.

Taseko committed to have an environmental coordinator on site throughout the Project life to ensure compliance with its environmental management plan. The Panel notes that should

the Project proceed, it will be important to attempt to build trust with First Nations and to operate in a fully transparent manner with them. Involving First Nations in the environmental management plans would be a means to assist in this regard. In the Panel's view, this could be accomplished through the establishment of an independent monitoring committee with costs to be borne by Taseko. The committee would involve appropriate government agencies and or independent experts, First Nation and local non-First Nations members. The committee would have the responsibility to independently review and monitor the Project effects and the implementation of mitigation measures.

**RECOMMENDATION 23**

If the Project proceeds, the Panel recommends that the federal and provincial governments establish an independent monitoring committee as soon as possible to assist in building trust between Taseko and First Nations and to demonstrate that Taseko is implementing its commitments as intended throughout the mine life; the committee would consist of appropriate government agencies and/or independent experts, First Nations affected by the Project and local non-First Nation members, and would be funded by Taseko.

**RECOMMENDATION 24**

If the Project proceeds, the Panel recommends that the responsibilities of the independent monitoring committee should include the following:

- reviewing and monitoring surface water quality and arsenic and mercury levels in fish tissue;
- reviewing the hydrogeological data collected as per commitment 8.6, Appendix 4;
- reviewing and monitoring the data collected from the long-term follow-up and monitoring program to verify the predicted seepage rates and concentration of contaminants from the tailings storage facility toward Jidizay Biny (Big Onion Lake) and the effectiveness of the proposed primary mitigation measures;
- reviewing and monitoring data collected on the implementation of the fish and fish habitat compensation plan;
- reviewing the effectiveness of measures to control invasive plant species along the transmission line;
- reviewing the information collected on any Project-related grizzly bear-vehicle collisions or near misses;
- participating in the development of and reviewing the implementation of the access management plan for the transmission line;
- participating in the development of and reviewing the implementation of the wildlife habitat compensation plan; and
- other matters that may arise during the construction, operation, and closure of the mine, as a result of monitoring and adaptive management measures.

## SECTION 11: SUMMARY OF PANEL'S CONCLUSIONS

The Panel's mandate required it to consider and provide conclusions on the significance of the environmental effects of the Project. With respect to Aboriginal rights and title, the Panel interpreted its mandate to mean that it was also required to consider and provide conclusions on the significance of the effects of the Project on potential or established Aboriginal rights or title in the area of the Project. However, the Panel was not mandated to make any determinations regarding the validity of Aboriginal rights or title claims or the strength of those claims, the scope of the Crown's duty to consult First Nations, or whether Canada had met its respective duty to consult and accommodate in respect of rights recognized and affirmed by section 35 of the *Constitution Act, 1982*.

The following provides a summary of the Panel's conclusions on the significance of the environmental effects of the Project and effects on potential and established Aboriginal rights in the area of the Project. The Panel's conclusions are based on the assumption that Taseko will implement all of the commitments included in the provincial Environmental Assessment Certificate (Appendix 4) and all the mitigation and environmental management measures outlined in its EIS.

The Panel has reached the following conclusions:

### PURPOSE OF AND NEED FOR THE PROJECT

- Taseko has adequately outlined the purpose and need for the Project for the purposes of this environmental assessment;

### ALTERNATIVES TO THE PROJECT

- Taseko's decision that an open pit mine would be the only feasible alternative to mine ore of this grade was reasonable;

### ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT

- Taseko's rationale for selecting its preferred alternative for the mine development plan and its approach to selecting the centreline for the transmission line were reasonable for the purposes of this environmental assessment;

### SURFACE WATER

- the Project would not result in a significant adverse effect on surface water hydrology in the Project area;
- the Project would not result in a significant adverse effect on surface water quality;
- the Project would not result in a significant adverse effect on fish health in the Dasiqox (Taseko River);

### GROUNDWATER

- seepage from the tailings storage facility would not result in a significant adverse effect on water quality in Jidizay Biny (Big Onion Lake);

### FISH AND FISH HABITAT

- the Project would result in a significant adverse effect on fish and fish habitat in the Teztan Yeqox (Fish Creek) watershed;

TERRAIN AND SOILS

- the Project would not result in a significant adverse effect on terrain and soils;

VEGETATION

- the Project would not result in a significant adverse effect on old growth forest;
- the Project would not result in a significant adverse effect on grassland ecosystems;

WILDLIFE AND WILDILFE HABITAT

- the Project would not result in a significant adverse effect on mule deer and moose and their habitat;
- provided a wildlife habitat compensation plan is developed and implemented, the Project would not result in a significant adverse effect on migratory birds and their habitat;

ATMOSPHERIC ENVIRONMENT

- emissions of particulate matter from the Project would not result in significant adverse effect;
- the contribution to greenhouse gases from the Project would not result in a significant adverse effect;
- light pollution from the Project would not result in a significant adverse effect;

NOISE

- Project-related noise would not result in a significant adverse effect;

ARCHAEOLOGY

- provided the recommendation identified by the Panel is implemented, the Project would not result in a significant adverse effect on physical heritage and sites of archaeological importance;

CUMULATIVE EFFECTS

- the Project would not result in a significant adverse cumulative effect on vegetation;
- the Project, together with past, present and reasonably foreseeable future forestry activities in the area, would result in a significant adverse cumulative effect on the South Chilcotin grizzly bear population but would not result in a significant adverse cumulative effect on deer, moose, and other wildlife;
- the Project, in combination with an extended mine life proposal, would not result in a significant adverse cumulative effect on surface water and groundwater;
- the Project, in combination with an extended mine life proposal would further increase the likelihood of failure of the fish and fish habitat compensation plan and thus result in a significant adverse cumulative effect on fish and fish habitat;

LAND AND RESOURCE USES

- the Project would not result in a significant adverse effect on the forest industry;
- the proposed mine site would result in a locally significant adverse effect on the users of the meadows within the Teztan Yeqox (Fish Creek) watershed due to the loss of grazing lands;
- the Project would not result in a significant adverse effect on ranching and grazing along the transmission line corridor;
- the Project would not result in a significant adverse effect on hunting in the region;

- the Project would not result in a significant adverse effect on trapping in the region, but would result in a significant adverse effect on the Xení Gwet'in (Nemiah Band)/Sonny Lulua trapline that would be most affected by the mine site footprint;
- the Project would not result in a significant adverse effect on tourism and recreation in the region, but would result in a significant adverse effect on Taseko Lake Outfitters tourism business;

#### NAVIGATION

- the Project would result in a significant adverse effect on navigation;

#### TRAFFIC

- increased traffic from the Project would not result in a significant adverse effect;

#### HUMAN HEALTH

- the Project would not result in a significant adverse effect on human health from consuming fish, moose meat and drinking water;
- the Project would not result in a significant adverse effect on community health services;

#### CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES

- the Project would have a significant adverse effect on the Tsilhqot'in Nation regarding their current use of lands and resources for traditional purposes and on cultural heritage resources;
- the Project would not result in significant adverse effects on the Secwepemc Nation's current use of land and resources for traditional purposes and on cultural heritage;

#### ABORIGINAL RIGHTS AND TITLE

- the Project would result in a significant adverse effect on established Tsilhqot'in Aboriginal rights as defined in the *William* case;
- the Project would result in a significant adverse effect on the potential Tsilhqot'in Aboriginal right to fish in Teztan Biny (Fish Lake);
- the Project would result in a significant adverse effect on Tsilhqot'in Aboriginal title that could be granted;
- provided the planned mitigation to avoid construction in sensitive locations would be applied in cooperation with the Secwepemc, the Project would not result in a significant adverse effect on established or potential Secwepemc rights;
- depending on the size of the land settlement through the treaty process, the Project may result in a significant adverse effect on any such title that could be granted to the Esketemc (Alkali Lake Band) and the Stswecem'c/Xgat'tem (Canoe Creek Band);

#### CAPACITY OF RENEWABLE RESOURCES

- the Project would result in the inability of the fisheries resource in the Teztan Yeqox (Fish Creek) watershed and the South Chilcotin grizzly bear population to meet the needs of present and future generations;

#### BIODIVERSITY

- the Project would not result in a significant adverse effect on biodiversity;

#### EFFECTS OF THE ENVIRONMENT ON THE PROJECT

- the effects of the environment on the Project would not be significant;

MEASURES TO ENHANCE ANY BENEFICIAL ENVIRONMENTAL EFFECTS

- the proposed mitigation measures would not result in an enhancement of beneficial environmental effects; and

ACCIDENTS AND MALFUNCTIONS

- the proposed mitigation measures, emergency plans and commitments to address the possibility of accidents and malfunctions are adequate.



## SECTION 12: INFORMATION ON JUSTIFIABILITY OF SIGNIFICANT ADVERSE ENVIRONMENTAL EFFECTS

In light of the Panel's conclusion that the Project would result in significant adverse environmental effects, the Panel has prepared this section of its report to assist decision makers in reaching a conclusion on whether the significant adverse effects are justified under the circumstances.

In accordance with the *Canadian Environmental Assessment Act*, responsible authorities may exercise any duty or function that would permit the Project to be carried out where a determination has been made that the Project would likely result in significant adverse environmental effects, provided the effects can be justified under the circumstances. Such a determination must be in conformity with the approval of the Governor in Council (i.e. the Cabinet of Ministers). The Panel's Terms of Reference required it to "ensure that information with respect to the justifiability of any significant adverse environmental effects is obtained." The Panel has interpreted its mandate (as outlined in Section 4.3) to mean that it must only provide information to assist decision makers in reaching a decision on justifiability. Therefore, the Panel has not reached a conclusion on whether the significant adverse environmental effects are justified in the circumstances, nor has it provided any recommendations on this matter.

Issues for consideration by decision makers in reaching a decision on justifiability are presented here in the same order as they appear in this report. The Panel has presented its conclusions and observations relating to these issues.

British Columbia has concluded that the Project would have significant adverse effects on fish and fish habitat but that such effects would be justified. However, given that the Province completed its review in December, 2009, it did not have the benefit of the final federal departmental positions and expertise on alternative means of carrying out the Project, the feasibility of the proposed fish and fish habitat compensation plan, surface and groundwater quality and quantity, health effects, effects on migratory birds and species at risk, as well as expertise brought to the public hearing by various participating organizations. Additionally, given the limited participation of First Nations in the provincial working group, the Province also did not have the benefit of the extensive views and information presented by First Nations during the public hearing regarding the effects of the Project on their current use of lands and resources for traditional purposes, on cultural heritage and on potential and established Aboriginal rights and title.

The Panel has determined that the Project would result in significant adverse environmental effects on:

- fish and fish habitat,
- navigation,
- the current use of lands and resources for traditional purposes by the Tsilhqot'in,
- Tsilhqot'in cultural heritage, and
- potential or established Aboriginal rights and title as follows:
  - the established rights of the Tsilhqot'in to hunt and trap birds and animals as granted by the Supreme Court of British Columbia;
  - the potential right of the Tsilhqot'in to fish in Teztan Biny (Fish Lake); and
  - the potential Aboriginal title of the Tsilhqot'in that could be granted.

Also, the Panel has concluded that, depending on the size of the land settlement through the treaty process, the Project may result in a significant adverse effect on the potential Aboriginal title that could be granted to the Esketemc (Alkali Lake Band) and and Stswecem'c/Xgat'tem (Canoe Creek Band).

Further, the Panel concluded that there would be a significant adverse cumulative effect on the South Chilcotin grizzly bear population, as a result of the effects of the Project in combination with past, present and reasonably foreseeable future forestry activities. The Panel also concluded that the Project, in combination with the potential future mine life extension, would result in a significant adverse cumulative effect on fish and fish habitat. The reasons for these conclusions are outlined in the preceding sections of this report and are not reproduced here.

Additionally, the Panel has concluded that the Project would result in a significant adverse environmental effect at the local level on:

- the users of the meadows within the Teztan Yeqox (Fish Creek) watershed due to the loss of grazing lands;
- the Xení Gwet'in (Nemiah Band) / Sonny Lulua trapline at the mine site; and
- the tourism business operated by Taseko Lake Outfitters.

Taseko has offered measures to offset the losses of fish and fish habitat and navigation, largely through the creation of Prosperity Lake and supporting fish and fish habitat compensation measures. While the Panel recognizes that this plan would partly offset the losses, it has reached a conclusion that the residual effects would still be significant.

With respect to the Panel's conclusion that there would be significant adverse effects on the current use of lands and resources for traditional purposes by the Tsilhqot'in and on Tsilhqot'in cultural heritage, the Panel notes that there has been no proposal to offset or mitigate these effects, nor has the Panel suggested any recommendations in this regard. In the Panel's view, these matters cannot be mitigated through the sort of mitigation measures that would typically be seen in an environmental assessment, such as changes to Project design or by offsetting losses or replacing the lost environment.

Regarding the finding of significant adverse cumulative effects to the South Chilcotin grizzly bear population, the Panel notes that the population in the region is already stressed due to past activities. Further, the measures proposed by Taseko to mitigate adverse effects of the Project on the South Chilcotin grizzly bear population may not be adequate to prevent Project-related bear mortalities. These mitigation measures would not replace lost habitat, nor would they reduce fragmentation of the landscape. Regarding the potential cumulative effects on fish and fish habitat as a result of the Project in combination with the potential future mine life extension, the Panel notes that the extension would place further stress on the likelihood of success of the fish and fish habitat compensation plan.

Factors that decision makers may wish to consider in deciding whether the significant adverse effects of the Project are justifiable in the circumstances include:

### Alternatives

- there are no economically viable alternatives to the Project or alternative means of carrying out the Project that would avoid or eliminate the findings of significant adverse environmental effects; while three technically viable alternatives were proposed, one of which would avoid the destruction and contamination of Teztan Biny (Fish Lake), Taseko stated that its preferred mine development plan was the only economically viable option given the proximity of the ore body to Teztan Biny;

### Water Quality

- surface water discharge from the open pit would not be expected to occur until Year 44; in order to meet water quality objectives, it would be likely that the discharge water would require treatment; Taseko identified water treatment as a contingency measure only, but the Panel has concluded that water treatment would likely be required into the far future, thus potentially creating a future burden for governments;
- while groundwater seepage from the tailings storage facility would migrate towards Jidizay Biny (Big Onion Lake) and the Dasiqox (Taseko River), the Panel concluded that with the proposed mitigation measures, the effects on Jidizay Biny (Big Onion Lake) would not be significant;
- while the potential future mine life extension from 20 to 33 years to allow for the extraction of the entire mineral resource would increase the volume and possibly the concentration of contaminants seeping toward Jidizay Biny (Big Onion Lake) from the tailings storage facility, the Panel concluded that planned groundwater monitoring should provide sufficient information for regulatory bodies to verify predictions and determine if an extension to the mine should be approved;

### Fish and Fish Habitat

- Taseko has indicated that the destruction of Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and portions of Teztan Yeqox (Fish Creek) to allow for the construction of the mine waste management area and the new fish compensation lake (Prosperity Lake) would result in a loss of approximately 90,000 rainbow trout;
- to compensate for the loss of the Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and the Teztan Yeqox (Fish Creek) fishery, Taseko has proposed the creation of Prosperity Lake, spawning channels adjacent to and upstream of the tailings storage facility, as well as fish habitat near the Dasiqox (Taseko River) at the mouth of Teztan Yeqox;
- Prosperity Lake would support up to 20,000 fish stocked with fry from the Clearwater Hatchery, introduced into Prosperity Lake approximately 7 years after mine operation begins; the new fishery would allow for fewer but larger, trophy-sized rainbow trout;
- while recreational fishers might use Prosperity Lake in the future, the resulting fishing experience would be different as Prosperity Lake would not recreate the current environment found at Teztan Biny;
- First Nation fishers would lose a fishery they rely upon when salmon, their main food fishery, are low in numbers; First Nations stated they would be unlikely to fish in Prosperity Lake due to the perception of contamination;
- Fisheries and Oceans Canada indicated that the proposed fish and fish habitat compensation plan would not achieve the requirement of No Net Loss, as outlined in its Policy for the Management of Fish Habitat;
- the Panel concluded it is unlikely that the proposed fish and fish habitat compensation plan would function as planned and would likely require perpetual

maintenance and stocking of fish in order to meet the fish population objectives established by British Columbia;

- the Panel was informed that no other examples exist where an entire ecosystem was successfully replaced;
- if the potential future mine life extension from 20 to 33 years to allow the extraction of the entire mineral resource were to occur, the Panel concluded it would further affect the proposed fish and fish habitat compensation plan and increase the risks and uncertainties associated with the plan;
- due to the high level of risk and uncertainty associated with the proposed fish and fish habitat compensation, the level of distrust between First Nations and Taseko and the First Nations strong opposition to the destruction of Teztan Biny (Fish Lake), the Panel cannot recommend any measures that would mitigate the significant adverse effects of the Project on fish and fish habitat in the Teztan Yeqox (Fish Creek) watershed;

#### Wildlife

- while the Project would result in adverse effects on wildlife and wildlife habitat, with the implementation of mitigation, the effect would not be significant;
- the South Chilcotin grizzly population, classified as threatened, would experience further adverse effects from the Project, in combination with other past, present and reasonably foreseeable future projects; this could adversely effect the sustainability of this population;

#### Socio-economic Effects

- the Panel observed strong support from the Williams Lake community for the Project due to potential opportunities for job creation and diversification of the economy;
- Taseko and the business community stated that the Project would result in a significant boost to the local economy, an economically depressed area; Taseko predicted:
  - the creation of an average of approximately 375 direct jobs per year during construction and operation;
  - the creation of approximately 600 indirect and induced jobs per year within British Columbia during the 20-year mine operation;
  - an annual pay role of approximately \$30 million;
  - \$200 million in annual expenditures in the regional and provincial economy; and
  - expected annual government revenues of \$30 million;
- Taseko stated that many of the skilled workers would be hired from outside the region and that many of the people it would employ would likely already be employed elsewhere;
- tourism in the region would not likely be significantly affected with the exception of Taseko Lake Outfitters;

#### First Nation Issues

- The Panel observed that there was strong opposition to the Project from the Tsilhqot'in and Secwepemc Nations as well as the Union of British Columbia Indian Chiefs; First Nations stated that while they were not opposed to mining in general, the location of the Project was not acceptable to them;
- the Panel concluded that the area of Teztan Biny (Fish Lake) and Y'anah Biny (Little Fish Lake) was an important cultural and spiritual area, and was currently used by

the Tsilhqot'in for traditional purposes; this area would be permanently lost to First Nations as a result of the Project;

- First Nations felt that they would only experience negative effects as a result of the Project, with little opportunity for employment or to receive any benefits;
- no impact benefit agreements were under discussion at the time of the close of the public hearing; the provincial revenue sharing policy, as explained by Taseko, was seen to offer no certainty to First Nations about the likelihood that they would receive any benefit;
- First Nations frequently stated that financial benefits could not compensate for the destruction of Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and portions of Teztan Yeqox (Fish Creek) and Nabas;
- First Nations explained that, should the Project proceed, their inability to use the land that they consider to be rightfully theirs would create further emotional and psychological losses and negatively affect the healing process that was stated to be underway;
- given the substantial value of the Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and Nabas areas to the Tsilhqot'in, the Panel cannot recommend any measures that would mitigate the significant adverse effects of the Project on the current use of lands and resources for traditional purposes and cultural heritage by the Tsilhqot'in Nation at the proposed mine site; and
- the Project would infringe on established Aboriginal rights, as per the *William* case and the *Alphonse* case; it is the Panel's view that typical mitigation measures would be unable to provide accommodation for this infringement.

In determining that the Project would result in significant adverse environmental effects and significant adverse effects on Aboriginal rights and title, the Panel has carefully considered the information provided by Taseko and other participants, including the proposed mitigation measures and commitments included in the provincial Environmental Assessment Certificate. It is the Panel's conclusion that despite the proposed mitigation measures and commitments, the Project would result in significant adverse effects. The Panel also notes that while it has provided recommendations that should be implemented should the Project proceed, it does not believe that these recommendations would eliminate or accommodate the significant loss First Nations would experience as a result of the Project.

## SECTION 13: SUMMARY OF RECOMMENDATIONS

The Panel has provided recommendations relating to the appropriate procedures for the management of environmental effects, should a decision be made to approve the issuance of authorizations, permits or approvals that would be required to enable this Project to proceed. These recommendations include measures to further mitigate potential effects and to assist in consultation with First Nations beyond those commitments included in the provincial Environmental Assessment Certificate (Appendix 4). However, the Panel believes that these recommendations, if accepted, would not eliminate or accommodate the significant loss First Nations would experience as a result of the Project.

If the Project proceeds, the Panel recommends that:

- 1) Taseko and appropriate parties re-examine the choice of the transmission line corridor to determine whether one transmission line would be an appropriate alternative to serve both the Project and the Tsilhqot'in National Government's proposed biomass fired, thermal electric power plant, should that project proceed prior to construction of the transmission line;
- 2) Taseko monitor water levels in Bisqox (Beece Creek) and implement appropriate corrective action in order to minimize flooding at Taseko Lake Lodge;
- 3) a long-term follow-up and monitoring program be designed and implemented to verify the predicted seepage rates and concentration of contaminants from the tailings storage facility toward Jidizay Biny (Big Onion Lake) and the effectiveness of the proposed primary mitigation measures. Should the results show that the movement and concentration of contaminants is higher than predicted, additional mitigation measures should be put in place, such as the addition of more interception wells;
- 4) further detailed terrain hazard and soils mapping should be done by Taseko in areas of the transmission line right-of-way that have been identified as having potentially hazardous terrain and sensitive soils to assist in finalizing the centreline;
- 5) Taseko complete an additional assessment of areas of slope instability on the access road at Tête Angela Creek crossing;
- 6) areas identified as unstable undergo a detailed on-site terrain stability assessment by a qualified professional so that appropriate planning and mitigation measures can be undertaken prior to the commencement of construction activities;
- 7) Taseko construct the transmission corridor right-of-way in such a manner as to avoid long straight-line sight distances to reduce the negative effect of the right-of-way on predator-prey relationships;
- 8) Taseko begin discussions immediately with the British Columbia Ministry of Environment and the affected First Nations to develop a wildlife habitat compensation plan for mule deer;
- 9) Taseko involve the affected First Nations in the development and implementation of the mitigation measures to address the concerns regarding access along the transmission line right-of-way;

- 10)** Taseko develop and implement a wildlife habitat compensation plan that provides for the creation of additional wetland/riparian habitat beyond that proposed by Taseko at the mine site, in collaboration with Environment Canada, the British Columbia Ministry of Environment, affected First Nations and appropriate environmental organizations such as Ducks Unlimited;
- 11)** local First Nations, the Province and Taseko develop an agreement outlining mitigation measures to avoid or minimize damage to archaeological finds, as well as how found artifacts would be preserved. The agreement should incorporate traditional values of First Nations and be completed prior to the start of construction. In particular, the Panel recommends that as a component of such an agreement Taseko consider the development and implementation of a chance find procedure in collaboration with First Nations and the Province to address all artifacts found during construction of mine site infrastructure and the transmission line right-of-way, including a process of communication with First Nations to address chance finds and employ a trained archaeological monitor to evaluate effects during construction activity;
- 12)** Taseko consider relocating the transmission line outside the Esketemc Community Forest, or consider options mutually agreeable to all parties involved to minimize or compensate for the effects on the Community Forest;
- 13)** Taseko meet with the affected tourism business owners to discuss compensation for lost business as a form of mitigation;
- 14)** Taseko monitor ground level concentrations of particulate matter at the Taseko Lake Lodge;
- 15)** Transport Canada hold further discussion with Taseko, First Nations and recreational users to determine whether interim access to other lakes would be desirable and if so, appropriate measures be developed to minimize the environmental effects of creating increased access to navigation and related fishing opportunities elsewhere;
- 16)** Taseko provide access to Prosperity Lake within the same season that the lake becomes available as a compensation fishery – in approximately Year 7 of the operation phase;
- 17)** Taseko establish access to Prosperity Lake to allow for boat launching, camping and fishing to replicate as much as possible the water bodies it would replace;
- 18)** Taseko monitor arsenic and mercury in fish tissue as a precautionary matter to verify predictions and the results of the monitoring be provided to appropriate federal and provincial authorities;
- 19)** Taseko collaborate with the Secwepemc when determining the final alignment of the transmission line centreline in order to minimize disturbance resulting from the Project to areas of importance to the Esketemc (Alkali Lake Band) and Stswecem'c/Xgat'tem (Canoe Creek Band);
- 20)** Taseko commit to monitoring of transplanted *Schistidium heterophyllum* populations and the implementation of appropriate adaptive management measures to ensure its survival;

**21)** Taseko investigate pit wall stability prior to closure to minimize any post-closure stability problems;

**22)** Taseko develop a revised emergency response plan before mine closure to address a possible embankment failure;

**23)** the federal and provincial governments establish an independent monitoring committee as soon as possible to assist in building trust between Taseko and First Nations and to demonstrate that Taseko is implementing its commitments as intended throughout the mine life; the committee would consist of appropriate government agencies and/or independent experts, First Nations affected by the Project and local non-First Nation members, and would be funded by Taseko; and

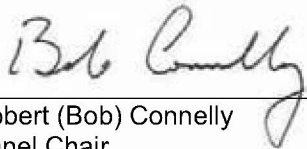
**24)** the responsibilities of the independent monitoring committee should include the following:

- reviewing and monitoring surface water quality and arsenic and mercury levels in fish tissue;
- reviewing the hydrogeological data collected as per commitment 8.6, Appendix 4;
- reviewing and monitoring the data collected from the long-term follow-up and monitoring program to verify the predicted seepage rates and concentration of contaminants from the tailings storage facility toward Jidizay Biny (Big Onion Lake) and the effectiveness of the proposed primary mitigation measures;
- reviewing and monitoring data collected on the implementation of the fish and fish habitat compensation plan;
- reviewing the effectiveness of measures to control invasive plant species along the transmission line;
- reviewing the information collected on any Project-related grizzly bear-vehicle collisions or near misses;
- participating in the development of and reviewing the implementation of the access management plan for the transmission line;
- participating in the development of and reviewing the implementation of the wildlife habitat compensation plan; and
- other matters that may arise during the construction, operation, and closure of the mine, as a result of monitoring and adaptive management measures.



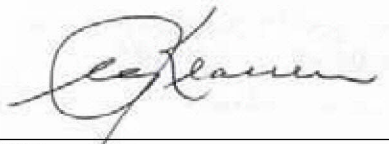
REPORT OF THE FEDERAL PROSPERITY REVIEW PANEL

Dated in Ottawa, Ontario on July 2, 2010



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Robert (Bob) Connelly  
Panel Chair



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William Klassen  
Panel Member



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Nalaine Morin  
Panel Member

**025397**

## APPENDIX 1: Panel's Terms of Reference

### TERMS OF REFERENCE

#### PANEL REVIEW OF THE PROPOSED PROSPERITY GOLD-COPPER MINE PROJECT Section 33 Canadian Environmental Assessment Act

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##### Introduction

Following a request by the Minister of Fisheries and Oceans, a federal Review Panel (the Panel) has been appointed by the federal Minister of the Environment, in accordance with the requirements of the *Canadian Environmental Assessment Act* (CEAA), to conduct a review of the environmental effects of Taseko Mines Limited's proposed Prosperity Gold-Copper Mine Project (the Project). The proposed Project is an open-pit gold and copper mine located 125 kilometres southwest of Williams Lake, British Columbia.

These Terms of Reference, issued by the Minister of the Environment, have been developed in consultation with the Responsible Authorities (Fisheries and Oceans Canada, Transport Canada, Natural Resources Canada) for the Project, and in consideration of comments that were received from First Nations, Taseko Mines Limited (the Proponent), and the public.

##### Definitions

The definitions of terms used within the Terms of Reference are listed in Annex 1.

##### Mandate

The mandate of the Panel is to conduct an assessment of the environmental effects (including any effect of any change that the Project may cause in the environment on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes by aboriginal persons, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance) of the proposed Project and to report to the Minister of the Environment and the Responsible Authorities in accordance with section 34 of the CEAA.

The Panel shall consider and provide conclusions on the significance of the environmental effects of the Project. Where, taking into account the implementation of any mitigation measures, the Project is likely to cause significant adverse environmental effects, the Panel should also ensure that information with respect to the justifiability of any significant adverse environmental effects is obtained.

In addition, the Panel report may provide recommendations relating to the appropriate procedures for the management of short-term and long-term environmental effects associated with the Project, should the Project proceed.

The Panel will have the mandate to invite information from First Nations related to the nature and scope of potential or established Aboriginal rights or title in the area of the Project, as

well as information on the potential adverse impacts or potential infringement that the Project may have on potential or established Aboriginal rights or title.

The Panel shall fully consider and include in its report:

1. information provided by First Nations regarding the manner in which the Project may adversely affect potential or established Aboriginal rights or title; and
2. in the case of potential Aboriginal rights or title, information provided by the First Nation regarding the First Nation's strength of claim respecting Aboriginal rights or title.

The Panel will not have a mandate to make any determinations as to:

1. the validity of Aboriginal rights or title claims asserted by First Nations or the strength of those claims;
2. the scope of the Crown's duty to consult First Nations; and/or
3. whether Canada has met its respective duty to consult and accommodate in respect of rights recognized and affirmed by section 35 of the *Constitution Act*, 1982.

The Panel shall ensure that the information required for the assessment is obtained and made available to the public. Additionally, the Panel will hold hearings in a manner that offers the public the opportunity to participate in the assessment.

At the end of the review, the Panel shall prepare a report pursuant to the section of these Terms of Reference entitled "Report" and submit the report to the Minister of the Environment and the Responsible Authorities.

### **Panel Composition**

After consulting with the Responsible Authorities, the Minister of the Environment has appointed members of the Panel, including the chairperson. The Panel will be composed of three members, chosen from outside the public service, each of whom shall be unbiased, free from any conflict of interest relative to the Project and shall have knowledge or experience relevant to the anticipated environmental effects of the Project.

In the event that a Panel member resigns or is unable to continue to work, the remaining members shall constitute the Panel unless the Minister determines otherwise. In such circumstances, the Minister may choose to replace the Panel member.

### **Scope of the Project**

The proposed gold and copper mine project site is located roughly 125km southwest of Williams Lake, British Columbia, on a 35 square kilometre parcel of Provincial crown land currently held in the form of 118 mineral claims by Taseko Mines Ltd.

The Project includes the construction, operation, decommissioning and abandonment of a large open pit mine development with a 20 year operating life. The Project includes large-scale open pit mining equipment and conventional copper porphyry flotation processing. In addition to the mine and associated tailings and waste rock areas, the Project includes the development of an onsite mill and support infrastructure, a 125 km long power transmission line and associated substations, explosives factory and magazine, a 2.8 km mine access road to connect to existing logging roads and highways and transportation of concentrate to the existing Gibraltar Mine Concentrate Load-out Facility near Macalister, 54 km north of Williams Lake.

**Scope of the Assessment**

The assessment by the Panel will include a consideration of the following factors listed in subsections 16(1)(a) to (d) and 16(2) of the CEEA:

1. The environmental effects of the Project pursuant to section 2 of the CEEA, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
2. The significance of the effects referred to in paragraph 1;
3. Comments from the public and First Nations that are received during the public review;
4. Measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
5. The purpose of the Project;
6. Alternative means of carrying out the Project, including those that are technically and economically feasible, and the environmental effects of any such alternative means;
7. The need for, and the requirements of, any follow-up program in respect of the Project; and
8. The capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future.

In accordance with subsection 16(1)(e) of the CEEA, the assessment by the Panel will also include a consideration of the additional following matters:

9. Description of the Project, including temporal and spatial boundaries;
10. Need for the Project;
11. Alternatives to the Project;
12. Community knowledge and aboriginal traditional knowledge;
13. Extent to which biological diversity (e.g. ecosystems and/or species diversity) is affected by the Project;
14. Description of the existing environment which may reasonably be expected to be affected, directly or indirectly, by the Project;
15. Measures to enhance any beneficial environmental effects;
16. Proposal for contingency plans to address malfunctions or accidents that may occur in connection with the Project; and

17. Extent of the application of the precautionary principle to the Project.

**Environmental Impact Statement Guidelines**

The Canadian Environmental Assessment Agency (the Agency) and the British Columbia Environmental Assessment Office (BC EAO) have prepared joint Guidelines that will guide the Proponent in the preparation of the Environmental Impact Statement (EIS). The EIS Guidelines outline how and to what level of detail the Proponent shall address the factors outlined above.

**Draft EIS Guidelines**

The draft EIS Guidelines were released by the Agency and the BC EAO for public comment from November 3 to December 3, 2008. The Guidelines were subject to a 30-day public comment period.

**Final EIS Guidelines**

The final EIS Guidelines were issued by the Minister of the Environment and the BC EAO at the same time the Minister announced the referral of the Project to a Panel and announced the appointment of the Panel members. The Agency, in consultation with the Responsible Authorities and the BC EAO, was responsible for considering comments received and recommended appropriate changes in the EIS Guidelines to the Minister of the Environment.

**EIS Preparation**

The Panel will require the Proponent to prepare the EIS in accordance with the EIS Guidelines. It is expected that the Proponent will submit the EIS to the BC EAO on or around January 15, 2009. The BC EAO will undertake a 30 day screening of the application against the EIS Guidelines. Once the BC EAO determines that the EIS meets the requirements of the British Columbia *Environmental Assessment Act*, the Proponent will submit the EIS to the Panel. The Proponent will notify the Panel of any deviation from the schedule at least 15 days prior to the submission date of the EIS to the BC EAO.

**EIS Sufficiency**

Once submitted to the Panel, the EIS will be placed on the public registry, and will be made available for public review and comment for a period of 60 days. Comments on the adequacy of the EIS as measured against the EIS Guidelines and on the technical merit of the information should be provided to the Panel in writing.

Within 30 days of completion of the public review of the EIS, the Panel, taking into consideration the comments received and its own review of the EIS, will determine if the EIS contains sufficient information to proceed to public hearings.

If the Panel determines that the EIS contains sufficient information to proceed to public hearings it will schedule and announce hearings in accordance with the procedures set out in these Terms of Reference.

If the Panel determines that there are significant information deficiencies, such that the EIS is not sufficient to proceed to public hearings, the Panel will issue a deficiency statement requesting additional information which the Proponent will provide. At the same time the Panel will place the deficiency statement on the public registry and make it available to the public.

Upon completion of the public review of the additional information, the Panel, taking into consideration the comments received and its own review of the additional information, will determine within 30 days if the EIS, supplemented by the additional information, is sufficient to proceed to public hearings. The procedures described above will apply until such time as the Panel determines that the EIS contains sufficient information to proceed to public hearings.

**Announcement of Hearings**

Once the Panel determines that the EIS contains sufficient information to proceed to public hearings, it will schedule and announce the public hearings within 7 days. The public hearings will begin no earlier than 30 days after the schedule is announced. The Panel will issue detailed procedures for the conduct of the public hearings. The public hearings will provide the Proponent, Responsible Authorities, First Nations and members of the public an opportunity to present their views on the Project. The public hearings will be conducted in a manner that ensures a comprehensive examination of matters relevant to the Panel's Terms of Reference and in particular the examination of technical evidence. The public hearings will be held in the communities most affected by the proposed Project. The Panel will use its best efforts to complete the public hearings within 30 days.

**Specialist Advisors to the Panel**

The Panel may request specialist or expert information or knowledge with respect to the Project from federal authorities in possession of such information or knowledge. The Panel may also retain the services of independent non-government experts to provide advice on certain subjects within the Panel's Terms of Reference.

The names of the experts retained and any documents obtained or created by the experts and that are submitted to the Panel will be placed on the public registry. For greater certainty, this shall exclude any information subject to solicitor-client privilege where the expert is a lawyer.

The Panel may require an expert to appear before the Panel at the public hearing sessions and testify in regard to the documents they have created or obtained and that were submitted to the Panel and made public in accordance with the preceding paragraph.

**Report**

Following the completion of the public hearings, the Panel will prepare and submit to the Minister of the Environment and the Responsible Authorities a report including, but not limited to, a description of the Panel review process, the rationale, conclusions and recommendations of the Panel relating to the environmental assessment of the Project, including any mitigation measures and follow-up programs. The Panel shall also include within its report a summary of any comments received from the public and First Nations.

The Panel will submit its report at the earliest possible date, within 60 days following the completion of the public hearings.

On receiving the report submitted by the Panel, the Minister of the Environment will make the report available to the public and will advise the public that the report is available.

## ANNEX 1 TO TERMS OF REFERENCE

### DEFINITION OF TERMS

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“**BC EAO**” means the British Columbia Environmental Assessment Office

“**CEAA**” means the Canadian Environmental Assessment Act;

“**EIS Guidelines**” means the direction provided to the Proponent by the Minister of the Environment and the BC EAO on matters that must be addressed in the Proponent’s Environmental Impact Statement;

“**Environmental Assessment**” means an assessment of the environmental effects of the Project that is conducted in accordance with the Terms of Reference and CEAA;

“**First Nations**” means those First Nations who have potential or established Aboriginal rights or title or who assert Aboriginal rights at or near the Project area including but not limited to the members of the Tsilhqot’in Nation (comprised of the Alexandria Indian Band (?Esdilagh), the Alexis Creek Indian Band (Tsi Del Del), Stone Indian Band (Yunesit’in Government), Anaham Indian Band (TI’etinqox’t-in Government), Xení Gwet’in First Nations Government and the Toosey Indian Band (TI’esqox)); the Canoe Creek Band, the Williams Lake Band, the Soda Creek Band, the Esketemc First Nation, the Canim Lake Band and the High Bar Band.

“**Panel**” means the review panel established by the Minister of the Environment pursuant to CEAA and composed of the persons appointed by the Minister of the Environment pursuant to section 33(1) of CEAA to conduct an assessment of the Project;

“**Precautionary Principle**” means the application of prudent foresight, the recognition of uncertainty, and, when decisions must be taken, to err on the side of caution;

“**Project**” means the project as described in the section of the Terms of Reference entitled “Scope of the Project”

“**Proponent**” means Taseko Mines Limited;

“**Public Registry**” means a registry established by the Agency in accordance with s. 55 of the CEAA;

## APPENDIX 2: Biographies of Panel Members

### **Robert (Bob) Connelly**

Mr. Connelly is a consultant who has worked in the field of environmental assessment for much of his career. He graduated from the University of Waterloo in 1970 as a civil engineer.

Mr. Connelly worked for the Canadian Environmental Assessment Agency and its predecessor, the Federal Environmental Assessment Review Office, for 27 years. He was appointed as Acting President of the Canadian Environmental Assessment Agency and served in this capacity for 17 months before his retirement in 2005. Prior to this, Mr. Connelly served as Vice-President, Policy Development for ten years and was responsible for policy and regulation development under the *Canadian Environmental Assessment Act*, research and development, inter-governmental affairs, relations with Aboriginal organizations, as well as international programs. In 2006, the International Association of Impact Assessment presented him with the Rose-Hulman Award in recognition of his contribution and leadership in the field of environmental assessment.

Mr. Connelly has experience chairing federal and joint environmental assessment review panels across Canada. He chaired federal review panels examining issues related to the problem of diseased bison in Wood Buffalo National Park, and the CN Rail twin tracking program and the Fraser-Thompson corridor review in British Columbia. He also chaired the initial Panel reviews of the Rafferty-Alameda dams in Saskatchewan and airport expansion at Pearson International Airport in Toronto. Mr. Connelly co-chaired the joint federal-provincial panel reviewing the construction of a second nuclear reactor at Point Lepreau, New Brunswick and recently chaired the joint review panel reviewing a natural gas drilling project proposed in the Canadian Forces Base Suffield National Wildlife Area in Alberta. He also chaired a United Nations working group that developed the United Nations Convention on Environmental Impact Assessment in a Transboundary Context.

### **Bill Klassen**

Bill Klassen is a private consultant with extensive experience in natural resource management and environmental assessment in northern Canada. He has a Bachelor of Science degree in Wildlife Management from the University of Alaska, Fairbanks and obtained a Master of Forestry degree from the Yale School of Forestry and Environmental Studies. He resides in Whitehorse, Yukon Territory.

Mr. Klassen has lived and worked in the Yukon, Northwest Territories, Nunavut and Alaska for the past 40 years. He has served as Deputy Minister of Renewable Resources and Deputy Minister of Health and Human Resources for the Yukon Government. He has worked as a consultant for government, First Nations and the private sector on a wide range of projects and has facilitated the engagement of Aboriginal communities in resource development projects, including two diamond mines. He was the federal member on the Environmental Fund Board for the Anvil Range Mine for ten years.

Mr. Klassen has broad experience with environmental assessment in northern Canada. He was a member of two Federal Environmental Assessment Review Office panels which reviewed the Foothills Alaska Highway Gas Pipeline project. He represented the Yukon Government in negotiations related to the drafting of the *Yukon Environmental and Socioeconomic Assessment Act*. He was appointed by federal Order-in-Council to chair the Environmental Impact Screening Committee, the committee that screens all development



projects for the Inuvialuit Settlement Region in the western Arctic. He also served as Yukon member of the Environmental Impact Review Board for the Inuvialuit Final Agreement.

**Nalaine Morin**

Ms. Morin holds a Bachelor of Applied Science degree from the University of British Columbia, a Mechanical Engineering Technology Diploma from the British Columbia Institute of Technology, and is currently working on a Masters of Applied Science degree from the University of British Columbia. She resides in Sparwood, British Columbia.

Ms. Morin has focused her career working in the mining and resource development industry and has experience working with industry, government and First Nations. She has worked in various operations across Canada including Alberta, Manitoba, British Columbia and the Northwest Territories. During her time at Hudson Bay Mining and Smelting in Flin Flon, Manitoba, Ms. Morin was successful in gaining experience both as a metallurgist in milling, smelting and hydrometallurgical operations and as a section leader where she was responsible for the environmental water and air monitoring programs.

Most recently, Ms. Morin's has been working and living in British Columbia. She was formally the manager of the Tahltan Heritage Resources Environmental Assessment Team, a traditional knowledge based working team, where she played an integral role in the team's design and development. She was also instrumental in the development of processes for this team and for the Tahltan that ensured the inclusion of Tahltan knowledge in the environmental assessment and permitting processes for resource development projects in Tahltan territory. Her skill set, combined with being of First Nation descent, enabled her to marry both First Nation traditional knowledge and western science together in a way that bridged cultural understanding on both sides. During her tenure with the Tahltan, she supervised the review of multiple environmental assessment applications. Ms Morin has gained a national reputation for effectively managing complicated mining issues in a cross cultural setting.

**Appendix 3 – List of Appearances at the Public Hearing**

**General Hearing Sessions**

<b>Name</b>	<b>Organization</b>
Alexis, Chief Fabian	Okanagan Indian Band
Alleyne, Dr. Carl	Health Canada
Alphonse, J.	Tl'etinqox (Anaham Band)
Baptiste, Chief Marilyn	Xeni Gwet'in, Tsilhqot'in Nation
Barley, G.	Williams Lake Construction Association
Battison, B.	Taseko Mines Limited
Baye, D.	Ranchland Honda
Bedard, B.	Esketemc First Nation
Bell-Irving, R.	Taseko Mines Limited
Birchwater, S.	Personal capacity
Bird, S.	Personal capacity
Burgess, M.	Natural Resources Canada
McPherson, K.	Natural Resources Canada
Jonstone, R.	Natural Resources Canada
Carruthers, B.	Share the Cariboo-Chilcotin Resources Society
Charleyboy, Former Chief Ervin	Personal capacity
Christianson, D.	Personal capacity
Clark, Keith	Taseko Mines Limited
Cook, Mayor Kerry	City of Williams Lake
Diether, D.	Personal capacity
Doerkson, L.	Personal capacity
Dressler, J.	Council of Canadians, Williams Lake Chapter

<b>Name</b>	<b>Organization</b>
Elkins, Chief Bernie	?Esdilagh (Alexandria Band)
Fugge, D.	Fugge family
Galipeau, J	Personal capacity
Garland, B.	Garland family
Garson, J.	B.C. Chamber of Commerce
Grand Chief Phillip	Penticton Indian Band Council
Gratton, P.	Mining Association of BC
Grinder, C.	Tsilhqot'in Nation
Grinder, Coucillor Blaine	Tl'etinqox (Anaham Band)
Guichon, Chief Percy	Tsi Del Del (Redstone Band)
Haines, E.	Personal capacity
Harjap, G.	Council of Canadians
Hart, R.	MiningWatch Canada
Hennecker, R.	Community Enhancement and Economic Development Society
Hoglund, G.	Lower Bridge Creek Water Stewardship Society
Hooper, B.	Personal capacity
Hornby, C.	Personal capacity
Hurley, Dr. K	University of Victoria
Jones, C	Personal capacity
Jones, S.	Taseko Mines Limited
Karunanathan, M.	Council of Canadians
Kelly, Stephanie	University of Victoria

Name	Organization
Kohlen, R.	Personal capacity
Kohut, S.	Personal capacity
Lee, G.	Personal capacity
Loewen, R.	Personal capacity
Mackie, J.	Transport Canada
McMechan, F.	Williams Lake Field Naturalists
Meyers, Chief Ivor	Yunesit'in (Stone Band)
Mingo, Coucillor Dave	District of 100 Mile House
Mumford, R.	Cariboo Regional District Board
Myers, L.	Tsilhqot'in Nation
Myers, T.	Tsilhqot'in Nation
Lulua, R.	Tsilhqot'in Nation
Nelson J.	Tsilhqot'in National Government
Nixon, S.	Tsilhqot'in National Government
Nunez, C.	Personal capacity
Oppermann, N.	Xeni Gwet'in Cultural Tourism
Osorio, F.	Personal capacity
Peterson, W.	Personal capacity
Phillip, Grand Chief Stewart	Okanagan Indian Band
Redford, S.	Williams Lake and District Chamber of Commerce
Reuter, S.	Taseko Lake Outfitters
Reuter, K.	Taseko Lake Outfitters
Robbins, Chief Fred	Esketemc First Nation
Samuel Myers Ross, R.	Personal capacity
Sharples, D.	Mining Suppliers of British Columbia

Name	Organization
Silverstein, A.	Fisheries and Oceans Canada
Smith, D.	Pacific Coastal Airlines
Smith, L.	Tsilhqot'in National Government
Stadfeld, Dr. Bruce	Canoe Creek Indian Band
Stoddard, A.	Cariboo Chilcotin Conservation Society
Sullivan, L.	Transport Canada
Summers, J.	Fisheries and Oceans Canada
Taylor, E	Personal capacity
Teegee, Vice Tribal Chief Terry	Carrier Sekani Tribal Council via letter presented by Chief Percy Guichon
Thompson, A.	Great West Equipment
Tucket, J.	Personal capacity
Tugnum, T.	Personal capacity
Wellburn, J.	Personal capacity
William, Former Chief Roger	Tsilhqot'in National Government
Williams, L.	Tsilhqot'in National Government
Wilson, D.	Personal capacity
Zibeau, M.	Personal capacity

**Community Hearing Sessions**

Name	Organization
Alexis, Chief Tom	Upper Fraser Fisheries Conservation Alliance
Allen, S. and students	Personal capacity
Alphonse, C.	Personal capacity
Alphonse, Chief Joe	Tl'etinqox (Anaham Band)
Alphonse, G.	Personal capacity
Alphonse, M.	Personal capacity
Alphonse, S.	Personal capacity
Alphonse, W.	Personal capacity
Archie, D.	Personal capacity
Archie, S.	Personal capacity
Baptiste, Chief Marilyn	Xeni Gwet'in First Nation
Barry, B.	Personal capacity
Battison, B.	Taseko Mines Limited
Bedard, B.	Personal capacity
Belleau, J.	Personal capacity
Bell-Irving, R.	Taseko Mines Limited
Billy, A.	Personal capacity
Billy, D.	Personal capacity
Billy, S.	Personal capacity
Billy, T.	Personal capacity
Billyboy, C.	Personal capacity
Billyboy, D.	Personal capacity
Billyboy, Former Chief Tommy	Personal capacity
Billyboy, P.	Personal capacity

Name	Organization
Billyboy, W.	Personal capacity
Bobby, M.	Personal capacity
Calabrese, K.	Tsi Del Del Health Practitioner
Camille, C.	Personal capacity
Camille, Chief Marilyn	Secwepem'c First Nation (Canoe Creek Band)
Carelson, J.	Personal capacity
Carelson, S.	Personal capacity
Case, G.	Personal capacity
Case, J.	Personal capacity
Case, L.	Personal capacity
Char, A.	Personal capacity
Char, Councillor Terry	Personal capacity
Char, E.	Personal capacity
Charelyboy, J.C.	Denisiqi Service Society
Charleyboy, B.	Personal capacity
Charleyboy, M.	Personal capacity
Charleyboy, O.	Personal capacity
Chelsea, Councillor Patricia	Personal capacity
Chelsea, Dr. Phyllis	Personal capacity
Chelsea, Former Chief Andy	Personal capacity
Chelsea, Former Chief Bill	Personal capacity
Chelsea, Lynn	Personal capacity
Chipman, G.	Personal capacity
Clark, Keith	Taseko Mines Limited

Name	Organization
Colgate, G.	Personal capacity
Cooper, B.	Personal capacity
Cooper, C.	Personal capacity
Cooper, G.	Personal capacity
Dan, Councillor Troy Sr.	Personal capacity
Denault, Chief Rick	Skeetchestn First Nation
Diablo, D.	Personal capacity
Diablo, N.	Personal capacity
Dick, Former Chief Arthur	Personal capacity
Dick, M.	Personal capacity
Dick, Willard	Personal capacity
Dick, Wes	Personal capacity
Duncan, G.	Personal capacity
Elkins, Jerry	Personal capacity
French, D.	Personal capacity
George, N.	Personal capacity
Gilpin, P.	Personal capacity
Gizikoff, K.	Taseko Mines Limited
Gottfriedson, Chief Shane	Tk'emlups First Nation
Grinder, Councillor Blaine	Personal capacity
Grinder, Former Chief Cecil	Personal capacity
Grinder, M.	Personal capacity
Guichon, C.	Personal capacity
Guichon, Chief Percy	Tsi Del Del (Redstone Band)
Guichon, Councillor Rocky	Personal capacity
Guichon, M.	Personal capacity

Name	Organization
Guichon, P.	Personal capacity
Guichon, S.	Personal capacity
Haig-Brown, H.	Personal capacity
Haig-Brown, L.	Personal capacity
Haines, E. Jr.	Personal capacity
Haines, I.F.	Personal capacity
Haines, J.	Personal capacity
Haller, A.	Personal capacity
Haller, C.	Personal capacity
Haller, D.	Personal capacity
Haller, T.	Personal capacity
Hance, J.	Personal capacity
Hance, O.	Personal capacity
Hance, R.	Personal capacity
Hancock, T.	Personal capacity
Harry, A.	Personal capacity
Harry, C.	Personal capacity
Harry, Councillor Patrick	Personal capacity
Harry, D.	Personal capacity
Harry, H.	Personal capacity
Harry, Larry	Personal capacity
Harry, Louise	Personal capacity
Hink, B.	Personal capacity
Hink, D.	Personal capacity
Hink, Marlene	Personal capacity
Hink, Molly	Personal capacity

Name	Organization
Holmes, R.	Personal capacity
Holte, G.	Personal capacity
Hughson, S.	Xeni Gwet'in First Nation Health Care Practitioner
Hunt, E.	Esketemc First Nation
Inscho, Edith	Personal capacity
Inyallie, M.	Personal capacity
Isnardy, J.	Personal capacity
Isnardy, W.	Personal capacity
Jack, P.	Personal capacity
Jack, R.	Personal capacity
Jeff, H.	Personal capacity
Jensen, R.	Personal capacity
Jim, M.	Personal capacity
Johnny, C.	Personal capacity
Johnny, Councillor Georgina	Personal capacity
Johnny, D.	Personal capacity
Johnny, Nora	Personal capacity
Johnny, P.	Personal capacity
Johnny, S.	Personal capacity
Johnny, T.	Personal capacity
Johnny, V.	Personal capacity
Johnson, Councillor Irvine	Personal capacity
Johnson, Councillor Joyce	Personal capacity
Johnson, Dorothy	Personal capacity
Johnson, Frederick	Personal capacity

Name	Organization
Johnson, Francis Jr.	Personal capacity
Johnson, L.	Personal capacity
Kershaw, D. and students	Naghtaneqed Elementary School
King, Audrey	Personal capacity
Kooley, R.	Personal capacity
Laceese, Chief Francis	Personal capacity
Laceese, Jarvis	Personal capacity
Leon, Chief Nelson	Sexqeltqin First Nation
Lightning child	Personal capacity
Louis, Charlie	Personal capacity
Louis, Charlize	Personal capacity
Lulua, A.	Personal capacity
Lulua, B.	Personal capacity
Lulua, Dinah	Personal capacity
Lulua, Dave	Personal capacity
Lulua, I.	Personal capacity
Lulua, Juliana	Personal capacity
Lulua, Joyce	Personal capacity
Lulua, James. Jr.	Personal capacity
Lulua, James. Sr.	Personal capacity
Lulua, K.	Personal capacity
Lulua, M.	Personal capacity
Lulua, P.	Personal capacity
Lulua, R.	Personal capacity
Lulua, S.	Personal capacity
Maryann, C.	Personal capacity

Name	Organization
Maryann, J.	Personal capacity
McCrory, W.	Personal capacity
Merritt, A.	Personal capacity
Michel, A.	Personal capacity
Myers, Chief Ivor	Yunesit'in (Stone Band)
Myers, Lloyd	Personal capacity
Myers, Madaline	Personal capacity
Myers, Maria	Personal capacity
Myers, W.	Personal capacity
Nakada, H.	Personal capacity
Nixon, S.	Tsilhqot'in National Government
Norris, C.	Personal capacity
Palmantier Gentles, J.	Personal capacity
Palmantier, C.	Personal capacity
Palmantier, Q.	Personal capacity
Palmantier, S.	Personal capacity
Palmer, Dr. Andie	Personal capacity
Paul, Councillor Neil	Personal capacity
Perry, S.	Personal capacity
Peter, J.	Personal capacity
Peters, L.	Personal capacity
Peters, W.	Personal capacity
Phillips, R.	Personal capacity
Pukacz, G.	Personal capacity
Quilt, E.	Personal capacity
Quilt, J.	Personal capacity

Name	Organization
Reuter, S.	Taseko Lake Outfitters
Robbins, Chief Fred	Esketemc First Nation
Robbins, Councillor Bertha	Personal capacity
Robbins, V.	Personal capacity
Robbins, W.	Personal capacity
Rosette, P.	Personal capacity
Runka, G.	Personal capacity
Samson, B.	Personal capacity
Sellars, B.	Personal capacity
Sellars, T.	Personal capacity
Setah, D.	Personal capacity
Setah, M.	Personal capacity
Setah, N.	Personal capacity
Setah, V.	Personal capacity
Seteh, S.	Personal capacity
Shadowhawk	Personal capacity
Sheen, K.	Personal capacity
Simmons, J.	Naghtaneqed Elementary School
Smith, J.	Personal capacity
Solomon, A.	Personal capacity
Solomon, G.	Personal capacity
Solomon, Mabel and family	Personal capacity
Solomon, Marty	Personal capacity
Solomon, N.	Personal capacity
Solomon, R.	Personal capacity
Solomon, T.	Personal capacity

Name	Organization
Sort, S.	Personal capacity
Squillian, L.	Denisiqi Service Society
Stadfeld, Dr. Bruce	Secwepemc First Nation (Canoe Creek Band)
Stewart-Harawira, Dr. M.	Personal capacity
Stieman, D.	Personal capacity
Stieman, G.	Personal capacity
Students	Tsi Del Del Senior School Class
Stump, C.	Personal capacity
Stump, J.	Personal capacity
Stump, Councillor Leslie	Personal capacity
Stump, Lionel	Personal capacity
Stump, M.	Personal capacity
Stump, Stanley	Personal capacity
Stump, Sherry	Personal capacity
Stump, T.	Personal capacity
Stump, V.	Personal capacity
Stump-William, S.	Personal capacity
Sure, N.	Personal capacity
Tanis, K.	Naghtaneqed School
Terry, Grand Chief Saul	Intertribal Treaty Organization
Theodore, D.	Personal capacity
Ward, J.	Personal capacity
Whitey-Hunlin, B.	Personal capacity
William, Agnes	Personal capacity
William, Alice	Personal capacity
William, April	Personal capacity

Name	Organization
William, Doreen	Personal capacity
William, Delia	Personal capacity
William, Former Chief Roger	Personal capacity
William, G.	Personal capacity
William, K.	Personal capacity
William, Maryanne	Personal capacity
William, Marvin	Personal capacity
William, Mary	Personal capacity
William, S.	Personal capacity
William, T.	Personal capacity
Williams, D.	Personal capacity
Williams, L.	Personal capacity
Williams, S.	Personal capacity
Williams, T.	On behalf of his late mother, Maryann and on behalf of his late Uncle, Tony Myers
Wilson, B.	Personal capacity
Wilson, Chief Judy	Neskonlith First Nation



**Topic-Specific Hearing Session**

<b>Name</b>	<b>Organization</b>
Battison, B.	Taseko Mines Limited
Bedard, B.	Esketemc First Nation
Bell-Irving, R.	Taseko Mines Limited
Birchwater, S.	Personal capacity
Bird, M.	Personal capacity
Bryden, C.	on behalf of Taseko Mines Limited
Burgess, M.	Natural Resources Canada
Carruthers, B.	Share the Cariboo-Chilcotin Resources Society
Cathcart, J.	on behalf of Taseko Mines Limited
Cobb, W.	Williams Lake and District Chamber of Commerce
Crook, A.	on behalf of Tsilhqot'in National Government
Crozier, T.	on behalf of Taseko Mines Limited
Day, S.	on behalf of Taseko Mines Limited
de Shield, C.	Environment Canada
Desbarats, Dr. A.	Natural Resources Canada
Dumaresq, C.	Environment Canada
Hagen, M.	Environment Canada
Hart, R.	MiningWatch Canada
Hartman, Dr. Gordon	on behalf of Tsilhqot'in National Government
Holmes, R.	on behalf of Tsilhqot'in National Government
Hume, J.	Fisheries and Oceans Canada
Johnstone, R.	Natural Resources Canada
Jones, S.	Taseko Mines Limited

<b>Name</b>	<b>Organization</b>
Kallio, R.	Environment Canada
Kunkel, T.	Personal capacity
Kuyek, J.	MiningWatch Canada
Kwong, J.	Natural Resources Canada
Larcombe, P.	on behalf of Tsilhqot'in National Government
Lalonde, M.	Environment Canada
Liebe, R.	on behalf of Taseko Mines Limited
MacGregor, D.	on behalf of Taseko Mines Limited
Mackie, J.	Transport Canada
Maest, Dr. Anne	on behalf of Tsilhqot'in National Government
McPherson, K.	Natural Resources Canada
Morin, Dr. K.	on behalf of Tsilhqot'in National Government
Morris, Dr. Jeff	on behalf of Tsilhqot'in National Government
Munro, K.	on behalf of Taseko Mines Limited
Nicol, S.	on behalf of Taseko Mines Limited
Osorio, F.	Personal capacity
Paquet, M.	Friends of the Nemaiah Valley
Pearse, T.	on behalf of Tsilhqot'in National Government
Robbins, Chief Fred	Esketemc First Nation
Robinson, A.	Environment Canada
Ruble, B.	on behalf of Taseko Mines Limited
Ryll, J.	Williams Lake and District Chamber of Commerce
Selbie, Dr. Dan	Fisheries and Oceans Canada
Shaffer, Dr. Marvin	Friends of the Nemaiah Valley
Silverstein, A.	Fisheries and Oceans Canada

Name	Organization
Smyth, G.	on behalf of Taseko Mines Limited
Sullivan, L.	Transport Canada
Summers, J.	Fisheries and Oceans Canada
Travers, C.	on behalf of Taseko Mines Limited
Trusler, S.	on behalf of Taseko Mines Limited
Twohig, K.	on behalf of Taseko Mines Limited
Verhaeghe, C.	Tsilhqot'in National Government
Weinberger, D.	on behalf of Taseko Mines Limited
Williams, D.	Friends of the Nemaiah Valley
Wobus, C.	on behalf of Taseko Mines Limited

**Closing Remarks**

<b>Name</b>	<b>Organization</b>
Alphonse, Chief Joe	Tsilhqot'in National Government Chiefs
Baptiste, Chief Marilyn	Tsilhqot'in National Government
Hooper, Barbara	Personal capacity
Bedard, B.	Esketemc First Nation
Camille, Chief Marilyn	Canoe Creek Band
Carruthers, B.	Share the Cariboo-Chilcotin Resources Society
Cook, Mayor Kerry	City of Williams Lake
Elkins, Chief Bernie (Presented by Chief Marilyn Baptiste)	Tsilhqot'in National Government Chiefs
Osorio, F.	Personal capacity
Guichon, Chief Percy	Tsilhqot'in National Government Chiefs
Harry, Councillor Gertrude	Canoe Creek Band
Hart, R.	MiningWatch Canada
Nakada, H.	Personal capacity
Hunt, E.	Esketemc First Nation
Laceese, Chief Francis	Tsilhqot'in National Government Chiefs
Myers, Chief Ivor	Tsilhqot'in National Government Chiefs
Nixon, S.	Tsilhqot'in National Government
Philip, Grande Chief Stewart	Tsilhqot'in National Government
Reuter, S.	Taseko Lake Outfitters
Reuter, K.	Taseko Lake Outfitters
Robbins, Chief Fred	Esketemc First Nation
Birchwater, S.	Personal capacity

<b>Name</b>	<b>Organization</b>
Stadfeld, Dr. Bruce	Canoe Creek Band
Kohut, S.	Personal capacity
Williams, D.	Friends of the Nemaiah Valley

**SECRETARIAT STAFF**

Name
Dunn, Carolyn
Dyble, Jaron
Fitch, Gavin (Legal Counsel)
Jamualt, Lucille
McKeage, Patricia
Michaud, Livain
Parker, Cindy
Ronzio, Joseph
Spagnuolo, Colette

**APPENDIX 4: Environmental Assessment Certificate #M09-02, Schedule B – Proponent’s Commitment List**

Sustainability Area / Component	Commitment
<b>Governance</b>	
1.0 Policies	<p>1.1: Develop and implement corporate policies (Policies) that will be made available on the Taseko website for reference during all phases of the Project. Current policies in place or under development comprise the Prosperity Sustainability framework and include:</p> <ul style="list-style-type: none"> <li>a. Environment Policy (in place);</li> <li>b. Health and Safety Policy (in place);</li> <li>c. Code of Ethics and Trading Restrictions (in place);</li> <li>d. First Nations Long-term strategy for consultation and engagement (in place);</li> <li>e. Emergency Preparedness (under development); and,</li> <li>f. Responsible Resource Development (on-going development)</li> </ul> <p>Taseko’s goal is to develop the mineral resource while making certain that the construction, operations and closure of Prosperity are handled in a sustainable manner, including the primary responsibility of contributing towards the maintenance of healthy lands, communities, resources and ecosystems for present and future generations. Moreover, Taseko is committed to ensuring the entire Project makes a net positive contribution to sustainability of lands, communities, resources and ecosystems over the long term.</p> <p>1.2: Implement Prosperity’s Sustainability Framework through the life of the Project.</p> <p>1.3: Ensure that responsible site management, employees and contractors are familiar with these Policies, and their actions at all times comply with them and relevant acts, regulations, permits, licenses, authorizations and approvals.</p>
2.0 Consultation/First Nations	<p>2.1: Maintain early, open, and full communication with First Nations on Taseko projects and programs in their asserted traditional territories.</p> <p>2.2: Recognize and take into consideration the value and significance First Nations place on traditional, cultural and heritage knowledge and interest.</p> <p>2.3: Promote the development of mutually beneficial partnerships with our First Nation neighbours.</p> <p>2.4: Work with First Nation Governments to encourage the formation and development of locally owned businesses.</p> <p>2.5: Provide opportunities for employment.</p> <p>2.6: Provide opportunities for training and career advancement for employees</p> <p>2.7: Continual improvement in the protection of human health and responsible stewardship of the natural environment.</p> <p>2.8: Prior to or during the construction of the transmission line, should information become</p>

Sustainability Area / Component	Commitment
	available from First Nations identifying habitat, vegetation, or features of importance not previously considered in the constraints analysis undertaken to select the centre-line, Taseko will make reasonable efforts to avoid or mitigate impacts to these features
3.0 Consultation/Communities	3.1: Maintain early, open, and full communication with local communities. 3.2: Promote the development of mutually beneficial partnerships with local communities. 3.3: Work with local communities to encourage the formation and development of locally owned businesses. 3.4: Provide opportunities for employment. 3.5: Provide opportunities for training and career advancement for employees. 3.6: Continual improvement in the protection of human health and responsible stewardship of the natural environment.
4.0 Sustainability Management Plan	4.1: Develop and implement an Environmental Management System (EMS) the Project to encompass continual improvement in sustainability and the protection of human health and stewardship of the natural environment. 4.2: Establish measureable sustainability goals and targets through the EMS which would include commitments agreed to with First Nations, local communities and regulatory agency representatives.
5.0 Contractors/External Forces	5.1: Require that Prosperity's contractors or consultants comply with Taseko Policies related to sustainability, environment, health and safety, training, local employment, and procurement.
<b>Environmental Stewardship</b>	
6.0 Environmental Management System	6.1: Establish an EMS which will include Environmental Management Plans (EMPs) as an integral part of the Project and provide guidance on all environmental aspects during all phases of the Project. These EMPs convert the environmental assessment mitigation measures and best management practices (BMPs) as identified throughout the Application, as well as future permit or panel commitments, into actions that are intended to minimize or eliminate negative environmental effects associated with the Project. The EMPs presented in Volume 3 of the Application will be further developed and finalized prior to construction, where relevant, and prior to operations in all cases. Standard Operating Procedures (SOPs) will be used to implement the EMPs. 6.2: Maintain a proactive working relationship with appropriate Regulatory authorities in the development of EMPs. 6.3 Qualified Environmental and Engineering staff must be on site during all phases of mine development (i.e. construction, operation, closure and post-closure) and: <ul style="list-style-type: none"> <li>a. Will ensure that all Prosperity employees, contractors and their employees are fully aware of environmental requirements.</li> <li>b. Will monitor compliance with EMPs and specific operating procedures.</li> </ul>

Sustainability Area / Component	Commitment
	<p>c. Will report any incidents of non-compliance in accordance with the compliance reporting required by the EA Certificate and as required by regulation.</p>
<p>7.0 Acid Rock Drainage Prevention and Metal Leaching Control (ARD/ML)</p>	<p>7.1: Implement the Mine Materials Handling Plan described in the Application, Volume 3, Section number 9.2.3.</p> <p>7.2: Ensure that potentially acid generating waste rock (PAG), overburden, tertiary basalt and tailings with criteria described in Table 9.3 of the Application is segregated and deposited in subaqueous disposal in the PAG waste rock disposal facility (tailings impoundment).</p> <p>7.3: Submerge PAG waste rock before onset of ARD/ML.</p>
<p>8.0 Water Management</p>	<p>8.1: Finalize and implement the construction water management plan as described in Volume 3, Section number 9.2.1 of the Application to ensure, at a minimum, that procedures and policies are followed with respect to site access, geotechnical stability, soils salvage, erosion control, vegetation, wildlife, cultural and heritage resources, and emergency response.</p> <ul style="list-style-type: none"> <li>a. Develop and implement an erosion and sediment control plan (ESCP) consistent with industry BMPs to mitigate environmental effects attributed to sediment as detailed in Volume 3, 9.2.11 of the Application. <ul style="list-style-type: none"> <li>i. Designate at least one Qualified Environmental staff person on-site during active construction to ensure the ESCP is properly implemented. The qualified staff person will report to the senior engineer on-site.</li> </ul> </li> <li>b. Ensure all necessary sediment and erosion control mitigation measures will be in place and operational prior to construction.</li> </ul> <p>8.2: Operate a closed system that contains all mine waters on the Project site until approximately 27 years after the cessation of pit operations when the pit is flooded. Direct any surface drainage, sewage treatment plant, sediment or metal-laden water to the tailings storage facility (TSF) during operations.</p> <p>8.3: Implement the Tailings Impoundment Operation EMP elements as described in Volume 3, Section 9.2.4 of the Application. This plan will include but is not limited to:</p> <ul style="list-style-type: none"> <li>a. Ensuring seepage reduction provisions are in place to minimize seepage losses from the TSF;</li> <li>b. Installing surveillance instrumentation in the tailings embankment and foundation during construction and over the life of the Project and monitoring on a consistent basis;</li> <li>c. In the event of premature mine closure, the PAG waste would be excavated to a level below the natural flood elevation of the TSF or otherwise submerged; and,</li> <li>d. In the event of a temporary closure, the actions outlined in the July 31, 2009 Temporary Closure Reclamation and Decommissioning Plan (IR 2.2) would be implemented.</li> </ul>

Sustainability Area / Component	Commitment
	<p>8.4: Develop and implement the Tailings Dam Operation, Maintenance and Surveillance (OMS) Plan and ensure an annual Dam Safety Review is conducted as required by the Mines Act HSRC, and Dam Safety Reviews are conducted as set out by the Canadian Dam Association (CDA) Guidelines.</p> <p>8.5: Continue to identify areas of high risk for erosion and sedimentation throughout the life of the Project (planning and design, construction, operation, decommissioning and reclamation) and implement general mitigation measures detailed in Volume 3, Section 9.2.11.1 of the Application.</p> <p>8.6: Develop and implement a hydrologic and hydrogeological data collection and monitoring program appropriate to:</p> <ul style="list-style-type: none"> <li>a. Meet compliance monitoring requirements; and,</li> <li>b. Increase confidence in interpreted hydrogeological conditions assumed for the Project area. In particular with respect to the west embankment, development and implementation of this program will be consistent with the mitigation measures and technical considerations outlined in Taseko's July 9, 2009 memorandum to the BC Ministry of Environment (MOE) on the subject. Taseko commits to collecting the additional information to further assess seepage issues and that this information will be available and incorporated into the detailed designs for seepage control and interception measures. Timing of the provision of this additional information will be determined at the <i>Mines Act</i> permitting stage but will be prior to the detailed design stage.</li> </ul> <p>8.7: Meet generic and any site-specific Water Quality Guidelines (WQG) in Fish Creek that may be developed during permitting through treatment, if required, as detailed in Volume 5, Section 2 of the Application. The water quality objectives for Taseko River stipulate no change from upstream to downstream of mine operations</p>
9.0 Fish Compensation	<p>9.1: Develop and implement a Fish and Fish Habitat Compensation Plan that supports provincial fisheries management objectives and the application of federal policy respecting the protection of fish and fish habitat. The Fish and Fish Habitat Compensation Plan will be designed and implemented to achieve the following objectives:</p> <ul style="list-style-type: none"> <li>a. Maintenance of the genetic line exhibited in the trout population in the Fish Lake system;</li> <li>b. Development and maintenance of lake and stream environments of similar or better productive capacity for trout as provided by the Fish Lake system;</li> <li>c. A healthy, self sustaining trout population; and,</li> <li>d. A trout fishery for First Nations and the public of at least similar character to what is supported by Fish Lake under current conditions.</li> </ul>



Sustainability Area / Component	Commitment
	<p>The performance measures outlined in Taseko's December 4, 2009 memorandum will be used to assess whether the Fish and Fish Habitat Compensation Plan meets each of the objectives. These measures will need to be effective for the period of time defined in the December 4<sup>th</sup> memorandum.</p> <p>9.2: Develop and implement a monitoring program to verify the proper implementation of all performance measures and a follow-up program to determine the accuracy of conclusions and the efficacy of the required measures as described in Volume 3, Section 8.4 of the Application. This program is to be developed and implemented in consultation with MOE and DFO.</p> <p>9.3: Use an adaptive management process to incorporate contingency planning, management objectives, ongoing monitoring, and commitment for achieving benchmark goals within specified timelines with regard to fish and fish habitat compensation plans.</p>
10.0 Wildlife	<p>10.1: Implement the mitigation measures for wildlife for all aspects of the Project as described in Volume 5, Section 6.4.1 and Table 6-67 (Mine), 6-68 (Transmission Line), and 6-69 (Access road) of the Application.</p> <p>10.2: Implement additional wildlife protection measures to apply to Project personnel travelling to and from the Project on workdays. These provisions will include but are not limited to:</p> <ul style="list-style-type: none"> <li>a. Firearms are prohibited at all times except when specifically authorized (e.g., wildlife monitor);</li> <li>b. No littering;</li> <li>c. No feeding or harassment of wildlife;</li> <li>d. No hunting and fishing on the Project site; and,</li> <li>e. Project-related traffic is restricted to designated access roads and trails (including all-terrain vehicles and snowmobiles).</li> </ul> <p>10.3: Commit to the strict and rigorous implementation of mitigation measures, in concert with MOE and with other agencies as appropriate, to eliminate or severely minimize the risk of direct mortality to grizzly bear (from all sources, see also Sections 6.1.2.1 and 6.3.4.8 of the Application). Taseko will work with the BC Ministry of Transportation and Infrastructure (MOT) to control mine related traffic speed along the section of Taseko Lake Road that is within known grizzly bear range.</p> <p>10.4: Record all Project-related wildlife-vehicle collisions or near misses as described in Volume 5 in Section 6.4.3.1 of the Application. Wildlife vehicle collisions will be reviewed regularly by Qualified Environmental staff person who will take appropriate action. If a problem area is identified appropriate actions will be taken (e.g., warning signs, site-specific speed limits). In addition, Taseko Mines Ltd. will report any wildlife mortalities resulting from Project vehicles to the MOE regional office and MOT.</p> <p>10.5: Implement the Vegetation and Wildlife Management Plan (Volume 3, Section 9 of the</p>

Sustainability Area / Component	Commitment
	<p>Application) and mitigation measures (Volume 5, Section 6.4.1 of the Application) and Materials Handling and Waste Management Plan for dealing with potential human-bear conflicts.</p> <p>10.6: Implementation of wildlife protection provisions as detailed in the Transportation and Access Management Plan Volume 3, Section 9.2.2 of the Application.</p> <p>10.7: Design and construct a transmission line consistent with BCTC’s standard practices to mitigate potential transmission line electrocution/collision impacts to migratory birds.</p>
11.0 Habitat Compensation	<p>11.1: Develop and implement a plan for achieving compensation for adverse impacts to wetland habitat, the productive capacity of the lake, recreation values, wildlife, wildlife habitat and the critical habitat of species at risk. Development and implementation of the plan will be guided by the following principles:</p> <ul style="list-style-type: none"> <li>a. A suite of mitigation measures designed to eliminate or minimize Project effects have been outlined in the Application. The effectiveness of these mitigation measures will be taken into account when assessing the need and justification for specific compensation measures.</li> <li>b. Compensation measures will be considered and implemented on a case-by-case basis based on the appropriateness of each proposed compensation measure in each case.</li> <li>c. There will be no need for compensation if there is a technically defensible confirmation that there is no adverse impact. The process by which a determination of impact is reached will be transparent, readily understood, and undertaken in consultation with MOE, CWS, and First Nations.</li> </ul> <p>11.2: Taseko will work with MOE officials in a timely manner to develop a “Reference Document” in which roles and responsibilities, timing and strategies for implementation of the plan outlined in 11.1 will be detailed.</p>
12.0 Vegetation, Wetland and Riparian Habitats	<p>12.1: Implement BMP and methods for constructing and upgrading the access road(s) and transmission line, and related stream crossings (Volume 3, Section 9.2.1 in the Application).</p> <p>12.2: Implement mitigation measures to minimize mine related environmental effects on wetland ecosystems. These mitigation measures will be primarily directed at protecting and conserving wetlands in close proximity to the mine footprint to minimize potential for incremental disturbance. The principles of these mitigation measures will be to: Avoid vegetation loss, minimize disturbance, mitigate against invasive species, and maintain natural drainage patterns (Volume 5, Section 5.3.2 of the Application).</p> <p>12.3: 12.3 Implement all appropriate mitigation measures for wetland ecosystems on the</p>

Sustainability Area / Component	Commitment
	<p>transmission line including but not limited to:</p> <ul style="list-style-type: none"> <li>a) Timing construction to avoid activity until ground is frozen;</li> <li>b) Transmission pole delivery to wetland areas completed by helicopter drop; and,</li> <li>c) Minimize the area of excavation for pole foundations and area of footprint of the side cast material.</li> </ul> <p>12.4: Monitor construction of the access road and transmission line to ensure that wetland ecosystems are avoided wherever possible and environmental effects to wetland ecosystems are minimized through application of prescribed mitigation measures. Taseko must follow DFO Pacific Region's <i>Maintenance of Riparian Vegetation in existing Rights of Way</i> Operational Statement and principles and practice in British Columbia Hydro's <i>Approved Works Practices</i> or <i>Managing Riparian Vegetation</i> when maintaining the transmission line right-of-way. Replant only native species in disturbed areas associated with the transmission corridor that fall within the grassland zones.</p> <p>12.5: Implement the invasive plant management plan as proposed in Volume 5, Appendix 5-5-K: and as discussed in Volume 3 section 9.2.12 of the Application. This will include a weed management strategy for maintenance of the transmission line developed in consultation with regulatory agencies, land owners, and First Nations.</p> <p>12.6: Execute mitigation measures for the reduction or elimination of construction related sediment releases into fish-bearing and non fish-bearing habitats as detailed in EMP (Volume 3, Section 9 of the Application). These measures will follow the <i>Standards and Best Practices for In-stream Works</i> (MWLAP 2004) and DFO Operational Statements</p>
13.0 Reclamation and Closure	<p>13.1: Implement Reclamation, Temporary Closure and Decommissioning Plans as described in Volume 3, Section 9.3 of the Application and Taseko's July 31, 2009 memo Temporary Closure Reclamation and Decommissioning Plan (IR 2.2).</p> <p>13.2: Implement the soil salvage plan described in Volume 3, Section 9.3.3.1 of the Application.</p> <p>13.3: Implement reclamation practices that are consistent with the BC Mines Act and its <i>Health, Safety and Reclamation Code</i>. The conceptual reclamation practices and decommissioning plan described in the Application provides a basis for detailed reclamation planning and bonding discussions that will be held with the BC Ministry of Energy, Mines and Petroleum Resources (MEMPR) at a later date as part of the permitting application.</p> <p>13.4: 13.4 Further develop reclamation and decommissioning plans, including progressive reclamation, in consultation with regulatory agencies, First Nations and local communities. At the end of mine operations, complete implementation of the approved closure plan.</p> <p>13.5: Mitigate residual effects of mining with respect to recreation values, wildlife, wildlife habitat, at-risk plant communities and the habitat of species at risk through reclamation approaches as described in the decommissioning plan.</p>

Sustainability Area / Component	Commitment
	<p>13.6: Remove the transmission line and reclaim the transmission line corridor when no longer required.</p>
<p>14.0 Protection of Ecological Values</p>	<p>14.1: Employ BMP throughout all Project phases and activities. In particular, prior to construction commencing, undertake all appropriate measures to ensure that sensitive habitat features and wildlife values are identified and all appropriate mitigative measures are implemented to avoid adverse effects.</p> <p>14.2: Identification and implementation of additional measures adequate to protect aquatic life as detailed in Volume 1, Table 20-1 of the Application.</p> <p>14.3: Develop policies and procedures, conduct public consultation, and conduct access planning for the transmission line ROW.</p> <p>14.4: Identify and quantify Project effects on wildlife and vegetation at a local level on a scale that would enable the identification of appropriate mitigation/compensation measures.</p>
<p>15.0 Mitigation specific to transmission line construction</p>	<p>15.1: Review transmission line final design details and proposed construction scheduling with MOE-ESD (Environmental Stewardship Division) before commencement of construction.</p> <p>15.2: During construction, work with MOE-ESD and with other regulatory bodies as appropriate to implement all appropriate mitigation strategies as detailed in Taseko's "Transmission Line Corridor Mitigation Strategies" (IR 6.2). This will include surveying the final transmission line corridor to identify and mitigate impacts to wildlife features, rare plants, and other features of importance.</p>
<p>16.0 Monitoring</p>	<p>16.1: Implement the follow-up and monitoring plan described in Volume 3, Section 9 in the Application (which includes a program for environmental effects monitoring and follow-up through construction, operation, closure, and post-closure to verify the accuracy of the environmental assessment) and determine the effectiveness of mitigation measures.</p> <p style="padding-left: 20px;">a. Develop and implement compliance monitoring programs to meet applicable provincial and federal permits, licenses and approvals and meet any reporting requirements of these permits, licenses and approvals.</p> <p>16.2: Conduct the Follow-up and Monitoring programs summarized in Table 16-1, Volume 1 of the Application in the nine specific disciplines listed through all mining phases.</p> <p>16.3: Assess the suitability of reclaimed sites for wildlife use through trace element monitoring in vegetation.</p> <p>16.4: Assess routine monitoring results for the various waste streams during operations to develop specific effluent treatments if needed. Investigate if monitoring results indicate effluent quality of specific waste streams is likely to contribute to exceedances post-</p>

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	<p>closure.</p> <p>16.5: Continue ongoing discussions with MOE-ESD and undertake additional hydrology and hydrogeology baseline sampling.</p>
<p>17.0 Air Emissions</p>	<p>17.1: Incorporate into Project design, Best Available Technology that is Economically Achievable (BATEA) measures to reduce Criteria Air Contaminants (CAC) and Greenhouse Gas (GHG) emissions wherever possible.</p> <p>17.2: Utilize effective dust suppression methods and CAC and GHG mitigation measures, including but not limited to:</p> <ul style="list-style-type: none"> <li>a. Install covered conveyor belt ore transport systems and housing of the rail load-out facilities to minimize fugitive particulate emissions;</li> <li>b. Install a water suppression system at the discharge point of the coarse ore stockpile to reduce dust emissions;</li> <li>c. Install dust control measures at the primary crusher truck dump to control dust emissions;</li> <li>d. Cover trucks used to transport concentrate to prevent loss of this material and to ensure there is no tracking of any residual concentrate on route to the concentrate load-out facility;</li> <li>e. Ensure posted speed limits are followed by all mine equipment and vehicles;</li> <li>f. Ensure application of surface-binding chemicals or water on site roads and exposed surfaces as required to control dust;</li> <li>g. For vehicles, off-road construction, and mining equipment, best practices will include ensuring equipment is properly tuned and maintained, and vehicle idling times reduced to a minimum;</li> <li>h. Optimize vehicle movements to minimize emission of GHGs; and,</li> <li>i. Minimize disturbances and manage all land clearing to minimize burning.</li> <li>j. Develop and implement an Air Quality and Dust Control Management Plan as described in Volume 3, Section 9.2.9.</li> </ul> <p>17.3: Taseko will work with MOE to develop an Air Quality and Emissions Monitoring and Management Plan (AQEMMP) as outlined in the MOE submission (dated May 25, 2009 from Graham Veale to EAO). The AQEMMP will be implemented as soon as practicable after a decision to proceed with the Project has been made and will continue through the life of the Project. The AQEMMP will ensure that facility emissions are tracked and contaminants of potential concern are monitored; that all applicable federal and provincial ambient air quality, criteria, standards, objectives, and guidelines are met; and provide an umbrella document to house all related monitoring programs and management plans, including contingency plans with identified actions and triggers for implementation.</p> <p>17.4: Ongoing monitoring of dust resulting from the tailings beach to verify the predicted</p>

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	<p>levels and to ensure that any impacts are minimized. Design of monitoring program will allow for input from regulatory agencies.</p> <p>17.5: Limit fugitive dust caused by wind erosion on the tailings by maintaining a water cover over the deposited materials as stipulated in the Operational Deposition Plan. Fugitive dust caused by wind erosion on the waste rock piles will be mitigated by progressive reclamation</p> <p>17.6: Prepare and execute a burn plan for vegetative debris consistent with the Open Burning Smoke Control Regulation (BC Reg. 145/93) prior to initiation of the construction and commissioning phase.</p> <p>17.7: Develop and maintain an annual inventory of GHGs and CACs for both internal management and potential external reporting needs.</p> <p>17.8: PM<sub>2.5</sub> Ambient Air Quality Objectives (AAQO's) will be included in the Prosperity Ambient Air Monitoring Program.</p>
18.0 Adaptive Management	<p>18.1: Incorporate adaptive management processes for this Project including contingency planning, management objectives, ongoing monitoring, and the proponent's commitment for achieving benchmark goals within specified timelines.</p> <p>18.2: Implement corrective measures should unforeseen adverse effects arise during the life of the Project. Measures will be taken to correct these effects and prevent them from occurring in the future. The EMS is then updated and associated training programs enhanced to improve the level of environmental protection based on the results of these programs.</p>
<b>Economic Contributions</b>	
19.0 Direct Employment	<p>19.1: Implement hiring practices consistent with good business decisions and underlying principles of delivering maximum economic value and social benefit—locally, regionally and provincially.</p> <p>19.2: Give local candidates preference where all things being equal, two candidates seek employment at Prosperity, and there is only one position available. A local employment candidate shall be defined as someone who lives in the Cariboo-Chilcotin region.</p> <p>19.3: Expand efforts to hire local First Nations candidates by ensuring employment opportunities are communicated. Undertake to inform local communities of the employment positions and opportunities available at Prosperity before expanding the search for potential employees beyond the Cariboo-Chilcotin region.</p> <p>19.4: Establish policies to help potential candidates gain required standards and qualifications to ensure local people have the opportunity to be eligible for hiring and career advancement (see Training below).</p>

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	19.5: Encourage Taseko suppliers, contractors, and consultants to give local candidates preference.
20.0 Training	20.1: Promote “ <i>Mining: Your Future</i> ”, Taseko’s education and training initiative, to give individuals the opportunity for gainful employment in the mining industry.
21.0 Business Opportunities	21.1: Develop policies on procurement of goods and services to build and operate the mine based on good business decisions and guided by a desire to deliver maximum economic value and social benefit—locally, regionally and provincially. 21.2: Cultivate an entrepreneurial spirit to develop lasting relationships with suppliers based on cost competitiveness, continuous innovation, service and productivity improvement, employee health and safety, and environment protection. 21.3: Encourage First Nations to form and develop locally owned businesses that provide supplies or services to Prosperity. 21.4: Ensure contractors share Taseko’s commitment to investing in local community success through their respective purchasing, hiring, contracting, and logistical support practices.
<b>Social Development</b>	
22.0 Health and Safety	22.1: Implement a comprehensive health and safety program based on the current Taseko Policy that includes safety leadership by mine management, risk and harm reduction, safety management systems, safe work behaviour programs, and continual improvement. 22.2: Establish at the commencement of development, an Occupational Health and Safety Committee. 22.3: Meet the obligations set out in the BC Mines Act (1996, updated to 2007) Regulation and appropriate sections of the <i>Health, Safety and Reclamation Code</i> , including the provision of support to contractors and contractors’ managers to comply with the Act when on-site. 22.4: Develop and implement a Transportation and Access Management Plan for the Project as described in Volume 3, Section 9.2.2 of the Application, to safely meet the needs of mine employees and contractors, local residents, and the general public. This plan will include but will not be limited to: <ul style="list-style-type: none"> <li>a. Appointing safety and security personnel before construction;</li> <li>b. Providing transportation for workers to and from the mine site from strategic locations throughout all phases of mine life; and,</li> <li>c. Developing and implementing access control protocols to ensure employee and contractor safety and to minimize social and environmental effects such as wildlife mortality related to the Project.</li> </ul> 22.5: Taseko will implement a plan to monitor and ensure open pit stability to protect worker

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23.0 Emergency Response	<p style="text-align: center;">safety</p> <p>23.1: Continue to implement a risk management approach for the design, construction, operation and closure of the Project.</p> <ul style="list-style-type: none"> <li>a. Implement procedures and measures to address accidents, malfunctions and unplanned events. Table 17-1 in Volume 1 of the Application summarizes these measures and Volume 9 of the Application provides detailed procedures.</li> </ul> <p>23.2: Develop a full Mine Emergency Response Plan specific to the Project for any material risks identified before operations start.</p> <p>23.3: Follow procedures for the handling, storage and disposal of hazardous chemicals used from construction through closure as dictated by the Material Handling and Waste Management Plan.</p> <ul style="list-style-type: none"> <li>a. Manage all hazardous materials according to their Material Safety Data Sheet (MSDS) and provide training for employees handling these chemicals in the Workplace Hazardous Materials Information System.</li> </ul> <p>23.4: Institute measures to ensure that fuel and lubricants do not escape to surrounding areas by:</p> <ul style="list-style-type: none"> <li>a. Equipping fuel systems with emergency fire safety valves and anti-siphon solenoid valves at tanks;</li> <li>b. Installing concrete grade slabs sloped to direct any spillage back into the containment;</li> <li>c. Any precipitation or drips which fall within the containment will pass through an oil/water separator before discharge to the environment;</li> <li>d. Implementing the Spill Prevention and Response Plan to promote the prevention of the accidental release of harmful substances into the receiving environment; and,</li> <li>e. In the event of a spill, providing adequate information to guide the response crew to safely, efficiently and effectively respond to and clean-up a spill.</li> </ul>
24.0 Cultural Heritage Resources	<p>24.1: All Project plans and drawings to identify areas of archaeological and cultural sensitivity that require protection and/or monitoring.</p> <p>24.2: Implement archaeological resource management measures throughout the Project area to avoid or mitigate adverse effects on identified resources and culturally sensitive areas as outlined in the Ministry of Tourism, Culture and the Arts' letter of 22 May 2009. The mitigation program, details of which will be specified in subsequent permit applications, will include but will not be limited to:</p> <ul style="list-style-type: none"> <li>a. Systematic excavation of 16 of the 79 archaeological sites identified within the mine footprint of which 6 are to be subject to intensive investigation;</li> <li>b. A survey of the lake basin after draining and the gathering and analysis of palaeo-environmental data from the lake basin; and,</li> </ul>



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	<p>c. Lithic sourcing.</p> <p>24.3: Completion of the Archaeological Impact Assessment for the transmission line and a management plan prepared to the satisfaction of the Archaeology Branch prior to commencement of construction.</p> <p>24.4: Completion of the Archaeological Impact Assessment of the proposed 2.8 kilometres of new road and to further assess the cairn-like feature at site EIRv-7.</p>