

Report of the Federal Review Panel

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

October 31, 2013

REPORT OF THE FEDERAL REVIEW PANEL

NEW PROSPERITY GOLD-COPPER MINE PROJECT

TASEKO MINES LIMITED

BRITISH COLUMBIA

OCTOBER 31, 2013

Report of the Federal Review Panel – New Prosperity Gold-Copper Mine Project

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CONTENTS

1	The Environmental Assessment Review Process.....	1
1.1	Introduction.....	1
1.2	EIS Guidelines	2
1.3	Panel's Terms of Reference	2
1.4	Panel's Membership.....	3
1.5	Public Participation in the Review.....	3
1.5.1	Opportunities for Participation.....	3
1.5.2	Panel Ruling on Interested Party Status.....	4
1.5.3	Participant Funding Program.....	4
1.6	Site Visit.....	5
1.7	Determination of EIS Sufficiency.....	6
1.8	Public Hearing.....	7
1.8.1	Requests for Confidential Filing of Information.....	8
2	Project Description	9
2.1	Project Setting.....	9
2.2	Project Background.....	10
2.3	Project Components.....	10
2.4	Project Phases.....	15
3	Panel's Mandate and Approach.....	17
3.1	Panel's Mandate.....	17
3.1.1	Mandate of the Panel to Assess Impact on Aboriginal Rights.....	17
3.1.2	Mandate of the Panel to Assess Environmental Effects	18
3.2	Panel's Approach	18
3.2.1	Environmental Effects under CEAA 2012	19
3.2.2	Acting in a Precautionary Manner	21
3.2.3	Determining Significance of Environmental Effects	22
3.2.4	Assessing Cumulative Effects.....	23
4	Need for and Purpose of the Project	25
4.1	Proponent's Assessment.....	25
4.1.1	Views of Participants	25
4.2	Alternatives to the Project.....	27
4.2.1	Proponent's Assessment	27
4.2.2	Views of Participants	28
4.3	Alternative Means of Carrying Out the Project.....	28
4.3.1	Proponent's Assessment	28
4.3.2	Views of Participants	31
4.4	Transmission Line	33
4.4.1	Proponent's Assessment	33
4.4.2	Views of Participants	35
4.5	Panel's Conclusions and Recommendations.....	36

5	Hydrogeology	39
5.1	<i>Geochemistry.....</i>	39
5.1.1	<i>Metal Leaching and Acid Rock Drainage Characterization</i>	39
5.1.1.1	<i>Proponent's Assessment</i>	39
5.1.1.2	<i>Views of Participants.....</i>	41
5.1.1.3	<i>Panel's Conclusions and Recommendations.....</i>	42
5.2	<i>Groundwater.....</i>	43
5.2.1	<i>Groundwater Interactions between Fish Lake (Teztan Biny) and the Open Pit.....</i>	44
5.2.1.1	<i>Proponent's Assessment</i>	44
5.2.1.2	<i>Views of Participants.....</i>	46
5.2.1.3	<i>Panel's Conclusions and Recommendations.....</i>	51
5.3	<i>Seepage from the Tailings Storage Facility.....</i>	52
5.3.1	<i>Seepage Potential.....</i>	52
5.3.1.1	<i>Proponent's Assessment</i>	52
5.3.1.2	<i>Views of Participants.....</i>	56
5.3.1.3	<i>Panel's Conclusions and Recommendations.....</i>	63
6	Surface Hydrology	66
6.1	<i>Changes to Stream Flow Pathways and Watershed Area.....</i>	66
6.1.1	<i>Proponent's Assessment</i>	66
6.1.2	<i>Views of Participants</i>	69
6.2	<i>Water Quality Modeling</i>	71
6.2.1	<i>Proponent's Assessment</i>	71
6.2.2	<i>Views of Participants</i>	72
6.3	<i>Water Quality Predictions.....</i>	73
6.3.1	<i>Proponent's Assessment</i>	73
6.3.2	<i>Views of Participants</i>	76
6.4	<i>Water Treatment and Adaptive Management</i>	80
6.4.1	<i>Proponent's Assessment</i>	80
6.4.2	<i>Views of Participants</i>	82
6.5	<i>Panel's Conclusions and Recommendations.....</i>	84
7	Fish and Fish Habitat.....	90
7.1	<i>Project Effects on Fish and Fish Habitat in Fish Creek Watershed and Surrounding Water Bodies 90</i>	
7.1.1	<i>Proponent's Assessment</i>	90
7.1.2	<i>Views of Participants</i>	94
7.2	<i>Fish Lake Recirculation</i>	97
7.2.1	<i>Proponent's Assessment</i>	97
7.2.2	<i>Views of Participants</i>	98
7.3	<i>Fish and Fish Habitat Compensation Plan</i>	101
7.3.1	<i>Proponent's Assessment</i>	101
7.3.2	<i>Views of Participants</i>	105
7.4	<i>Salmon Habitat</i>	108
7.4.1	<i>Proponent's Assessment</i>	108
7.4.2	<i>Views of Participants</i>	109
7.5	<i>Panel's Conclusions and Recommendations.....</i>	111

8	Vegetation.....	117
8.1	<i>Wetlands and Riparian Ecosystems.....</i>	<i>117</i>
8.1.1	Proponent's Assessment	117
8.1.2	Views of the Participants.....	122
8.2	<i>Old Forest.....</i>	<i>125</i>
8.2.1	Proponent's Assessment	125
8.2.2	Views of Participants	126
8.3	<i>Grassland Ecosystems.....</i>	<i>127</i>
8.3.1	Proponent's Assessment	127
8.3.2	Views of the Participants.....	128
8.4	<i>Panel's Conclusions and Recommendations.....</i>	<i>129</i>
9	Wildlife	133
9.1	<i>Grizzly Bear.....</i>	<i>133</i>
9.1.1	Proponent's Assessment	133
9.1.2	Views of Participants	135
9.2	<i>Moose.....</i>	<i>137</i>
9.2.1	Proponent's Assessment	137
9.2.2	Views of Participants	138
9.3	<i>Mule Deer</i>	<i>140</i>
9.3.1	Proponent's Assessment	140
9.3.2	Views of Participants	141
9.4	<i>Migratory Birds.....</i>	<i>141</i>
9.4.1	Proponent's Assessment	141
9.4.2	Views of Participants	142
9.5	<i>Species at Risk.....</i>	<i>143</i>
9.5.1	Proponent's Assessment	143
9.5.2	Views of Participants	143
9.6	<i>Panel's Conclusions and Recommendations.....</i>	<i>143</i>
10	Atmospheric Environment.....	150
10.1	<i>Air Quality</i>	<i>150</i>
10.1.1	Proponent's Assessment.....	150
10.1.2	Views of Participants.....	151
10.2	<i>Noise</i>	<i>151</i>
10.2.1	Proponent's Assessment.....	151
10.2.2	Views of Participants.....	153
10.3	<i>Light Pollution.....</i>	<i>154</i>
10.3.1	Proponent's Assessment.....	154
10.3.2	Views of Participants.....	154
10.4	<i>Panel's Conclusions and Recommendations.....</i>	<i>154</i>
11	Human Health	156
11.1	<i>Dust and Country Food Consumption</i>	<i>156</i>
11.1.1	Proponent's Assessment.....	156
11.1.2	Views of Participants.....	157
11.2	<i>Perception of Contamination</i>	<i>159</i>

11.2.1	Proponent's Assessment.....	159
11.2.2	Views of Participants.....	161
11.3	<i>Panel's Conclusions and Recommendations</i>	163
12	Aboriginal Matters.....	165
12.1	<i>Historical Context</i>	165
12.2	<i>Current Use of Lands and Resources for Traditional Purposes</i>	168
12.2.1	Overview	168
12.2.1.1	Proponent's Assessment	168
12.2.1.2	Views of Participants.....	170
12.2.2	Fishing.....	172
12.2.2.1	Proponent's Assessment	172
12.2.2.2	Views of Participants.....	173
12.2.3	Hunting and Trapping.....	174
12.2.3.1	Proponent's Assessment	174
12.2.3.2	Views of Participants.....	176
12.2.4	Plant and Medicine Gathering	179
12.2.4.1	Proponent's Assessment	179
12.2.4.2	Views of Participants.....	180
12.3	<i>Archaeological and Historical Resources</i>	181
12.3.1	Proponent's Assessment.....	181
12.3.2	Views of Participants.....	184
12.4	<i>Cultural Heritage</i>	187
12.4.1	Proponent's Assessment.....	187
12.4.2	Views of Participants.....	189
12.5	<i>Panel's conclusions and Recommendations</i>	194
13	Aboriginal Rights and Title.....	202
13.1	<i>Proponent's Assessment</i>	202
13.1.1	Taseko's Comments on Aboriginal Rights and Title Generally.....	202
13.1.2	Taseko's Comments on Rights and Title of Tsilhqot'in Nation	202
13.1.3	Taseko's Comments on Rights and Title of Secwepemc Nation.....	203
13.2	<i>Views of Participants</i>	204
13.2.1	Tsilhqot'in Nation on its Rights and Title	204
13.2.2	Secwepemc Nation on its Rights and Title	207
13.2.2.1	Stswecem'c Xgat'tem	207
13.2.2.2	Esk'etemc	207
13.2.3	Other Participants	210
13.3	<i>Panel's Conclusions and Recommendations</i>	211
14	Socio-Economic Conditions	216
14.1	<i>Land and Resource Uses</i>	216
14.1.1	Outdoor Recreation and Tourism	216
14.1.1.1	Proponent's Assessment	216
14.1.1.2	Views of Participants.....	218
14.1.2	Agriculture and Ranching	220
14.1.2.1	Proponent's Assessment	220
14.1.2.2	Views of Participants.....	220

14.1.3	Hunting and Trapping.....	221
14.1.3.1	Proponent's Assessment	221
14.1.3.2	Views of Participants.....	222
14.1.4	Forestry	222
14.1.4.1	Proponent's Assessment	222
14.1.4.2	Views of Participants.....	223
14.1.5	Panel's Conclusions and Recommendations	224
14.2	<i>Harvesting of Country Food</i>	227
14.2.1	Proponent's Assessment.....	228
14.2.2	Views of Participants.....	228
14.2.3	Panel's Conclusions and Recommendations	229
14.3	<i>Navigation</i>	230
14.3.1	Proponent's Assessment.....	230
14.3.2	Views of Participants.....	232
14.3.3	Panel's Conclusions and Recommendations	234
15	Other Issues	236
15.1	<i>Capacity of Renewable Resources</i>	236
15.1.1	Proponent's Assessment.....	236
15.1.2	Views of Participants.....	236
15.1.3	Panel's Conclusions and Recommendations	236
15.2	<i>Effect of the Environment on the Project</i>	237
15.2.1	Proponent's Assessment.....	237
15.2.2	Views of Participants.....	238
15.2.3	Panel's Conclusions and Recommendations	238
15.3	<i>Accidents and Malfunctions</i>	238
15.3.1	Proponent's Assessment.....	238
15.3.2	Views of Participants.....	241
15.3.3	Panel's Conclusions and Recommendations	242
15.4	<i>Justifiability of Significant Adverse Environmental Effects</i>	242
16	Environmental Management	245
16.1	<i>Proponent's Assessment</i>	245
16.2	<i>Views of Participants</i>	248
16.3	<i>Panel's Conclusions and Recommendations</i>	250
17	List of Panel's Conclusions and Recommendations	251
	Appendix 1 Panel Terms of Reference	258
	Appendix 2 Panel Members Biographies	269
	Appendix 3 Panel Ruling on Interested Party Status	271
	Appendix 4 Hearing Schedule and List of Participants	290
	Appendix 5 Panel's Decision Regarding its Mandate to Assess Impacts on Aboriginal Rights	297
	Appendix 6 Clarification from the Canadian Environmental Assessment Agency regarding the Panel's Mandate to Consider Environmental Effects	304
	Appendix 7 List of Acronyms and Abbreviations	306

TABLES

Table 1. Steps involved in the Panel's determination of the EIS Sufficiency.....	6
Table 2. Embankment lengths and estimated seepage heights.....	53
Table 3. Overall seepage recovery estimates.....	56
Table 4. Comparison of Modelling Parameters.....	59
Table 5. Comparison of Seepage Estimates taken from the August 21, 2013, Natural Resources Canada Technical Memorandum to the Panel.....	60
Table 6. Summary of Aquatic Effect of the New Prosperity Project on Middle and Upper Fish Creek.....	93
Table 7. Aquatic Effects of the Project on Middle and Upper Fish Creek after Mitigation.....	102

FIGURES

Figure 1. Overview of the Project Components in a Regional Setting	11
Figure 2. Tailings Storage Facilities Overlay: T1 [Original Prosperity] T2 [New Prosperity]	12
Figure 3. Mine Site Layout – General Arrangement, End of year 20	13
Figure 4. Conceptual Reclamation Plan.....	16
Figure 5. Proposed alternatives for mine waste disposal MDP T2 (Fish Creek South) and MDP T6 (Tête Angela Creek)	30
Figure 6. Generalized Groundwater Movement through the Proposed Project Area.....	44
Figure 7. Borehole log for well 94-164. The complete stratigraphic section is not shown, e.g. 67 m to 144 m and 162 m to 195 m	49
Figure 8. Stylized longitudinal section showing the relative elevation of the pit, Fish Lake and the tailings storage facility post closure.	54
Figure 9. TSF Seepage Flux Components	58
Figure 10. Fish Creek watershed and adjacent water bodies	67
Figure 11. Maximum Footprint Wetlands Ecosystem – Mine Site	118
Figure 12. Baseline Riparian Ecosystems – Mine Site	119
Figure 13. Baseline Old Forest – Mine Site	126
Figure 14. Location of Moose Management Zone 5D	140
Figure 15. No Shooting Zone and Location of the proposed Fish Lake Recreation Site	160
Figure 16. Project Location in relation to First Nations Traditional Territories and Established Rights	205
Figure 17. Conceptual Centreline Cross Section – Fraser River Crossing	208

EXECUTIVE SUMMARY

Taseko Mines Limited (Taseko) has proposed the development of the New Prosperity Gold-Copper Mine Project (the Project), 125 km southwest of Williams Lake, British Columbia. The Project would entail constructing, operating, and closing a large open pit mine, which would be built over two years and would operate for 20 years. The Project would include an open pit, concentrator facility, support infrastructure, and associated tailings and waste rock storage areas, and the construction of a 2.8-km access road to the mine site. The Project would also include a 125-km power line, and the transport of mine concentrates to an existing concentrate load-out facility near Macalister, British Columbia.

This report presents the results of the federal Review Panel's (the Panel) assessment of the potential environmental effects of the proposed Project. This report has been completed in accordance with the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and the Panel's Terms of Reference issued by the Minister of the Environment (the Minister). This report addresses the factors identified in the Panel's Terms of Reference and sets out the rationale, conclusions and recommendations of the Panel, including proposed mitigation measures and follow-up programs.

Taseko had submitted a previous project, known as the Prosperity Gold-Copper Mine project (original Prosperity project) which was subject to an environmental assessment under *British Columbia's Environmental Assessment Act* and a federal review panel under the former *Canadian Environmental Assessment Act*. In January 2010, the Government of British Columbia issued an environmental assessment certificate for the original Prosperity project concluding there would be significant adverse environmental effects on fish and fish habitat but that those significant effects were justifiable in the circumstances.

In July 2010, the previous panel concluded that the project as proposed would result in significant adverse environmental effects. In November 2010, the Government of Canada accepted the previous panel conclusions and determined that the significant adverse environmental effects could not be justified under the circumstances. The Government of Canada indicated that its decision did not preclude the proponent from submitting a project proposal that addressed the factors considered by the panel.

Following the Government of Canada decision, Taseko revised its mine proposal to address the factors identified by the previous panel and submitted the New Prosperity Gold-Copper Mine Project for review. The most important change implemented by Taseko in its new proposal was the preservation of Fish Lake (Teztan Biny) and portions of its tributaries. This outcome would be achieved primarily by relocating the tailings storage facility 2.5 km upstream of the lake and by introducing a lake recirculation water management scheme. Taseko stated that the redesign would enable future generations to use these waters for navigation, fishing and recreational activities and would also mitigate the effects on the cultural heritage and on the current use of the lands and resources by Aboriginal peoples. The area disturbed by the new mine development plan would also be reduced by 23% compared to the original proposal. Taseko has also proposed to implement additional measures to assist in the protection of the region's grizzly bear population.

Taseko focused its assessment on those aspects of the Project that had changed or were new from the previous project proposal. There were no changes in the Project design for the transmission line, the existing rail load-out facility or the road access.

The mine site would cover an area of approximately 27 km² in the Fish Creek (Teztan Yeqox) watershed. The watershed, which drains into the Taseko River (Dasiqox), consists of Fish Lake (Teztan Biny), Little Fish Lake (Y'anah Biny) and the surrounding area called Nabas. The area was characterized as a recreational area as well as an area used by Aboriginal peoples for many traditional activities and cultural practices. The mine site would involve the permanent loss of Little Fish Lake and its surrounding area from the placement of a 12 km² tailings storage facility, which consists of 7.8 km of earth-rock filled dams up to 115 m high. To make up for the reduction in tributary flow to Fish Lake and to ensure Fish Lake is preserved as a viable ecosystem, Taseko proposed to recirculate Fish Lake water during operations and into closure, until the tailings storage facility lake water is of suitable quality to be released to Fish Lake. The development redesign for New Prosperity would increase the capital cost by \$300 million to an estimated total of \$1.0 billion dollars. Taseko submitted a fish and fish habitat compensation plan to compensate for the loss of fish habitat in Upper Fish Creek and Little Fish Lake and the temporary reduction in water flows to Lower Fish Creek.

The Project would be located in the Cariboo-Chilcotin Regional district, a sparsely populated, rural region with Williams Lake as the regional service centre. The economy within the local study area was reported to be heavily dependent on forestry and mining. According to Taseko, the Project would be expected to create 550 direct jobs and 1280 indirect over its expected 20 years of operation. Taseko estimated that annual government revenues would be \$26.2 million during construction and \$48.4 million during operations and would continue for the life of mine operations, exceeding 1 billion dollars.

The Aboriginal groups that would be affected by the Project are the Tsilhqot'in and Secwepemc Nations. The Tsilhqot'in traditional territory includes the mine site area, located in the Fish Lake (Teztan Biny) and Nabas areas, as well as the western portion of the transmission line corridor. The Secwepemc traditional territory includes the eastern portion of the transmission line corridor as well as the mine site. The Aboriginal groups have maintained strong opposition to the Project.

The Project is subject to review under the *Canadian Environmental Assessment Act, 2012* and would likely require Fisheries and Oceans Canada, Transport Canada and Natural Resources Canada to issue permits, approvals, authorizations and/or licences pursuant to the *Fisheries Act*, the *Navigable Waters Protection Act* and the *Explosives Act* respectively. In addition, given Taseko had identified the need to use Little Fish Lake (Y'anah Biny) and Upper Fish Creek (Teztan Yeqox) for the disposal of mine waste, including tailings and waste rock, as well as the management of process water, the *Metal Mining Effluent Regulations* would need to be amended to include these water bodies to Schedule 2 and to designate them as tailings storage, if the Project receives the required approvals.

The federal Minister of the Environment appointed the three-member Panel under the former *Canadian Environmental Assessment Act* on May 9, 2012, and the Panel was continued under the new *Canadian Environmental Assessment Act, 2012*. The Panel consists of Dr. Bill Ross (chair), Dr. George Kupfer and Dr. Ron Smyth. The Panel Terms of Reference require the Panel to conduct an assessment of the environmental effects of the Project and to determine the significance of these effects. The Panel was also instructed to accept and review information from Aboriginal groups on how the Project might affect potential or established Aboriginal rights or title within the Project area and to include this information in its report.

During the environmental impact statement (EIS) review, federal and provincial government departments and agencies participating in the review provided views and expertise on the adequacy and technical merit of the EIS and additional information submitted by Taseko as

measured against the EIS Guidelines. The federal departments participated throughout the public hearing, both with written submissions and with presentations by the subject matter experts at the hearing. The provincial government agencies chose to participate by providing written submissions and written responses to questions raised during the hearing. The Panel commends the significant contribution both governments, experts, participants, Aboriginal groups and Taseko made throughout the environmental assessment of the Project.

Taseko submitted its environmental impact statement to the Panel on September 27, 2012 and on June 20, 2013 the Panel determined that the EIS, supplemented by the additional information provided by Taseko, contained sufficient information to proceed to the public hearing. The hearing took place from July 22 to August 23, 2013 in the communities most affected by the Project: Williams Lake, six Tsilhqot'in and two Secwepemc communities. The hearing provided an opportunity for registered interested parties and the public to present their overall views on the Project and its potential environmental effects and for Taseko to present its assessment of the Project and to answer questions from participants. As part of the community hearing sessions the Panel also held two site visits: 1) a site visit near Taseko River (Dasiqox) and at Fish Lake (Teztan Biny), and 2) a site visit at Little Dog, where the proposed transmission line would cross the Fraser River.

The public hearing sessions were well attended, and the Panel was able to hear from most of the participants wanting to present to the Panel. In total, approximately 300 individuals or groups made presentations to the Panel during the various hearing sessions.

This report presents the Panel's conclusions and recommendations and takes into account information obtained during the course of the New Prosperity Project review as well as information generated as part of the previous review. In accordance with the Panel's mandate. The list of Panel conclusions and recommendations are presented in Chapter 17. The Panel's key conclusions are summarized below. The Panel makes no suggestion as to whether the Project should proceed; that decision will be made by the governments of Canada and British Columbia.

The Panel concludes that the New Prosperity Project would result in several significant adverse environmental effects; the key ones being effects on water quality in Fish Lake (Teztan Biny), on fish and fish habitat in Fish Lake, on current use of lands and resources for traditional purposes by certain Aboriginal groups, and on their cultural heritage. The Panel also concludes there would be a significant adverse cumulative effect on the South Chilcotin grizzly bear population, unless necessary cumulative effects mitigation measures are effectively implemented.

The reasons for these conclusions are summarized as follows:

Water Quality

The Panel has determined, based on strong evidence submitted by government agencies (both Canada and British Columbia) and other participants, that Taseko underestimated the volume of tailings pore water seepage leaving the tailings storage facility and the impacts on water quality caused by recirculation of water within the Fish Lake (Teztan Biny) and Upper Fish Creek (Teztan Yeqox) system. The Panel has also determined considerable uncertainty remains regarding Taseko's contingency plan for water treatment. Again, this conclusion was based on strong evidence submitted by governments and other participants. The Panel has determined that the proposed target water quality objectives for Fish Lake are not likely achievable and, even with expensive water treatment measures, the protection of Fish Lake water quality is unlikely to succeed in the long term.

Although the seepage mitigation measures proposed by Taseko have the potential to substantially reduce the volume of seepage, the Panel concludes it would not eliminate seepage from entering Fish Lake (Teztan Biny). The Panel concludes the concentration of contaminants of concern in Fish Lake would be considerably larger than Taseko's predictions and that eutrophication of Fish Lake would be a significant problem that is unlikely to be mitigable in the long term.

Fish and Fish Habitat

The likely significant adverse effects on water quality in Fish Lake and the expected eutrophication of Fish Lake would therefore result in a significant adverse effect on fish and fish habitat in Fish Lake.

Aboriginal Matters

The Tsilhqot'in and Secwepemc currently use the mine site area and the transmission line corridor for traditional purposes and for carrying out of ceremonial and spiritual practices. Fish Lake (Teztan Biny) and Nabas areas are places of unique and special significance for Tsilhqot'in cultural identity and heritage and they have occupied Nabas and used Fish Lake for generations. The Panel heard the Tsilhqot'in concerns about likely burial and cremation sites in the Project area, notably around Little Fish Lake (Y'anah Biny), that were not completely identified in archaeological studies for the previous project. This area would be buried under the tailing storage facility.

Taseko committed to maintain access to Fish Lake for Aboriginal peoples to continue practicing their activities. However, the Tsilhqot'in stated that if the Project proceeds, they would avoid going to Fish Lake because of the disturbance resulting from the presence of a mine, their fears of contamination, and the loss of the spiritual and cultural connections they have with a very special cultural place.

In the Panel's view, the loss of Nabas and the changes to the environment caused by the mine components would reduce the area where the Tsilhqot'in can practice their traditional harvesting activities, disturb burial and cremation sites that are of great importance to them and endanger their ability to sustain their way of life and cultural identity. The Panel has determined that the Project would have adverse effects on the Tsilhqot'in current use of lands and resources for traditional purposes, archaeological and historical sites, and cultural heritage and that these adverse effects could not be mitigated and therefore would be significant.

The Secwepemc stated that the transmission line corridor as proposed would go through their traditional territory, their most important hunting grounds, over important fishing and plant gathering areas, but also through sacred areas notably where the transmission line would cross the Fraser River, which could not be avoided by moving the centreline within the proposed corridor. The Panel recognizes that the proposed transmission line corridor crosses areas of high archaeological potential and significance.

The Secwepemc explained that it is important for their history, culture and identity that they practice their traditional activities and cultural ceremonies and rituals in sacred areas where they have connections with their ancestors. The Panel finds that the presence of the transmission line would constitute an interference with the spiritual nature of the area that would disturb cultural and spiritual activities, and therefore would compromise the Secwepemc cultural heritage.

The Panel recommends that, if the Project proceeds, Taseko be required to consider other feasible alternative routes for the transmission line crossing at the Fraser River, to avoid these areas of cultural significance to the Secwepemc.

If the proposed transmission line crossing at the Fraser River is the only feasible option, the Panel's conclusions on the effects on the Secwepemc current use of land and resources for traditional purposes, cultural heritage, archaeological and historical sites are as follows: one Panel member determines that the proposed Project would result in significant adverse effects; two Panel members determine that, after taking into account the context and temporary nature of the transmission line, these effects would be acceptable and therefore not significant.

Potential or established Aboriginal rights and title

The Tsilhqot'in have proven and asserted Aboriginal rights throughout the mine site area, as well as asserted Aboriginal title. The Esk'etemc and the Stswecem'c Xgat'tem have asserted Aboriginal rights throughout the transmission line corridor and asserted Aboriginal title. The Panel determines that the Project would adversely affect established and asserted rights and title for the Tsilhqot'in and Secwepemc Nations.

Cumulative effect on South Chilcotin Grizzly Bear

The South Chilcotin grizzly bear population has been determined by the province of British Columbia to be threatened. The Panel took this determination to be an indication that the population has undergone significant adverse effects in the past and therefore there is an existing (before any effects of the proposed New Prosperity Project) significant adverse cumulative effect on grizzly bears.

According to Taseko, without additional mitigation measures, the Project would have an adverse effect on grizzly bears in the area. This effect would combine with the effects of previous human activities and exacerbate the existing significant adverse cumulative effect. Taseko proposed to undertake further mitigation measures to reduce the existing cumulative effects. The Panel has determined that if the mitigation measures proposed by Taseko were effectively implemented, the South Chilcotin grizzly bear population would be in better shape after the Project than before the Project; however effectively implementing these measures could be challenging.

The Panel believes that the most challenging task would be to effectively control access on existing roads and trails in the region to restore secure grizzly bear core habitat. The Panel concludes that there is a need to control enough access so that, in combination with the other mitigation measures proposed by Taseko, the Project effects are offset and that the access control measures alleviate some of the cumulative effect.

1 THE ENVIRONMENTAL ASSESSMENT REVIEW PROCESS

1.1 INTRODUCTION

Taseko Mines Limited (Taseko) has proposed the development of a large gold and copper mine, referred to as the New Prosperity Gold-Copper Mine Project (the Project), 125 km southwest of Williams Lake, British Columbia. The Project would entail constructing, operating, and closing a large open pit mine which would be built over two years and would operate for 20 years. Components of the Project would include an open pit, concentrator facility, support infrastructure, and associated tailings and waste rock storage areas, and the construction of a 2.8-km access road to the mine site. The Project would also include a 125-km power line, and the transport of mine concentrates to an existing concentrate load-out facility near Macalister, British Columbia.

This report presents the results of the federal Review Panel's (the Panel) assessment of the potential environmental effects of the proposed Project. This report has been completed in accordance with the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), and with the Panel's Terms of Reference issued by the Minister of the Environment (the Minister). This report addresses the factors identified in the Panel's Terms of Reference and sets out the rationale, conclusion and recommendations of the Panel relating to the environmental assessment for the Project, including proposed mitigation measures and follow-up programs.

A previous version of the project, the Prosperity Gold-Copper Mine Project (original Prosperity project) was assessed under the *British Columbia Environmental Assessment Act* and by a federal review panel under the former *Canadian Environmental Assessment Act* (CEAA).

In January 2010, the Government of British Columbia issued an environmental assessment certificate for the original Prosperity project concluding there would be significant adverse environmental effects on fish and fish habitat but that those significant effects were justifiable in the circumstances.

In July 2010, the previous federal review panel released its report and concluded that the original Prosperity project, as proposed, would result in significant adverse environmental effects on fish and fish habitats, 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 concluded that the original Prosperity 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.

In November 2010, in its response to the panel's report, the Government of Canada indicated that it accepted the conclusions of the panel and determined that the significant adverse environmental effects could not be justified under the circumstances. The Government of Canada also noted that its decision did not preclude Taseko from submitting a revised project proposal that addressed the factors considered by the panel.

Following the federal government response, Taseko revised its mine proposal in response to the factors identified by the panel and in 2011 submitted a project description for New Prosperity Gold-Copper Mine Project to the Canadian Environmental Assessment Agency (the Agency) for consideration. The Agency accepted the project description, on August 9, 2011 and in

consultation with federal authorities, recommended to the Minister to refer the Project to a review panel.

On November 7, 2011, the Minister announced that the Project would undergo a federal environmental assessment by way of a review panel.

In referring the Project to a review panel, the Minister instructed the Agency to design a process that would:

- thoroughly assess whether the proposal addresses the environmental effects identified in the environmental assessment of the original Prosperity project;
- make use of the information obtained during the previous environmental assessment, to the extent possible, in order to ensure a timely decision; and
- allow the Agency to complete these activities and the Panel to conduct its review, including holding public hearings and preparing its report, within a timeframe of no more than 12 months.

1.2 EIS GUIDELINES

In January 2012, the Agency issued draft Environmental Impact Statement Guidelines (the EIS Guidelines) for the preparation of an environmental impact statement (EIS) in order to assess the Project pursuant to the former CEAA. The EIS Guidelines identified the nature, scope and extent of the information and analysis to be addressed by Taseko in its EIS for the proposed Project. More specifically, in line with the direction provided by the Minister, the EIS Guidelines required Taseko to focus on new project components or on aspects of the Project that had changed from the original Prosperity project proposal and on corresponding changes to the environmental effects previously predicted. The draft EIS Guidelines also required Taseko to consider components and activities associated with the Project that had not changed but for which environmental effect determinations may have changed since the previous federal review, completed in 2010.

The draft EIS Guidelines were subject to a public comment period from January 23, 2012 to February 22, 2012. Following consideration of the comments received, the EIS guidelines were finalized, issued to Taseko and made available to the public on March 16, 2012.

1.3 PANEL'S TERMS OF REFERENCE

In January 2012, the Agency also issued draft Terms of Reference for the Panel for its review of this Project. The Terms of Reference establish the mandate and authorities of the Panel, as well as the procedures and timelines for the review. The draft Terms of Reference were subject to a public comment period from January 23, 2012 to February 22, 2012. On May 9, 2012, the Terms of Reference were finalized and issued by the Minister to the Panel.

On July 6, 2012, CEAA 2012 came into force, repealing the former CEAA. In a letter to the Panel dated July 6, 2013, the Agency informed the Panel that the environmental assessment of the Project was to be governed by CEAA 2012. On August 3, 2012, the Panel's Terms of Reference were amended to reflect the provisions of CEAA 2012, to clarify the Panel's reporting requirements under the CEAA 2012, and to confirm the timelines for the Panel to complete its review and submit its report to the Minister. More details pertaining to the Panel's mandate as fixed by its Terms of Reference are provided in Chapter 3.

A copy of the Panel's amended Terms of Reference is included in Appendix 1.

1.4 PANEL'S MEMBERSHIP

The Minister appointed the three-member Panel under the former CEAA on May 9, 2012, and the Panel was continued under CEAA 2012. The Panel consists of Dr. Bill Ross (chair), Dr. George Kupfer and Dr. Ron Smyth. A short biographical description of each Panel member is included in Appendix 2.

1.5 PUBLIC PARTICIPATION IN THE REVIEW

One of the purposes of CEAA 2012 is to ensure that opportunities are provided for meaningful public participation during a federal environmental assessment.

1.5.1 Opportunities for Participation

The Agency and the Panel provided opportunities for public participation throughout the environmental assessment process.

The Canadian Environmental Assessment Registry Internet site for the Project allowed for public access to all documents associated with the environmental assessment of the Project. Funding was made available to a number of groups and individuals through the Agency's Participant Funding Program to help the public and Aboriginal groups participate in the environmental assessment of the Project. More details on participant funding allocation are provided in Section 1.5.3 below.

Prior to the Panel's appointment, the Agency provided opportunities for public input from January 23, 2012 to February 22, 2012 when drafting the EIS Guidelines and Panel's Terms of References.

Following its appointment, the Panel provided several opportunities for Aboriginal groups, the public, government agencies and Taseko to provide input on various procedural matters during the panel process. The Panel solicited public comment on the following:

- Panel's site visit;
- Panel's mandate to assess impacts on Aboriginal rights;
- Panel's mandate to assess environmental effects under CEAA 2012;
- Public Hearing Procedures and Procedures for Requesting Confidentiality;
- Taseko's EIS and Taseko's responses to the Panel's information requests; and
- Two requests for confidentiality during the public hearing.

During the EIS review phase, the Panel provided a 45-day public comment period from September 26, 2012 to November 11, 2012 for public input regarding the adequacy of the information provided in the EIS as measured against the EIS Guidelines. The Panel subsequently provided 15-day and 10-day comment periods on Taseko's responses to two rounds of information requests issued by the Panel.

During the EIS review, the Panel requested the federal and provincial government departments and agencies participating in the review to provide their views and expertise on the adequacy and technical merit of the EIS and additional information submitted by Taseko as measured against the EIS Guidelines. Comments were requested from the following federal departments: Fisheries and Oceans Canada, Natural Resources Canada, Transport Canada, Environment Canada, Health Canada, and Aboriginal Affairs and Northern Development Canada. Comments were also requested from the following provincial government agencies: British Columbia

Environmental Assessment Office, Ministry of Energy and Mines, Ministry of the Environment, Ministry of Forests, Lands and Natural Resource Operations, and Ministry of Aboriginal Relations and Reconciliation.

The Panel held the public hearing from July 22, 2013 to August 23, 2013, during which registered interested parties and members of the public had the opportunity to present their overall views on the Project and its potential environmental effects. More details regarding the public hearing are given in Section 1.8 below.

Government departments and agencies were also invited to participate in the public hearing to provide expertise and information relevant to the environmental assessment of the Project. All federal departments presented their submissions at the hearing, whereas the provincial government agencies chose to participate by providing written submissions and written responses to questions raised during the public hearing phase.

The Panel also retained the services of two independent non-government experts to provide advice on geotechnical issues and potential impacts on the receiving environment associated with the open pit and with the proposed tailings storage facility and potential impacts to the receiving environment. The two experts filed their written submissions and presented their reports to the Panel during the hearing session held on those topics.

1.5.2 Panel Ruling on Interested Party Status

On July 16, 2012, Ecojustice on behalf of MiningWatch Canada requested that MiningWatch Canada be granted status as an “interested party” pursuant to subsection 2(2) of CEAA 2012 to participate in this review. Subsection 2(2) defines an interested party as a person who, in the opinion of the Panel, is either “directly affected by the carrying out” of the Project, or has “relevant information or expertise”

On September 14, 2012, the Panel issued directions on the process to apply for interested party status for those who wished to participate in all aspects of the review during the public hearing, and specified how those applications would be determined.

The Panel also granted “interested party” status to Taseko, the Aboriginal groups that had previously registered for this review and those federal and provincial departments and agencies invited by the Panel to provide technical expertise or relevant information. The Panel received 31 applications, and granted interested party status to all of the applicants on October 12, 2012. Subsequently, the Panel received twenty additional applications and decided to grant interested party status to these applications by applying the same decision criteria and analysis as in the initial ruling.

While the Panel provided the opportunity for general public input during the environmental review, only those persons with interested party status were permitted to participate in all aspects of the review during the public hearing. The Panel's directions and rulings regarding interested parties as well as the list of interested parties can be found in Appendix 3.

1.5.3 Participant Funding Program

The Agency administers the Participant Funding Program, which supports individuals, non-profit organizations and Aboriginal groups interested in participating in federal environmental assessments.

Participant funding was made available to help the public and Aboriginal groups participate in the environmental assessment of the Project. The Participant Funding Program consisted of two funding envelopes: the regular funding envelope and the Aboriginal funding envelope. Funding was made available to help participants review the draft EIS Guidelines, the Panel's Terms of Reference, the EIS and to prepare and participate in the public hearing.

The Agency established Funding Review Committees, independent from the Panel, to review funding applications and to recommend funding allocations. In total, the Agency allocated funding to the following applicants:

- Canoe Creek Indian Band: \$27 800
- Environmental Mining Education Foundation: \$12 285
- Esketemc First Nation: \$27 800
- Frederico G. Osorio: \$1 195
- Friends of Nemaiah Valley: \$19 000
- Métis Nation British Columbia: \$19 000
- MiningWatch Canada: \$15 885
- Share the Cariboo - Chilcotin Resources Society: \$11 356
- Sierra Club British Columbia: \$18 603
- Tsilhqot'in National Government: \$111 000
- Williams Lake and District Chamber of Commerce: \$12 676

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

1.6 SITE VISIT

On June 29, 2012, the Panel notified participants that it would conduct a site visit of the Project area, without the presence of Taseko or any other registered party. The Panel also invited registered parties to suggest any particular areas or features that the Panel should see during this tour. On July 12 and 13, 2012, the Panel and Panel Secretariat conducted a ground tour of the proposed Project area including Fish Creek (Teztan Yeqox) at Taseko Lake Road, the north shore of Fish Lake (Teztan Biny), the proposed location of the southern part of the open pit, Big Onion Lake (Jidizay Biny), and the access roads: Highway 20 from Williams Lake to Hanceville; Taseko Lake Road from Hanceville to Big Onion Lake; 4500 Road to the proposed location of the Access Road to the mine site; and Fish Lake Road to Fish Lake.

The Panel and Secretariat also conducted an aerial tour of the proposed Project area via helicopter and made several ground stops. The Panel viewed the existing BC Transmission Line from Williams Lake to the proposed tie-in station at Dog Creek; the location of the tie-in station at Dog Creek; the entire route of the proposed transmission line; the location of the proposed transmission line crossing at the Fraser River; the location of the proposed open pit; water bodies in the Project area including Fish Lake (Teztan Biny), Beece Creek (Bisqox), Taseko River (Dasiqox) near the mine site; the location of the proposed main and south embankments of the tailings storage facility as marked by cut lines; the location of the Taseko Lake Lodge; and the historical Aboriginal settlement at Little Fish Lake (Y'anah Biny).

The Panel and Secretariat also drove the route (Highway 97) from Williams Lake to the Gibraltar Mine concentrate load-out facility near Macalister.

1.7 DETERMINATION OF EIS SUFFICIENCY

The Panel was mandated by its Terms of Reference to determine whether the EIS submitted by Taseko contained sufficient information to proceed to the public hearing. To make its determination on EIS sufficiency, the Panel:

- reviewed the EIS and issued two rounds of information requests to Taseko;
- solicited comments from Aboriginal groups, the public, governments and other participants on the adequacy and technical merit of the EIS as measured against the EIS Guidelines, and on the additional information submitted by Taseko; and
- reviewed Taseko's responses to information requests and comments on Taseko's responses.

On June 20, 2013, the Panel determined that the EIS along with the additional information submitted by Taseko contained sufficient information to proceed to the public hearing. At the same time, the Panel announced that the public hearing would begin in Williams Lake, British Columbia, on July 22, 2013, and would be completed within approximately 30 days.

The steps taken by the Panel to determine EIS sufficiency are summarized in Table 1 below.

Table 1. Steps involved in the Panel's determination of the EIS Sufficiency

Date	Step
September 27, 2012	Taseko submits its EIS to the Panel.
September 27, 2012 to November 11, 2012	The Panel provides a 45-day public comment period to review the EIS.
November 26, 2012	The Panel issues its first information request to Taseko regarding cumulative environmental effects.
December 10, 2012	The Panel issues its first deficiency statement and additional information requests to Taseko on various topics.
February 28, 2013	Taseko files its responses to the information requests.
March 1, 2013 to March 16, 2013	The Panel provides a 15-day public comment period on Taseko's responses to the information requests.
March 28, 2013	The Panel issues its second deficiency statement and supplemental information requests to Taseko.
June 6, 2013	Taseko submits its responses to the supplemental information requests.
June 6, 2013 to June 16, 2013	The Panel provides a 10-day public comment period on Taseko's responses to supplemental information requests.
June 20, 2013	The Panel determines EIS sufficiency and announces the public hearing.
July 22, 2013	The public hearing begins in Williams Lake, British Columbia.

1.8 PUBLIC HEARING

The Panel released its draft Public Hearing Procedures and Procedures for Requesting Confidentiality on September 14, 2012 and invited Aboriginal groups, Taseko, the public, and other participants to provide comments on these draft procedures. After considering the comments received, the Panel's mandate and the directions provided in its amended Terms of Reference, its ruling on Interested Party applications, and the requirements under CEAA 2012, the Panel issued the final public hearing and confidentiality procedures on February 20, 2013.

The Panel held its public hearing from July 22 to August 23, 2013 in the communities most affected by the Project. The hearing provided opportunities for Taseko to present the Project and its assessment of the Project's environmental effects, and to respond to concerns and questions raised by other participants. The public hearing also provided opportunities for the other participants to share with the Panel information and perspectives on the Project and its environmental effects.

The Panel held three types of hearing sessions: General, Topic-Specific, and Community. The General hearing sessions were held from July 22 to July 25, 2013 in Williams Lake and provided an opportunity for registered interested parties and the public to present their overall views on the project and its potential environmental effects.

Topic-Specific hearing sessions were held in Williams Lake from July 25 to August 1, 2013. Topic-Specific sessions provided an opportunity for experts possessing specialized knowledge or expertise to present to the Panel the results of their technical review of the potential environmental effects of the Project. Topic-Specific sessions were held on the following topics: Geology and Hydrogeology; Aquatic Environment; Terrestrial Environment, and Human Environment. Participation in Topic-Specific hearing sessions was restricted to Interested Parties.

The Panel also held Community hearing sessions in eight Aboriginal communities to allow community members to express to the Panel their views and present information and issues of importance to them in an informal setting. Community sessions were held in the communities of Xeni Gwet'in (Nemiah) (August 6 to August 9, 2013), Tsi Del Del (Redstone) (August 12, 2013), Yunesit'in (Stone) (August 13, 2010), ?Esdilagh (Alexandria) (August 14, 2013), Tl'esqox (Toosey) (August 15, 2013), Tl'etingox (Anaham) (August 16-17, 2013), Esk'etemc (Alkali Lake) (August 19 and August 20, 2013), and Stswecem'c Xgat'tem (Dog Creek) (August 19 and August 21, 2013).

The sessions with the Xeni Gwet'in community also involved an on-site visit near Taseko River (Dasiqox) and at Fish Lake (Teztan Biny) on August 9, 2013. Similarly on August 19, the Stswecem'c Xgat'tem and Esk'etemc community sessions involved a site visit at Little Dog, where the proposed transmission line would cross the Fraser River. The site visits were intended to provide Tsilhqot'in and Secwepemc representatives the opportunity to present information about these specific sites and to communicate community views about the Project's environmental effects on these sites and their traditional use.

A Closing Remarks session was held in Williams Lake on August 23, 2013, which concluded the hearing. Participation in the Closing Remarks session was restricted to Interested Parties.

The Panel was in session for 24 hearing days, over 33 calendar days. The Panel tried to accommodate all participants wishing to make an oral presentation; however, priority was given to parties who had registered in advance, with the greatest priority given to interested parties.

Participants were invited to give presentations on any aspect within the scope of the review as established by the Panel's Terms of Reference. The public hearing sessions were well attended, and the Panel was able to hear most of the registered participants. The Panel also encouraged parties to file written submissions in the event the hearing schedule could not allow them to present in front of the Panel. In total, approximately 300 individuals or groups made presentations to the Panel during the various hearing sessions.

The hearing schedule and the list of participants who appeared before the Panel during the hearing can be found in Appendix 4.

1.8.1 Requests for Confidential Filing of Information

During the public hearing, the Panel received two requests for confidentiality, pursuant to section 45 of CEAA 2012 which permits the Panel to order that information be reviewed but not disclosed publicly in certain circumstances. The Tsilhqot'in National Government asked to submit a report and present information on cultural heritage in confidence to the Panel members and representatives of Taseko who signed a confidentiality undertaking during the community session held in Xeni Gwet'in. The Esk'etemc made a similar request to present information on Esk'etemc specific claims area and sacred sites and burial grounds during the community session held in Alkali Lake. Before making its decision, the Panel solicited comments from the other parties. In both cases, after considering all of the submissions received, the Panel granted the requests.

2 PROJECT DESCRIPTION

2.1 PROJECT SETTING

The proposed New Prosperity Gold-Copper Mine Project would be located 125 km southwest of Williams Lake, approximately 25 km east of the Xeni Gwet'in community in the Cariboo-Chilcotin Regional District of British Columbia. The Project would include a 525-m deep open pit, a 70 000-tonne per day concentrator facility with an annual production of 108 million pounds of copper and 247 thousand ounces of gold production over a 20-year mine life. The Project would also include support infrastructure, associated tailings and waste rock areas, a 125-km power transmission line, an existing concentrate load-out facility near Macalister, British Columbia and the construction of a 2.8-km mine access road.

According to Taseko, the Project would create value and opportunity for the people of British Columbia and Canada. Taseko says it would generate \$11 billion in gross domestic products and create 57 000 person-years of employment and would result in substantial economic and social benefit for the Cariboo-Chilcotin region, including job creation, training and increased investment in services.

The deposit was described as being located approximately 300 m north of Fish Lake (Teztan Biny) within the Fish Creek (Teztan Yeqox) watershed, on a 35 km² parcel of Provincial Crown land currently held by Taseko in the form of a mining lease and mineral claims. In the upper part of the Fish Creek watershed, a 12 km² tailings storage facility would be constructed over Little Fish Lake (Y'anah Biny) and the upper reaches of Fish Creek. The tailings storage facility would be contained by over 7 km of earth filled dams, or embankments, on three sides.

The Project would be located within the Tsilhqot'in and the Northern Secwepemc's traditional territories. The Tsilhqot'in Nation includes seven communities, which could all potentially be affected by the Project: Xeni Gwet'in (Nemiah Indian Band); Yunesit'in (Stone Indian Band); Tsi Del Del (Alexis Creek Indian Band); ?Esdilagh (Alexandria Indian Band); Tl'etingox-t'in (Anaham Indian Band); Tl'esqox (Toosey Indian Band); and Ulkatcho Indian Band. The Secwepemc communities located in the Project area are: Stswecem'c Xgat'tem (Canoe Creek Indian Band); Esk'etemc (Alkali Lake Indian Band); Xat'sull/Cmetem (Soda Creek Indian Band); T'exelcemc (Williams Lake Indian Band); and Llenlleyen'ten (High Bar Indian Band).

The mine site area was reported to be used recreationally for camping, fishing, boating, and by the Tsilhqot'in people for traditional use and cultural practices. The Tsilhqot'in referred to this area as Nabas. For the purpose of this report, when referring to Nabas, the Panel is referring to the area south of Fish Lake (Teztan Biny) encompassing Little Fish Lake (Y'anah Biny) and the surrounding meadows.

A tourism operation, Taseko Lake Outfitters, was reported to operate in the area and owned a lodge at the north end of Taseko Lake (Dasiqox Biny) approximately 3 km from the west embankment of the tailings storage facility. The proposed mine site area around Little Fish Lake (Y'anah Biny) was also reported to be used for hay and for grazing horses and cattle.

The Project was reported to be within the Claim Area at issue in *Tsilhqot'in Nation v. British Columbia*, 2007 BCSC 1700, rev'd in part 2012 BCCA 285 (the "William case"), where the BC Court of Appeal upheld the trial judge's findings of certain Tsilhqot'in Aboriginal rights in this area.

Portions of the proposed transmission line would cross areas where the Esk'etemc and the Stswecem'c Xgat'tem are asserting Aboriginal rights and title. Both the Esk'etemc and the Stswecem'c Xgat'tem indicated they were in stage 4 of the 6-stage treaty negotiation through the British Columbia treaty process. The effects of the Project on Aboriginal rights and title are discussed further in Chapter 13 of this report.

The transmission line and access road components of the Project would cross four provincial Management Units and three Forest Districts, including the Chilcotin Forest District where the mine would be situated. There were two Ducks Unlimited Canada projects reported to fall within the area of the transmission line.

2.2 PROJECT BACKGROUND

As noted above, the original Prosperity project submitted by Taseko was subject to both a provincial and federal environmental assessment. The Government of British Columbia issued an environmental assessment certificate for the proposed project in January 2010. However, in November 2010 the Government of Canada determined that the significant adverse environmental effects of the proposed project could not be justified under the circumstances.

As a result of the Government of Canada decision, Taseko revised its mine proposal, in particular the mine development plan and mine site layout, to address the factors identified during the previous review and submitted its proposal for the Project that is the subject of this review. The most important change implemented by Taseko in its new proposal was the preservation of Fish Lake (Teztan Biny) and portions of its feeding tributaries by relocating the tailings storage facility 2.5 km upstream of the lake.

2.3 PROJECT COMPONENTS

The Project as proposed would consist of an open-pit mine and concentrator facility that would produce gold and copper over a 20 year operating life with a production capacity of approximately 70 000 tonnes per day. The mine would have an average annual production of 108 million pounds of copper and 247 thousand ounces of gold. The Project would also include support infrastructure, a tailings storage facility, ore and waste rock storage areas, a 125-km power transmission line, a 2.8-km mine access road, and transport of concentrate to the existing Gibraltar Mine concentrate load-out facility near Macalister, 54 km north of Williams Lake.

The Project would include four main elements: mine, transmission line, access road and transportation corridor, and a concentrate rail load-out facility (Figure 1). Many elements and features of the Project design would be identical to the original proposal. There have been no changes to the proposed open pit or milling operations and facilities. Also, the transmission line, access road and transportation corridor, and the concentrate rail load-out facility would remain unchanged from the previous project proposal.

Changes to the mine from the original Prosperity project would include the relocation of the tailings storage facility, the ore stockpile and the non-potentially acid generating waste rock and overburden stockpile. According to Taseko, the most important change would be the relocation of the tailings storage facility 2.5 km upstream of Fish Lake (Teztan Biny) and the preservation of Fish Lake and its associated habitats. (Figure 2) The proposed fish compensation works and the site water management would also change substantially from the previous proposal due to the preservation of Fish Lake and the reduction in loss of fish habitat with the new mine plan. Changes were made to address the previous panel findings regarding significant adverse environmental effects from the previous mine proposal.

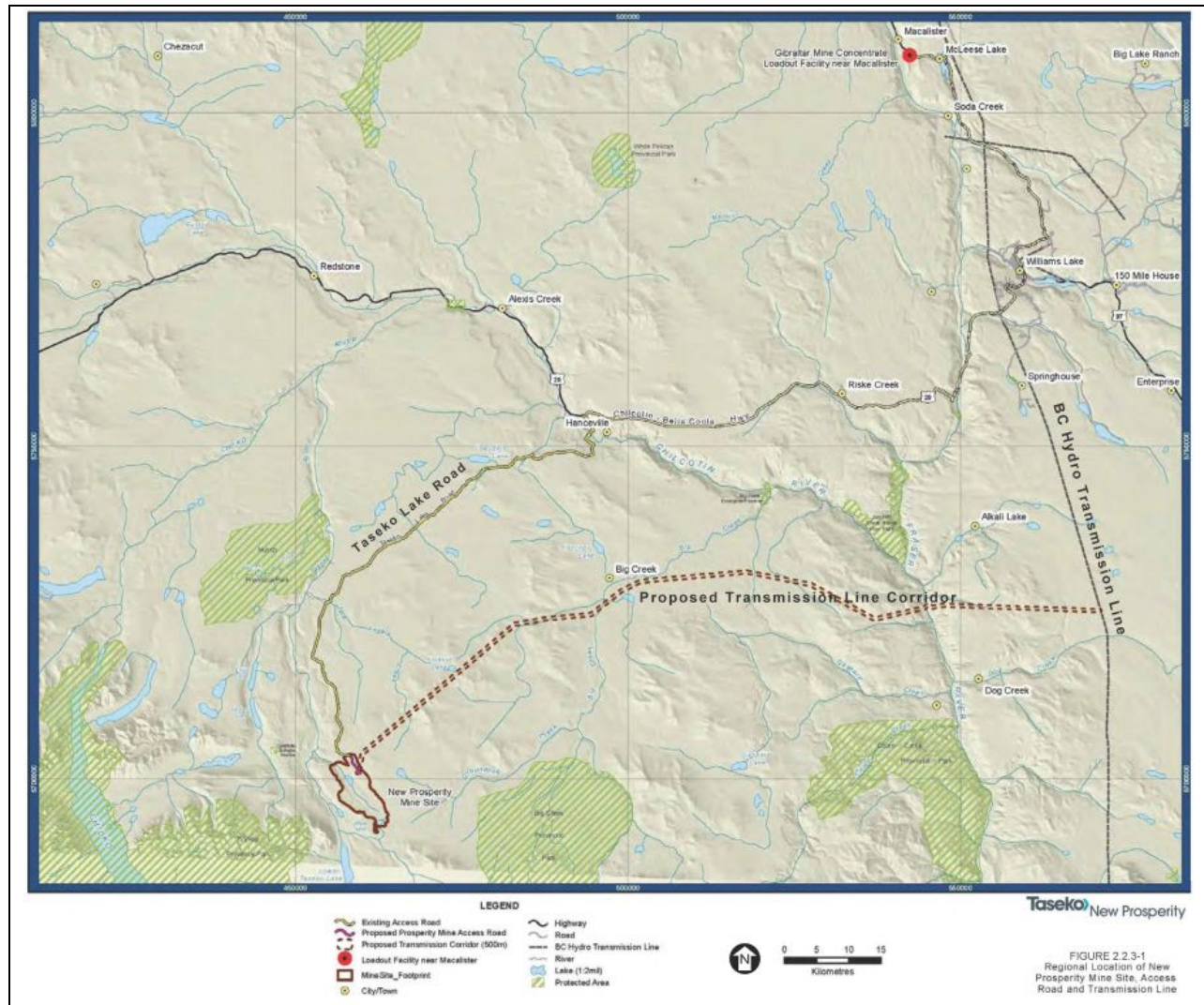


Figure 1. Overview of the Project Components in a Regional Setting (Source: Modified from Taseko)

The Mine Site

The Project would involve a conventional shovel and truck open pit mine with crushed ore conveyed 2 km to a concentrator. The mine components include the open pit, ore stockpiles, waste rock and overburden stockpiles, primary crusher and overland conveyor, explosives manufacture and storage, coarse ore transfer, storage and reclaim areas, the plant site, the tailings storage facility, other infrastructure, water supply and distribution, communications and plant power distribution. The revised mine layout as proposed for the New Prosperity Mine Project is shown in Figure 3.

The south rim of the open pit would be located approximately 300 m north of Fish Lake (Teztan Biny). The pit would be conical in shape, 1 200–1 600 m in diameter at the pit rim and 525 m deep at closure. Non-potentially acid generating open pit overburden and waste rock materials would be used to construct the tailings storage facility embankments and roads. The tailings storage facility would impound tailings and potentially acid generating waste materials. Pit dewatering systems would be implemented and designed to ensure safe operation of the pit. Pit water would go directly to the mill or to the tailings storage facility. A combination of

depressurization techniques including vertical wells, in-pit horizontal drains and collection systems would be implemented during pit development in order to minimize the potential for slope failure of the pit walls.

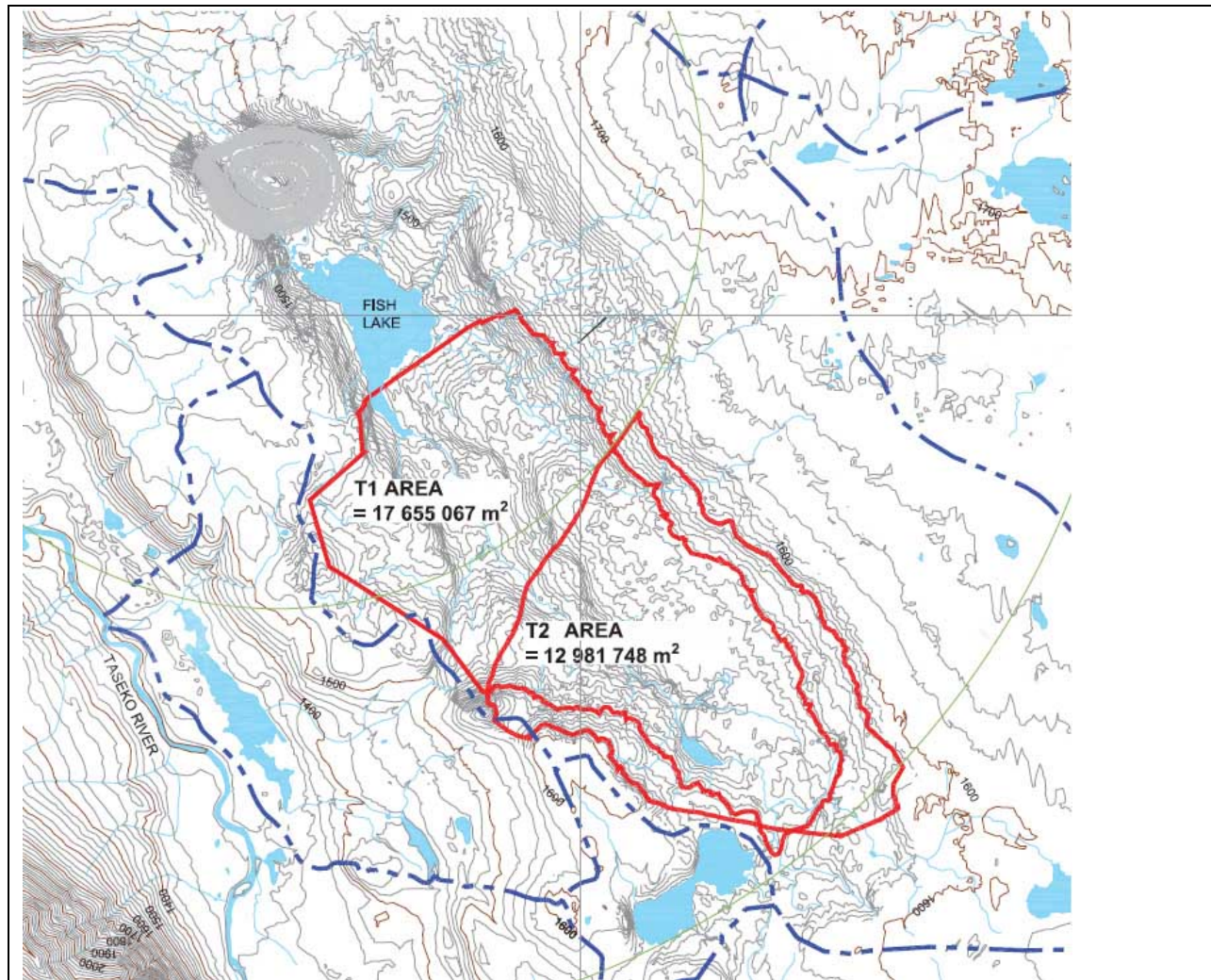


Figure 2. Tailings Storage Facilities Overlay: T1 [Original Prosperity] T2 [New Prosperity]
(Source: Modified from Taseko)

Taseko estimated that the total tonnage of waste material to be mined from the open pit would be approximately 400 (Mt): 12 Mt of potentially acid generating overburden, 60 Mt of non-potentially acid generating overburden, 225 Mt of potentially acid generating waste rock and 102 Mt of non-potentially acid generating waste rock. The non-potentially acid generating waste and overburden not used in the tailings storage facility embankment or road construction would be deposited to the northeast of the open pit. The ore stockpile would be located to the east of the pit. Potentially acid generating waste would be trucked directly to the tailings storage facility. The haul road from the open pit to the tailings storage facility would be approximately 2 km longer than the previous project proposal.

The ore would be hauled from the open pit to the primary crusher located near the southern rim of the pit. The crushed ore would be carried to the stockpile at the plant site by a 1 900 m overland conveyor where it would subsequently be fed to the grinding circuit. The plant site

would be located approximately 2 km east of the primary crusher. Structures at the plant site would include crusher stockpile and reclaim facilities, a concentrator building, a 230-kilovolt (kV) substation, and an assay laboratory. Conventional crushing, grinding and froth flotation would be used to process ore. The copper-gold concentrate would then be loaded in trucks to be transported to the load-out facility at Macalister. The plant would operate 24 hours per day, 365 days per year with scheduled downtime for equipment maintenance. Standard chemical reagents in combination with froth flotation would be used for ore beneficiation.

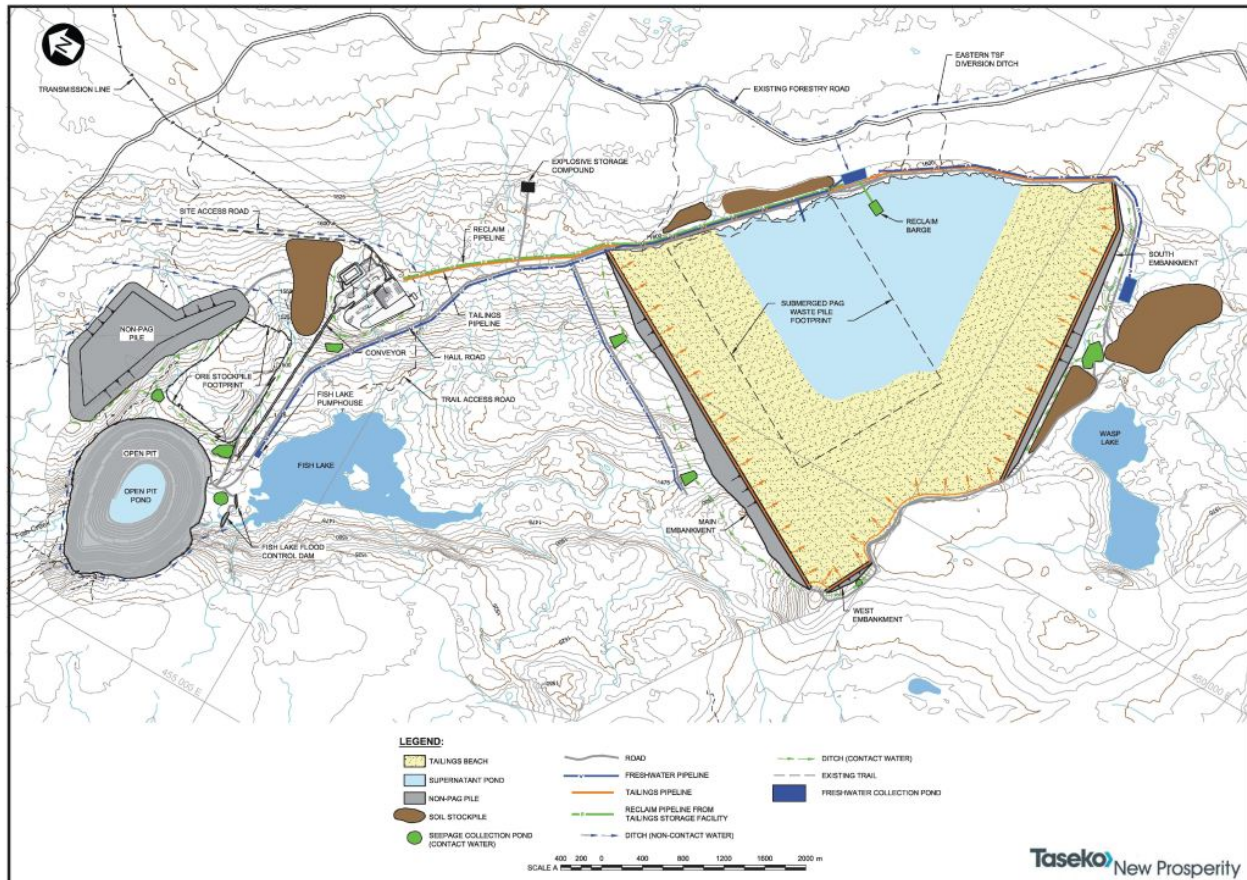


Figure 3. Mine Site Layout – General Arrangement, End of year 20 (Source: Modified from Taseko)

The tailings storage facility would be located approximately 2 km south of the plant site and would be contained within three embankments. The embankments would be constructed using low permeability glacial till, overburden and non-potentially acid generating waste rock materials from the open pit. The main embankment would be relocated approximately 2 km south from where it was proposed in the previous project proposal. Construction of the main and south embankments would begin in Year 1 of operations. The west embankment would be constructed later in the mine life (approximately Year 7 of operations).

All three embankments would be constructed as water-retaining structures for the entire life of the mine using a low-permeable glacial till core with centreline method of construction. For the main embankment, this would be a fundamental change in the design compared to the downstream construction method that was proposed for the previous project. The primary purpose of this new design feature was to minimize seepage as much as possible from the tailings storage facility through the main embankment. Site drainage and seepage management had changed from the previous project proposal. Contact water collection systems would be

located downstream of the mine components in order to capture as much contact water as possible and for use in the milling process. Groundwater interception wells downstream of the main embankment would be placed to enhance seepage recovery. All non-contact water would be redirected to Fish Lake (Teztan Biny).

The tailings storage facility would also include diversion and seepage collection ditches, collection ponds, tailings distribution system, reclaim water system, potentially acid generating waste rock/overburden stockpile, tailings beaches, and supernatant water pond.

Other mine site infrastructure would include administration and change house facilities, an on-site workers camp to host an estimated peak of 1 000 workers during construction, a truck shop and maintenance facilities, an assay and environmental laboratory, a warehouse and explosives facilities. Fresh water would be supplied by deep pit dewatering wells and surface run-off collection. Potable water would be supplied by wells. The explosives facilities had been relocated relative to that described in the previously assessed project as a result of the revised stockpile locations. All other components would be the same as in the original Prosperity project proposal.

The process water pond with a total storage capacity of approximately 110 000 m³, located adjacent to the concentrator, would be supplied by three sources: pit dewatering, surface runoff from the ore and non-potentially acid generating waste rock and overburden stockpiles and the tailings supernatant pond reclaim.

Fish Lake (Teztan Biny) outlet would be dammed by a coffer dam. The lake would have a collection and distribution system to manage outflows from the lake, as well as to capture non-contact water from the Fish Creek (Teztan Yeqox) valley, which would direct flows to the inlet channels of the lake. The lake outflows would be managed by a pumping system located at the northern end of the lake, with water conveyed in a pipeline and released to the inlet channels of the lake, immediately downstream of the tailings storage facility main embankment. Excess flows not needed for the inlet channels would be directed to the tailings storage facility. Two non-contact water ponds, located east and south of the tailings storage facility would capture water in the undisturbed catchments surrounding the tailings storage facility. Pumping systems located in each pond would direct water to the inlet channels of the lake, immediately downstream of the tailings storage facility main embankment.

Electrical power to the mine would be supplied through a 230-kV substation at the mine site. Emergency power would be provided by standby diesel generators.

Transmission Line

A 230-kV transmission line would be constructed by Taseko to bring electrical power to the mine from the existing BC Hydro 230-kV transmission line near Dog Creek through a new switching station to be designed and constructed by former BC Transmission Corporation (now BC Hydro).

A 3 km wide route for the transmission line was established for the previous proposal, following an assessment of a number of possible alternatives, and carried forward to this project. Within this 3-km wide route, a 500-m wide corridor was determined within which the centreline of the eventual 30 to 80-m wide transmission line right-of-way would be selected.

The route of the transmission line would follow a general westerly direction from the switching station at Dog Creek. A 710-m wide crossing of the Fraser River canyon would be located approximately 15 km south of the community of Esk'etemc (Alkali Lake). The transmission line

would consist of wood or fiberglass H-Frame pole structures similar to standard BC Hydro designs with average spans of 225 m.

Access Road and Transportation Corridor

Access to the mine site would use existing roads with the exception of a new 2.8-km access road from the 4500 Road to the mine site. Concentrate would be trucked from the mine site to the load-out facility near Macalister would use existing roads: 4500 Road, Taseko Lake Road, Highway 20 to Williams Lake and Highway 97 from Williams Lake.

Concentrate Rail Load-Out Facility

The existing Gibraltar Mine concentrate load-out facility near Macalister on the CN Rail mainline would be used to transport the concentrate to the port of Vancouver for shipping to overseas smelters. Any capital improvements to the concentrate loading facility would occur within the existing yard, requiring no change to the overall footprint of the facility.

2.4 PROJECT PHASES

This Project would essentially have four phases: construction; operation; closure; and post-closure.

The construction phase would take approximately two years beginning with the development of the new site access road and timber harvesting along the transmission line. Site infrastructure development, water and sediment control systems, tailings dam construction, the upgrading of the 4500 Road, clearing of the transmission line right-of-way, construction of the Dog Creek switching station (to be performed by BC Hydro), and timber clearing would also occur during this phase.

The operations phase would involve the sequential enlarging of the open pit until completion of mining activities in the pit. This would also involve tailings embankment construction. Construction of the main embankment would continue until Year 17, and construction of the south embankment would begin in Year 1 and the west embankment in Year 7. Ore would be processed until Year 20. The operations phase would begin when the concentrator reaches commercial production and would last for approximately 20 years until no more tailings were generated by the concentrator. Concurrent reclamation activities would also begin during this phase.

The closure phase would begin when tailing production ceases, and would continue until the open pit discharges water to Lower Fish Creek (Teztan Yeqox) approximately 27 years later. This phase would include the decommissioning of site infrastructures and reclamation (Figure 4). Roads, plant site facilities and decommissioned water management structures would be reclaimed with windrowed soil while the overburden stockpiles, tailings beach, and tailings embankments would be reclaimed through the placement of salvaged and stockpiled soil. At this stage, an outlet channel/spillway would be constructed to allow surface water to be discharged from the tailings storage facility to Fish Lake (Teztan Biny), the open pit, and Lower Fish Creek. Additionally, the transmission line would be decommissioned, dismantled, and reclaimed. Water would be pumped from the supernatant pond to the pit early in the closure phase, and water would be released from the south and west seepage collection ponds to Wasp Lake and Onion Lake (Jidizay Biny), respectively. Water from the main embankment seepage collection ponds and wells would be pumped to the pit until water quality allowed for discharge to Fish Lake.

Post-closure would start when the open pit would be filled with water and had started to discharge to Lower Fish Creek (Teztan Yeqox) at about Year 48. This phase would involve all environmental monitoring and follow-up requirements for which Taseko would be responsible. This phase would continue until all conditions of the *Mines Act* Reclamation Code and permits had been fulfilled and Taseko had been released from its obligations under the *Mines Act*. Continued environmental monitoring may be required and could include periodic inspection of the tailings storage facility embankments, evaluation of water quality and flow rates, fish and aquatic life monitoring, and soil and vegetation monitoring.

In the event of premature mine closure, it could be necessary to pump the supernatant water from the tailings storage facility to the open pit until water quality in the tailings storage facility is suitable for direct discharge into Fish Lake (Teztan Biny). The potentially acid generating waste would be excavated to a level below the natural flood elevation of the tailings storage facility. As for the ore stockpile, it could either be processed, hauled back in the pit, or be left in its stockpile and covered to minimize water infiltration.

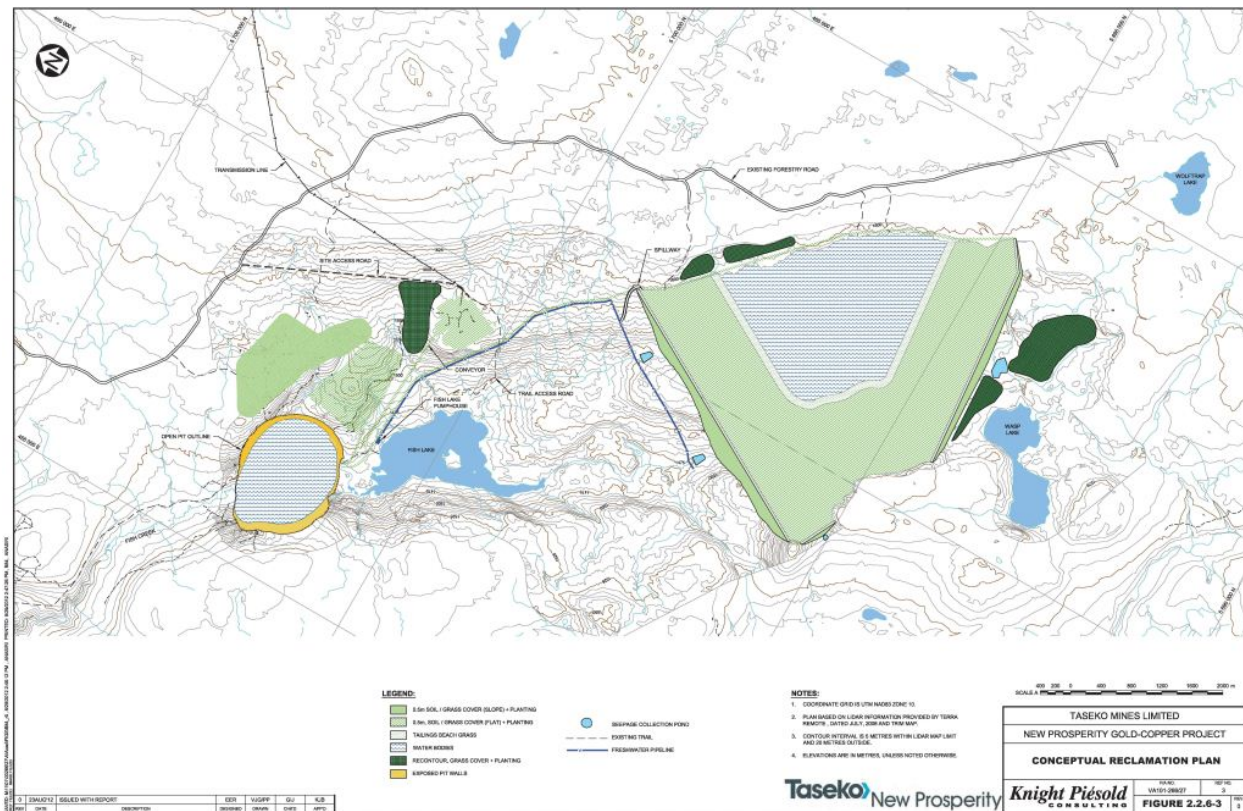


Figure 4. Conceptual Reclamation Plan (Source: Taseko)

3 PANEL'S MANDATE AND APPROACH

In this chapter, the Panel outlines its interpretation of key aspects of its mandate and its approach to the environmental assessment review.

3.1 PANEL'S MANDATE

The Panel's mandate is defined by CEAA and its Terms of Reference.

On July 6, 2012, after the Panel had commenced its review of the Project, the federal government repealed and replaced CEAA with CEAA 2012. On August 3, 2012, the Minister amended the Panel's Terms of Reference to reflect the fact that, with the coming into force of CEAA 2012, the review of the Project was to be continued and completed under CEAA 2012.

In general terms, the Panel was mandated to assess the environmental effects of the Project and to determine whether it was likely to cause significant adverse environmental effects, taking into account the implementation of mitigation measures, within the bounds of CEAA 2012 and its Terms of Reference.

In advance of the hearing, some Interested Parties asked the Panel to clarify certain aspects of its mandate. Further explanation follows:

3.1.1 Mandate of the Panel to Assess Impact on Aboriginal Rights

In June and July 2012, the Panel received requests from the Tsilhqot'in National Government and the Stswecem'c Xgat'tem to clarify its mandate regarding Aboriginal rights as set out in articles 3.8 to 3.11 of its Terms of Reference, and in particular whether the Panel would consider, assess and make recommendations concerning the potential impacts of the Project on Aboriginal rights. Following these requests, the Panel allowed other parties to comment on the interpretation of articles 3.8 to 3.11, and on the following question:

To what extent do the Terms of Reference allow the Panel to consider, assess and make recommendations concerning the potential impacts of the Project on potential or established Aboriginal rights or title?

After considering the comments received, the Panel released its decision (see Appendix 5) on September 13, 2013 with the following statement:

The Panel's view is that the *Canadian Environmental Assessment Act 2012* (CEAA 2012) and its TOR allow it to consider, assess and make recommendations on the potential impacts of the Project on potential or established Aboriginal rights, provided it respects the limits established by Article 3.12 and 3.13 of the TOR.

The Panel must therefore assess how the potential environmental effects of the Project may affect relevant Aboriginal interests, rather than attempting to determine the validity of the underlying Aboriginal rights claims or issues related to the scope or discharge of the Crown's duty to consult and accommodate in relation to those claims. Issues related to reconciling the interests of the potentially affected Aboriginal groups and the interests of the Crown are for the Crown, not the Panel. The Panel's assessment may inform the Crown in its subsequent efforts to reconcile interests, but the Panel's assessment must be limited to environmental effects of the Project as defined in section 5 of CEAA 2012.

The Panel's assessment of the potential impacts of the Project on Aboriginal interests is presented in Chapter 12 of this report.

3.1.2 Mandate of the Panel to Assess Environmental Effects

After the release of the Panel's amended Terms of Reference, the Panel received letters from the Tsilhqot'in National Government and MiningWatch asking the Panel to clarify its mandate to assess environmental effects under CEAA 2012 and the amended Terms of Reference. The issue arose because Appendix 1 to the Terms of Reference continued to use the definition of "environmental effects" from CEAA, and not the definition of "environmental effects" found in section 5 of CEAA 2012. In response, the Panel sought comments from the other participants on the following question:

Is the Panel's assessment of the environmental effects of the Project limited to the definition in section 5 of CEAA 2012, or must the Panel also consider the environmental effects of the Project as defined in Appendix 1 of its Amended Terms of Reference?

After considering the comments received, the Panel decided to seek clarification of the amended Terms of Reference to reconcile the definition of environmental effects contained in Appendix 1 of its amended Terms of Reference with the definition contained in section 5 of CEAA 2012.

On March 4, 2013, the Panel wrote to the Agency's President, asking:

Is the Panel's assessment of the "environmental effects" of the New Prosperity Gold-Copper Mine Project (Project) limited to the definition in section 5 of the *Canadian Environmental Assessment Act, 2012*, S.C. 2012, c. 19 (CEAA 2012), or must the Panel also consider the "environmental effects" of the Project as defined in Appendix 1 of its Amended TOR?

The Panel received a response from the Agency's President on March 6, 2013, as follows:

The definition of environmental effects that is found in Appendix 1 to the Panel's Terms of Reference has not been amended and remains as it was prior to the coming into force of CEAA 2012 and prior to the August 3, 2012, amendments to the Terms of Reference. This means that in conducting the assessment of the "environmental effects" of the Project in a manner consistent with CEAA 2012 and with the Panel's Terms of Reference (see section 2.1 of the amended Terms of Reference), the Panel must also consider the "environmental effects" of the Project as defined in Appendix 1 of the amended Terms of Reference.

Through the August 3, 2012, amendments to the Terms of Reference, the Minister added a new requirement for the Panel, that applies at the reporting stage of its mandate, to identify which of its conclusions/recommendations relate to "environmental effects" as defined in section 5 of CEAA 2012.

The response from the President of the Agency can be found in Appendix 6.

3.2 PANEL'S APPROACH

In the following sections, the Panel outlines its approach on selected aspects of its review as mandated by its Terms of Reference and CEAA 2012.

3.2.1 Environmental Effects under CEAA 2012

As clarified by the Agency, the Panel is to consider all environmental effects defined under both its Terms of Reference and CEAA 2012, and must specifically identify in its report those environmental effects that are specific to CEAA 2012.

Appendix 1 to the Panel's Terms of Reference defines "environmental effects" as follows:

"environmental effect" means

- (a) any change that the Project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*,
 - (b) any effect of any change referred to in paragraph (a) on (i) health and socio-economic conditions, (ii) physical and cultural heritage, (iii) the current use of lands and resources for traditional purposes by aboriginal persons, or (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or
 - (c) any change to the Project that may be caused by the environment,
- whether any such change or effect occurs within or outside of Canada.

Under CEAA 2012, environmental effects are defined in subsections 5(1) and 5(2). For ease of reference, those sections are cited here:

Environmental effects

5. (1) For the purposes of this Act, the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project are

(a) a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:

- (i) fish as defined in section 2 of the [Fisheries Act](#) and fish habitat as defined in subsection 34(1) of that Act,
- (ii) aquatic species as defined in subsection 2(1) of the [Species at Risk Act](#),
- (iii) migratory birds as defined in subsection 2(1) of the [Migratory Birds Convention Act, 1994](#), and
- (iv) any other component of the environment that is set out in Schedule 2;

(b) a change that may be caused to the environment that would occur

- (i) on federal lands,
- (ii) in a province other than the one in which the act or thing is done or where the physical activity, the designated project or the project is being carried out, or
- (iii) outside Canada; and

(c) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on

- (i) health and socio-economic conditions,
- (ii) physical and cultural heritage,
- (iii) the current use of lands and resources for traditional purposes, or
- (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Exercise of power or performance of duty or function by federal authority

(2) However, if the carrying out of the physical activity, the designated project or the project requires a federal authority to exercise a power or perform a duty or function conferred on it under any Act of Parliament other than this Act, the following environmental effects are also to be taken into account:

- (a) a change, other than those referred to in paragraphs (1)(a) and (b), that may be caused to the environment and that is directly linked or necessarily incidental to a federal authority's exercise of a power or performance of a duty or function that would permit the carrying out, in whole or in part, of the physical activity, the designated project or the project; and
- (b) an effect, other than those referred to in paragraph (1)(c), of any change referred to in paragraph (a) on
 - (i) health and socio-economic conditions,
 - (ii) physical and cultural heritage, or
 - (iii) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

The environmental effects defined under subsection 5(1) consist of changes that may be caused to the following components of the environment that are within the legislative authority of Parliament:

- fish and fish habitats;
- other aquatic species defined under the *Species at Risk Act*;
- migratory birds; and
- effects on Aboriginal peoples that may be caused by any change to the environment that causes an effect on:
 - health and socio-economic conditions;
 - physical and cultural heritage;
 - the current use of lands and resources for traditional purposes; or
 - any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

In this review, subsection 5(2) is also triggered since the Project requires permits, approvals, authorizations and/or licences under the *Fisheries Act*, *Navigable Waters Protection Act* and *Explosives Act*. The Project would also require designation of Little Fish Lake (Y'anah Biny) and portions of Fish Creek (Teztan Yeqox) as a tailings impoundment area and listing on Schedule 2 of the *Metal Mining Effluent Regulations* under the *Fisheries Act*.

The environmental effects defined in paragraph 5(2)(a) of CEAA 2012 include changes to the environment that are "directly linked or necessarily incidental to" any federal decisions about a

project, other than a change already identified in paragraph 5(1)(a) and (b). The Panel interprets the two branches of this definition of effects as follows:

- “directly linked” environmental effects to be effects that are the direct and proximate result of a federal decision; and
- “necessarily incidental” environmental effects are other effects that are substantially linked to a federal decision although they may be secondary or indirect effects.

All direct environmental effects resulting from the loss of Little Fish Lake (Y’annah Biny) and the upper reaches of Fish Creek (Teztan Yeqox) that are not captured under subsection 5(1) would be considered under subsection 5(2). Also, if the loss of the above-mentioned areas results in the loss of habitats used by the moose or grizzly bear, for example, those indirect and substantial effects on the grizzly bear and moose would be considered environmental effects that are necessarily incidental to a federal decision, and would therefore be captured under subsection 5(2) of CEAA 2012.

Further, when considering the environment effects of the federal decisions, the Panel was careful to take into account the effects of the federal decisions on Aboriginal peoples, as directed by paragraph 5(1)(c).

There are many linkages between and among environmental changes, including changes that are environmental effects defined under CEAA 2012 and those that are not. For example, the Panel determined that the Project would generate seepage of pore waters from the tailings storage facility. This would be considered a change in the environment – i.e. a change in the quantity and quality of groundwater influenced by seepage originating from the tailings storage facility. This seepage would also result in a change in surface water quality when it would seep into Fish Lake (Teztan Biny) which is located down slope from the tailings storage facility. That change in water quality in Fish Lake would be considered an environmental effect under the former Act but it would not, by itself, fall within one of the listed categories defining an environmental effect under subsection 5(1) of CEAA 2012. Fish Lake, however, consists of fish habitat which sustains a viable population of fish, namely rainbow trout. The change in the water quality in Fish Lake would have an adverse effect on both the fish habitat and the fish which are both within the listed environmental effect categories.

Moreover, Fish Lake (Teztan Biny) is used by the Tsilhqot’in for traditional purposes and as part of their cultural heritage. The changes caused to the Lake would affect the Aboriginal cultural heritage as well as the current use of land and resources by Aboriginal peoples for traditional purposes. These too would be environmental effects under subsection 5(1) of CEAA 2012.

Since the effects and linkages are a complex and interactive web, the Panel was careful to consider those interactions when deciding how to categorize the environmental effects. The Panel will attempt to point out these linkages in this report. The Panel will also identify clearly which changes are environmental effects under the CEAA 2012 and which are not.

3.2.2 Acting in a Precautionary Manner

CEAA 2012 states that designated projects, such as the Project under review, are to be considered in a careful and precautionary manner to avoid significant adverse environmental effects.

In the context of discussing a precautionary approach, Taseko indicated “the Panel can and should consider post-EA monitoring, adaptive management, and the role of subsequent permitting agencies that must approve the project before any construction can proceed.”

Citing the Agency's Operational Policy Statement - *Adaptive Management Measures under the Canadian Environmental Assessment Act*, Environment Canada and the Tsilhqot'in National Government noted the following:

- If, taking into account the implementation of mitigation measures, there is uncertainty about whether the Project is likely to cause significant adverse environmental effects, a commitment to monitor Project effects and to manage adaptively is not sufficient.
- A commitment to implementing adaptive management measures does not eliminate the need for sufficient information regarding the environmental effects of the Project, the significance of those effects and the appropriate mitigation measures required to eliminate, reduce or control those effects.
- Where additional information collection or studies are needed over the life-cycle of the Project, such studies in themselves should not be considered "mitigation measures".

The British Columbia Ministry of Energy and Mines stated: "Water treatment is a primary mitigation strategy for this project and it should be demonstrated to be feasible at the EA phase, especially since it is key to conclusions on project related effects".

Taseko declined to provide some materials requested by the Panel and by other participants (e.g., description of water quality model for Fish Lake). To deal with the resulting uncertainties, the Panel considered various risk management strategies, including adaptive management in some circumstances. However, when the Panel concluded the potential adverse environmental effects were potentially "significant", it did not agree that deferring decisions on the approach to manage the risk to subsequent regulatory processes is appropriate. It is necessary at the environmental assessment stage for the Panel to determine if a significant adverse effect is likely and to consider if and how the risk can be managed to acceptable levels.

If, after reviewing the record of information for the review, the Panel decided that there were serious uncertainties about a potential adverse environmental effect and the ability to manage that effect and the risk of serious or irreversible environmental harm was high, then the Panel adopted a precautionary approach.

In some cases, such as the matter of acid rock drainage and metal leaching (an important issue for the proposed New Prosperity Mine), the Panel believes the information provided was sufficient for an environmental assessment. There were residual uncertainties but they were not substantial. The Panel found that these uncertainties and the related risk could be adequately managed at a later stage of Project development. In those cases, the Panel made recommendations to fill the information gaps prior to a subsequent regulatory review.

In other cases, where there was a greater chance that the information gap could result in serious or irreversible adverse environmental effects, the Panel identified the risk and made recommendations to assist any subsequent regulatory review.

In no case did the Panel conclude there would be a significant adverse environmental effect based solely on the presence of an information gap. When considering any issue, the Panel considered the record carefully to consider the best approach forward to assess the Project.

3.2.3 Determining Significance of Environmental Effects

The Agency provides a guidance document to assist with determining the significance of environmental effects: *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects*. In it, the following five factors are recommended to assist with the

determination of significance: magnitude; geographic extent; duration and frequency; degree to which the effect is reversible; and ecological context.

The same guidance document also suggests the most common method of determining significance of an adverse effect:

The most common method of determining whether the adverse environmental effects of a project are significant is to use environmental standards, guidelines, or objectives. If the level of an adverse environmental effect is less than the standard, guideline, or objective, it may be insignificant. If, on the other hand, it exceeds the standard, guideline, or objective, it may be significant.

The Panel generally applied this common-sense approach, varying it when necessary to fit the specific circumstances of the issue being considered. For example, the Panel used British Columbia's and Canada's water quality guidelines to determine the significance of water quality effects. When there were no guidelines available, the Panel considered more in-depth approaches, including the more complex approach used by Taseko (evaluating each of the five factors independently).

For cultural heritage effects, the Panel followed the Agency's guide: *Reference Guide on Physical and Cultural Heritage Resources* which indicates that the following aspects should be considered: magnitude; geographic extent; duration and frequency; reversibility; and context. The difference is that the final factor is "context", not "ecological context". In considering "context", the Panel also listened carefully to information provided by those who would be affected by the Project.

3.2.4 Assessing Cumulative Effects

Under CEAA 2012, cumulative effects are defined as "environmental effects that are likely to result from the [Project] in combination with other physical activities that have been or will be carried out". This is commonly referred to as the effects of the Project in combination with other past, present and reasonably foreseeable future projects.

It is good practice to carry out cumulative effects assessments for ecological components or key indicators for which: (1) there is a residual adverse project effect; and (2) the effects of other projects and activities act cumulatively with this project effect. If the Project has no residual effect on the ecological component or key indicator, there are no cumulative effects to assess. If the residual effect is positive, the project improves the ecological component or key indicator and there is no need to assess cumulative effects. If there are no other projects or activities that affect the same ecological component or key indicator, again, there are no cumulative effects to assess.

In the EIS, Taseko suggested an additional requirement for this test – i.e. that the Project effect make a significant contribution to the cumulative effect. By adopting this additional test, Taseko excluded cumulative effects that should be assessed under CEAA 2012. The main cumulative effects excluded from the assessment were those resulting from past forest harvesting.

To correct this deficiency, the Panel requested in writing that Taseko complete cumulative effects assessments involving past forest harvesting activities that have contributed to effects that may be caused by the Project on valued ecosystem components or key indicators. Taseko's response only included forest harvesting since 2009, and argued that cumulative effects assessments only needed to be carried out for vegetation, wildlife, resource use, and Aboriginal interests. The Panel agreed that Taseko could limit its analysis on those components

and made a supplemental information request for cumulative effects assessments for all forest harvesting that acted cumulatively with Project effects. The Panel found Taseko's subsequent response sufficient to proceed to a hearing, noting it would be seeking further information during the hearing.

Based primarily on information provided to the original Prosperity panel, this Panel determined that cumulative effects for wildlife generally and moose in particular could be important. Accordingly, the Panel requested information from the British Columbia Ministry of Forestry, Lands and Natural Resource Operations on this subject. The Ministry provided recent studies of moose in the region where the Project is proposed. The Panel used this information to understand cumulative effects. The Panel also considered the cumulative effects of the Project on the South Chilcotin grizzly bear population which had been identified as a significant adverse cumulative effect by the previous Prosperity panel and was treated as a cumulative effect by Taseko in the EIS.

Cumulative effects on a valued ecosystem component or on a key indicator are addressed in the relevant chapters of the report when required.

4 NEED FOR AND PURPOSE OF THE PROJECT

Section 19 of CEAA 2012 requires the Panel to consider the purpose of the Project, alternative means of carrying out the Project which are technically and economically feasible, and the environmental effects of any such alternative means. The Panel's Terms of Reference also direct the Panel to consider the need for and alternatives to the Project.

4.1 PROPONENT'S ASSESSMENT

Taseko reported that the New Prosperity mineral deposit was currently the seventh largest undeveloped gold-copper resource in the world. The purpose of the Project was to use this proven mineral reserve to create value and opportunity for the people of British Columbia and Canada, and for the shareholders of Taseko. Taseko suggested the Project was needed to help sustain the economic and social health of rural British Columbia communities.

According to Taseko, the Project would help fill the predicted global shortage of copper concentrate and help fill a current gap that exists between the production of, and demand for, gold. Development of the Project would contribute to Canada's role as a producer of copper and gold in the world economy, and would help sustain Canada as a copper and gold producer. Taseko stated this purpose was consistent with Canada's overall strategy of encouraging private corporations to generate national export commodities and tax revenues from natural resource development.

The Project was expected to generate local and provincial economic value and tax revenues in excess of the estimates provided in the previous Prosperity proposal. Taseko stated that the Project was expected to generate \$11 billion in real gross domestic product and 57 000 person-years of employment over its anticipated 20 years of operation. In Taseko's view the Project was needed to bring training, employment opportunities, and increased investment in services to the local population and all of British Columbia. These developments are positive impacts for a region hard hit by the Mountain Pine Beetle epidemic that had put the future of the interior forest industry in jeopardy.

4.1.1 Views of Participants

In its presentation to the Panel the Mining Association of British Columbia stated that major mines were economic drivers that offer long-term, high paying employment. The Association for Mineral Exploration British Columbia, representing British Columbia's mineral exploration sector, stated that the Project represented a rare and special mineral deposit in British Columbia and was one of the world's most significant undeveloped gold deposits. It stated that government revenues would be nearly \$10 billion over the life of the mine. The Association described a number of recent agreements and business partnerships that had been developed between British Columbia mines and Aboriginal groups through sharing of mineral tax revenues. The Association also described the lead role it had played in a number of new initiatives to build relationships with Aboriginal communities, including the Industry Council for Aboriginal Business, British Columbia Aboriginal Mine Training Association and the British Columbia First Nation Energy and Mining Council and expressed confidence that if the Project was to be developed that it would be a major "economic engine boost" for all the people living in the Cariboo-Chilcotin region.

In its submission, MiningWatch Canada stated that mining was not the best way to develop jobs for BC. MiningWatch Canada stated that mining was a poor 'jobs' generator in terms of the amount of investment required to create a job and while the jobs created are above average

salary compared to other sectors, the job intensity (employment / gross domestic product) of mining was amongst the lowest of all other sectors. MiningWatch Canada claimed that there was also a considerable amount of uncertainty and instability in the mining sector, which negated some of the benefits of higher wages.

MiningWatch Canada remained concerned about the financial viability of such a low-grade deposit, submitting that global copper and gold prices were softening while average construction and operating costs had continued to climb since the review of the previous project proposal. Taseko therefore may not be able to operate in the long term and, if it were able to operate, it may not have adequate resources to fulfill its commitments regarding mitigation and monitoring activities.

In his review of the previous Prosperity proposal, Dr. Marvin Shaffer, on behalf of the Tsilhqot'in National Government, concluded: "contrary to statements in the EIS suggesting this project would generate billions of dollars in net benefits, the project would appear, based on the available information, to generate significant net cost for British Columbians and Canadians as a whole". MiningWatch Canada commissioned an updated report from Dr. Shaffer for the Project whose conclusions remained unchanged.

In his submissions, Dr. Shaffer provided a critique of Taseko's claims to regional economic benefits of the Project. Dr. Shaffer found that there were substantial subsidies that would go to the Project, that net employment would be much less than Taseko described, and that there was no information available on which to assess Taseko's claims of tax revenues to British Columbia and the federal government. Specifically, with the increased demand for skilled workers throughout western Canada due to increasing resource development and the imminent retirement of many older workers, the reality was that Canada was facing considerable skilled labour shortage. He suggested that the employment benefits that Taseko promises were therefore not as positive since many of the jobs that the mine would provide would have to come from elsewhere.

A study by Don MacKinnon, on behalf of Friends of the Nemaiah Valley, looked at the costs of upgrades to public access roads. MacKinnon estimated the costs of road upgrades to allow the year-round transport of mine concentrate using B-train trucks at \$26.2 million in capital costs and maintenance expenditure over 20 years at \$0.8 million/year in addition to normal road maintenance costs. These estimates did not include the cost of two new bridges which might be required. In his presentation to the Panel, Don MacKinnon stated that taxpayers would bear the cost of road upgrades and annual maintenance costs required for mine traffic which would total an overall cost of \$42.2 million over 20 years.

The Mayor of Williams Lake, Kerry Cook, expressed the view that the New Prosperity project would present an opportunity to strengthen the economic base of Williams Lake and the region: "there is an economic need for the New Prosperity Gold-Copper Mine Project". Ms. Cook noted that although Williams Lake needed to realize greater economic diversification, that was hard to do without a strong community base. A major industrial development such as the Project would be a huge economic generator on its own, but that could also result in the expansion of existing businesses and the attraction of new investment in businesses that serve the Project.

In a written submission to the Panel, Donna Barnett, Member of the Legislative Assembly for the Cariboo-Chilcotin constituency, stated that the devastation caused by the Pine Beetle in the region, and many other parts of rural British Columbia, have created economic hardships in the forest industry, which at one time was the driving force behind a vibrant part of this province. Ms. Barnett claimed that the region had a chance to once again prosper and thrive, but without

the Project moving forward, the economic future of the Cariboo-Chilcotin was in jeopardy. The New Prosperity Project would be of great importance to not only the region of the Cariboo-Chilcotin, but the province of British Columbia as a whole.

4.2 ALTERNATIVES TO THE PROJECT

The Agency defines “alternatives to the project” as the functionally different ways to meet a project’s need and achieve a project’s purpose. It also notes that alternatives to a project should be established in relation to the project need and purpose and from the perspective of the project proponent.

4.2.1 Proponent’s Assessment

In the previous review of the proposed Prosperity project, the “alternatives” considered by Taseko included underground mining rather than open pit mining and the selection of a corridor for the transmission line. Taseko concluded that underground mining was not economical and for that reason no further consideration was given to underground mining, and only open pit mine development plans were examined.

In the current EIS Taseko stated that the only functionally different way to meet the Project’s need and achieve the Project’s purpose was to develop alternative copper and gold mines in Canada, preferably in British Columbia. Taseko explained that the nature of economic mineral resources was that they were very rare and currently Taseko did not have an economically viable alternative at the same advanced level of geological definition, engineering, and environmental assessment as the New Prosperity Project proposal.

In its EIS Taseko stated it was already maximizing its copper production at Gibraltar Mine through a recently completed \$700 million investment to expand the mill and increase production. The only remaining alternatives were to economically extract the resource at New Prosperity or to do nothing. The “no project” alternative would not meet the need for and purpose of the Project. The “no project” alternative would mean the loss of employment, business, and training opportunities, as well as taxes and royalties to all levels of government from Taseko and mine employees. Taseko concluded that the “no project” alternative would not provide economic returns to Taseko’s shareholders, nor contribute to global supply for copper and gold.

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 electrical grid. Taseko completed a transmission line selection study in 1997. The study identified nine 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 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 125 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 in the previous project and Taseko did not present any alternatives to the transmission line corridor in the current EIS.

During the previous review Taseko was informed that the Tsilhqot’in National Government and Western Power Biomass Cooperation were proposing a 60 MW forest-based biomass-fired, thermal electric power generating plant outside of Hanceville. Taseko included the proposal as

part of its cumulative impact assessment but did not consider it as an alternative to supplying electrical power to the mine site. The power generating plant would produce energy from wood affected by the mountain pine beetle and includes approximately 70 km of 230-kV electric transmission line from Hanceville to Soda Creek substation along the same or similar routing as the option that was examined by Taseko. At the time of the current EIS, the proposal was still in the pre-application stage and it was not a focus of discussion during the hearing.

4.2.2 Views of Participants

During the General hearing session Joan Kuyek suggested that there were many initiatives in the Cariboo-Chilcotin region that provided opportunities for community economic development. If the same kind of government subsidies and investments were put into building a more diverse and healthy economy the citizens of the Cariboo-Chilcotin could create many more jobs than what the mine would create. Ms. Kuyek presented examples of sustainable alternatives such as; renewable energy products, tourism, horse logging, wood fiber initiatives, sustainable agriculture, specialty ranching, food activities, arts and heritage.

Professor John Meech, on behalf of The Williams Lake and District Chamber of Commerce and Share the Cariboo-Chilcotin Resources Society, stated that as ore grades continue trending down, new methods to reduce costs or increase recovery are always under development. With New Prosperity being one of the top-ten unexploited copper-gold deposits in the world in terms of size and values, the question is not "Should we mine?", rather it is "When will it be mined?" Dr. Meech was confident Taseko would apply the principles of Sustainable Mining: sustaining the company; sustaining the environment; and sustaining local communities.

4.3 ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT

4.3.1 Proponent's Assessment

Taseko had determined that there were no new alternative means to carry out the various components and activities of the Project that had not changed (e.g. the pit) from those previously assessed. The previous panel concluded that Taseko's rationale for selecting its preferred alternative for the mine development plan and its approach to selecting the centerline for the transmission line were reasonable for the purposes of the environmental assessment.

For those aspects of the Project that have changed, namely tailings storage facility, ore, and waste rock locations Taseko stated it developed a new proposal that substantially addressed or accommodated the environmental and Aboriginal concerns identified by the previous panel.

The previous Prosperity review resulted in a comparison of three alternative mine development plans. All three alternatives were technically feasible, providing varying degrees of mitigation and compensation for fish and fish habitat. The fundamental differences between the three mine development plans were the waste rock and tailings storage methods and locations. The preferred alternative, referred to as mine development Option 3 was based on the fact it afforded the greatest environmentally responsible option by submerging all potentially acid generating waste rock in Fish Lake (Teztan Biny) and was the most appropriate option from an overall technical, socio- economics and economics perspective. The other two alternatives were flawed due to excessive economic risk.

Following the Government of Canada's decision that the project as proposed could not be justified, Taseko revised its proposal. Given that the long-term outlook for higher metal prices were increasing to a point that a different configuration of the mine development plan could be

considered as economically feasible, Taseko determined that it could accept the additional cost and submitted the current Project for review. Taseko presented a variation of one of the mine development plans that was assessed in the previous review, as its preferred option. The stated goal of the new mine development plan, referred to as MDP T2 (Fish Creek South), was: “through the relocation of the tailings storage facility, the ore stockpile and the non-potentially acid generating waste rock and overburden stockpile, the mine site layout of New Prosperity preserves Fish Lake and the lower portions of Upper Fish Creek, including the island in Fish Lake and surrounding archaeology sites.”

To meet the requirements of the EIS Guidelines, Taseko assessed alternative means of disposing of mine waste. The assessment utilized a semi-quantitative decision-making tool known as a multiple accounts analysis as recommended by Environment Canada's Guidelines, *Guidelines for the Assessment of Alternatives for Mine Waste Disposal* (September 2011). Taseko conducted a pre-screening of 15 alternatives for the disposal of tailings and potentially acid generating waste rock as well as for the disposal of non-potentially acid generating waste rock and the stockpiling of overburden and low grade ore. Key to this pre-screening was the use of “fatal flaw” criteria and exclusionary screens to eliminate alternatives. A single fatal flaw or two or more exclusionary factors (constituting an effective fatal flaw) were grounds for removing an alternative from further analysis.

Based on pre-screening results, Taseko identified a short list of potentially viable disposal alternatives which were then used to develop two possible mine development plans, known as MDP T2 (Fish Creek South) and MDP T6 (Tête Angela Creek) (Figure 5). Each mine development plan presented a conceptual design for the mine site as a whole, including disposal of tailings and waste rock, as well as key site infrastructure.

MDP T2 (Fish Creek South) would involve the use of Little Fish Lake (Y'anah Biny) and a portion of Upper Fish Creek (Teztan Yeqox) for the co-disposal of tailings and potentially acid generating waste rock. In this option the tailings storage facility would be situated 7 230 m away from the proposed open pit and 2.5 km south of Fish Lake (Teztan Biny). A 3.9 km long embankment would be constructed across Upper Fish Creek with a secondary embankment 3.3 km long located to the south which would be constructed as the tailings storage facility expands. The tailings storage facility would consist of three dams with a total length of 7.84 km and a maximum height of 115 m. The overall footprint of the tailings storage facility would be 12.0 km². Potentially acid generating waste rock would be transported and deposited by truck. The tailings would be piped as a slurry to the tailings storage facility and would be spigotted from varying locations on dam crests to manage beach and supernatant pond locations.

MDP T6 (Tête Angela Creek) would locate the tailings storage facility 7 940 m away from the proposed open pit within the Tête Angela tributary watershed with a small portion infringing on the Tête Angela Creek watershed. It would involve the use of an unnamed lake and a portion of Tête Angela Creek for the co-disposal of tailings and potentially acid generating waste rock. The tailings storage facility would consist of two dams with a total length of 6.2 km and a maximum height of 115 m. The overall footprint of the tailings storage facility would be 13.1 km².

Taseko concluded that the assessment of alternatives for mine waste disposal demonstrated that MDP T2 (Fish Creek South) was more favourable with respect to environment, socio-economics, technical, and project economics and was therefore the preferred mine development option. Taseko stated: “a significant distinguishing factor favoring Fish Creek South is the ability to limit direct impacts to a single watershed. Concentrating the effect of the Project into a single watershed allows for greater control and containment of mine water and

waste by limiting the pathways to the greater receiving environment and lessening the overall environmental liability upon mine closure.”

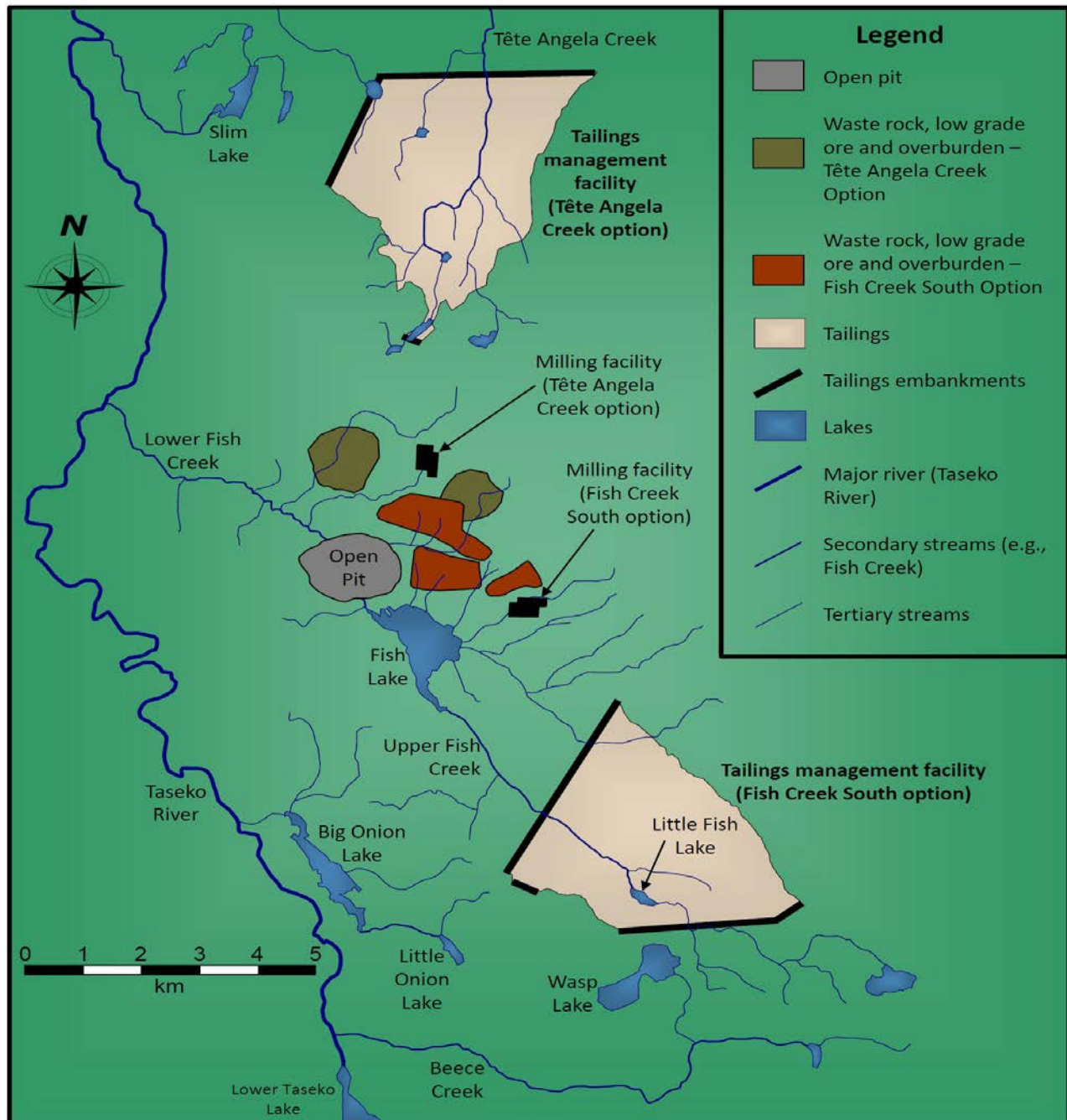


Figure 5. Proposed alternatives for mine waste disposal MDP T2 (Fish Creek South) and MDP T6 (Tête Angela Creek) (Source: Environment Canada)

Taseko also stated that with the MDP T2 option the open pit would be sited between the tailings storage facility and the Taseko River (Dasiqox) which provided an additional measure of protection to minimizing or eliminating the possibility of surface water flows and the vast majority of groundwater migrating to the Taseko River located downstream of the Fish Creek (Teztan Yeqox) drainage system. MDP T6 (Tête Angela Creek) would not provide such protection.

For fish and fish habitat both MDP T2 and MDP T6 provided stream and lake habitat for a monoculture of rainbow trout. MDP T2 (Fish Creek South) would result in 12 600 m² less permanent stream impacts and 11 600 m² less ephemeral impacts relative to MDP T6 (Tête Angela Creek). MDP T6 also impacted over twice the area of open water as well as twice the length of stream habitat downstream from the tailings storage facility which would experience indirect effects through flow reduction.

Taseko stated that although the potential impacts to water quality in Fish Lake for MDP T6 (Tête Angela Creek), were assumed to be minimal, because the mitigation required would be simple water management and handling, that mine development plan was rejected because it affected other fish bearing lakes, resulted in extra expense and it would affect three watersheds whereas MDP T2 (Fish Creek South) was confined to one watershed.

During the hearing Taseko stated it heard from a number of participants that the mine development plan being proposed as part of the Project was the same as one of the alternatives assessed as part of the previous review. Taseko responded that this was not the case. In the current MDP T2 Taseko has moved the location of the tailings storage facility 2.5 km upstream of Fish Lake (Teztan Biny) so the toe of the embankment was no longer right up against the lake. This has allowed space to monitor water quality and apply mitigation.

Taseko indicated that with the new configuration of the Project's mine development plan, the Tsilhqot'in people would have access to Fish Lake (Teztan Biny) during the all phases of mining from mine construction, to active mining, and closure. Although it would not be realistic to return the immediate area of the mine into its original configuration, modern progressive reclamation methods would allow for the capability of the land to be recovered relatively quickly after mine closure.

Taseko concluded: "New Prosperity responds to the 2010 panel review concerns. Preserves Fish Lake, provides access during operations, is a smaller fingerprint, less land disturbance, and it has enhanced its compensation and reclamation plans".

4.3.2 Views of Participants

Environment Canada reviewed Taseko's assessment of alternatives for mine waste disposal because Taseko had proposed the use of Little Fish Lake (Y'anah Biny) and a portion of Upper Fish Creek (Teztan Yeqox) for the disposal of tailings and potentially acid generating waste rock and overburden. Little Fish Lake and Upper Fish Creek are natural, fish-frequented water bodies, as such, in order for Taseko to use these water bodies for mine waste disposal, the *Metal Mining Effluent Regulations* would need to be amended to add these water bodies to Schedule 2 of the Regulations.

Environment Canada's analysis of environmental impacts related to the alternatives for waste rock and tailings disposal focused on the impacts of each mine development plan on water quality in water bodies outside the Fish Creek (Teztan Yeqox) watershed, including Wasp Lake, Big Onion Lake (Jidizay Biny) and the Taseko River (Dasiqox).

Environment Canada reviewed the assessment of alternatives for waste rock and tailings disposal as undertaken by Taseko. Particular attention was given to the two mine development plans assessed in detail by Taseko. Environment Canada determined that overall the two mine development plans were similar from an environmental, technical and socio-economic perspective.

In its submission to the Panel, Environment Canada identified concerns about the potential for impacts on water quality associated with implementing MDP T2 (Fish Creek South). These concerns related primarily to potential impacts on water quality in Wasp Lake and Big Onion Lake (Jidizay Biny) due to seepage from the proposed tailings storage facility and the potential to impact the water quality in Fish Lake (Teztan Biny) given several of the mine infrastructure components would be located upstream or within the catchment of Fish Lake. Alternatively, MDP T6 (Tête Angela Creek) would not have any major mine infrastructure components upstream or within the catchment of Fish Lake.

Given these concerns and Taseko's intent to protect Fish Lake (Teztan Biny) and to limit direct effects of the Project to a single watershed, Environment Canada concluded that MDP T2 (Fish Creek South) had greater potential to impact water quality in Fish Lake than did MDP T6 (Tête Angela Creek) and that MDP T2 (Fish Creek South) had the potential to have more impacts on adjacent watersheds than otherwise anticipated by Taseko. These potential impacts stood in contrast to Taseko's argument that "concentrating the effects of the Project into a single watershed allows for greater control and containment of mine water and waste by limiting the number of pathways to the greater receiving environment"

In its analysis of Taseko's assessment of alternatives, Environment Canada admitted it placed more emphasis on the water quality in adjacent water bodies associated with MDP T2 (Fish Creek South) than those associated with MDP T6 (Tête Angela Creek) because Aboriginal groups had indicated that those water bodies, including Big Onion Lake (Jidizay Biny) and Wasp Lake, were important to them. The water bodies associated with MDP T2 (Fish Creek South) were relatively closer to the Taseko River (Dasiqox) and Taseko had only provided analysis of water quality for adjacent water bodies that were associated with MDP T2 (Fish Creek South). There was no such analysis for water bodies such as Tête Angela drainage or Vick Lake drainage that were associated with MDP T6 (Tête Angela Creek).

The Tsilhqot'in National Government submitted that MDP T2 (Fish Creek South) was identical in almost all respects to an alternative mine design that Taseko itself described in the previous review as less environmentally responsible and less appropriate with respect to technical issues and impact on the physical environment. The Tsilhqot'in National Government stated that Taseko's New Prosperity Project proposal had failed to address the factors considered by the previous panel and as directed by the federal Government in its decision to reject the previous project, namely impacts to fish and fish habitat in Fish Lake (Teztan Biny) and the cultural and spiritual value of the area for the Tsilhqot'in people.

The Tsilhqot'in National Government noted that during the previous review Taseko asserted, and the previous panel had agreed, that:

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 Tsilhqot'in National Government also noted that the previous panel recognized that the proximity of the open pit and associated mining facilities would be close enough to Fish Lake (Teztan Biny) to eliminate the intrinsic values of the area to First Nations even if another alternative were chosen. In addition, the previous panel agreed with Environment Canada and

Taseko's own observation that the previous mine development plan Option 2 would result in greater long-term environmental risk than the preferred alternative.

Mr. Tony Pearce, on behalf of the Tsilhqot'in National Government, argued that all Taseko had done was move the tailings impoundment 2.5 km upstream of Fish Lake (Teztan Biny) and had not provided an assessment of the effect of having moved the tailings storage facility that distance.

The Tsilhqot'in National Government noted that Taseko asserted that the previous mine development plan Option 2 was rejected during the previous environmental assessment for economic reasons. The Tsilhqot'in National Government argued that this was not the case. They pointed to the letter filed with the Panel that set out a number of statements made by Taseko suggesting it was also rejected for environmental reasons and, in fact, Taseko stated that: "Even the issue of economics aside, mine development plan Option 3, which was the rejected Prosperity proposal was the most appropriate option with respect to impact on the physical environment, and the most environmentally responsible option." The Tsilhqot'in National Government stated it was left wondering why mine development plan Option 2, an option that was less appropriate in terms of environmental impact was now Taseko's preferred option.

4.4 TRANSMISSION LINE

As detailed in the EIS Guidelines the focus of this environmental assessment was on the environmental effects associated with those aspects of the Project that have changed or were new from the previous Prosperity proposal, and on corresponding changes to the environmental effects previously predicted. Therefore Taseko and the Panel, as per its Terms of Reference, made use of existing relevant information generated as part of the previous review process and information gathered during the New Prosperity hearing.

4.4.1 Proponent's Assessment

The corridor selection process began in 1993 when Taseko identified options for the transmission line corridor. The study identified nine possible corridors through a map analysis of the region. The evaluation of the corridor options considered technical difficulty, cost estimates, socio-economic features and effects and environmental feature and effects. Overall, the Dog Creek route was the preferred option and was selected for a more detailed study and right-of-way definition.

In 2008 Taseko recognized that some of the specific detailed values from 1997 had changed, such as capital and operating costs and number of red and blue-list species. However, none had changed to the degree that warranted a re-evaluation of alternate routes.

Electrical power to the mine would be supplied from the existing 230 kV transmission line near Dog Creek through a new switching station to be designed and constructed by British Columbia Transmission Corporation. Following an assessment of alternative routes a 3 km wide, economically and technically feasible route for the transmission line was established: the Dog Creek route. Within this 3 km wide route, a 500 m wide corridor had been determined within which the centreline of the eventual 30 to 80 m wide right-of-way would be selected. Taseko stated that the exact placement of the poles (i.e. the centreline) would not be known until after the environmental assessment. The previous panel concluded that Taseko's rationale for selecting the centreline for the transmission line was reasonable for the purposes of that environmental assessment.

The 125 km line would run in a westerly direction from the switching station at Dog Creek located on the east side of the Fraser River, cross the Fraser River and Big Creek and follow access roads over easy terrain for the majority of its length before reaching the mine site at Fish Lake (Teztan Biny) (Figure 1). In addition to the 142 m wide Fraser River and the 20 m wide Big Creek crossing sites, approximately 125 additional definite or indefinite streams would be crossed by the transmission line.

The transmission line would consist of wood or fiberglass pole H-Frame pole structures with average spans of 225 m. Taseko would build a 230 kV substation at the mine site. The transmission line would be decommissioned, dismantled, and reclaimed during the closure phase.

Taseko indicated in the EIS that the proposed transmission line would traverse traditional territories of four Secwepemc communities; the Stswecem'c Xgat'tem (Canoe Creek), the T'exelcemc (Williams Lake), the Esk'etemc (Alkali Lake) and the Llenlley'ten (High Bar). The transmission line would also traverse the traditional territories of three Tsilhqot'in communities; the Xeni Gwet'in (Nemah), the Tl'esqox (Toosey) and the Yunesit'in (Stone).

Taseko acknowledged that the previous panel concluded that, provided Taseko implemented mitigation to avoid construction in sensitive locations and these were applied in cooperation with the Secwepemc, the project would not result in a significant adverse effect on established or potential Secwepemc Aboriginal rights and title. Taseko indicated it was open to working with both Secwepemc and Tsilhqot'in in finalizing the alignment of the transmission line for the New Prosperity Project, including the route through the Esk'etemc Community Forest.

During the hearing Taseko stated there were numerous mitigation measures it had committed to that remained applicable to the Project. Considerations for final alignment within the proposed corridor were developed to protect grasslands, wetlands, riparian areas, sensitive wildlife features, and locations of interest to Aboriginal groups for current use or cultural heritage.

Further, Taseko would work with Aboriginal groups, regulators, land owners, and stake owners to develop an access management strategy for the transmission line corridor, and use its staff resources and technical expertise to identify roads and trails for deactivation during transmission line construction.

Throughout the community hearing sessions Taseko stated that it intended to minimize the effects of the transmission corridor by routing the line through some of the existing clearings in the roads and developing road access and road de-commissioning plans. Taseko indicated that in addition to the numerous major roads the forest licensees had control over, there were numerous other trails, skid trails, all-terrain vehicles, and hunting trails that get developed across the plateau off these major arteries. Taseko stated its intention to work with the community to identify which ones of these could be eliminated to address, not just concerns with regard to moose or grizzly bear, but concerns about all-terrain vehicles damage to sensitive sites and excessive hunting by non-Aboriginal people.

During the hearings Taseko confirmed that the transmission line would be decommissioned when it was no longer required for New Prosperity, subject to Taseko fulfilling all its reclamation and decommissioning obligations. Taseko stated that even if pumping was required in the long-term there were alternatives to the transmission line depending on the nature of the power that was required at the mine site at that time. Taseko claimed that it had looked at options for generating power at the mine site that might meet the requirements for pumping but nothing had been finalized.

In a written submission to the Panel, Taseko clarified that statements claiming that it did not consider alternative routes for the transmission line corridor were simply not true and that alternatives were considered. As directed in the Panel's Terms of Reference, the Panel was to use to the greatest extent possible the evidence from the previous panel proceeding in relation to components of the new project that were not expected to change and Taseko noted specifically that the transmission line had not changed.

Taseko explained that in 1993, it commissioned an ethnographic study for the area to inform the transmission line alternatives, with Esk'etemc and Stswecem'c Xgat'tem participation. Burial sites were identified, and avoided. During the previous review, Taseko noted that it had not conducted a thorough archaeological assessment and there were areas of high archaeological value all along the Fraser River. Thereafter, in the summer of 2010, Taseko initiated an archaeological impact assessment at the major water crossings, which has not been completed. Taseko stated that the Secwepemc leaders chose not to participate in the study. From the work Taseko had done, it was confident it would be able to avoid any archaeological sites of significance.

4.4.2 Views of Participants

During the Community hearing sessions the Panel heard much opposition to the proposed transmission line corridor. Chief Frederick Robbins of the Esk'etemc Nation expressed to the Panel that Taseko had not proposed any alternative corridor that would avoid affecting the Esk'etemc sacred areas and areas of importance to them. Chief Robbins noted that the proposal for the transmission line was exactly the same as the previous project proposal which meant that everything the previous panel determined was still true with this Project. The Esk'etemc also expressed concern that the loss would be long term and permanent since there was no end-date in sight for the de-commissioning of the transmission line.

The Esk'etemc stated that the proposed transmission line would be the largest clear cut through the Esk'etemc Community Forest ever. The Esk'etemc were of the view that the linear clear cut created by the transmission line through the community forest would have direct impacts to the wildlife, including impacts on important habitat for mule deer and moose where many of the community members hunt.

Chief David Archie of the Stswecem'c Xgat'tem stated Taseko better find another alternative to the transmission line because it is not something that is acceptable to his people. Chief Archie pointed out that the previous panel had recommended 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 Esk'etemc and Stswecem'c Xgat'tem.

The Secwepemc stated that Taseko, the province and Canada had done nothing to address the Esk'etemc and the Stswecem'c Xgat'tem concerns that were identified by the previous panel. Chief Archie stated: "we don't understand why no one has looked at an alternative route for the transmission line like the first panel recommended. We are beginning to feel that we have no confidence that our concerns will be addressed".

Mr. Patrick Harry, council member for Stswecem'c Xgat'tem, stated that more time was needed to look at all the alternatives. Mr. Harry concluded that given that the previous panel put forward a number of recommendations that was a sign that this route was not the right one for the transmission line.

During the community hearing session, Mr. Gord Chipman, a registered professional forester, offered an alternative to the proposed transmission line route, stating that there was more than one way to come up with solutions to what some people might see as problem. Mr. Chipman suggested one route that already had access to the power line and was just north of Alkali Lake, still within the community forest along an area called the Place Lake Road. It's a straight road which goes east and west, straight to the power line. Mr. Chipman claimed that if the power line went there the amount of transmission line that would need to be constructed would be reduced and it would cover a lot less controversial ground. It would be able to cross the Fraser River in a place where it is not covered by sacred land or where there is not a lot of fishing sites.

4.5 PANEL'S CONCLUSIONS AND RECOMMENDATIONS

In reaching its conclusions on Need, Purpose, Alternative means and Alternatives to the Project, the Panel considered the following factors to be relevant:

- Both mine development plans T2 (Fish Creek South) and T6 (Tête Angela Creek) were technically and economically feasible.
- Current economics allowed for the tailings storage facility to be moved 2.5 km upstream of Fish Lake (Teztan Biny) which allowed space to monitor water quality and apply mitigation measures.
- Taseko explained it rejected MDP T6 (Tête Angela Creek) because it affected fish bearing lakes, resulted in extra expense and it would affect three watersheds. The Panel considers this decision reasonable.
- Criticism of Taseko's examination of alternative means of carrying out the Project focused on the fact that the preferred alternative was exactly the same as a mine development plan rejected by Taseko in the previous review. The Panel accepts this is a legitimate concern, and addresses it further below.
- Taseko did not provide any new information on alternatives corridors for the proposed transmission line, relying on information gathered as part of its alternatives assessment carried out in 1997.
- The Panel heard much opposition to the proposed transmission line corridor from the Esk'etemc and the Stswecem'c Xgat'tem. The Panel is concerned about these effects, and addresses them further in Chapter 12.
- The Panel heard considerable criticism of Taseko's examination of alternatives to the transmission line corridor and the inadequate involvement with Aboriginal groups.

The Panel concludes that Taseko has adequately demonstrated the purpose of the Project and the need for the Project to meet the requirements of this environmental assessment.

The Panel concludes that an open pit mine would be the only economically viable way to meet the Project's need and achieve the Project's purpose.

The Panel understands that the general approach taken to select a preferred alternative to mine waste disposal consisted of the identification of candidate alternatives based on mine waste disposal sites, disposal technologies, and disposal storage options, pre-screening to filter out infeasible options, and a multiple accounts evaluation of resulting mine development plans. The Panel notes that this procedure was carried out in the previous review and the previously identified alternatives had been carried forward for this assessment.

The Panel notes that from an assessment of 15 potential alternatives for mine waste disposal 13 of those were found to be fatally flawed due to excessive cost, unproven methodology for acid rock drainage and metal leaching mitigation, uncertainty of self-sustaining water cover at closure, or unacceptable environmental liability. Taseko concluded that the MDP T2 (Fish Creek South), waste management option was the preferred option for the development of the Project. A significant distinguishing factor favouring MDP T2 (Fish Creek South) was the ability to limit direct impacts to a single watershed. The Panel agrees with Taseko that concentrating the effect of the Project into a single watershed allows for greater control and containment of mine water and waste by limiting the pathways to the greater receiving environment.

The Panel notes that overall Environment Canada was satisfied with Taseko's assessment of alternatives for mine waste disposal. In most cases, Taseko had selected appropriate indicators and assigned scores and methodology for the indicators to distinguish between the two mine development plans. The Panel also accepts that although the two mine development plans were similar from an environmental, technical and socio-economic perspective, MDP T2 (Fish Creek South) had a greater potential to affect water quality in Fish Lake (Teztan Biny) than did MDP T6 (Tête Angela Creek) and that MDP T2 (Fish Creek South) has the potential to have more impacts on adjacent watersheds, than otherwise anticipated by Taseko.

The Panel notes that during the previous review the Aboriginal groups were opposed to the preferred alternative and that no support was offered for any of the other alternatives. The Panel agrees that the preferred alternative for the New Prosperity Project is similar to an alternative that was rejected by Taseko and the Aboriginal groups during the previous review. The Panel heard that although the newly proposed mine development plan attempts to preserve Fish Lake (Teztan Biny) by moving the tailings storage facility upstream in the Fish Creek (Teztan Yeqox) watershed, the open pit and associated mining facilities would still be close enough to Fish Lake to eliminate the intrinsic value of the area.

The Panel acknowledges that if the Project proceeds, Environment Canada would examine in more detail the choice of alternatives to deposit of mine waste into a natural fish-bearing water body, in accordance with provisions of the *Metal Mining Effluent Regulations*. For the purpose of the environmental assessment, the Panel considers that the approach used by Taseko to select its preferred alternative for the mine development plan to be consistent with the requirements of CEAA 2012.

There was no change with regards to the transmission line corridor in the New Prosperity Project; therefore Taseko used the information from the original Prosperity project in its analysis of the alternatives for the transmission line corridor. Based on the information available, the Panel accepts Taseko's approach to evaluating alternative alignments for the transmission line corridor and concludes that the methodology Taseko used when selecting its preferred corridor for the transmission line corridor was reasonable.

The Panel concludes that Taseko's methodology for selecting its preferred alternative for the mine development plan and the transmission line corridor was reasonable for the purpose of this environmental assessment.

Despite this conclusion, in its review of the Project effects on the Secwepemc, particularly on archaeological and historical sites and cultural heritage, the Panel concludes that the rationale Taseko presented to support the selection of preferred transmission line corridor alignment and the lack of engagement of the Secwepemc is inadequate. More details are provided in Section 12.5 of this report on the Panel's findings and recommendations with regards to the transmission line corridor alignment.

5 HYDROGEOLOGY

5.1 GEOCHEMISTRY

5.1.1 Metal Leaching and Acid Rock Drainage Characterization

The New Prosperity ore body is a sulphide rich porphyry copper-gold deposit that has many characteristics of past and present porphyry copper mines in British Columbia. All of these mines have metal leaching and acid rock drainage issues that require careful management. For the New Prosperity Project the key issues relating to geochemistry are metal leaching and acid rock drainage into the receiving environment from various sources including:

- the ore stockpile and plant site;
- the soil and overburden stockpiles;
- the tailings storage facility;
- potentially acid generating waste rock; and
- the exposed pit wall.

5.1.1.1 Proponent's Assessment

Taseko stated that metal leaching and acid rock drainage would be derived principally from the natural weathering of sulphide-containing rocks. Taseko stated that the effect of metal leaching and acid rock drainage would depend on the magnitude of the acidity, the degree of neutralization, the sensitivity of the receiving environment, dilution and/or attenuation.

Based on its investigations, Taseko stated that:

- pyrite and chalcopyrite were the principal sulphide minerals;
- potentially leachable elements included arsenic, antimony, copper, cadmium, molybdenum, lead and zinc. Taseko also stated that the selenium content of the mine host rocks was elevated and that leaching of selenium from the tailings and from mine waste rocks might be a concern;
- the dominant carbonate minerals, important for their acid consuming and neutralization capacity, were dolomite and calcite;
- the dominant silicate minerals had low reactivity and were expected to contribute limited acid consuming capacity at near neutral pH; and
- calcium sulphate could be expected to leach from exposed rock to release dissolved sulphate and contribute to acidic conditions.

Taseko noted the pathways through which site water affected by metal leaching and acid rock drainage could enter the environment. These include surface water discharges to Fish Lake (Teztan Biny) and Fish Creek (Teztan Yeqox) seepage via the main, south and west embankments of the tailings storage facility, seepage from the tailings storage facility basin, and groundwater discharges to adjacent watersheds.

Taseko stated that investigation and characterization programs for metal leaching and acid rock drainage had been carried out in five phases between in 1993 and the present. These investigations included:

- static testing (e.g. elemental analysis and acid base accounting testing) carried out to characterize the variability of acid rock drainage potential and metal content of the rocks;

- kinetic geochemical and tailings characterization programs consisting of laboratory-based (~1 kg sized samples) humidity cells and saturated column testing, to predict metal leaching and the timeframes for the onset of acid rock drainage; and
- the development of water chemistry predictions. Specifically, estimates of the chemical loadings for the different Project components were used together with the site water balance to generate geochemical source terms, to inform overall water quality predictions.

Taseko noted that the static and kinetic testing methodologies and the results and conclusions outlined in the current EIS were essentially unchanged from the previous EIS, aside from reporting the results of on-going, laboratory-based, kinetic tests.

Taseko presented site water chemistry predictions for tailings, ore, mine waste rock and the exposed final pit walls. Based on the acid-base accounting results Taseko reported that the waste rock exhibited a wide range of neutralization potential / acid potential values, and no correlation existed between rock type and neutralization characteristics such as the neutralization potential / acid potential ratio. Further testing was conducted to determine whether the waste rock could be successfully managed by segregating it into potentially acid generating and non-potentially acid generating rock during mining.

Taseko stated that the preliminary classification criteria it adopted, in advance of the completion of metal leaching and acid rock drainage characterization, were based on experiences with other porphyry copper deposits. Taseko stated that its provisional estimate of available neutralization potential (NP) was made by subtracting 10 kg CaCO_3 equivalent/tonne from the neutralization potential value determined in laboratory tests to deduct the portion of measured neutralization potential commonly derived from silicate minerals. This estimate of available neutralization potential was then compared to acidification potential (AP) values to arrive at a waste category classification, as follows:

- non-potentially acid generating: all material having $(\text{NP}-10)/\text{AP} \geq 2$; and
- potentially acid generating: all material having $(\text{NP}-10)/\text{AP} < 2$.

The preliminary classification was applied to the acid base accounting block model to estimate tonnages of potentially acid generating and non-potentially acid generating waste rock that would be produced as mining progresses.

Taseko claimed that subsequent metal leaching and acid rock drainage characterization showed that the 'NP-10' value underestimated actual available neutralization potential, indicating that the preliminary classification it used was conservative.

Overall, Taseko claimed that results indicated that segregation would be a feasible waste management strategy for the Project. However, Taseko recognized that segregation during mining would be challenging and 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 and that although segregation failures as high as 10% had historically been recorded at other mines, segregation failures at the Project would affect only 3% of the rock, and that this was a typical estimate for modern open pit mine operations. This could result in about 3% of potentially acid generating rock materials being sent to the non-potentially acid generating waste rock pile. Further modeling was completed by Taseko to help determine whether the potential misclassification of waste rock would result in adverse environmental effects. Taseko stated that the non-potentially acid generating rock pile 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.

Lag time for onset of acid rock drainage: The delay to the onset of acid rock drainage in the potentially acid generating rock was calculated based on kinetic tests. 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 in the tailings storage facility, it expected that pH neutral weathering conditions would be maintained in 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 ore stockpile and in the open pit.

Taseko stated that for tailings, test results indicated that the full scale (bulk) tailings were expected to be non-potentially acid generating. However, monitoring of the acid base accounting characteristics of the bulk tailings during operations would be necessary to ensure that the tailings conformed to these predictions. 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.

Seepage: Taseko concluded that leaching of sulphate from tailings, waste rock and pit wall rock would be controlled by calcium sulphate dissolution and that the effect of dilution on any seepage was expected to be significant due to the large catchment area of the site.

Tailings seepage was predicted to be pH neutral and expected to contain sulphate, copper, and manganese concentrations controlled by equilibrium dissolution and precipitation of gypsum, tenorite and rhodochrosite. Subaqueous column testing on combined tailings samples indicated that tailings disposed underwater would leach low concentrations of most heavy metal ions. Leaching of sulphate, manganese and fluoride could be expected from dissolution of calcium sulphate, carbonates and fluorine-bearing minerals such as apatite.

With the new objective of preserving Fish Lake (Teztan Biny), Taseko stated that detailed management of surface water would be necessary to maintain appropriate levels of geochemical loading (i.e. water quality) to Fish Lake and its tributaries, and that it might be necessary to carry out similar detailed management of groundwater for the same purposes into the post-closure phase of the Project. Taseko also stated that if discharge water was contaminated and did not meet the water quality guidelines that water treatment might be required.

Taseko noted that an acid rock drainage/metal leaching prediction and prevention plan would be a permitting requirement for the Project, pursuant to the British Columbia *Mines Act*.

5.1.1.2 Views of Participants

Natural Resources Canada stated that Taseko's metal leaching and acid rock drainage assessments were compatible with current common practices. Natural Resources Canada noted that co-disposal of potentially acid generating waste rock with tailings was a relatively new concept that remained unproven in the long term. Natural Resources Canada stated that it did not expect significant environmental impacts from acid rock drainage for the proposed Project provided Taseko was diligent in carrying out all the committed monitoring and adopting appropriate adaptive measures to prevent, mitigate or treat any contaminant release. In this regard, Natural Resources Canada recommended that if the Project proceeds, that timely

reporting and analysis of monitoring results should be a regulatory requirement to identify any deteriorating trends.

Natural Resources Canada, in its review of Taseko's groundwater modeling of the tailings storage facility requested the Panel to consider a strong likelihood that, for average precipitation conditions and without mitigation measures, Taseko would not be able to maintain all tailings submerged beneath the water table. This meant that conditions favourable for generation of acid rock drainage from the tailings could develop in the tailings storage facility post closure without mitigation.

The British Columbia Ministry of Energy and Mines noted that geochemical testing of various mining wastes had continued since the previous review, and that the new geochemical data were used by Taseko to review and update the source terms used in site water quality predictions. Furthermore the Ministry expressed a general satisfaction with the approach taken with definition of geochemical source terms, being reasonably conservative and appropriate for use in water quality prediction modeling.

Dr. Kevin Morin, on behalf of the Tsilhqot'in National Government outlined concerns with Taseko's metal leaching and acid rock drainage predictions. He noted:

- *Improper scaling up of metal leaching and acid rock drainage laboratory tests results:* Dr. Morin claimed that Taseko took the results of ~1 kg laboratory tests under relatively steady conditions and scaled them up to hundreds of millions of tonnes under variable on-site conditions. Dr. Morin further claimed there was no intermediate-scale, on-site confirmation of the laboratory results.
- *Source terms for groundwater seepage from the soil stockpile not provided:* Taseko assumed that runoff from the soil stockpile would have background concentrations. However, Dr. Morin claimed that the stockpile would contain geochemically reactive overburden that can release toxic levels of metals and other elements.
- *Missing predictions for variables such as temperature and nitrite:* Dr. Morin claimed that these could have major effects on water quality.
- *Inaccurate metal leaching and acid rock drainage predictions:* Dr. Morin claimed that reasonable potential existed for rapid acid rock drainage development in parts of the ore stockpile. For instance, in his review of Taseko's test results, Dr. Morin claimed that two cells predicted not to become acidic until more than 1000 years appeared acidic immediately.

5.1.1.3 Panel's Conclusions and Recommendations

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

- Waste rock is predicted to have a wide range of neutralization potential / acid potential values, and no correlation exists between rock type and neutralization characteristics such as the neutralization potential / acid potential ratio.
- While considered feasible, segregation of waste rock during mining will be challenging.
- There is potential for misclassification of waste rock materials during mining, leading to segregation failures. These failures could result in about three percent of potentially acid generating rock being directed to the non-potentially acid generating waste rock pile. Monitoring will be required to ensure waste rock is appropriately classified and managed during mining.

- Five percent of potentially acid generating waste rock is predicted to become acidic within 38 years, and reasonable potential exists for rapid acid generation in parts of the ore stockpile. Runoff from the ore stock pile will be collected and directed to the process water pond.
- Taseko plans to flood the potentially acid generating waste rock within two years of placement in the tailings storage facility.
- There is reportedly 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.
- The tailings are expected to be non-potentially acid generating. Similarly, runoff from exposed tailings beaches is not predicted to be acid generating.
- Tailings disposed underwater will leach low concentrations of most heavy metal ions. In addition leaching of sulphate, manganese, fluoride and possibly selenium is expected. The resulting solute could seep from the tailings storage facility to groundwater and nearby streams.
- An acid rock drainage/metal leaching prediction and prevention plan will be a permitting requirement for the Project, pursuant to the British Columbia *Mines Act*.

The Panel notes that Taseko's metal leaching/acid rock drainage assessment is compatible with current common practices and that provincial and federal government reviewers do not perceive significant environmental effects from acid rock drainage as a result of the Project. However, the Panel notes the limited on-site confirmation of test results, the potential for error in both the segregation of potentially acid generating and non-potentially acid generating waste rock, and uncertainties in the prediction of the onset of metal leaching and acid rock drainage.

In light of these uncertainties the Panel agrees with Natural Resources Canada in that, if the Project proceeds, that Taseko must be diligent in carrying out all the committed monitoring, and should adopt appropriate adaptive measures to prevent, mitigate or treat any contaminant release.

The Panel concludes that metal leaching from potentially acid generating waste and tailings contained in the tailings storage facility would result in an adverse effect on water quality in the down gradient receiving environment. This conclusion is discussed further in Chapter 6

RECOMMENDATION 1

The Panel recommends that, if the Project proceeds, Taseko be required to provide timely reporting and analysis of metal leaching / acid rock drainage monitoring results to the regulators and to undertake to early identification of deteriorating trends, and development of aggressive adaptive management plans.

5.2 GROUNDWATER

This section discusses the key effects of the Project on groundwater quantity and the efficacy of mitigation measures proposed by Taseko. Taseko identified four key outstanding questions related to groundwater (Figure 6):

- groundwater interactions between the tailings storage facility and Fish Lake (Teztan Biny) and Wasp Lake;
- groundwater interactions between Fish Lake and the proposed open pit;
- groundwater interactions between open pit and the Taseko River (Dasiqox);
- deep groundwater interaction between the tailings storage facility and the Taseko River, Big Onion Lake (Jidizay Biny) and Little Onion Lake.

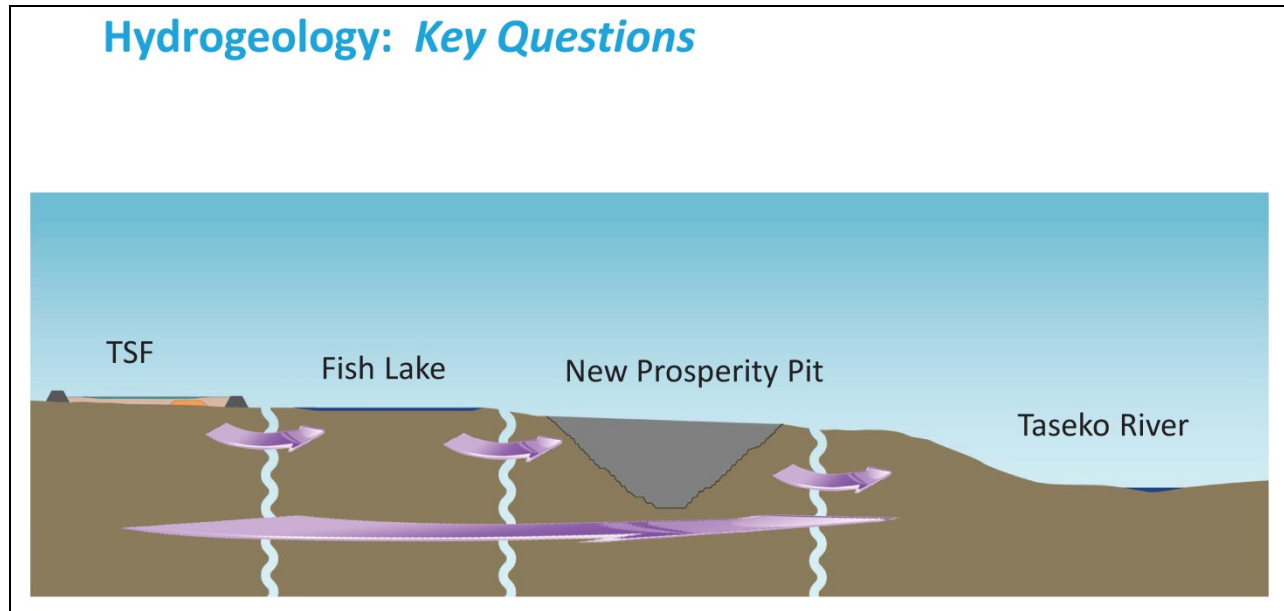


Figure 6. Generalized Groundwater Movement through the Proposed Project Area (Source: Taseko)

5.2.1 Groundwater Interactions between Fish Lake (Teztan Biny) and the Open Pit

Taseko stated that detailed hydrogeological and geotechnical investigations were completed between 1992 and 2010. However, the Panel notes that all of the hydrogeological work completed prior to 2010 assumed that Fish Lake (Teztan Biny) would be drained and therefore the groundwater interaction between Fish Lake and the proposed 525 m deep open pit was not a factor. Since the mine plan was revised the Panel notes that no new hydrogeological investigations have been carried out between Fish Lake and the proposed open pit. The 2012 investigations were limited to test pits, shallow boreholes and geophysics in the area of the relocated tailings storage facility.

The Fish Creek (Teztan Yeqox) valley is a broad glacial valley that is underlain by a complex sequence of glacial sediments (till, glacial sands and gravels, glaciolacustrine silts, glaciofluvial deposits with intercalated thin basalt flows). A bedrock sill, or rise, has been defined in the vicinity of the north end of the proposed open pit where the glacial sequence is less than 5 m thick. The glacial till thins out on the upper valley slopes to less than 0.5 m.

5.2.1.1 Proponent's Assessment

Taseko stated that the water table in the Fish Creek (Teztan Yeqox) valley system mimicked the surface topography, and that groundwater flow was driven by recharge in upland areas to discharge in the network of streams, swamps, marshes and lakes that occupy the valley floor.

The water table was at or near ground surface in low lying areas and was found at greater depths along the ridges. Taseko stated that it expected similar flow systems in the peripheral smaller catchments for Wasp Lake and Big Onion Lake (Jidizay Biny) and Little Onion Lake.

Taseko stated that two groundwater divides were present in the Project area. One divide separated the Upper Fish Creek (Teztan Yeqox) watershed from the Big Onion Lake (Jidizay Biny) watershed and the Taseko River (Dasiqox) to the west in the vicinity of the western margin of the tailings storage facility. The second divide was between the open pit and the Taseko River downstream of the open pit.

Taseko conducted a desktop review of available baseline data on groundwater hydrology in 2012 and conceptualized the stratigraphy of the Project area in terms of three main hydrogeologic units:

- *Quaternary Period:* Glacial till, glaciofluvial and glaciolacustrine deposits that blanketed the majority of the site. These varied in thickness from <0.3 m along the Western Ridge to >22 m in the vicinity of the open pit.
This unit also contained an intercalated highly fractured basalt flow(s) in the order of 12 m thick in the area between Fish Lake (Teztan Biny) and the open pit. These units were well described in borehole 94-164 drilled between Fish Lake and the open pit. Taseko assigned these basalts to the older Tertiary flood basalts. (The Panel noted that in Borehole 94-164 the basalt was shown to be intercalated with glacial sediments, presumably of Pleistocene age). However, Taseko indicated that the age of the basalts and their position in the stratigraphic column did not appear to be important in terms of hydraulic conductivity. Taseko lumped the till, the glacial sediments and the basalts into an “overburden” unit for its groundwater modeling.
- *Tertiary Period:* A thick sequence of flood basalts that Taseko assigned to the Chilcotin Group of Tertiary age. The western ridge in the Project area was reported by Taseko to be underlain by this volcanic unit.
- *Cretaceous Period:* A bedrock unit consisting of the Cretaceous volcanic and sedimentary rocks that were intruded by the mineralized Late Cretaceous Fish Lake Intrusive Complex in the area of the open pit. Taseko reported that the hydraulic conductivity of the bedrock tends to decrease with depth and was observed to vary over approximately three to four orders of magnitude at any given depth.

Taseko claimed that the hydraulic conductivities in the overburden units did not vary significantly at the valley scale, and considered it appropriate for the baseline assessment to treat all overburden deposits (till, unconsolidated sediments, basalt) as one unit, to which Taseko assigned an average hydraulic conductivity value of 4×10^{-8} m/s.

Taseko noted that hydrothermal alteration that created the Fish Lake (Teztan Biny) ore body was marked by gypsum fractures and veinlets. Taseko further noted that gypsum made up to 5% of the rock mass in the ore body. In the upper one third of the ore body the gypsum had been dissolved by historic fluctuations in the regional groundwater table leaving behind a fractured rock. Gypsum was prevalent below the “gypsum line” in the lower three quarters of the ore body. The gypsum line varied in depth between 150 m and 300 m below the surface. Despite the fractured nature of the rocks above the “gypsum line” Taseko claimed in 2012 that the primary control on hydraulic conductivity was depth. However, in the previous EIS and appendices Taseko reported a permeability of 5×10^{-5} cm/s for rocks above the gypsum line and 5×10^{-7} cm/s for rocks below the gypsum line and that the hydraulic conductivity in the rock mass of the ore body was largely controlled by the presence or absence of gypsum.

Taseko noted that the ore body was cut by two major north-south trending faults, the QD Fault and East Fault. Taseko related these faults to the regional scale, northwest trending, steeply dipping Yalakom Fault that lay to the west of the tailings storage facility. Taseko claimed that its review of the hydraulic data led it to assume that late dyke intrusions associated with Fish Lake Intrusive Complex had resulted in healing of pre-existing fractures and that no particular fault had a substantial control on the groundwater flow regime within the Fish Lake (Teztan Biny) valley. As a result, Taseko stated it did not explicitly include fault structures in the 2012 conceptual hydrogeology model.

Taseko stated that Fish Lake (Teztan Biny), which lies about 300 m south of the proposed open pit, was perched on a 15 to 30 m thick sequence of low hydraulic conductivity glacial till and lacustrine sediments. It further claimed that the lake existed because of these underlying sequences contain the inflow of surface runoff with only minor groundwater discharge.

Taseko's modelling predicted that the average annual surface water input to Fish Lake (Teztan Biny) was on the order of 250 L/s, or 21,600 m³/d. Groundwater flow into the lake represented about 2% of the total lake inflow. Taseko concluded that Fish Lake water levels are surface water controlled and hence Taseko represented the Fish Lake water level as a constant head boundary condition in its 2D and 3D modelling.

Taseko predicted that mining the open pit would lower the water table within the open pit area by approximately 500 m by year 17, and that total groundwater extraction from open pit operations (open pit inflow plus dewatering well flows) would be 33.6 L/s (2900 m³/d) by Year 17 (which coincides with the end of open pit extraction activities). Taseko further predicted that the lowered water table and resultant cone of depression would shift the location of the groundwater divide that separates Fish Creek (Teztan Yeqox) and Taseko River (Dasiqox) watersheds approximately 100 m closer to the Taseko River. Taseko estimated open pit dewatering and the reduction in groundwater recharge due to mine site development would decrease baseflow to Fish Lake (Teztan Biny) by approximately 8% to 10% in the summer and winter, respectively. Reductions in groundwater base flow to Fish Lake plus induced lakebed seepage due to development of the open pit were predicted to total 0.61 L/s (53 m³/d), which equated to 11% of the baseline average annual groundwater base flows and 0.24% of the baseline average annual surface water inflows to Fish Lake.

Taseko's predicted the filling time of the pit lake would be 28 years after which the groundwater divide north of the pit lake would revert to its pre-development conditions. Once the pit lake is full, Taseko predicted that groundwater baseflow into Fish Lake (Teztan Biny) would stabilize at a rate slightly lower (10-15%) than baseline conditions. Similarly, as the pit lake fills, Taseko predicted that lakebed seepage out of Fish Lake would return to pre-development conditions.

Taseko stated that based on the results of its packer testing and sensitivity analyses of groundwater flows and effects on Fish Lake (Teztan Biny), that there was no evidence of a structural conduit that could provide a direct hydraulic connection between the pit and Fish Lake.

Taseko stated that its modeling results indicated that with its planned water management strategies (e.g. lake recirculation, coffer dams), that lake level fluctuations could be maintained at or close to natural levels during operations, closure and post-closure phases.

5.2.1.2 Views of Participants

Owing to the new objective of preserving Fish Lake (Teztan Biny), Natural Resources Canada and Dr. Daniel Watterson (Watterson Geoscience Inc.) on behalf of the Tsilhqot'in National

Government raised significant concerns relating to Taseko's ability to maintain existing water levels in Fish Lake during operations, closure and post-closure phases of the mine life

Specifically, Natural Resources Canada stated its concerns that Taseko's 2D and 3D numerical groundwater flow modeling analyses used to determine pit de-watering requirements represented Fish Lake (Teztan Biny) as a constant head boundary condition in which the lake level would be fixed at an elevation of 1 457 m above sea level. Natural Resources Canada went on to state that this numerical representation of Fish Lake implicitly assumed that there was an infinite amount of recharge water available with which to maintain the level of the lake during pit dewatering and post-closure infilling. Natural Resources Canada further stated that because the level of Fish Lake was fixed in the model at the pre-mining elevation, Taseko's numerical groundwater flow analyses were incapable of predicting whether the lake level would change in response to pit dewatering.

Both Natural Resources Canada and Dr. Watterson expressed concerns that Taseko's conceptual hydrogeological model was highly simplistic and did not account for the substantial heterogeneity in the overburden unit and in the underlying shallow bedrock. For instance, Natural Resources Canada noted the significant heterogeneity in the overburden encountered in borehole 94-164 located between Fish Lake (Teztan Biny) and the open pit (Figure 7). Borehole logs provided by Taseko described intercalated glacial till, glaciolacustrine silts, sands and gravels, conglomerate and a 12 m thick "strongly broken basalt layer". High water flow was noted in three horizons; the upper sand, the basalt, and the gravel. In addition, the contact between the overburden and the bedrock (Cretaceous andesitic volcanics) was marked by a 2 m thick poorly consolidated conglomerate that in the 1994 pump test was described as a significant aquifer.

Natural Resources Canada stated that in spite of the observed heterogeneity of these lithostratigraphic units, they were represented by a single till layer up to 30 m thick in Taseko's 3D numerical groundwater flow model. Also in the model the bedrock was undifferentiated and zoned by depth according to hydraulic conductivity. The upper (0-100 m), intermediate (100-200 m) and lower (200+ m) bedrock zones were assigned hydraulic conductivities of 2×10^{-7} m/s, 8×10^{-8} m/s, and 4×10^{-9} m/s, respectively.

Dr. Watterson concluded that the stratigraphy and geology in the project were highly complex and noted that there was a lack of consistency between various reports and analyses provided by Taseko. In addition, he commented that the geological oversimplification caused by lumping together glacial sediments and basalt with highly variable characteristics, significantly reduced confidence in Taseko's understanding of site geology and hydrogeology, and reduced confidence in its analyses of baseline hydrogeologic conditions.

Natural Resources Canada and Dr. Watterson also stated their concerns regarding interpretation and results of Taseko's 1994 pump test on borehole 94-164 which provided data on the hydraulic conductivity of the overburden and the basalt. Natural Resources Canada added that its concerns regarding Taseko's interpretation of 1994 pump test data from the three nearby observation wells (94-154, 94-157 and 94-159) remained unresolved despite a meeting and correspondence between the parties. In its responses to the Panel's Supplemental Information Request, Taseko outlined its interpretation of, and position regarding the 1994 pump test data, stating among other things that:

Taseko remains of the opinion that the existing 3-D and 2-D modelling and sensitivity analyses is adequate for purposes of the environmental assessment.

While Taseko acknowledges that there will be a need for additional information with respect to large scale hydraulic conductivity in the overburden between Fish Lake and the pit, this will be undertaken as part of the detailed engineering design phase of the project.

Additional local-scale 3-D modelling is not warranted at this time with the data presently available.

Natural Resources Canada and Dr. Watterson disagreed with the rationale used by Taseko's consultant to disregard the 1994 pump test results. Taseko's explanation included: (i) wells were screened across multiple hydrogeological units; (ii) the pumping rate was not recording throughout the test duration, and (iii) the observed pumping water levels suggested that a steady state pumping rate was not achieved. Instead of considering the data unreliable and disregarding the pump test results, absent any other pump test data in this area, both Natural Resources Canada and Dr. Watterson interpreted the results as highly significant and evidence of a leaky aquifer behavior. They claimed that during the test, steady state conditions were reached, whereby groundwater withdrawal at the pumping well was balanced by inflows to the aquifer, which were from sources that they stated likely included Fish Lake (Teztan Biny).

Taseko rebutted this interpretation by stating that based on its assessment of the groundwater elevations and hydraulic head, groundwater recharge in the test wells was supplied from storage arising in higher elevations west of the proposed pit and not from Fish Lake (Teztan Biny). Furthermore, Taseko claimed that while it maintained that the pump test data did not support the conclusion of a leaky aquifer, it was reasonable to expect leaky aquifer behaviour in some subsurface materials in the area. In this regard Taseko added that it was possible that there were localized water bearing layers, separated by lower hydraulic conductivity layers, between which groundwater would be induced to flow towards the pit or to the dewatering wells once dewatering commenced. However, Taseko claimed there was no evidence to suggest that there was a direct hydraulic connection between the lake and these aquifers, which were at a lower elevation than the lake bottom. Taseko went on to state that in the event of a significant increase in seepage from Fish Lake, the water would be collected by the pit dewatering system and could be recycled to Fish Lake. Taseko claimed that there would be no effect on the water level of Fish Lake.

Natural Resources Canada and Dr. Watterson both expressed concerns over Taseko's modelling results and prediction of 0.61 L/s (53 m³/d) of induced seepage from Fish Lake (Teztan Biny) based on a calculated pit dewatering rate of 33.6 L/s (2900 m³/d). In both Natural Resources Canada and Dr. Watterson's opinions, because information provided by the 1994 pump test was not used in Taseko's 3D model, the model would in fact predict sustained groundwater withdrawal from storage over the 17 years of mine operation. They concluded that the upper limit to induced seepage was the total pit dewatering rate. As a result, Natural Resources Canada cautioned that induced seepage might be as high as the pit dewatering rate; and that Taseko's most authoritative pit dewatering rate had been presented as 127.3 L/s (11 000 m³/d). Based on its analysis, Natural Resources Canada recommended that the Panel consider this figure as a conservative upper bound estimate of induced seepage from Fish Lake.

Dr. Erik Eberhardt, an independent expert retained by the Panel noted that the borehole drilling used for the open pit site investigation was carried out in the 1990's when the mine plan was to drain Fish Lake (Teztan Biny). Since then, there have been no new boreholes to investigate the geotechnical and hydrogeological characteristics of the QD and East Faults, subsequent to their identification in 1998, or to investigate the ground conditions between the open pit and Fish Lake.

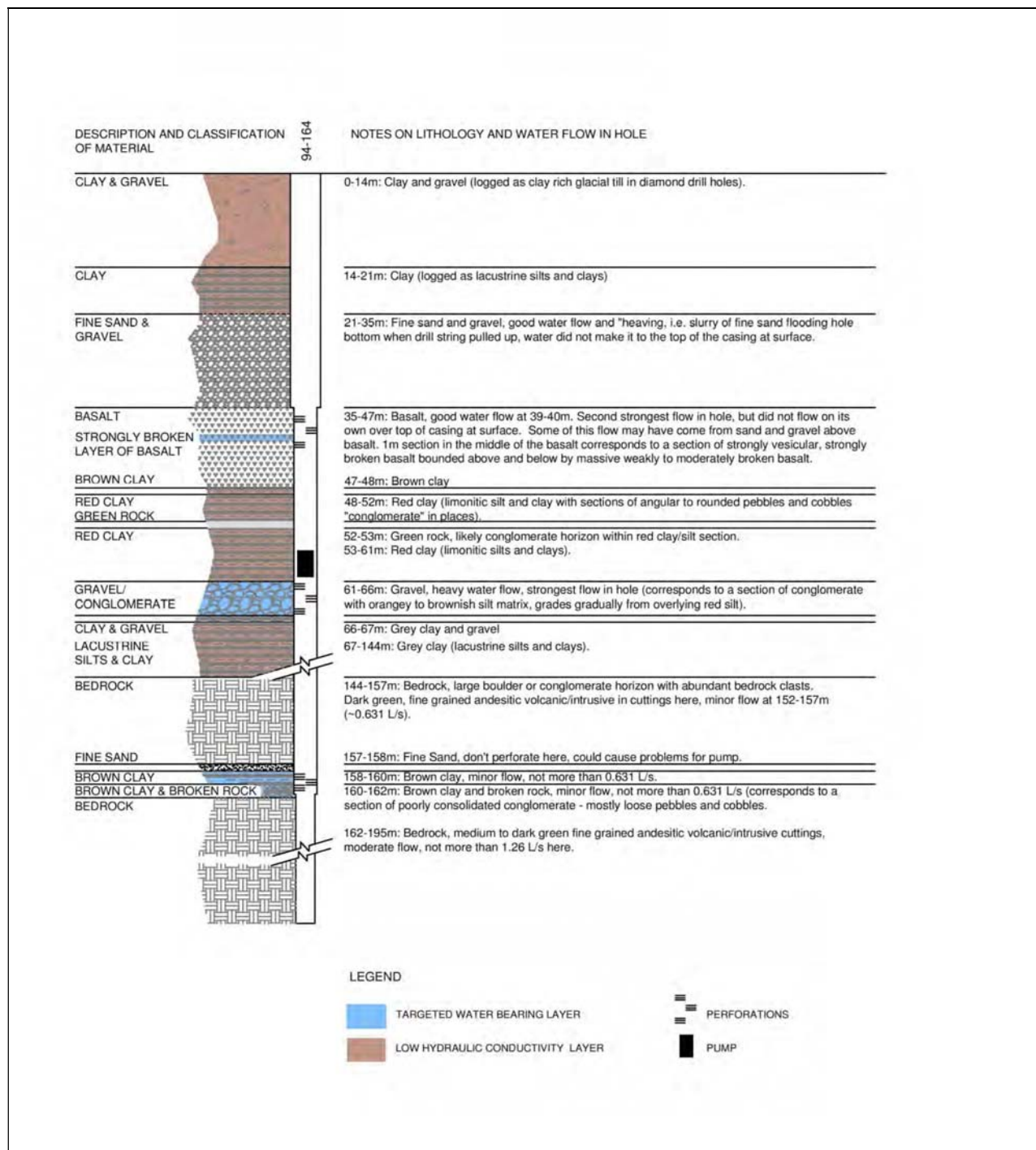


Figure 7. Borehole log for well 94-164. The complete stratigraphic section is not shown, e.g. 67 m to 144 m and 162 m to 195 m (Source: Taseko)

Dr. Eberhardt noted that his analysis of the borehole logs for the open pit area indicated the presence of two extensive sand and gravel intervals at 20 and 50 m below the surface from 10 to 25 m thick. He stated that these sand layers suggested the presence of significant confined aquifers between the pit and Fish Lake (Teztan Biny), in addition to the thin confined aquifer at

the overburden / bedrock contact that was more frequently cited and discussed by other participants. He also stated that he expected the bedrock above the gypsum line to have higher hydraulic conductivities than that below the line.

Dr. Eberhardt further noted that equating the hydraulic conductivities of the fault zones to those of the bedrock, as Taseko did in its preliminary open pit design, was counter to most experiences involving large fault zones similar in scale to the QD and East Faults. He went on to state that although a central fault gouge zone may form a relatively impervious aquiclude that impedes flow normal to the fault, the fracture zones adjacent to the fault gouge often served to significantly enhance permeability parallel to the fault. He noted that these faults may be in direct hydraulic contact with the confined artesian aquifer at the overburden / bedrock contact. He noted that there was precedence where such a situation had significantly limited depressurization efforts due to recharge to confined aquifers via faults. Dr. Eberhardt also suggested that this scenario offered an alternative hypothesis regarding the source of the leakage observed in the 1994 pump tests. Dr. Eberhardt stated that based on his review of the data there was no evidence of a conduit providing a direct hydraulic connection between the pit and the lake; but he emphasized that this conclusion was based only on the available data.

With respect to pit slope stability, Dr. Eberhardt also observed that statements made in the EIS to the effect that the interaction between Fish Lake (Teztan Biny) and the groundwater table had been assessed with respect to the pit wall design, were not strongly supported in the EIS. He stated that a major collapse of the south or south-east wall was unlikely, and in any event could be mitigated against. He stated that slope displacements that could develop in response to deep toppling movements in the south wall could potentially generate deep vertical tension cracks behind the pit crest and that these could potentially breach the Fish Lake water control dams, or Fish Lake directly. He recommended that if the project proceeds that future analyses should be carried out prior to construction of the water control dams to determine how far back behind the pit crest tension cracks could develop in response to possible slope displacements. Dr. Eberhardt noted that based on experiences at other large open pits where large-scale toppling had been observed that tension cracks could extend more than 150-200 m behind the slope crest.

In general, with regards to groundwater pressures and pit slope stability Dr. Eberhardt noted that the proposed pit slope design was reasonable and appropriate for "preliminary" level design. He stated that the stability analyses performed and design criteria applied conformed to commonly accepted industry practices. However he suggested that the acceptance criteria for the design of the south and south-east walls should be elevated to a higher Factor of Safety (1.4 instead of 1.3) to better reflect a "high" consequence of failure. A higher Factor of Safety would require a flatter final pit slope design. He noted that the 1.3 Factor of Safety was derived from the 2007 pit design in which Fish Lake (Teztan Biny) was drained and that the Factor of Safety was not revised in the 2012 plan in which Fish Lake is preserved. Also the 1999 Open Pit design, which was carried forward to 2012 EIS, did not consider the adverse effects of encountering artesian pressures in the aquifer at the base of the overburden, again because Fish Lake was to be drained.

Dr. Eberhardt concluded by stating that the EIS correctly recognizes that if the project proceeds that the pit design would undergo further modification and optimization. Monitoring and updating of the geotechnical and hydrogeological models, and their implications with respect to stability of the open pit slopes would be required. He claimed that the rating of likelihoods assigned in the risk assessment regarding the open pit design and its influence on Fish Lake (Teztan Biny) arguably underestimated the overall risk but not significantly so. He closed his remarks by stating that a ground control management plan should be developed outlining the open pit

hazard inventory, risk reduction options, and an action response plan in the event that unstable pit slope movements develop or if dewatering measures were not as effective as required.

5.2.1.3 Panel's Conclusions and Recommendations

In reaching its conclusions on groundwater interactions between Fish Lake (Teztan Biny) and the open pit, the Panel considered the following factors to be particularly relevant:

- Although the key feature of Taseko's revised New Prosperity Mine Plan is the preservation of the quantity and quality of water in Fish Lake during and after mining operations, there have been no new field investigations, such as targeted boreholes and pump tests, to investigate the ground conditions between the open pit and Fish Lake since 1999.
- Only one pump test was carried out in the critical area between the open pit and Fish Lake, in 1994. This pump test identified the presence of four aquifers in the 162 m of overburden between the surface and the bedrock.
- Natural Resources Canada claimed that the 1994 pump test data indicates the presence of a leaky aquifer and suggested a groundwater connection with Fish Lake.
- In the event of a significant increase in seepage from Fish Lake, the (non-contact) water would be collected by the pit dewatering system and could be recycled to Fish Lake.
- Dr. Eberhardt suggested an alternative interpretation: that the confined aquifer at the overburden / bedrock contact is connected to the two major faults in the underlying bedrock.
- Taseko's conceptual hydrogeological model was considered by many participants to be highly simplistic and does not account for the substantial heterogeneity in overburden and shallow bedrock in the Fish Lake and open pit area.
- Taseko's lumping of Quaternary sediments together with fractured basalt with highly variable characteristics and assigning a single conductivity value to this unit significantly reduces confidence in Taseko's analysis of the hydrogeology.
- The identification of two significant intervals of sand and gravel in the overburden that are continuous over several hundred metres between the pit area and Fish Lake suggest the presence of significant aquifers in this area.
- In the absence of a reliable, long duration, pump test Natural Resources Canada recommended that the Panel consider the total pit dewatering rate as the conservative upper bound estimate of the induced seepage from Fish Lake. In this regard, Natural Resources Canada has noted that Taseko's most authoritative pit dewatering rate had been presented at 127.3 L/s (11 000 m³/d).
- Taseko's 2D and 3D numerical groundwater flow modeling analyses carried out to determine pit dewatering requirements represent Fish Lake as a constant head boundary condition in which the lake level is fixed at an elevation of 1 457 metres above sea level. Because the level of Fish Lake is fixed at the pre-mining elevation, Taseko's numerical groundwater flow analyses are incapable of predicting whether this level will change in response to pit dewatering.
- Although a major collapse of the south or south-east wall is considered unlikely, slope displacements in the pit walls could potentially generate deep vertical tension cracks behind the pit crest that could potentially breach the water control dams or Fish Lake directly.
- With regards to groundwater pressures and pit slope stability the proposed pit slope design is reasonable and appropriate in the context of a "preliminary" level design.

The Panel concludes that Taseko's failure to provide any new hydrogeological data in support of the new mine plan and its refusal to provide additional geotechnical field data or modelling results as requested by the Panel have resulted in an incomplete understanding of the interaction between Fish Lake (Teztan Biny) and the open pit. This information deficiency impedes the Panel's ability to provide a reliable assessment of several critical issues, including the effect of pit dewatering on Fish Lake and the potential encroachment of the pit on the water control dams and possibly on Fish Lake.

To act in a precautionary manner in the absence of reliable data, the Panel accepts Natural Resources Canada's recommendation that the upper bound seepage rate from Fish Lake (Teztan Biny) will be equal to Taseko's assumed pit dewatering rate of 127.3 L/s (11 000 m³/day). The Panel notes this would be among the highest dewatering rates (and most expensive) in British Columbia open pit mines.

The Panel is unable to draw any conclusions on the effect this water flow might have on future pit wall stability.

The Panel concludes there would be no significant adverse effect of pit dewatering on Fish Lake water level, because of the predicted annual surface water inflow to Fish Lake (Teztan Biny) of 250 L/s (21 600 m³/d), and the ability to pump non-contact water from the groundwater depressurization wells back to Fish Lake. Based on the strong evidence, the risk of this outcome is high.

RECOMMENDATION 2

The Panel recommends that, if the Project proceeds, Taseko be required to:

- further investigate the hydrogeological conditions between Fish Lake (Teztan Biny) and the proposed open pit before development of the open pit. This should include sufficient long duration pump tests to fully investigate the groundwater conditions in this critical area.
- develop a ground control management plan that outlines the open pit hazard inventory, risk reduction options, and an action response plan in the event that unstable pit slope movements develop or if dewatering measures are not as effective as required.

5.3 SEEPAGE FROM THE TAILINGS STORAGE FACILITY

5.3.1 Seepage Potential

5.3.1.1 Proponent's Assessment

Taseko predicted the changes in groundwater quantity and flow that would result from establishing the tailings storage facility. The tailings storage facility would cover an area of 12 km² and would be contained behind two large and one minor earth-rock filled dams. Taseko stated that the main, south and west embankments would be constructed to a final crest

elevation of 1 595 metres above sea level, with a main embankment height of 115 m above the valley floor. Embankment lengths and estimated seepage heights are given in Table 2.

Table 2. Embankment lengths and estimated seepage heights

Embankment	Length	Dam height from the valley bottom	Embankment seepage without mitigation
Main	3.9 km	115 m	28.1 L/s
South	3.3 km	46 m	23.9 L/s
West	0.64 km	26 m	3 L/s
Total	7.84 km		

Taseko stated that there were three seepage pathways for tailings pore water from the tailings storage facility basin. These included:

- down the axis of the Fish Lake valley to Fish Lake (Teztan Biny) and the open pit;
- through the western ridge towards Big Onion Lake (Jidizay Biny) and the Taseko River (Dasiox);
- through the south embankment towards Wasp Lake.

Figure 8 below shows the generalized seepage pathways in relation to the major mine components. This figure also provides a general sense of the comparative elevations and depths of the various mine components discussed in this chapter.

Taseko reported that there was a groundwater divide between the Fish Creek watershed and the Big Onion Lake (Jidizay Biny) watershed in the area of the western ridge that would be breached by about Year 1-2 when the tailings storage facility reaches between 1 539 and 1 549 metres above sea level. Absent mitigation, some of the tailings pore water would flow to the west. Taseko predicted that this would lead an increase in groundwater inflow of 1 to 5 percent into Little Onion Lake, whereas inflow rates to Big Onion Lake was predicted to decrease by 3% on an average annual basis.

The rise in elevation of the water table as a result of the tailings storage facility was also predicted to cause an increase in groundwater inflow into Wasp Lake to the south of 3 to 16 percent in summer and winter, respectively. Lakebed seepage from Wasp Lake was predicted to rise by 13 to 17 percent in summer and winter, in response to the rise in groundwater level.

Based on its 2-D and 3-D groundwater flow models, Taseko reported that, during operations, seepage from the base of the tailings storage facility to the underlying groundwater flow system, or basin seepage, was predicted to increase and then decline through time to a relatively constant rate of approximately 9 L/s (760 m³/d) by about Year 25, due to a rise in the regional water table in response to the presence of the tailings storage facility pond.

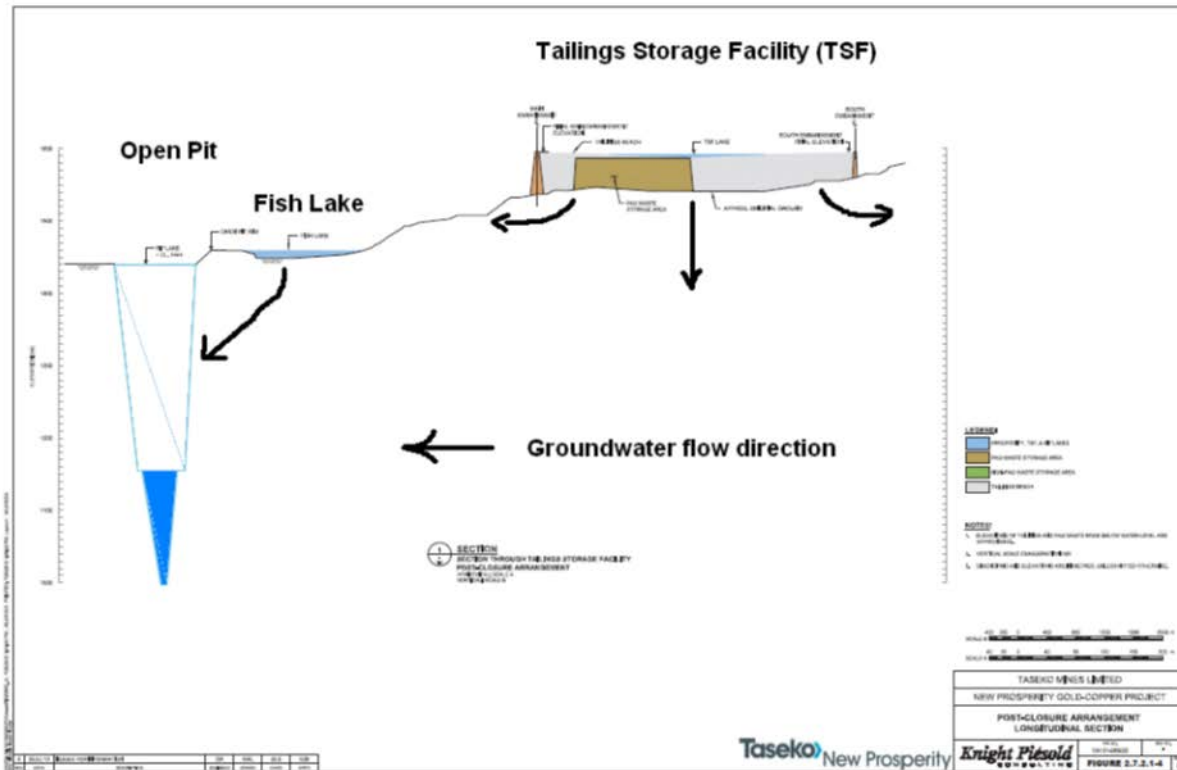


Figure 8. Stylized longitudinal section showing the relative elevation of the pit, Fish Lake and the tailings storage facility post closure. (Source: Modified from Taseko (The black arrows indicating seepage added by NRCan))

The total embankment seepage leaving through the main and south embankments combined was estimated to be 10 L/s (864 m³/d) at the end of Year 1 and increasing to 52 L/s (450 m³/d) at the end of Year 20. The 52 L/s includes 3 L/s that leaves through the west embankment. Of the total seepage through the main and south embankments, 54% was assumed to be through the main and the 46% through the south.

The following mitigation measures were proposed by Taseko to minimize the effects of the tailings storage facility on groundwater elevations and seepage:

- incorporating primary seepage control measures in the design of the main, south and west embankments. Examples of control measures include a low permeability till core and cut-off ditches keyed into the native till, embankment drains, seepage collection ponds, and depressurization wells in the embankment shell zone;
- deposition of tailings so as to create a beach along the tailings storage facility embankments that will force the supernatant pond (during operations), and the tailings lake (during closure and post-closure) away from the embankments to mitigate seepage through the embankments;
- installation of 10 seepage pump back wells downstream of the main embankment as needed during operations and into closure to meet groundwater quality permit objectives; and
- installation of monitoring wells to evaluate groundwater quality downstream from the main embankment.

In addition to the above mitigations, Taseko committed to the use of water treatment if considered necessary.

Taseko reported the expected seepage capture efficiency during operations and closure for the embankments as:

- 65% of seepage through the embankments is assumed recovered in depressurization wells and drains in the embankments;
- of the remaining 35% that bypasses the embankment depressurization wells, 50% of this seepage is assumed to be captured by the downstream seepage collection ponds;
- groundwater pumping wells installed downstream of the main embankment seepage collection ponds is stated to capture approximately 60% of the seepage that may bypass the seepage collection ponds; and
- all of the captured seepage will be pumped back to the tailings storage facility.

Taseko modelled solute transport from the tailings storage facility to evaluate groundwater flow paths and to determine contaminant concentration and arrival time at potential receptors. The model was also used to evaluate the mitigation effectiveness of a seepage interception system. In the absence of mitigation, seepage was predicted to first reach Wasp Lake in about Year 30, and to first reach Big Onion Lake (Jidizay Biny) in Year 85. By Year 100, seepage at concentrations up to 50% of source concentration could be discharging to the Wasp Lake, and seepage at concentrations up to 2% could be discharging to Big Onion Lake. Taseko made no predictions beyond Year 100.

Taseko claimed that its modeling results demonstrated that for the base case, 10 seepage pumpback wells downstream of the main embankment could intercept all the seepage between the tailings storage facility and the Fish Lake (Teztan Biny) tributaries. Model results also showed that as an indirect effect, these wells may also mitigate seepage migration through the western ridge and down-gradient to the Big Onion Lake (Jidizay Biny) and Little Onion lake system. Taseko submitted revised groundwater flow simulations on August 15, 2013 that included 3 seepage pumpback wells downstream of the west embankment. The stated purpose of the revised simulations was to evaluate the capture efficiency of the seepage collection ponds. The revised simulation with three wells downslope of the west embankment showed no particle pathlines towards Big Onion Lake.

Taseko went on to state that although its transport modelling results showed that 100% seepage interception could be achieved, for the purpose of its base case water balance model and the base case water quality model, a conservative assumption was used that the seepage pumpback system would only intercept 50% of the tailings storage facility seepage. Taseko considered this to be a reasonable recovery rate for interception wells in a fractured bedrock system. Taseko claimed that this mitigation measure could effectively intercept seepage between the tailings storage facility and the Fish Lake (Teztan Biny) tributaries. However, towards Wasp Lake the groundwater baseflow into Wasp Lake was predicted to increase by up to 24% and the solute arrival time of 30 years remained unchanged.

Taseko's overall seepage recovery estimates, with mitigation, are summarized in Table 3.

Table 3. Overall seepage recovery estimates

	Total Seepage (L/s)	Recovered Seepage (L/s) (Mitigation)	Unrecovered Seepage (L/s)
Main Embankment	28.1	18.3 (Embankment depressurization wells) 4.9 (Interception wells) <u>3.6</u> (Pump-back wells) 26.8	2.40
South Embankment	23.9	19.8 (Embankment depressurization wells and Interception wells)	4.5
West Embankment	3.0	2.5 (Embankment depressurization wells)	0.68
Basin Seepage-Deep Groundwater	15.0		13.5
TOTAL (% of total)	70.0 (100%)	≈49.0 (70%)	≈ 21.0 (30 %)

Taseko predicted that unrecovered seepage would enter into water bodies at the following rates:

- Fish Lake (Teztan Biny) - 2.40 L/s (207 m³/d)
- Wasp Lake 4.5 L/s (389 m³/d)
- Big Onion Lake (Jidizay Biny) - 0.68 L/s (59 m³/d)

Taseko mapped two groundwater seeps at the southwest toe of the western ridge above Big Onion Lake (Jidizay Biny), and stated that more seeps were expected to be located along the toe of this ridge with more detailed work. Once the groundwater divide between the Fish Creek (Teztan Yeqox) and Big Onion Lake watersheds is breached these seeps could become pathways for solute transport from the tailings storage facility to the Big Onion watershed.

If the Project were to proceed Taseko noted the importance of collecting additional hydrogeologic data in the Fish Lake (Teztan Biny) watershed and in the adjacent Big Onion (Jidizay Biny) and Little Onion Lake systems, Wasp Lake, and adjacent Taseko River (Dasiqox) to increase confidence in the interpreted hydrogeologic conditions.

5.3.1.2 Views of Participants

Natural Resources Canada noted that seepage of tailings pore water from the base of the tailings storage facility represented the largest potential source of contaminant loadings that could affect water quality in Fish Lake (Teztan Biny), Wasp Lake and Big Onion Lake (Jidizay Biny) and stated that Taseko's estimates of seepage from the tailings storage facility were unrealistically low for such a large (12 km²) facility.

Natural Resources Canada was critical of Taseko's estimated seepage through the base of the tailings storage facility at approximately 9 L/s (760 m³/d) in the post-closure period. Taseko obtained this estimate by assuming that the hydraulic conductivity of tailings was 1x10⁻⁸ m/s. Natural Resources Canada stated its concerns that Taseko based this critical parameter on only

two laboratory scale samples to represent 482 Mt of tailings. Natural Resources Canada noted that the actual measurements of hydraulic conductivity on these samples ranged over three orders of magnitude (from 6.1×10^{-6} to 4.4×10^{-9} m/s) depending on the test methodology. The value Taseko retained for the groundwater flow modeling and to estimate tailings storage facility seepage (1×10^{-8} m/s) was at the low end of this range. In Natural Resources Canada's view this could not be considered conservative.

Dr. Watterson noted that no data were provided to characterize the deep overburden, bedrock or hydrogeology below the tailings storage facility. He also noted that only six test pits were completed in the large area of the tailings storage facility in which the potentially acid generating waste rock would be stored. He went on to state that this lack of data meant that no information existed regarding potential groundwater flow pathways; and there was a lack of data to estimate seepage flow rates and to identify discharge areas and control measures for areas beneath the tailings storage facility. Dr. Watterson concluded there was considerable uncertainty about solute pathways through the till and into the underlying bedrock.

Dr. Watterson also noted that no data were available for the overburden and bedrock west of the proposed tailings storage facility. He noted that the elevation of Big Onion Lake (Jidizay Biny) and the Taseko River (Dasiqox) was about 200 m below the base of the tailings storage facility base. At closure the elevation difference would be about 300 m from the top the tailings storage facility. He noted that no deep boreholes were drilled within and west of the tailings storage facility to be able to develop a meaningful understanding of the potential deep flow pathways between the tailings storage facility and Big Onion and Little Onion Lakes and the Taseko River.

Dr. Watterson also noted that the EIS contained no discussion of the implications of the seeps along the base of the west ridge adjacent to the Onion Lakes and that no substantive information was provided on the source and pathways of groundwater flow to these seeps. The result is that potential pathways for seepage from the tailings storage facility to these springs had not been evaluated in the EIS.

Dr. Watterson also noted that there were large distances between data points in the tailings storage facility basin with some boreholes located as much as 1.5 km apart. This he viewed as a significant deficiency given the tailings storage facility was known to be underlain by a heterogeneous overburden sequence and fractured basalt layers. Moreover, he stated that the implications and effects of this poor data coverage on groundwater and tailings storage facility solute flow were not discussed by Taseko in the EIS. He contended that this deficiency demonstrated that Taseko had not developed an adequate understanding of site hydrogeological conditions, with the result that it substantially underestimated the risks from seepage transport through unknown flow pathways.

Dr. Watterson expressed major concern over why Taseko employed a "porous media" model to predict contaminant transport through fractured bedrock. He stated that such models only provided average flow rates through the bulk material being assessed and cannot account for more permeable intervals or fractures, and did not provide realistic timeframes for first arrival of seepage.

Natural Resources Canada and Dr. Watterson stated that Taseko's overall estimate of its seepage mitigation efficiency rate of 93% for embankment seepage was overly optimistic given the highly heterogeneous nature of overburden units beneath the tailings storage facility and the potential for rapid contaminant transport along preferential groundwater flow paths that might bypass the interception wells.

Taseko responded by stating that it had clarified that the efficiency rate was in fact 70% rather than 93%. Taseko also stated that its estimates on the effectiveness of controlling and collecting seepage were considered reasonable for this level of design. Taseko went on to state that if the project was to proceed, additional studies would be completed to refine the location, size and aspect of the various mitigation measures that had been proposed for the tailings storage facility including the number of seepage collection ponds. Furthermore, Taseko claimed that the potential for preferential groundwater pathways was a risk that could be managed.

Natural Resources Canada stated its concerns with Taseko's modelling methodologies due to unrealistically low hydraulic conductivity estimates for the tailings, potentially acid generating rock, overburden and bedrock units and with the scale of the regional 3-D model that Taseko used to estimate seepage from the tailings storage facility basin.

To better illustrate its concerns with Taseko's modelling of the tailings storage facility and to provide the Panel with what it considered to be a more reliable estimate of the seepage, Natural Resources Canada developed its own 3-D groundwater flow model using MODFLOW, an industry standard software program. In its model Natural Resources Canada used what it considered to be more realistic hydraulic conductivities for the tailings and the underlying overburden and bedrock units, based on the seepage flux components illustrated in Figure 9, below.

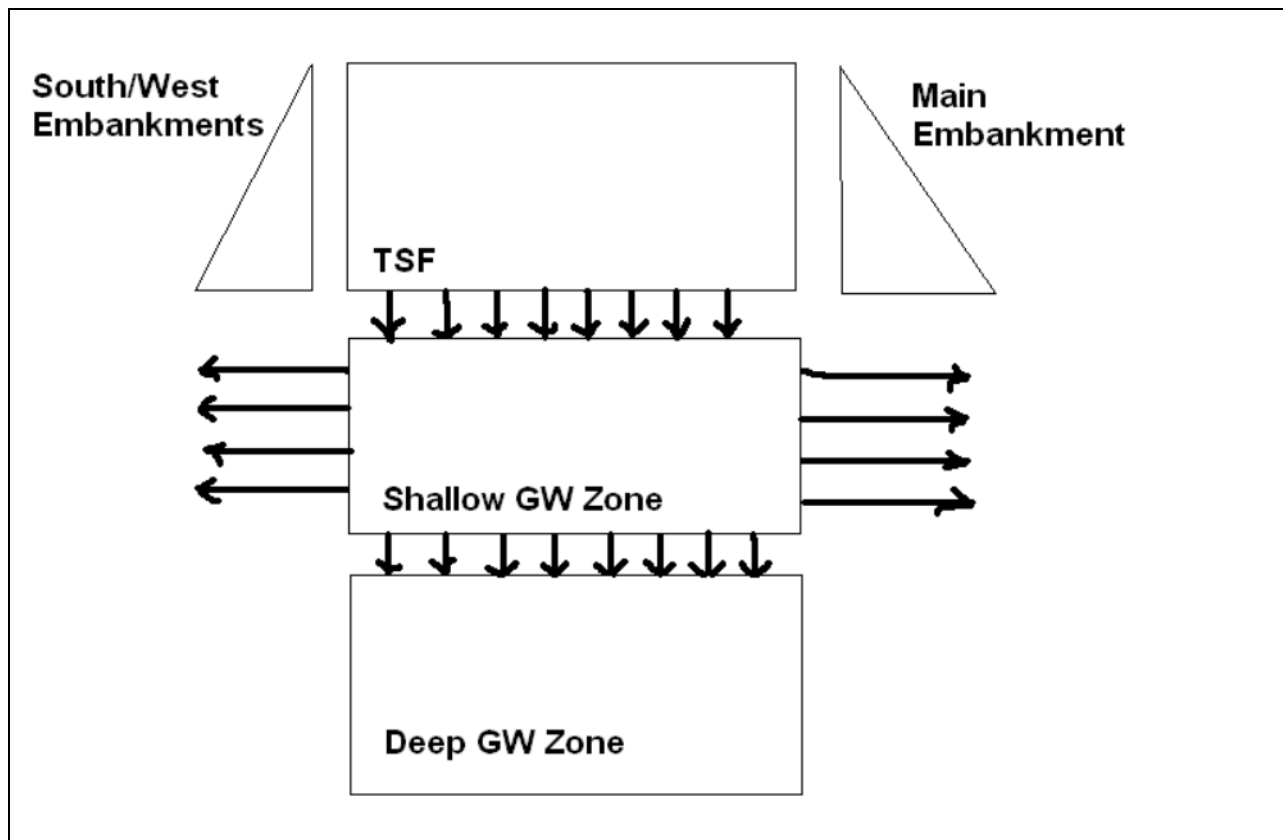


Figure 9. TSF Seepage Flux Components (Source: NRCan)

Taseko's and Natural Resources Canada's base case hydraulic conductivity and seepage estimates were compared and summarized at the hearing by Dr. Leslie Smith, an independent hydrogeological expert retained by the Panel. Dr. Smith's summary comparison, augmented by

Natural Resources Canada information that was also presented at the hearing, is shown in Table 4 below.

Table 4. Comparison of Modelling Parameters

	Taseko	Natural Resources Canada
Model domain	Regional in scale and extends laterally to natural hydrologic boundaries. It encompasses a larger domain than the Natural Resources Canada model.	Restricted to the footprint of the tailings storage facility.
Seepage	Seepage from the tailings and potentially acid generating rock is applied as a flux boundary.	Includes the tailings and potentially acid generating rock within the computational grid.
Tailings (K)	Assigned a single value (1×10^{-8} m/s) to the entire deposit.	Tailings are represented in two zones: • Shallow unconsolidated tailings with an assumed horizontal hydraulic conductivity of 5×10^{-6} m/s; and • Deeper, consolidated tailings with an assumed hydraulic conductivity of 1×10^{-6} m/s. The vertical hydraulic conductivity of the tailings is assumed to be a factor of 10 lower in each zone.
Upper Basalt Unit (K)	Horizontal 2×10^{-7} m/s.	Horizontal 1×10^{-6} m/s; Vertical 1×10^{-7} m/s.
Till Layer (K)	Horizontal 5×10^{-8} m/s; Vertical 1×10^{-8} m/s	Horizontal 6×10^{-7} m/s; Vertical 2×10^{-7} m/s.
Characterization of Till Layer	Minimum 5 m thickness assumed in model	Model accommodates the thinner tills that are known to occur on the valley flanks
Deep Bedrock	Not considered. An impermeable boundary assumed below 100m (lower depth of the basalt layer). (Natural Resources Canada, July 2013)	Groundwater flow through deep bedrock (depths greater than 100 m assumed). (Natural Resources Canada, July 2013)

At the hearing, Natural Resources Canada took exception to Taseko's claim that there had been a substantial convergence of their respective expert opinions on the rate of seepage from the tailings storage facility and that there was no longer any material disagreement between Taseko and Natural Resources Canada on these matters. Natural Resources Canada stated that Taseko's assertion was not correct. In a subsequent technical memorandum to the Panel, Natural Resources Canada clarified its opinion regarding the breadth of disagreement that remained between the parties with respect to seepage estimates and the numerical methods by which they were obtained. The following is a comparative summary of seepage estimates prepared by Natural Resources Canada.

Table 5. Comparison of Seepage Estimates taken from the August 21, 2013, Natural Resources Canada Technical Memorandum to the Panel

	Taseko estimates (based on two different models)	Natural Resources Canada base case, based on its 3-D model
Post Closure seepage through bottom of the tailings storage facility	9 L/s (760 m ³ /d) From 3-D model	100 L/s (8650 m ³ /d)
Main Embankment seepage (towards Fish Lake)	28 L/s (2420 m ³ /d) From 2-D model	58 L/s (5087 m ³ /d)
South and West Embankment seepage	27 L/s (2333 m ³ /d) From 2-D model	29 L/s (2552 m ³ /d)
Deep basin seepage (greater than 200 mbgs)	0 L/s (Natural Resources Canada claims Taseko's 2D model precludes this flux component)	20 L/s (1699 m ³ /d)

As indicated in the above table, pore water seepage from the tailings storage facility basin was estimated by Natural Resources Canada to be 100 L/s (8 650 m³/d) which was more than an order of magnitude greater than what it considered to be Taseko's comparative prediction of 9 L/s. The Natural Resources Canada model showed that a further 20 L/s (1 699 m³/d) of seepage was predicted to flow to the deep groundwater zone beneath the basalt flows that underlie the tailings storage facility. Natural Resources Canada claimed that that this latter flux was not modeled in the Taseko's 2D approach because an impermeable boundary was assumed at the base of the basalt flows.

Natural Resources Canada's estimates of seepage rates through the main and south/west embankments were 58 L/s (5 087 m³/d) and 29 L/s (2 552 m³/d), respectively, compared to Taseko's estimates of 28 L/s (2 420 m³/d) and 27 L/s (2 333 m³/d) respectively. For Natural Resources Canada's base-case scenario, approximately 55% of tailings storage facility seepage flowed beneath the main embankment towards Fish Lake (Teztan Biny), representing more than twice the flux considered in Taseko's model. Natural Resources Canada also expressed uncertainty as to whether Taseko's seepage mitigation measures could handle such a flux. In particular, Natural Resources Canada stated that it was unclear if Taseko's analysis of interception well requirements, which were based on its 3D groundwater flow model, remained applicable.

Natural Resources Canada also expressed concerns about Taseko's assumption that there would be sufficient water retained in the tailings storage facility post closure to maintain the water table at the elevation of the outflow spillway. Natural Resources Canada subsequently modified its tailings storage facility model to incorporate "recharge boundary conditions" and determined that for average climatic conditions significant volumes of impounded tailings were likely to be above the water table in an oxidizing environment. With alternating wet and dry years, Natural Resources Canada stated that the tailings were likely to undergo cyclical saturation and de-saturation, which it noted were favorable conditions for generation of acid rock drainage.

Dr. Leslie Smith, an independent expert retained by the Panel, stated that in his opinion the framework used by Taseko to evaluate seepage of process (pore) water from the tailings storage facility followed accepted practice. He pointed out that the tailings and potentially acid

generating rock zones in the tailings storage facility were incorporated in the basin-scale models using a head-dependent flux boundary (Taseko approach) rather than incorporating these materials within the model grid (Natural Resources Canada approach). He noted that the Taseko model was a valid approximation, although the Natural Resources Canada model has greater flexibility if the tailings storage facility was explicitly included within the model grid.

Dr. Smith reported that with respect to groundwater models for 12 operating or proposed mines that he had reviewed in the past several years, that seven sites included the tailings storage facility within the model domain (Natural Resources Canada method), whilst five sites represented seepage from the tailings via a boundary condition (Taseko method).

Dr. Smith noted that Taseko did not include representation of the seepage collection ponds that would be located down-gradient of the embankments in its modeling. He stated that this was uncommon for an environmental impact level analysis as it eliminated the opportunity to calculate the volume of process-affected groundwater that could report to the collection locations. He went on to state that such an analysis would be required at the detailed design phase to evaluate seepage interception.

Dr. Smith noted that the packer test results carried out by Taseko in bedrock yielded a wide range of hydraulic conductivity (10^{-9} to 10^{-5} m/s for the basalts); however he stated that a four-order of magnitude variation in hydraulic conductivity across a data set was commonly observed in packer test results conducted on fractured rocks.

Commenting on Taseko's numerical modeling of the tailings storage facility Dr. Smith stated that it was becoming more common to see model calculations that zone the interior of the tailings storage facility relative to distance from spigot points and/or the degree of tailings consolidation. He stated that because Taseko assigned a single value of hydraulic conductivity (1×10^{-8} m/s) to the entire tailings deposit, the results of its 3-D model were at a lower bound value (i.e. lower conductivity) and therefore less conservative.

Dr. Smith considered that the value assigned to the hydraulic conductivity of the potentially acid generating deposit in the tailings storage facility of 10^{-4} m/s was acceptable and in his opinion, conservative.

Dr. Smith noted that Taseko's estimates of plume migration rates, and in particular the component entering the fractured basalts, were subject to considerable uncertainty because of the lack of reliable data for the effective porosity of these bedrock units. He stated that the porosity of the till unit was more readily estimated because of its narrower range of variation. Dr. Smith, like Dr. Watterson, suggested that the velocity of the plume migration would likely be higher than Taseko's estimate. He stated that Taseko's claim that maximum concentration in the plume would be in a depth range from 50 to 100 m below ground surface required greater clarity if the project was to proceed. He noted that a depth of 100 m coincided with the base of the upper, more permeable, basalt layer.

Dr. Smith stated that insufficient information was provided in the EIS to provide a firm opinion on the potential for seepage originating from the tailings storage facility to reach the Taseko River (Dasiqox) and that without mitigation he expected this would be the case. The final leg of the seepage pathway and the solute concentrations towards the Taseko River would depend upon the nature of the hydrogeologic connection between Big Onion Lake (Jidizay Biny) and the Taseko River, which had not been investigated. In this regard, he also stated that it was possible that a process (or pore) water plume (or part of the plume) could bypass Big Onion Lake and move directly to the Taseko River.

When commenting on the difference between Taseko's and Natural Resources Canada's modelling, Dr. Smith stated that the principal explanation for the differences in seepage estimates produced by the two models was likely the different values of hydraulic conductivity (tailings, till, shallow bedrock) used plus the different thickness of the till layers for the valley flanks. He also noted that Natural Resources Canada hydraulic conductivity estimates for till and basalt were not calibrated to the hydraulic head data set and stream flow data.

Dr. Smith stated that the Taseko 3-D model provided a reasonable basis for anticipating the general character of the seepage pathways from the proposed tailings storage facility to the surrounding streams and lakes. He further stated that the quantity of seepage was uncertain, and based on the scenarios developed by Taseko and Natural Resources Canada, he estimated that the seepage through the foundation of the tailings storage facility, for the latter part of the mine life and into closure, could be from 20 to 100 l/s (1 699 to 8 650 m³/d). In Dr. Smith's opinion, the value would be likely towards the upper end of this range.

Commenting on Taseko's planned mitigation measures, Dr. Smith noted that Taseko intended to re-contour and compact the till cover on the floor of the tailings storage facility, where necessary, to ensure a minimum thickness of 2 m of till within the footprint of the facility. He stated that there is precedence for this type of measure, but that success would depend on high quality control and quality assurance standards. He further noted that seepage blankets could reduce but would not eliminate tailings process water from entering the tailings storage facility foundation.

He noted that the suite of seepage interception measures Taseko had proposed had been evaluated at a conceptual level only, and that the performance of an integrated seepage management system was not provided in the EIS. For example, he noted that Taseko provided no design for a seepage interception system for the 3.3 km long south embankment.

Dr. Smith further stated that the seepage mitigation measures proposed by Taseko had the potential to substantially reduce the volume of seepage, but not eliminate seepage from entering Fish Lake (Teztan Biny), Wasp Lake and the Onion Lakes. Each of these water bodies was located downstream of a sector of the tailings storage facility where natural hydrodynamic containment was not present for the design height of the tailings storage facility impoundment.

Dr. Smith stated that effective implementation of Taseko's mitigation strategy would require a comprehensive design process, an ongoing commitment to adaptive management, and financial resources for long-term operation and maintenance of the seepage pump back wells. In this regard he stated that seepage interception was challenging at the location of the tailings storage facility because of a number of factors, including:

- the generally low hydraulic conductivity of the basalts;
- the heterogeneity of basalts and the likely occurrence of preferential flow paths that may not be easily identified in subsequent drilling programs; and
- the considerable length of the main and south embankments (3.9 km, and 3.3 km, respectively).

Given the geologic properties of the basalts and the importance of fractures in contributing to the large-scale hydraulic conductivity of the rock mass Dr. Smith stressed the need to incorporate a monitoring and mitigation plan to defend against preferential flow paths that could go undetected even in detailed design phase investigations.

Dr. Smith suggested that a realistic target may be 80% to 90% capture efficiency for solutes passing beyond the embankments. He noted that Taseko had provided a conceptual

demonstration of seepage interception at the main embankment, but did not illustrate a similar design for the south embankment. Further, Taseko had chosen what he considered a conservative value for interception efficiency of seepage interception wells of 60%.

In closing, Dr. Smith stated that if the Project proceeds it would be essential to conduct one or more pilot tests for interception wells in the upper basalt layer to evaluate pumping capacities and distance-drawdown relationships. He recommended that the only realistic way to address the uncertainty in timing of contaminant transport was to have a “baseline” interception system in place at the start of mining operations that was complemented by monitoring wells located between the interception wells and the embankments.

The Ministry of Energy and Mines stated that there was uncertainty with:

- the presence and thickness of till within the tailings storage facility to limit seepage;
- whether hydraulic conductivity could be sufficiently enhanced by the addition of till to thin spots in the tailings storage facility area that would meet or exceed the modelled hydraulic conductivity used in the Taseko numerical groundwater model;
- tailings storage facility seepage estimates due to the possible range of hydraulic conductivity in the hydrostratigraphic units underlying the tailings storage facility. The Ministry noted that this could result in more seepage from the tailings storage facility than modeled by Taseko.

The Ministry of Energy and Mines went on to state that the groundwater capture system proposed in the EIS was conceptual and that it was difficult, based on the information provided, to assess the effectiveness of the groundwater pumping /mitigation system to protect water quality in Fish Lake (Teztan Biny) and the Fish Lake tributaries.

Based on the information available, the Ministry stated that in the context of preserving Fish Lake (Teztan Biny) and its tributaries there remained uncertainties around the ability to limit and collect the expected volume of seepage from the tailings storage facility, and the ability to effectively treat water to maintain water quality in Fish Lake and its tributaries. The Ministry concluded that Taseko’s ability to prevent adverse effects to Fish Lake and its tributaries from a water quality perspective was uncertain.

The Ministry of Energy and Mines acknowledged that Taseko had proposed additional site investigation work if the project proceeds. It stated that this work would be examined by the Ministry during future regulatory processes and this should lead to a reduction in the uncertainties.

5.3.1.3 Panel’s Conclusions and Recommendations

In reaching its conclusions on seepage from the tailings storage facility, the Panel considered the following factors to be particularly relevant:

- The tailings storage facility would be a 12 km² facility with over 7 km of embankments up to 115 m high.
- Seepage of tailings pore water from the tailings storage facility, as noted by Natural Resources Canada, represents the largest potential source of contaminant loadings that could affect the water quality in Fish Lake (Teztan Biny) and the other lakes, creeks and rivers in the Project area.
- Three potential seepage pathways from the tailings storage facility have been identified:
 - down the center of Fish Lake Valley towards Fish Lake.

- through the adjacent western ridge, where the pre-development groundwater divide is predicted to be lost, towards Big Onion Lake (Jidizay Biny) and Taseko River (Dasiqox); and
- through the south embankment towards Wasp Lake.
- A lack of detailed geotechnical site investigations required to more reliably characterize the foundation of the tailings storage facility, particularly till thickness, variability in the overburden units, the likely existence of preferred pathways through the fractured upper bedrock units, and the nature and extent of the seeps and springs at the toe of the ridge west of the tailings storage facility.
- The fractured basalt intercalated with the glacial till in the valley bottom could represent a major seepage pathway from the tailings storage facility.
- In the absence of mitigation, Taseko predicted that:
 - solute migration towards the west through the ridge would commence in about year 8 of operations;
 - solute migration beyond the footprint of the tailings storage facility is possible along the axis of the Fish Creek (Teztan Yeqox) valley towards the Fish Lake tributaries, west towards Big Onion Lake (Jidizay Biny) by Year 85 and south towards Wasp Lake by Year 30.
- After mitigation, Taseko predicted that unrecovered seepage would enter into water bodies at the following rates:
 - Fish Lake - 2.40 L/s (207 m³/d)
 - Wasp Lake - 4.5 L/s (389 m³/d)
 - Big Onion Lake - 0.68 L/s (59 m³/d)
- The substantial heterogeneity of the overburden and of the shallow bedrock, particularly with respect to the intercalated basalt and glaciofluvial and glaciolacustrine deposits in the glacial till across the tailings storage facility and site. Despite this heterogeneity Taseko represented all overburden deposits (till, unconsolidated sediments, basalt) as one unit and assigned a bulk hydraulic conductivity value of 4×10^{-6} cm/s.
- Taseko's assignment of a single hydraulic conductivity of 10^{-8} m/s value for tailings does not recognize the spatial variation of particle size that will develop when the tailings are deposited in the tailings storage facility.

The Panel has determined that Taseko has underestimated the volume of tailings pore water seepage leaving the tailings storage facility and the rate at which the water plume would reach the various lakes and streams downslope of the tailings storage facility, even with the mitigations proposed.

The Panel accepts Natural Resources Canada's upper bound estimate as the expected seepage rate from the tailings storage facility (see Table 5 above).

The Panel concludes that there is strong evidence that the seepage from the tailings storage facility would be significantly higher than estimated by Taseko, resulting in potentially higher loading of contaminants in the receiving environment.

RECOMMENDATION 3

To act in a precautionary manner the Panel recommends that, if the Project proceeds, that Taseko be required to:

- install monitoring wells downstream of the three embankments prior to construction of the tailings storage facility to establish baseline conditions and for future monitoring of groundwater levels and groundwater quality;
- carry out a survey of the springs along the toe of the western ridge prior to construction of the tailings storage facility to evaluate potential zones of groundwater discharge from the tailings storage facility, and that a long-term monitoring program of the spring flow rates and water chemistry be a regulatory commitment.
- carry out a detailed drilling and test pit program in the area of the tailings storage facility basin to more accurately determine the hydrogeology and to accurately plan the till augmentation program.
- carry out sufficient pumping wells and tests on the upper basalt unit to determine its hydraulic properties and evaluate the pumping capacity and draw down relationships.

6 SURFACE HYDROLOGY

The Panel identified the following as the key issues related to surface hydrology: changes to stream flow pathways and watershed areas; water quality modelling; water quality impacts in Fish Lake (Teztan Biny); water quality impacts in adjacent lakes and streams; and water treatment and adaptive management. Each of these issues is associated with seepage from the tailings storage facility and with Taseko's proposal to recirculate water in Fish Lake. This chapter considers these issues in detail.

Based on Taseko's water balance model the baseline flow regime in the Fish Creek (Teztan Yeqox) watershed would be permanently altered as a result of the diversion of water within and around the project area. In general, the flow volume in Lower Fish Creek would decrease during mine operations and closure, eliminating rainbow trout spawning habitat in this portion of Fish Creek. The headwater tributaries that feed Fish Lake (Teztan Biny) would be impounded by the tailings storage facility or captured by the Project site drainage system. Recirculation of water to the Fish Lake inlet tributaries would increase flow volumes to Fish Lake, affecting water quality and aquatic ecology in the lake.

6.1 CHANGES TO STREAM FLOW PATHWAYS AND WATERSHED AREA

6.1.1 Proponent's Assessment

Fish Creek (Teztan Yeqox) watershed would cover 95.4 km² and would run for approximately 14 km in a northerly direction. The Fish Creek watershed was described by Taseko as having three distinct stream sections (Figure 10). Lower Fish Creek was defined as the section of stream from the confluence of the Taseko River (Dasiqox) upstream to an impassable waterfall preventing upstream fish migration. Middle Fish Creek runs from the waterfall to the north end of Fish Lake (Teztan Biny). The waterfall results in an isolated monoculture population of rainbow trout in the middle and upper sections of Fish Creek and in Fish Lake. Fish Lake would drain into Middle Fish Creek and then would flow northwest discharging into the Taseko River downstream at an elevation of approximately 178 m below the proposed mine. Upper Fish Creek was characterized as the section upstream of Fish Lake, including Fish Lake and Little Fish Lake (Y'anah Biny).

The Taseko River is about 6 km downstream from Wasp Lake by way of Beece Creek (Bisqox), and less than 1 km downstream from Big Onion Lake (Jidizay Biny).

Historical site-specific data and long-term regional precipitation and temperature data were used for the assessment of hydrological baseline values for the Project. The hydrology of the Fish Creek (Teztan Yeqox) was generally characterized by high flows in April and May as a result of snowmelt and precipitation followed by rapidly declining flows throughout the summer and a precipitation event-driven fall freshet. During the winter much of the stream reaches were either dry or frozen. Fish Lake (Teztan Biny) was characterized as a natural storage reservoir for the flows of Upper Fish Creek.

For Lower Fish Creek (Teztan Yeqox), the open pit and the coffer/flood control dams at the outlet of Fish Lake (Teztan Biny) would result in a reduction of the average annual flow volumes by approximately 76%, during operations and closure. Taseko had determined that the effects of the Project on the Taseko River (Dasiqox) would remain unchanged from the previous project effects which included a loss of surface flow contribution. Taseko reported that Fish Creek only contributed approximately 1% of the Taseko River flow for the majority of the year except during spring freshet when Fish Creek contributed up to 11% of the flow. Taseko indicated that any

effect of reduced flows in the Taseko River as a result of the Project would be immeasurable and insignificant.

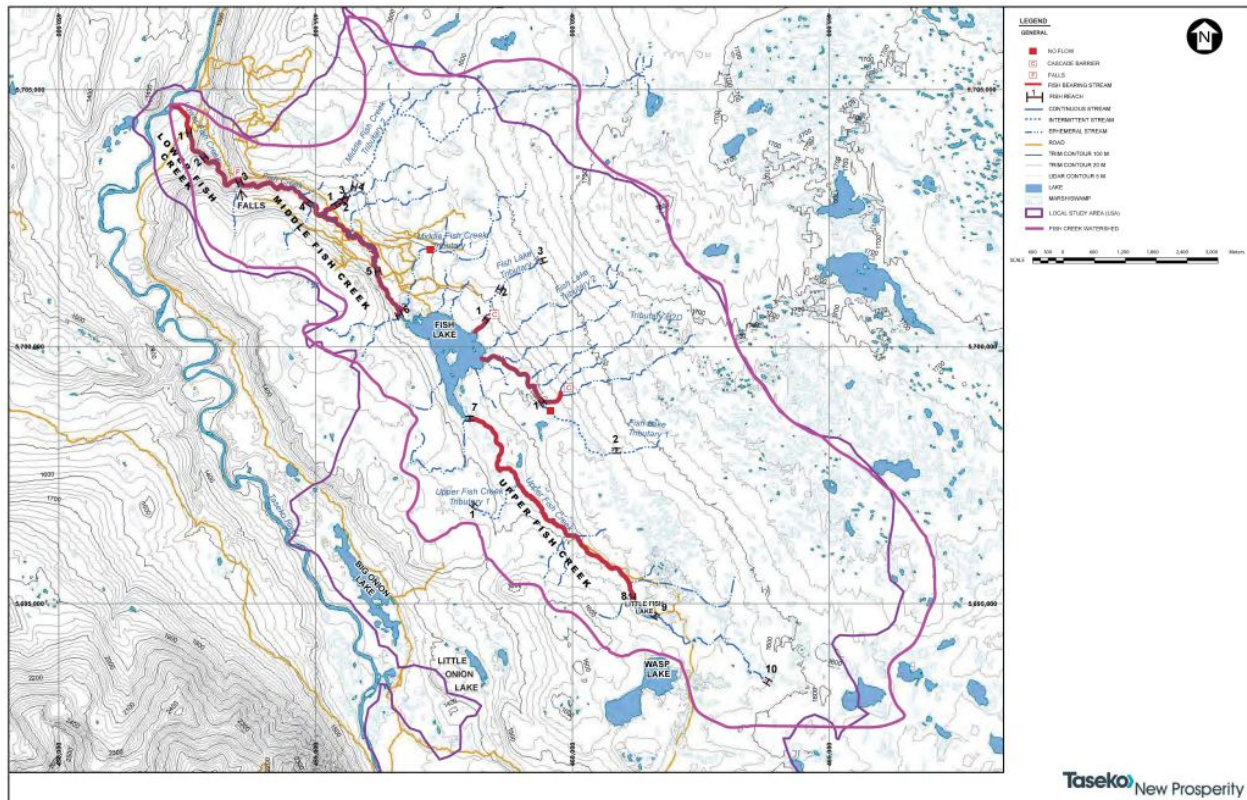


Figure 10. Fish Creek watershed and adjacent water bodies (Source: Modified from Taseko)

Fish Lake (Teztan Biny), located 2.5 km downstream of the tailings storage facility has a total catchment area of 65.8 km². The main embankment would extend across the Fish Creek valley and would reduce the size of the Fish Creek (Teztan Yeqox) catchment area thereby reducing the inflow from the two main inlet tributaries to Fish Lake by 58%. Taseko stated, although the proposed mine development plan would reduce the watershed area and the natural runoff contribution to Fish Lake, the development of the Project would have an overall positive effect on Fish Lake by increasing annual flow volumes by approximately 28% during operations and by 31% after decommissioning (baseline annual flow volume of Fish Lake was 4.8 Mm³). The increase in flows during operations would result from recirculation of the Fish Lake outflow as a mitigation measure to support the lake inlet spawning and to maintain the natural water levels of Fish Lake. At closure, and only when water quality was deemed to be suitable for release to the environment, Fish Lake base flow was expected to increase when overflow water from the tailings storage facility lake was released to Fish Lake. Recirculation would maintain year round flow in the tributaries and was stated by Taseko to have advantages to the overall health of the tributary and lake ecology.

During operations, the Project would not result in a change to stream flow in Beece Creek (Bisqox) but would result in increases to surface water flow at post-closure when non-contact water would no longer need to be directed to Fish Lake (Teztan Biny) inlets. The average annual flow volumes were expected to increase by 2.5% in post-closure but due to the large size of the Beece Creek watershed, Taseko stated the annual increase in flow volume was considered minor.

Wasp Lake, located at the southern boundary of Fish Creek (Teztan Yeqox) watershed, was characterized as having a total catchment area of 3.2 km² and periodically draining south to Beece Creek (Bisqox). At closure, the watershed area of Wasp Lake would be permanently increased from baseline conditions when the catchment runoff from the area south of the south embankment would be diverted into Wasp Lake.

Taseko proposed a water management plan to minimize the Project's effects on surface hydrology. Taseko stated that the primary objective of the water management plan would be to capture and direct all non-contact water from the Fish Creek (Teztan Yeqox) valley to Fish Lake (Teztan Biny).

Fish Lake (Teztan Biny) water level fluctuations would be maintained close to natural levels during operations through to post-closure with the installation of two outlet coffer dams. Outflows would be managed by a pumping system located at the northern end of the lake, with the diverted water conveyed in a pipeline and released to the inlet tributaries south of the lake, immediately downstream of the main embankment. Excess flows not needed for the inlet tributaries would be directed to the tailings storage facility. Two non-contact water collection ponds, located east and south of the tailings storage facility would collect non-contact water and the water would be pumped to the inlet tributaries. Based on Taseko's water balance model the total annual flow requirement to preserve inlet spawning habitat in Fish Lake, as well as mitigate for the loss of outlet spawning due the open pit development would be approximately 10.8 Mm³.

As a result of unknown contributions of groundwater and sub-surface flow to the tributaries Taseko stated that there remained some uncertainty with respect to the volumes that would be required for recirculation in order to maintain water volumes in Fish Lake (Teztan Biny). Taseko advised it might be up to 50% of the outflow on a long-term basis. The recirculation would be year-round with a minimum flow of approximately 0.15 m³/s and a maximum flow between 0.32 m³/s and 0.41 m³/s during peak discharge in April and June.

Based on the Project design, no releases of mine site water to the receiving environment was anticipated until post-closure, at approximately Year 48. Taseko proposed to restore the natural flow from the pit lake to Lower Fish Creek (Teztan Yeqox) in post-closure. The reclamation of the tailings storage facility lake and the open pit lake to natural flow paths would lead to the re-establishment of near baseline flows contributing to Lower Fish Creek.

Data from the regional climate station at Barkerville were used to assess climatic trends. Based on Taseko's review of regional trends over the past 100 years, increases in precipitation or temperature would not cause substantial changes to surface water stream flow volumes outside the natural variability of systems in British Columbia. Taseko stated that increases in extreme rainfall events and warmer temperatures were accounted for in the conservative nature of the estimates associated with surface water stream flow volumes and that if there were changes in precipitation and temperature outside the historic natural variability the water management system of the Project would allow maintenance of baseline stream flows and lake levels. In Taseko's view, the conservatism built into the model provided it with the certainty that the water management plan being proposed would work even in the worst case situations.

During the hearing Taseko maintained that it did not expect that the viability of Fish Lake (Teztan Biny) would require either 50% recirculation or a need to recirculate water in perpetuity. In response to a request by the Panel, Taseko undertook modelling of the tailings storage facility seepage collection efficiency. Taseko stated that the modelling supported its position that use of seepage collection ditches and ponds downstream of the embankment could achieve a capture rate of approximately 85%, a value greater than that used in the EIS water quality

modelling. Taseko also stated that un-captured seepage reporting to the inlets of Fish Lake would be a small component of the overall flow, and water quality in the inlets could be managed with the release of appropriate surface flows from the tailings storage facility lake and upstream catchments during the closure and post-closure phases. Taseko predicted that the seepage rate to Fish Lake from the tailings storage facility after bypassing collection ditches and ponds would be 2.4 L/s.

Taseko expected that recirculation would not be required in perpetuity and that there were numerous alternatives that could be implemented that would reduce or eliminate the reliance on recirculation, such as: directing portions of the catchment of the Fish Creek (Teztan Yeqox) valley to the tailings lake, as opposed to adjacent water bodies; releasing a portion of the surplus water from the tailings lake in the winter to the inlets of Fish Lake (Teztan Biny); and creating new spawning habitat or decreasing the size of the final tailings lake through selective tailings deposition.

During the hearing Taseko submitted it would have close to 30 years to finalize solutions to ensure that its water management goals could be achieved. With developments in technology over that time, Taseko had no doubt that it would succeed. Taseko stated it had shown in the EIS and in its evidence during the hearing that the mitigation measures proposed were well-known, in common use and had been proven effective in the industry. Taseko asserted there would be no residual negative effects to surface water stream flows, based on its existing water management strategies and its commitment to revise the water balance modelling prior to permitting to demonstrate how post-closure recirculation could be avoided or minimized.

6.1.2 Views of Participants

Fisheries and Oceans Canada agreed that the reduced surface flow contribution of Lower Fish Creek (Teztan Yeqox) would not represent a critical loss for the Taseko River (Dasiqox). Fisheries and Oceans Canada noted that while the Project as proposed would retain Fish Lake (Teztan Biny), a substantial portion of the associated inlet stream network would be eliminated. The loss of streams in the Fish Creek watershed presented a risk for ensuring the Fish Lake aquatic ecosystem functioned effectively to support a minimum viable population of rainbow trout. Fisheries and Oceans Canada also noted that water balance in Fish Lake would be a key factor in the maintenance of the system.

Environment Canada believed there remained uncertainty associated with estimates of long-term mean annual precipitation and mean annual unit runoff that the watershed model provided in the EIS and little evidence supported the claim that the estimates of hydrometeorological parameters were representative of local conditions. Environment Canada stated further uncertainty arose because Taseko did not provide evidence that it took into consideration the limited availability of site-specific meteorological and stream flow data, scarcity of regional data, challenging site data collection conditions, and localized climatic influences such as orography.

Environment Canada and Fisheries and Oceans Canada questioned the use of Barkerville Meteorological data to adequately assess climate change effects on surface hydrology. Environment Canada stated Taseko did not demonstrate that changes in precipitation and temperature would not alter surface water stream flow volumes in the future (i.e. beyond mine operations). Environment Canada established that future climate over the closure and post-closure periods would likely be beyond the range of variability observed over the past few decades and that observed changes in the past cannot be used to project climate in the future without clear scientific evidence.

MacDonald Environmental Sciences Ltd., on behalf of Tsilhqot'in National Government, reviewed Taseko's baseline characterization of surface hydrology. Mr. Donald MacDonald stated that there were numerous and serious deficiencies with the data and that the information provided by Taseko was not adequate to support a sound understanding of baseline conditions for water quality, water flows, sediment characterization, or lake ecology for any of the water bodies, including Fish Lake (Teztan Biny). Mr. MacDonald questioned Taseko's water balance model stating that although the estimated annual flow volumes reported by Taseko took the variability of low and high stream flow (i.e., 5th percentile and 95th percentile flows) into account, the estimates only used baseline conditions from a single year (i.e., measured stream flow in 2007), used precipitation data from Williams Lake and might not have captured the more critical inter-annual variability in stream flow or extreme low-flow or high-flow conditions.

Mr. MacDonald noted that while the estimated annual flow in Upper Fish Creek (Teztan Yeqox) was predicted to increase due to recirculation, the estimated monthly flow volumes were reportedly lower during critical spawning times (0.194 m³/s to 0.205 m³/s in May and 0.458 m³/s to 0.483 m³/s in June) than under baseline flow conditions. Under baseline conditions, the mean estimated flow during the critical spawning time ranged from 0.254 m³/s in May to 0.792 m³/s in June. Given that Taseko estimated the flow needed to support spawning rainbow trout in Upper Fish Creek was 0.450 m³/s, Mr. MacDonald submitted that flows would barely be adequate for spawning during the life of the Project and would be inadequate during years with less than average precipitation. Based on the predictions provided by Taseko the flow volume would not be achieved in Upper Fish Creek during operations, closure, and post-closure, even under the 95th percentile wet scenario. Mr. MacDonald concluded that the lack of a sensitivity analysis evaluating the performance of the recirculation system under various realistic scenarios left uncertainty as to whether adequate flows could be delivered to Fish Lake (Teztan Biny) tributaries and Fish Lake throughout the year.

The Tsilhqot'in National Government stated that there were substantial uncertainties both in estimates of stream flow under baseline conditions and in Taseko's modelling of future hydrological conditions in the vicinity of the site. It was therefore not possible to determine, with any level of confidence, if and how flows could be maintained within Upper Fish Creek (Teztan Yeqox) tributaries in perpetuity.

The British Columbia Ministry of the Environment stated that Taseko's assessment of surface hydrology was primarily based on modelling and the inputs and parameters used in the model did not appear to be related to the hydrology of the actual Project site. There was a lack of baseline data in the Fish Creek (Teztan Yeqox) watershed. Instead, the model relied on correlations to data from Williams Lake with no information on the reliability of the correlation of the data between Williams Lake and the Project site. The Ministry concluded that this would lead to substantially greater uncertainty about volumes and quality of water contributing to Fish Lake (Teztan Biny).

The Ministry also stated that there was a risk that future water supply had been overestimated. The Ministry noted that while the predicted amount of physical spawning area during operations would be sufficient to sustain a viable rainbow trout population it would be challenging to maintain the fish population in Fish Lake (Teztan Biny) due to the possible lack of adequate water quantity to maintain critical flows for spawning and rearing.

Siegfried Reuter remained concerned about the increased flows in Beece Creek (Bisqox) and the impact it would have to his property at Taseko Lake Lodge. Mr. Reuter stated that the new Project proposal simply moved the tailings storage facility closer to his property and overflow from the tailings storage facility would drain into Wasp Lake then to Beece Creek.

6.2 WATER QUALITY MODELING

6.2.1 Proponent's Assessment

Water quality modelling was undertaken for drainages and water bodies within and adjacent to the proposed mine site that would receive seepage associated with the tailings storage facility or discharge from the pit lake once full. Estimates of chemical loadings from the different Project components were used together with the site water balance to generate overall water quality predictions.

Taseko used two different approaches to predicting impacts on water quality. The first was a mass balance stochastic model which combined total surficial and dissolved seepage concentrations; it was used to predict water quality at the mine site for Fish Lake (Teztan Biny), Upper Fish Creek (Teztan Yeqox), Tributary 1, and the pit lake. This approach used stochastically predicted discharge estimates, in conjunction with baseline and predicted element concentrations in the water. The Fish Lake water quality model was calculated on a daily basis for all project phases and included consideration for recirculated flow, contributions from airborne particles, in-lake chemical scavenging processes, seepage from the Fish Lake basin and water column stratification.

The second model used a mass balance calculation approach to predict changes to surface water quality in Wasp Lake, Beece Creek (Bisqox), Little Onion Lake, Big Onion Lake (Jidizay Biny) and the Taseko River (Dasiqox). Predicted variable concentrations were calculated at mixing points on a monthly basis, starting at the beginning of operations and ending in Year 200. Variable concentrations generally changed during specific phases of the Project and reached equilibrium within five years of each change, fluctuating with seasonal variability only. The water-balance model used in these cases was supported by a detailed accounting of input assumptions, with modelling results presented in tabular and graphical formats.

Both water quality models incorporated changes to groundwater quality in their methods. Taseko stated that although transport modelling results showed that close to 100% seepage interception could be achieved, for the purpose of base case water balance model and base case water quality modelling, the conservative assumption that the seepage pump back system would only intercept 50% of the tailings storage facility seepage was used.

Taseko stated it provided details of the stochastic water quality model in the previous EIS to enable a determination of whether the mitigation proposed would adequately address water quality issues to a reasonable level of confidence. The water quality model was created using Goldsim graphical software and presented the modelled results in EIS Appendix 2.7.2.1-I for each water body, on a substance by substance basis, in graphical format.

Taseko predicted water quality in the potentially affected lakes and streams for a period of 100 years, beginning in Year 1 of mine operations. Inputs to the model included baseline water quality data, catchment runoff, precipitation, and base flow, as well as inputs from the Project, including surface water runoff from the south and west seepage collection ponds, runoff from the pit lake, diverted catchment runoff, and contributions to groundwater base flow from the tailings storage facility pore water. The modelled water quality data for the mine site and adjacent lakes and creeks were evaluated and compared with the *British Columbia Water Quality Guidelines* and the Canadian Council of Ministers of the Environment guidelines. Where exceedances were identified, the predicted values were then reviewed using published toxicity data, ecological risk assessment values and the Biotic Ligand Model to predict impacts to water quality.

Taseko stated there was always some degree of uncertainty when predicting effects in a complex aquatic system, particularly decades into the future. To address uncertainties regarding model predictions, Taseko proposed to routinely monitor the water quality, sediment quality, and aquatic biota in Fish Lake (Teztan Biny) and other water bodies in the regional study area. Water quality alert levels were developed for all metals in Fish Lake.

6.2.2 Views of Participants

Several participants noted the absence of any technical information for Taseko's mass balance water quality model. Unlike the technical report supplied for the water balance water quality model for the tailings storage facility and adjacent watersheds, the only information provided for the Fish Lake (Teztan Biny) water quality predictions were graphs of the results.

On two separate occasions, the Tsilhqot'in National Government requested information regarding the Fish Lake (Teztan Biny) water quality model methodology. The Tsilhqot'in National Government submitted that there was no technical analysis to support or explain Taseko's water quality modelling predictions for Fish Lake. The Panel also directed Taseko to provide this information prior to the hearing, but Taseko never provided the Fish Lake modelling information. Taseko did provide digital files with water quality modeling data, but the Fish Lake information was not part of this.

During the hearing, Environment Canada noted the lack of documentation about the Fish Lake (Teztan Biny) water quality model, to the extent that it was not able to assess the likelihood or magnitude of the effects of the Project on water quality: "while Taseko indicated that complete details of the stochastic water quality model used to predict water quality in Fish Lake, Fish Creek Reach 8, Fish Lake Tributary 1, tailings storage facility lake, and Pit Lake can be found in Appendix 2.7.2.1-I, those details could not be located."

Dr. Rina Freed, on behalf of the Tsilhqot'in National Government, noted that while a number of EIS documents related to water quality modelling source terms and results were available, no document had been made available by Taseko that provided a detailed description of water quality modelling methodology for Fish Lake (Teztan Biny) and the inlet streams. Dr. Freed stated that the information provided by Taseko was not adequate for understanding the water quality modelling of Fish Lake in detail. Dr. Freed summarized her position by stating:

the time-series water quality prediction figures produced by SRK [Taseko's consultant] are not possible to reproduce with the information provided. Taseko had not provided clear and transparent information regarding the Project, especially with respect to Fish Lake water quality modeling. This is a significant shortcoming of the EIS, because without being able to review the water quality modeling documentation associated with Fish Lake it is not possible for reviewers to understand the fundamental reasons for the modeling results, or to evaluate the results.

MacDonald Environmental Services Ltd., on behalf of the Tsilhqot'in National Government, noted deficiencies in Taseko's water quality modelling; notably insufficient baseline data, insufficient quality assurance and the use of inappropriate detection limits for model inputs. Mr. MacDonald stated that Taseko had failed to provide a comprehensive description of model inputs and assumptions and the selection of model inputs were inappropriate. These deficiencies created substantial uncertainty in estimates of water and sediment quality and stream flow under baseline conditions and the predictions likely represent underestimates of future concentrations of contaminants of concern. Mr. MacDonald summarized Taseko's work on water quality and quantity: "Taseko had failed to demonstrate that changes in water quality

and water quantity due to mine-related activities would not cause significant adverse effects. There is a significant risk of failure if project proceeds.”

Fisheries and Oceans Canada also noted key deficiencies in the modelling predictions: “Taseko’s water quality model inputs likely do not capture real seasonal variability in nitrogen-availability in Fish Lake throughout the growing season, necessarily dampening variability in future water chemistry predictions; and concludes that, ‘significant uncertainty’ exists in Taseko’s predictions of fisheries productivity”.

6.3 WATER QUALITY PREDICTIONS

6.3.1 Proponent’s Assessment

Taseko stated most, if not all, of the streams and lakes were considered to be in undisturbed wilderness, with limited influence from human activities. With a few exceptions, the majority of measured baseline values studied did not exceed the *British Columbia Water Quality Guidelines* or water quality guidelines of the Canadian Council of Ministers of the Environment for the protection of aquatic life.

Taseko stated the components of the mine development plan that might impact water quality and aquatic ecology within the Project area included:

- placement of the tailings storage facility upstream of Fish Lake (Teztan Biny);
- maintenance (recirculation) of Fish Lake; and
- long-term changes to the hydrological regime in the Fish Creek (Teztan Yeqox) watershed:
- including reduced natural discharge into Upper Fish Creek and Fish Lake Tributaries; and
- the redirection of flow accumulated to the south of the tailings storage facility to Beece Creek (Bisqox) drainage (at closure).

Based on the Project design, no releases of mine site water to the receiving environment would occur until the post-closure period. During operations, any water that comes into contact with the mine site would be directed to the supernatant pond within the tailings storage facility. Fish Lake (Teztan Biny) outflow would be recirculated to the inlets of Fish Lake with excess water being pumped to the tailings storage facility. To the extent possible, seepage from the tailings storage facility would be collected in seepage collection ponds and in groundwater interception wells. All seepage water collected would be pumped back into the tailings storage facility.

In the post-closure period, mine site water, including seepage from the main embankment, would be directed to the open pit, by-passing Fish Lake, until such time as the water quality was deemed suitable to be released to the receiving environment.

Fish Lake

Fish Lake (Teztan Biny) was described as a relatively small (111 ha), shallow (mean depth of 4 m), meso-eutrophic, stratified lake with a hypoxic (decreased oxygen) and nutrient-rich bottom (hypolimnetic) water layer with substantial amount of phosphorous retained in the sediments. Taseko stated that Fish Lake was primarily a phosphorus-limiting lake. The effects of the Project on the aquatic ecology in Fish Lake were based on predictive water quality and productivity modelling that considered hydrologic inputs and chemical loadings.

Modelled water quality predictions indicate that, as a result of Fish Lake (Teztan Biny) recirculation and seepage inputs from the tailings storage facility, there would be an increase in

metals and sulphate concentrations in Fish Lake during operational and post-closure periods. These predictions would result in several water quality guidelines being exceeded. Aluminum, cadmium, iron, selenium, silver, and thallium would exceed the federal water quality guideline for the protection of aquatic life during all project phases. Other elements including aluminum, boron, and cadmium would exceed the provincial water quality guidelines during all project phases. Recirculation of lake water into the tributaries would also alter the current hydrologic and thermal regimes in the tributaries and the current trophic status of the lake. Modelled predictions also indicated an increase in nutrients concentration of approximately 28% through all project phases.

Two phosphorus-based models were used to predict the productivity and trophic status of Fish Lake (Teztan Biny); the Vollenweider empirical mass balance model and the BATHTUB eutrophication response model. The primary objective of the Fish Lake productivity models was to understand how the reduction in stream flow rates and induced recirculation of Fish Lake water and the potential un-captured tailings seepage, caused by the Project configuration, might affect nutrient cycling and fish population dynamics in Fish Lake. In addition, nutrient data from the (GoldSim) water quality model described above were used in conjunction with the BATHTUB model data to determine the trophic status of Fish Lake during the different project phases.

Modelled analyses based on total phosphorus and Chlorophyll a indicated the trophic status of Fish Lake (Teztan Biny) could change from the current baseline meso-eutrophic (total phosphorus (TP) of 20-35 µg/L) condition to a more productive, eutrophic (TP of 35-100 µg/L) state during the life of mine and beyond. This change, in turn could result in diminished fish productivity and a reduced lake water quality. The main cause of eutrophication would be excessive nutrient loading (28% increase). Despite reduced inflow and external nutrient loading from the watershed Taseko predicted that the increase in nutrient concentrations was likely related to substantial internal nutrient regeneration or loading. Nutrient loading could elevate oxygen consumption in the bottom waters resulting in hypolimnetic oxygen depletion which in turn could exacerbate the internal nutrient loading, particularly phosphorus. The ability of lake sediments to retain phosphorus was recognized by Taseko as the dominant internal process affecting lake water total phosphorus concentration and the key component in determining overall water quality in Fish Lake. Models showed that over 60% of the phosphorus budget in Fish Lake might be due to internal phosphorus regeneration. The release of sediments or sediment-laden water to Fish Lake would have the potential to affect aquatic ecology (phytoplankton and zooplankton). Taseko stated that the implications of more phosphorus inputs as a result of mine development would be a more productive (eutrophic) Fish Lake.

The predicted shift in Fish Lake (Teztan Biny) trophic status from a mesotrophic to eutrophic state might have an effect on phytoplankton productivity and biomass. Specifically, increase in phosphorus concentrations in Fish Lake might result in higher Chlorophyll a concentration, an indication of the status of a water body's primary productivity, which would result in elevated noxious algal (cyanobacteria) blooms, hypolimnetic oxygen depletion, and ultimately deterioration in water quality and lake biodiversity. In addition, Fish Lake's phytoplankton community might become overtaken by algal blooms. Taseko stated that an increase in nutrients could also result in growth and productivity of the zooplankton populations which would have a positive effect on fish in the form of an increased food source.

Reduced inflow would also affect the hydraulic (water) residence time, with implications for overall lake productivity. Hydraulic residence time and loading rate were considered important factors to determine a lake's trophic state. In general, an increased hydraulic residence time might provide more time for phytoplankton to up take nutrients, both from external sources and

internally regeneration from lake sediment. The potential change in hydraulic residence time with respect to the proposed reduced inflow to Fish Lake (Teztan Biny) would be increased hydraulic residence time in Fish Lake from the current 0.72 years to 1.81 years. However, the planned recirculation of water from the outlet of Fish Lake back to the inlet tributaries would lower hydraulic residence time to 1.05 years, minimizing the effects of reduced flow on the lake ecology (phytoplankton and zooplankton).

Taseko concluded that there was the possibility of a shift in lake productivity from the current meso-eutrophic to a eutrophic system with potential effects of increased algal blooms, macrophyte growth, and periodic winter fish kills; however, the change would be gradual and measurable so that monitoring and appropriate mitigation would allow Taseko to maintain water quality to the current trophic state.

Given that measurable increases to primary productivity were anticipated Taseko concluded that the magnitude of the significance for nutrient concentrations was high. Metal and sulphate concentrations were determined to be moderate. While the predicted effects were long-term, it was reversible. With implementation of proposed mitigation, frequent monitoring, and if required, adaptive management strategy, Taseko concluded that the environmental effects on Fish Lake (Teztan Biny) would not be significant and the lake ecology could be maintained.

Adjacent Lakes and Streams

Based on Taseko's water quality modelling, water quality guideline exceedances in lakes and stream adjacent to the Fish Creek (Teztan Yeqox) watershed were noted for a variety of predicted average and maximum concentrations. Predicted maximum concentrations in particular exceeded provincial or federal guideline values for aluminum, cadmium, iron, copper, sulphate, mercury, selenium and silver.

The pit lake and Wasp Lake showed the widest range of variables and predicted exceedances for the modeled water bodies, with the pit lake showing the highest average concentrations of metals and sulphate above selected toxicity values overall. During the period of pit filling, water would not leave the pit to downstream habitat in Fish Creek (Teztan Yeqox) and it would likely be necessary to adaptively manage water quality prior to its release downstream. Adaptive management would likely involve water treatment as the pit fills with water and potentially as the pit discharges downstream. Based upon this anticipated requirement and deployment of adaptive management in the pit lake, Taseko stated it would ensure that no adverse significant effect would occur.

The location of the tailings storage facility would be less than 500 m up-gradient of Wasp Lake. In the event that seepage water escaped from the south end of the tailings storage facility it could surface in the adjacent Wasp Lake. During the post-closure phase water from the southern-most catchment of the tailings storage area would be released to Wasp Lake. Taseko predicted that concentrations of most contaminants of concern would increase in Wasp Lake, and in many cases these increases would be by orders of magnitude. Taseko predicted that both selenium and mercury would begin exceeding the federal water quality guidelines during early mine operations and would be more than one order of magnitude higher (more than 10 times higher) than the water quality guidelines for post-closure. Sulphate, fluoride, cadmium, copper, iron, silver, aluminum and beryllium would all exceed the federal water quality guidelines by Year 21 due to seepage pond discharge entering the lake. Wasp Lake drained intermittently to Beece Creek (Bisqox) so changes in water quality variables in Wasp Lake affected water quality variables in Beece Creek and Taseko River (Dasiqox), which were characterized as fish bearing water bodies.

Taseko predicted that concentrations of most variables in Big Onion Lake (Jidizay Biny), located to the west and down-gradient of the tailings storage facility, would increase. However most of these variables would remain below the federal water quality guidelines. Water quality impacts to Big Onion Lake were not observed in the model until closure, approximately Year 21, when water from the west seepage collection pond entered the lake, and again at post-closure, approximately Year 50, when tailings storage facility pore water contributed to groundwater base flow entering the lake. The most notable change in Big Onion Lake was mercury, which exceeded the federal water quality guidelines by a factor of 32. Mercury would remain below the water quality guidelines (0.000026 mg/L) during operations but begin exceeding the guidelines during closure, reaching 0.00089 mg/L by Year 50. Selenium would begin exceeding the provincial and federal water quality guidelines during operations and would continue to increase at post-closure. Cadmium began to increase at closure exceeding both the federal and provincial water quality guidelines by a factor of approximately 2.5.

Lower Fish Creek (Teztan Yeqox) would receive water from the pit lake after it fills, at approximately Year 48. Model predictions indicated an increase in several variables within Lower Fish Creek during the post-closure phase. Taseko has committed to water treatment of the pit lake and tailings storage facility water, if unsuitable for discharge. The changes in post-closure water quality in Lower Fish Creek were found by Taseko to be high, local and lasting into the far future.

Water quality in Little Onion Lake is constant, changing only with seasonal variability, since the lake was predicted not to be affected by any direct or indirect impacts from the Project.

Overall, Taseko determined the magnitude of the residual effect on metal concentrations in adjacent lakes and streams was high, continuous and long term. With implementation of the mitigation measures the conclusion was that the environmental effects were not significant because the effect is site-specific and reversible.

6.3.2 Views of Participants

Mr. MacDonald, on behalf of Tsilhqot'in National Government, submitted that the results of Taseko's water quality modelling demonstrated that, for a number of substances, provincial water quality guidelines would be exceeded in Fish Lake (Teztan Biny) as a result of the proposed water recirculation. Mr. MacDonald submitted that Taseko had not developed nor tested a water treatment system that would enable Taseko to meet provincial guidelines; therefore Taseko's commitment to meet the water quality guidelines was optimistic. In addition, based on Natural Resources Canada higher predicted seepage volumes from the tailings storage facility, Mr. MacDonald claimed that the water quality conditions in Fish Lake would be worse than those predicted by Taseko.

In general, Environment Canada accepted that Taseko had collected, analyzed, and reported baseline data in accordance with standard procedures using appropriate quality assurance and control methods.

Environment Canada stated that Taseko's modelling suggested water quality in Fish Lake (Teztan Biny) might be marginal for the protection of aquatic life based on a comparison to the federal water quality guidelines and Environment Canada was uncertain that good water quality could be maintained in Fish Lake. Environment Canada expressed a concern that Taseko had underestimated the potential impacts of the Project on water quality in Wasp Lake, Little Onion Lake and Big Onion Lake (Jidizay Biny). Given that Big Onion Lake drains to the Taseko River (Dasiqox), Environment Canada was also concerned that Taseko might have underestimated

impacts on water quality in the Taseko River. This concern was based on three factors which introduced uncertainty to Taseko's water quality predictions:

- the potential underestimation of seepage from the tailings storage facility based on Natural Resources Canada's submissions;
- the potential for impacts on water quality caused by recirculation of water within the Fish Lake and Upper Fish Creek system, including uncertainty regarding how this recirculation was taken into account in the modeling; and
- doubts about Taseko's contingency plan for water treatment.

Environment Canada noted that Taseko asserted that recirculation would effectively maintain Fish Lake (Teztan Biny), but did not describe or cite case studies where mitigation of this kind had been successful. Environment Canada was concerned that the recirculation proposed to manage water quality and the biological productivity of Fish Lake were unproven at this scale, and might require additional intervention to ensure success. The high level of uncertainty regarding Taseko's proposed recirculation scheme was of particular concern given the stated goal of preserving Fish Lake.

In Environment Canada's view, if Taseko committed to the installation and operation of a water treatment plant at the outlet of the pit lake there would be no effects on water quality downstream of Fish Lake (Teztan Biny).

The potential for the Project to have impacts on the water quality in Big Onion Lake (Jidizay Biny), particularly with respect to mercury and selenium was a concern to Environment Canada. The main source of contaminants, including selenium, would be seepage from the tailings storage facility. If the amount of seepage had been underestimated then the volume of seepage from the tailings storage facility reaching Big Onion Lake could be much greater than the amount predicted by Taseko. Environment Canada noted that mercury in Big Onion Lake was predicted to begin exceeding the federal water quality guidelines by an order of magnitude during closure, reaching a level of approximately 32 times higher. Environment Canada was also concerned that methyl mercury concentrations might be elevated and might bioaccumulate in fish in Big Onion Lake.

Environment Canada was similarly concerned that increased concentrations of selenium in the water column might result in increased concentrations of selenium in the food chain. Big Onion Lake (Jidizay Biny) being a small water body, an increase in selenium in the food chain could lead to reproductive effects on the fish, amphibians and waterfowl found in that environment. Environment Canada stated that although selenium was an essential micro-nutrient at trace levels, the difference between essential concentrations and concentrations at which such effects could occur could be quite small and sensitivities to elevated selenium concentrations tend to be higher in smaller water bodies than in flowing water bodies such as rivers and creeks.

Environment Canada expressed concern that Taseko might have underestimated impacts to Wasp Lake. It noted that Taseko predicted that both mercury and selenium would begin exceeding the federal water quality guidelines during early mine operations and would be more than one order of magnitude higher than the federal water quality guidelines post-closure. Sulphate, fluoride, cadmium, copper, iron, silver, aluminum, manganese, and thallium would all exceed the federal water quality guidelines in Wasp Lake by Year 21. However, Taseko's water management report stated that seepage from the tailings storage facility would reach Wasp Lake sooner and at higher proportions than assumed in the water quality model. Environment Canada expressed concern that Taseko might have underestimated impacts to Wasp Lake. In addition, if the amount of seepage had been underestimated, then the amount of seepage

(and contaminants in the seepage) that enters Wasp Lake could be even greater than the amount predicted by Taseko in its water management report.

In its review, Environment Canada noted that Taseko had acknowledged its predictions for Fish Lake (Teztan Biny) indicated water quality would be marginal and that mitigation was likely to be needed. Environment Canada noted that the active management technologies proposed by Taseko to control dissolved metal levels and to control dissolved oxygen and phosphorus levels in Fish Lake were unproven at the scale proposed. Additional intervention might be needed to ensure preservation of water quality in Fish Lake. Given the degree of uncertainty, Environment Canada was unable to draw any conclusions regarding the likelihood or magnitude of the effects of the Project on water quality. However, Environment Canada indicated that water treatment would be needed and needed indefinitely.

Dr. Freed noted that water quality predictions for Lower Fish Creek (Teztan Yeqox), Big Onion Lake (Jidizay Biny) and Wasp Lake were all higher than guidelines and that the effects of mitigation were not modelled for these lakes and there were lack of plans to mitigate discharge from the pit lake. Concentration of cadmium could pose a very serious risk to salmon that frequent the Lower Fish Creek and possibly the Taseko River (Dasiqox).

The British Columbia Ministry of Energy and Mines concluded that the Project presented an environmental risk due to the significant uncertainty in the seepage estimates, the ability to limit and collect tailings storage facility seepage and to effectively and economically treat water to maintain water quality in Fish Lake (Teztan Biny) and its tributaries. The Ministry concluded that, based on the current project design, the ability to prevent adverse effects to Fish Lake and its tributaries was uncertain and might not be assured.

The Ministry of Energy and Mines noted that Taseko had committed to directing tailings storage facility discharge to the open pit during closure due to exceedances of several water quality guideline parameters but was uncertain when and if water would be suitable for discharge to Upper Fish Creek (Teztan Yeqox). The Ministry stated that the concentration of contaminants in the un-captured tailings storage facility seepage groundwater plume could continue to increase over the life of the mine as groundwater migrated towards Fish Lake (Teztan Biny). Given the uncertainties in the estimated seepage rates, the full effects of the groundwater plume on receiving waters might not occur until well into the post-closure phase. The Ministry concluded that discharge water from the tailings storage facility might need to be relayed to the open pit in the long term and therefore Fish Lake might require recirculation in perpetuity, and that the proposed target water quality objectives for Fish Lake could be either technically or financially unachievable.

Mr. Tony Pearce, on behalf of the Tsilhqot'in National Government, questioned whether Fish Lake (Teztan Biny) could be saved. He identified three concerns: contamination of ground water; changes in the water quality of Fish Lake; and loss of water through hydraulic connection with the open pit. Mr. Pearce noted that Natural Resources Canada predicted tailings storage facility seepage rates were 11 times higher than Taseko's and therefore the water quality predictions made by Taseko were not reliable and should be discarded.

The British Columbia Ministry of Environment indicated that the future water quality in Fish Lake (Teztan Biny) remained uncertain because of the reduction of natural water flowing into Fish Lake.

The Ministry of the Environment noted that water from the seepage collection ponds were to be discharged to Big Onion Lake (Jidizay Biny) and Wasp Lake and in the absence of adequate mitigation, these lakes were expected to see deteriorating water quality. Creeks leading from

these lakes would go to Beece Creek (Bisqox) and Taseko River (Dasiqox) which were characterized as highly valuable fish streams.

Dr. Morin, on behalf of the Tsilhqot'in National Government, stated that Taseko provided unrealistically low predictions of Project effects on water quality, water contamination, and aqueous concentrations in seepage from the tailings storage facility. The unrealistically low predictions of water quality were based on the fact that concentrations in water escaping the tailings storage facility had been underestimated and source terms for groundwater seepage from the soil stockpile were not provided. Dr. Morin also noted that variables like temperature, nitrite and in some cases pH were not incorporated into the water quality predictions. Dr. Morin further submitted that the water in the tailings storage facility would be recirculated and reused in the mill year after year adding more contamination to the water each time. As a result, the mill process water discharged to the tailings storage facility would not restart at baseline conditions, but instead could increase some aqueous concentrations through time. Thus, aqueous concentrations in the tailings storage facility were under predicted resulting in the seepage concentrations also to be under predicted. Dr. Morin concluded therefore that the effects on Fish Creek (Teztan Yeqox) tributaries and Fish Lake (Teztan Biny) were underestimated.

The Tsilhqot'in National Government stated a major long-term risk to Fish Lake (Teztan Biny) water quality was seepage from the tailings storage facility escaping into the groundwater pathways underneath the impoundment and moving down-gradient to the lake. The Tsilhqot'in National Government reported that the reviews conducted by both Watterson Geoscience and Natural Resources Canada demonstrated that the numerical modeling provided by Taseko was not reliably supported by available data and was not based on an accurate conceptual hydrogeological model. As a result there were significant uncertainties about how accurately Taseko had been able to predict project-related changes to groundwater flow rates and movement patterns. This increased the risk that contamination of Fish Lake and other adjacent water bodies would occur over the long-term.

Natural Resources Canada stated that the deep groundwater seepage from the tailings storage facility that would not be recoverable would likely flow along pathways such as the basalt layers and daylight in the springs to the west of the ridge, near Big Onion Lake (Jidizay Biny) and up-gradient to the nearby Taseko River (Dasiqox).

Mr. Kuipers, on behalf of the Tsilhqot'in National Government, cited a study completed for the mining industry in 2010. The study recognized that the treatment of selenium was extremely problematic, both technically and from an economic stand point. Mr. Kuipers stated selenium was a contaminant of concern at over 50 percent of the mine sites that he was familiar with and as a process engineer, he could attest that there was no proven viable technologies for the treatment of selenium.

Dr. Morin pointed out that, in Taseko's examples of mines that had successfully treated selenium, it failed to note that New Prosperity was not using the same water treatment process. For example, Taseko noted that the Barrick's Richmond Hill Mine, South Dakota, used reverse osmosis to polish selenium from mine water after treatment by iron reduction and precipitation. However, according to Dr. Morin most of the selenium removal at Richmond Hill Mine was accomplished by the iron, which was not proposed for the Project, and not by reverse osmosis which might be used for the Project.

6.4 WATER TREATMENT AND ADAPTIVE MANAGEMENT

6.4.1 Proponent's Assessment

The primary feature of the Project was the retention of Fish Lake (Teztan Biny) and the intent for the lake to remain functioning and able to sustain the resident monoculture population of rainbow trout. Taseko committed to ensuring that the water quality in Fish Lake would be maintained at or better than 75% of the federal water quality guidelines and that adjacent streams and rivers would meet either generic water quality guidelines or site-specific water quality objectives that might be developed by the Province.

Taseko identified a number of design elements that were included to protect water quality and to achieve the objectives of the site wide water management plan including: coffer/flood control dams and lake recirculation systems; sediment and erosion control elements; seepage collection and seepage interception wells and recycle ponds; vertical depressurization wells around the open pit; and adaptive management and monitoring.

Monitoring of primary key indicators would provide Taseko with a well-defined measure of the trophic status of Fish Lake (Teztan Biny), while secondary key indicators would provide Taseko with clear indication of the water quality and sediment quality in the lake. The three criteria upon which Taseko would base its decision to initiate mitigation measures would be: the identification of threshold levels using British Columbia water and sediment quality guidelines to alert if levels are changing; the rate of change of the concentration; and monitoring and modelling of future overall trophic status of Fish Lake. The goal of the adaptive management plan would be to maintain a habitat capable of supporting a viable population of rainbow trout during the life of the mine. Taseko stated that the final adaptive management plan and its associated threshold levels would be determined at the time of permitting and adjusted throughout its implementation. In the event that monitoring indicated that predicted action levels were reached, mitigation in the form of active water treatment would be implemented. Taseko stated that water treatment would likely be required for the pit lake. No mitigation measures were predicted to be required for adjacent water bodies.

Taseko stated that it recognized one of the most important requirements for attaining long-term success in controlling eutrophication was sufficient reduction of phosphorus loading. If Fish Lake (Teztan Biny) water quality monitoring showed cause for concern at any time during the life of the mine and beyond, Taseko would commit to deploying several techniques to address the nutrient input. These techniques included physical measures such as hypolimnetic aeration or oxygenation, and chemical methods such as alum. Taseko considered Fish Lake to be a good candidate for hypolimnetic oxygenation because internal phosphorus regeneration from anoxic sediments was seen as a significant component of the total nutrients in Fish Lake. Lake aeration through artificial circulation could improve fish habitat, reduce fish kills, and improve overall water quality. The system would withdraw cooler, nutrient laden water from the bottom layers of Fish Lake and discharge it into the inlet tributaries. Hypolimnetic oxygenation would reduce anoxic conditions in the hypolimnion of Fish Lake by injecting pure oxygen through a system of diffusers located at the bottom of the lake. The amount of oxygen could be adjusted to reduce total phosphorus levels, Chlorophyll a, transparency and dissolved oxygen to at least the current meso-eutrophic level.

A phosphorus concentration trigger or alert range based on current Fish Lake (Teztan Biny) water quality data would be established for the management of phosphorus in Fish Lake. Taseko stated it would use a 50% increase trigger based on phosphorus concentrations of 15 to

42 µg/L. Therefore the trigger or alert phosphorus concentrations range for Fish Lake would be 22 to 63 µg/L.

A portion (35%) of the recirculated water in Fish Lake (Teztan Biny) would be treated in the water treatment facility, if required. Nano filtration water treatment system in combination with sulphide and lime precipitation to treat the permeate and subsequent ion exchange circuits for sulphate and selenium removal were the proposed mitigation method for metal concentrations. Nano filtration would deplete the effluent of any essential minerals for fish habitat. Therefore, if required, sodium bicarbonate would be applied to the lake to maintain the current dissolved solids and overall alkalinity (pH) of the lake. Taseko stated that the design flows and system effectiveness for the water treatment had been sized in order to handle the worst case scenario predicted in the EIS. This would take into account the largest rate of increase in concentration of metals in Fish Lake throughout all phases of the Project.

In response to questions Taseko stated that it was unaware of any specific wilderness lakes that had been subject to a recirculation process similar to that being proposed for Fish Lake (Teztan Biny). Taseko submitted that while no other project might have been required to do what it was proposing, each of the components of the system had been proven at this scale and Taseko was simply proposing to put the components together.

During the hearing Taseko proposed additional commitments for monitoring water and the adaptive management plan that would address water quality variables, water levels in Fish Lake (Teztan Biny), flows into and out of Fish Lake groundwater, seepage and seepage interception, determination of threshold levels of action for the variables being monitored, and the recirculation system design. The plan would also specify the process for engaging regulatory agencies and Aboriginal groups during the implementation of the plan.

Taseko had also committed to the installation of a hypolimnetic aeration system in Fish Lake (Teztan Biny) before the start of construction to reduce the current seasonal eutrophication and to mitigate against further eutrophication once recirculation had started.

Prior to receiving a *Mines Act* permit and an *Environmental Management Act* permit from the Province to operate the mine, Taseko stated it would:

- assess available water quality treatment systems, including reverse osmosis, and identify the preferred system;
- confirm/revise water quality modeling with specific reference to the proposed water treatment system; and
- document how procurement, delivery, installation and operation of the system would be undertaken in accordance with the overall water monitoring and adaptive management plan.

Although potential exceedances had been identified, Taseko stated the predictions were conservative given the nature of the models used and that predictions were made without consideration for treatment and other mitigation efforts.

Subsequent modelling of the tailings storage facility seepage collection efficiency requested by the Panel provided an indication that the use of seepage collection ditches and ponds downstream of the embankments could achieve a capture rate of approximately 70%, a value greater than that used in the EIS water quality modelling. This result provided further support to the position that un-captured seepage reporting to the inlets of Fish Lake (Teztan Biny) would be a small component of the overall flow, and that water quality in the inlets could be managed

with the release of appropriate surface flows from the tailings storage facility lake and upstream catchments in the closure and post-closure phase.

Taseko claimed that a detailed monitoring and adaptive management plan was not required at the environmental assessment level. Rather, it argued that a “proof of concept” plan was sufficient in order to demonstrate that the concept could be successfully implemented and that the required technology and resources could be obtained and used. Taseko stated it had supplied a plan for the purposes of the environmental assessment that went beyond the proof of concept.

In its final submission Taseko stated that changes to water quality in Fish Lake (Teztan Biny) were very unlikely, but that the quality of the water in the lake would be carefully monitored. If a problem did arise there were a large number of mitigation measures readily available. Taseko predicted that any potential adverse effect would be small in magnitude and although the duration of effects would be long-term, they were site-specific to the Fish Lake watershed. The frequency of the effects would be continuous but gradual, allowing the application of adaptive management. Taseko concluded that Fish Lake would be preserved and protected and that speculation from other participants as to harm was largely unfounded. It went on to state that any harm to the lake that might result would not be irreversible. In this case for Fish Lake, “dead is not dead”, it would be “just resting”.

6.4.2 Views of Participants

Environment Canada noted that Taseko asserted recirculation of lake water would maintain Fish Lake (Teztan Biny), but did not describe or cite case studies where mitigation of this kind had been successful. Environment Canada expressed concerns that the recirculation proposed to manage water quality and the biological productivity of Fish Lake was unproven at this scale, and might require additional intervention to ensure success. The high level of uncertainty regarding Taseko’s proposed recirculation scheme was of particular concern given the stated goal of preserving Fish Lake. From Environment Canada’s perspective, the high levels of management at ever increasing levels of complexity increase uncertainty and risk.

Dr. Freed, on behalf of Tsilhqot’in National Government, stated that Fish Lake (Teztan Biny) water quality predictions produced by Taseko did not take treatment of Fish Lake into account. Although Taseko proposed treatment as a mitigation measure and a conceptual plan was provided, details on the effectiveness of the treatment were not provided or modelled. Dr. Freed developed an annual water quality model of Fish Lake with the intent to better understand the potential effects of the tailings storage facility seepage, other contaminant loading sources and the effectiveness of the proposed treatment system on water quality in Fish Lake. She used the model to predict the resulting concentrations for a contaminant of concern, specifically cadmium, in Fish Lake due to the mixing of different surface and sub-surface water sources entering and leaving Fish Lake.

The water quality model developed by Dr. Freed was run for various scenarios to assess the effects of the proposed treatment system (BIOTEQ) on Fish Lake (Teztan Biny) water quality, using unrecovered seepage inflow estimates provided by Taseko (2.4 L/s) and Natural Resources Canada (11.8 L/s). The parameters used in the model were derived from inflow and outflow assumptions, seepage flow paths and capture efficiencies presented in the EIS. The capture efficiency of tailings seepage that passes under the main embankment was assumed to be 80%. Dr. Freed stated that cadmium was selected as the contaminant of concern to illustrate the effectiveness of treatment because cadmium is a very sensitive constituent in the aquatic ecosystem.

Dr. Freed concluded that modelled results for each of the simulations showed that water quality guidelines could not be met with the BIOTEQ water treatment method proposed by Taseko. Using Taseko's seepage rates, her model showed that cadmium concentration would be 0.05 µg/L after treatment compared to the provincial water quality guidelines of 0.028 µg/L. Using Natural Resources Canada's seepage rates, her model showed that cadmium concentrations would be 0.09 µg/L after treatment. Dr. Freed submitted that even if 100% of the recirculation was directed to be treated, cadmium levels in Fish Lake would continue to be above 0.04 µg/L, which was not protective of aquatic life.

Several participants maintained that water treatment would be a long-term requirement of the Project and should not be viewed as a contingency plan. Dr. Morin stated there remained substantial uncertainty around which location(s) would be treated, when treatment would have to start, how long treatment would be needed, whether full-scale treatment would be successful, and whether the cost of treatment would render the Project economically unfeasible.

The British Columbia Ministry of the Environment evaluated the effects of the proposed mitigation strategies and concluded that there were a lot of uncertainties as to whether Fish Lake (Teztan Biny) water quality could be maintained. The treatment options proposed (aeration and chemical inputs) for phosphorus are typically used when human impacts to a lake have resulted in phosphorus levels that could not be dealt with through less invasive options such as reducing phosphorus input. In its review of various phosphorus treatment methods, the Ministry stated that success appeared to have been inconsistent and no option guaranteed success. This uncertainty makes it difficult to ensure phosphorus could be managed in Fish Lake once the upper watershed runoff was greatly reduced and water would be recirculated to the inlet tributaries.

The Ministry of the Environment added that there was also the potential for increased metals input to Fish Lake (Teztan Biny) and concluded: "while treatment is proposed, it is unproven technology over the long-term, potentially costly, and will impose another level for processing of Fish Lake water during its long-term recirculation".

The Tsilhqot'in National Government expressed concern regarding the likelihood that adequate monitoring would be undertaken to effectively implement the proposed adaptive management plan to mitigate unexpected ecosystem changes. In its view, Fish Lake (Teztan Biny) had been improperly characterized as being phosphorus-limited pointing to an array of evidence that suggested that the lake experienced nitrogen-limited conditions for primary production and stated that there existed conditions in the lake that might exacerbate nitrogen-deficiencies should Taseko recirculate hypolimnetic waters to the tributaries as proposed.

The British Columbia Ministry of Energy and Mines stated the water treatment for the Project did not provide confirmation that the proposed target water quality objectives for Fish Lake (Teztan Biny) were likely to be either technically or financially achievable. The Ministry concluded in a memo to the Panel that it was unlikely that the Project could be developed as currently designed without adverse effects to the water quality of Fish Lake and its tributaries from tailings storage facility seepage, and stated that even with expensive and long term measures to mitigate tailings storage facility seepage, the protection of Fish Lake water quality might not be assured. In a follow up memo the Ministry modified this statement by saying that the protection of Fish Lake water quality was uncertain.

Dr. Leslie Smith stated that the seepage mitigation measures described by Taseko had the potential to substantially reduce the volume of seepage, but not eliminate seepage from entering Fish Lake (Teztan Biny), Wasp, Little Onion Lake and Big Onion Lake. Each of these

water bodies is located downstream of the tailings storage facility where natural hydrodynamic containment is not present, for the design height of the impoundment. Further details can be found in Chapter 5.

6.5 PANEL'S CONCLUSIONS AND RECOMMENDATIONS

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

- The Project would result in a reduction in the annual flow volumes in Lower Fish Creek (Teztan Yeqox) during operations and closure but would be reversible in the post-closure period.
- The main embankment of the tailings storage facility would result in a reduction of the Fish Creek (Teztan Yeqox) catchment area thereby reducing the inflow from the two main inlet tributaries into Fish Lake (Teztan Biny) by 58% during operation and closure.
- The average annual flow volumes of the Beece Creek (Bisqox) watershed were expected to increase by 2.5% in post-closure and Taseko considered this change in annual flow volume minor.
- The watershed area of Wasp Lake would be permanently increased from baseline when water from the southern-most catchment of the tailings storage area was released to Wasp Lake and ultimately to Beece Creek.
- The Project would be designed so that there would be no planned discharge of water from the mine site to the receiving environment until Year 48.
- Recirculation of water from the outlet of Fish Lake back to the inlet tributaries would be required to maintain lake levels and inlet spawning habitat.
- There was uncertainty regarding how long recirculation of water in Fish Lake would be required but would likely be required in the long-term, potentially in perpetuity.
- Water quality variables were predicted to exceed many of the provincial and federal water quality guidelines in Fish Lake and adjacent water bodies.
- There was uncertainty regarding the water quality modelling methodology and no documentation had been made available by Taseko that provided a detailed description of the mass balance water quality model for Fish Lake.
- Taseko committed to water quality monitoring and adaptive management to ensure water quality variables did not exceed predictions.
- While water quality was predicted to change in Fish Lake and adjacent water bodies, Taseko viewed water treatment as a contingency plan.
- The Panel agrees that the active management technologies proposed by Taseko to control dissolved metals, dissolved oxygen and nutrient levels in Fish Lake are unproven at the scale proposed.
- The Panel agrees that treatment would be needed to treat water quality in Fish Lake indefinitely.
- Taseko indicated that although no mine had done exactly what it was proposing, similar mines in British Columbia had used the various strategies proposed by Taseko to mitigate water quality.
- After considering comments from several participants the Panel finds that the proposed membrane water treatment, sulphide reduction and ion exchange water treatment technologies were not widely used in mining applications and none were currently used at mines in British Columbia.

- There was uncertainty regarding the volume of seepage that would escape from the tailings storage facility and the volume of seepage that could be captured before reaching Fish Lake and the adjacent water bodies.
- The Panel assumed an unrecovered seepage rate from the tailings storage facility to Fish Lake of 11.8 L/s, as predicted by Natural Resources Canada, significantly higher than what was predicted by Taseko.
- Selenium content of the mine site host rocks was elevated and Taseko predicted that leaching of selenium from tailings and mine rock might be a concern.
- The Panel agrees that it is unlikely that the Project could be developed as currently designed without adverse effects to the water quality of Fish Lake and its tributaries from tailings storage facility seepage.
- The Panel agrees that the Project presents an environmental risk due to the significant uncertainty in the seepage estimates, the ability to limit and collect tailings storage facility seepage and to effectively and economically treat water to maintain water quality in Fish Lake and its tributaries.

Changes to stream flow pathways and watershed area

The retention of water at the mine site during mine operations and closure would considerably reduce flows from the Fish Creek (Teztan Yeqox) watershed into the Taseko River (Dasiqox). While there would clearly be a large change in flows in Lower Fish Creek the Panel considers these flows to be a small portion of the total flow in the Taseko River even during the spring freshet. The Panel also notes that Taseko would restore natural flows to Lower Fish Creek in post-closure and therefore considers these changes to be low in magnitude and would be reversible at post-closure. For Beece Creek (Bisqox), the flow would not change during operations and would permanently increase by 2.5% post-closure. In the previous review the previous panel determined that a 4% increase in flow levels in Beece Creek would still be within the range of natural variability. The Panel notes that the increase in flow levels in Beece Creek was raised by the owners of the Taseko Lake Lodge during the previous review and again during this review. Given the concerns raised regarding flooding at Taseko Lake Lodge, and the permanent nature of the change, the Panel encourages Taseko to explore options for post-closure water management to minimize potential flooding at this location.

The Panel concludes that the Project would permanently alter the water flows in the Fish Creek (Teztan Yeqox) and Beece Creek (Bisqox) watersheds, but these effects would not be significant.

RECOMMENDATION 4

The Panel recommends that, if the Project proceeds, Taseko be required to monitor water levels in Beece Creek (Bisqox) and implement corrective action if water levels fall outside the range of predicted natural variability.

Water Quality: Fish Lake

For water quality, the Panel notes that Taseko predicted water quality would exceed the provincial and federal water quality guidelines for several variables; aluminum, cadmium, iron, selenium, silver, mercury and thallium exceed the federal guideline for the protection of aquatic

life; and that aluminum, boron, and cadmium would exceed the provincial guidelines during and after mine operation.

Water quality predictions were modeled in the absence of mitigation measures such as collecting and pumping back seepage from the tailings storage facility or active water treatment. The Panel notes that the concentration of metals in Fish Lake (Teztan Biny) would be reduced by the collection and pump back wells. The Panel also notes that the seepage from the tailings storage facility expected by Natural Resources Canada is considerably greater than estimated by Taseko. On balance, the Panel concludes, as did most presenters on this subject, that there would be higher concentrations of water quality contaminants of concern in Fish Lake than modelled by Taseko.

The Panel heard uncertainties about whether the data collected by Taseko was sufficient to accurately predict water quality at the mine site. These uncertainties could result in even higher water quality guideline exceedances. The Panel notes that even if these predictions were underestimated, Taseko had 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 from the pit lake and the recirculated water in Fish Lake (Teztan Biny) to meet these requirements. The length of time for which recirculation of water in Fish Lake and water treatment might be required was also an uncertainty but was expected to be required into the far future; well beyond closure.

The Panel concludes the concentration of water quality variables in Fish Lake (Teztan Biny) would be considerably larger than Taseko's predictions. If so, then concentrations of contaminants of concern also would exceed the provincial and federal water quality guidelines. In accordance with guidance provided in the Agency's *Reference Guide: Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects*, and adopted by the Panel, this result would be a likely significant adverse effect.

In addition to the concentration of contaminants of concern, Taseko identified eutrophication of Fish Lake (Teztan Biny) as a potential problem. Taseko indicated it would manage this effect by adaptively managing the lake, and treating phosphorus as the limiting nutrient. Taseko also advised there were several treatment options available if changes in water quality in Fish Lake warranted it, which could mitigate the effect(s).

The Panel's mandate is to consider measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project. The Panel received a considerable amount of information concerning the effectiveness of the mitigation measures proposed by Taseko and some advice regarding whether these measures would be cost effective. The Panel concludes that several water treatment options would be necessary, but would likely not be effective in the long-term. The Panel notes that while Taseko has committed to implementing water treatment, if necessary, several participants from various organizations determined serious risks in relying on the water treatment methods proposed by Taseko. It is also possible or even likely that treatment would be required for pit lake discharge and for discharge of seepage pond water to water bodies such Wasp Lake and Big Onion Lake (Jidizay Biny).

As pointed out by the Province of British Columbia, Taseko would have to assume any costs of water treatment independent of any closure security held by the Province. The capital and operating costs for water treatment would be considered in any future evaluation of financial security requirements by the British Columbia Ministry of Energy and Mines but it expected that

the amount of financial security that could be required to fund this scale of long-term liability would be very high and would likely be unprecedented in the province.

Based on the evidence, the Panel finds it is unable to accept Taseko's conclusion that the water treatment options proposed would effectively mitigate the adverse effects of the Project on Fish Lake (Teztan Biny) water quality. The Panel concludes that the proposed recirculation scheme, the adaptive management plan and the water treatment options are unlikely to work effectively in the long-term. On this basis, the Panel concludes the "proof of concept" test proposed by Taseko for the environmental assessment has failed.

The Panel has assessed the Project's effects on water quality, pursuant to its mandate under section 5(2)(a) of CEEA 2012. The Panel notes that if the Project were to proceed Taseko would be required to obtain authorization under subsection 36(3) of the *Fisheries Act* and the *Metal Mining Effluent Regulations* under that Act. As set out in subsection 2(1), the *Metal Mining Effluent Regulations* applies to mines that exceed an effluent flow rate of 50 m³ per day, based on effluent deposited from all the final discharge points of the mine and deposit a deleterious substance in any water or place referred to in subsection 36(3) of the Act. Effluent includes seepage from tailings and other mine waste disposal facilities. As a result, if seepage is deposited in a lake or stream that is fish-frequented, or deposited into surficial geological units or into underlying rock units which are hydraulically connected to nearby lakes or streams that are fish-frequented, then that seepage would be subject to the requirements of the *Metal Mining Effluent Regulations*.

The Panel also notes that Fish Lake (Teztan Biny) is downstream of the proposed tailings storage facility, the milling facility, overburden and ore stockpiles. Although outside of the Fish Lake drainage basin, Wasp Lake, Big Onion Lake (Jidizay Biny), and Little Onion Lake could receive seepage from the tailings storage facility. Wasp Lake would be less than 500 m from the south embankment of the tailings storage facility.

The Panel concludes that the Project would result in a significant adverse environmental effect on water quality in Fish Lake (Teztan Biny).

The Panel is unable to recommend any measures that would mitigate the significant adverse effects of the Project on water quality in Fish Lake (Teztan Biny) should the Project proceed. The Panel is aware that there are many water treatment options available to Taseko should monitoring indicate there is a need for water treatment; however the Panel still questions the ability to maintain the water quality in Fish Lake in the long term. Given the predicted exceedances in water quality criteria for several variables, the uncertainty in tailings storage facility seepage and capture rates, and the intended goal to preserve the integrity of Fish Lake, the Panel is of the opinion there are too many risks and uncertainties with respect to the proposed recirculation scheme, the adaptive management plan and the technical and economic feasibility of the various water treatment options to conclude that the ecological integrity of Fish Lake could be maintained in the long term.

Water Quality: Adjacent Streams and Lakes

The Panel is concerned that Taseko has underestimated the potential impacts of the Project on water quality in Wasp Lake, Little Onion Lake and Big Onion Lake (Jidizay Biny). The Panel finds that Wasp Lake, Big Onion Lake, and Little Onion Lake could receive seepage from the tailings storage facility sooner than predicted. Given that these lakes drain to the Taseko River

(Dasiqox), the Panel is also concerned that Taseko's analysis is not sufficient to confidently estimate the impacts on water quality in the Taseko River.

The previous panel concluded the effects would not be significant. Although the tailings storage facility proposed for the New Prosperity Project has a smaller footprint, it is significantly higher than that proposed for the previous project, and consequently a greater amount of the seepage would flow in the direction of these water bodies. Moreover, the groundwater flows are not well understood in this area and have not been investigated in any detail. Significant pathways may exist between the tailings storage facility and the Onion Lakes and the Taseko River. The Panel took into consideration the long lead time before seepage would arrive at the Onion Lakes which allows Taseko time to monitor water quality and implement appropriate mitigation should water quality exceed applicable water quality guidelines.

The Panel concludes that even with mitigation the water quality in Wasp Lake is likely to be adversely affected. The Panel also concludes that without effective mitigation water quality in the Onion Lakes would be affected by seepage. The Panel considered Taseko's response to an undertaking made by the Panel, which incorporated additional mitigation to intercept seepage downstream of West Embankment and the model showed no seepage reaching the Onion Lakes. Given that Taseko's response was not reviewed by others the Panel needs to ensure that Taseko's proposed mitigation measure would be effective and feasible. To act in a precautionary manner the Panel accepts Environment Canada's and Dr. Smith's conclusion that seepage to the Onion Lakes is likely, even with mitigation and more information would be required for the Panel to be confident the effects would not be significant.

The Panel concludes that pore water seepage from the tailings pond would have a significant adverse effect on water quality in Wasp Lake.

The Panel concludes that pore water seepage from the tailings pond would not have a significant adverse effect on water quality in Big Onion Lake (Jidizay Biny) and Little Onion Lake provided effective mitigation is proven and applied.

The Panel concludes that the Project would not result in a significant adverse environmental effect on water quality in Beece Creek (Bisqox) and the Taseko River (Dasiqox).

RECOMMENDATION 5

The Panel recommends that, if the Project proceeds, Taseko be required to:

- reaffirm predicted impacts on all water bodies influenced by the Project to ensure adequacy of monitoring and mitigation measures. Attention should be given to water quality variables likely to exceed provincial and federal water quality guidelines and particular attention should be given to selenium and mercury concentrations;
- model water quality predictions with water treatment in place to evaluate the effectiveness of the proposed water treatment options for Fish Lake (Teztan Biny), pit lake discharge to Lower Fish Creek (Teztan Yeqox) and discharges from the tailings storage facility to receiving bodies such as Wasp Lake and Big Onion Lake (Jidizay Biny);
- provide detailed costing and model the economic feasibility of water management plans for the proposed Project such as long-term recirculation, seepage pump back

and water treatment of Fish Lake, pit lake discharge to Lower Fish Creek and discharges from the tailings storage facility to receiving bodies such as Wasp Lake and Big Onion Lake;

- work with Environment Canada, and Natural Resources Canada and the British Columbia Ministry of Energy and Mines to gain a better understanding on the current state of knowledge regarding sources, fate and effects of selenium in mining operations, and the sector's capacity to control it;
- measure site specific hydrometeorological conditions at the Project site, as well as review the watershed model periodically to ensure the water management plan continues to reflect the best available information;
- investigate the hydrogeology between the tailings storage facility and the Onion Lakes; and
- develop detailed plans and demonstrate the effectiveness of mitigation for the interception of seepage leading from the tailings storage facility to Big Onion Lake and Little Onion Lake.

7 FISH AND FISH HABITAT

This chapter discusses the Project's key effects on fish and fish habitat (stream, lake and riparian) and the feasibility of and potential for Taseko's proposed fish and fish habitat compensation plan to compensate for these effects. The Project effects on fish and fish habitat are linked to Project effects on water quality and quantity (Chapter 6). Because the water quality assessment indicated the potential for the water quality to be impaired in Fish Lake (Teztan Biny) and for Fish Lake to become eutrophic, the resultant impact to fish in Fish Lake is assessed in this chapter.

The key issues identified by the Panel include the permanent loss of Little Fish Lake (Y'anah Biny) and portions of Middle and Upper Fish Creek (Teztan Yeqox), the loss and alteration of fish habitat in Lower Fish Creek, the changes in Fish Lake aquatic ecology and the long-term viability of fish populations in Fish Lake. The Panel also has identified the proposed fish and fish habitat compensation plan, including the use of flow augmentation and recirculation to maintain Fish Lake (Teztan Biny) and the effects on salmon habitat as a potential concern.

The issues relating to food fisheries for Aboriginal people are addressed in Chapter 12.

7.1 PROJECT EFFECTS ON FISH AND FISH HABITAT IN FISH CREEK WATERSHED AND SURROUNDING WATER BODIES

7.1.1 Proponent's Assessment

Taseko stated that the Project would affect the quality and quantity of fish and fish habitat in the Fish Creek (Teztan Yeqox) watershed. Effects would encompass in-stream, lake and riparian habitats in the Fish Creek watershed, all mainstream and tributary habitat, to and including the confluence of Fish Creek with the Taseko River (Dasiqox).

Taseko stated that the Project would preserve Fish Lake (Teztan Biny) and much of the upstream fish habitat. Taseko acknowledged that there would be a loss of fish habitat immediately below Fish Lake.

Lower Fish Creek

Taseko reported that Lower Fish Creek (Teztan Yeqox) provided seasonal rearing and refuge habitat for fish from the Taseko River (Dasiqox). Rainbow trout, Chinook salmon, bull trout, mountain whitefish and white sucker accessed this habitat by migrating upstream from the Taseko River. Taseko reported that the Project would temporarily alter all 16 371 m² of in-stream habitat available in Lower Fish Creek. The Project would reduce flows to Lower Fish Creek by 75% of baseline levels, which would be insufficient to sustain fish populations or habitat in these lower reaches of Fish Creek. The natural flow regime to Lower Fish Creek would be re-established during post-closure, at approximately Year 48.

Flow contribution of Fish Creek (Teztan Yeqox) to Taseko River (Dasiqox) would be greatest during the Fish Creek freshet (April – May) but would remain below 5% for the remainder of the year. As a result, Taseko judged that the Project effects on fish migration in the Taseko River, particularly anadromous salmon and bull trout, which occur in the fall, were not significant.

Middle and Upper Fish Creek

Middle and Upper Fish Creek (Teztan Yeqox) (Reaches 4-6 and Reaches 7-10 respectively) was described by Taseko as 159 071 m² of ephemeral, intermittent and continuous stream habitat. Middle and Upper Fish Creek would be capable of providing all the habitat requirements to support the 73 600 individuals of rainbow trout using the available mainstream and tributary habitats. Taseko stated that the Project would result in the permanent loss and alteration of a total 46 485 m² of fish bearing and 20 996 m² of non-fish bearing habitat in these sections of Fish Creek watershed.

Fish Lake and Little Fish Lake

Taseko indicated that Fish Lake (Teztan Biny) has a drainage area of 6 490 ha, a total surface area of 111 ha, a shoreline perimeter of 11.7 km and a volume of 4.4 Mm³. Fish Lake was characterized as a shallow lake with an average depth of 4 m and a maximum depth of 13 m. Taseko stated that Fish Lake has both inlet and outlet channels that act as productive spawning and rearing habitat. The estimated rainbow trout population was 164 945, with approximately 85 000 residing in Fish Lake (Teztan Biny), 5 000 in Little Fish Lake (Y'anah Biny) and approximately 73 600 individuals utilizing available mainstream and tributary habitats.

During the hearing, Taseko stated that Fish Lake (Teztan Biny) was currently overpopulated which resulted in smaller sized rainbow trout in the watershed. Taseko reported that the life stage-specific population estimates of rainbow trout in Fish Lake were characterized as: 32% adults (9-13 inches); 26% sub-adults (5-9 inches); and 42% juveniles (3-5 inches). Based on this population estimate, as well as mean fish weight (mass) by life-stage, and the surface area of Fish Lake, fish production was estimated at 24.1 kg/ha/y.

Taseko noted that should spawning habitat be considered the limiting factor for population of individuals, and assuming that the proportion of spawners to adult fish, juveniles, and sub-adults remained the same, then the total population of fish in Fish Lake (Teztan Biny) would eventually stabilize at 35 000 of which over 11 000 would be adult fish. Taseko predicted that the effects of the Project would produce larger rainbow trout and a more stable, smaller, rainbow trout population.

Little Fish Lake (Y'anah Biny) was reported to have a total surface area of 6.6 ha, all of which was less than 6 m deep. The relocation of the tailings storage facility upstream of Fish Lake (Teztan Biny) would result in the permanent loss of Little Fish Lake and the removal and subsequent relocation or disposal of an estimated 5 000 rainbow trout. Taseko anticipated discussing possible options with regulatory agencies and Aboriginal groups to determining the appropriate relocation or disposal option.

Taseko stated that a coffer dam would be constructed at the outlet of Fish Lake (Teztan Biny) to manage outflows from the lake. A water collection and distribution system would capture outflows from Fish Lake as well as non-contact water from the Fish Creek (Teztan Yeqox) valley, directing flows to the inlet tributaries of the lake. This distribution and recirculation mitigation measure would conserve 111 ha of lake habitat. This savings was equivalent to a 94% reduction in lake effects compared to the previous Prosperity project.

Taseko also stated that since Little Fish Lake (Y'anah Biny) did not support documented fishing effort, the Project would not affect fishing opportunities in the watershed.

Riparian Habitat

Riparian habitat around the perimeter of Fish Lake (Teztan Biny) and Little Fish Lake (Y'anah Biny) and along the mainstream and tributary stream banks of Fish Creek (Teztan Yeqox) was defined by Taseko using the *Forests and Ranges Protection Act* and the *Riparian Area Regulations*.

According to Taseko, the main issues applicable to riparian ecosystems include the loss of habitat and changes in community composition and structure. Taseko stated that pit construction, fisheries compensation works, site water management plans, starter dam construction and subsequent flooding of Upper Fish Creek (Teztan Yeqox) drainage, would have an effect on riparian habitat. Taseko further noted that there would be no indirect effects on riparian vegetation because sufficient flows would be maintained to ensure riparian function.

It was initially reported that baseline riparian habitat was estimated at approximately 1.92 Mm², most of which (93%) was associated with streams. Riparian habitat associated with Fish Lake (Teztan Biny) and Little Fish Lake (Y'anah Biny) accounted for the remaining 7% of total riparian habitat. Taseko stated that there would be no effects to riparian vegetation in Lower Fish Creek (Teztan Yeqox) because there would be no physical disturbance and the remaining 25% of baseline flows would ensure continued riparian function.

In response to a Panel information request, Taseko indicated that with the application of buffer widths as recommended by the *Forests and Ranges Protection Act* and the *Riparian Area Regulations* the predicted effects on streams and lakes within the Project study area resulted in a total riparian effect of 394 570 m². Taseko further noted that applying the 30 m buffer to all affected reaches, including those with flow reduction only, would result in a total of 2 100,150 m² of riparian habitat being affected.

Taseko stated that the compensation plan to date did not include riparian habitat gains associated with the creation of the pit lake and the tailings storage facility supernatant pond. Taseko stated that regardless of whether these water bodies became fish bearing or not, the area of lake-side vegetation, roughly estimated to be 330 000 m² at closure, would have to be considered a gain in riparian habitat.

Taseko indicated that the riparian habitat that would be cleared to facilitate cleanup efforts would be replanted and that follow-up monitoring programs would be in place to ensure the success of the restoration programs. Taseko expects that the shoreline re-vegetation would be successful without soil capping.

Project Components

Taseko stated that the construction of the open pit and main embankment, the water management plan and the destruction of Little Fish Lake (Y'anah Biny) would result in the elimination of flows and the availability of rainbow trout habitat in portions of the Middle and Upper Fish Creek (Teztan Yeqox). Collectively, the mine facilities and operations, diversion channels, and coffer dams near the outlet of Fish Lake (Teztan Biny) would create a closed mine site which would restrict the local flow of water. Taseko stated that the Project would result in the permanent loss and alteration of a total 46 485 m² of fish bearing and 20 996 m² of non-fish bearing habitat in these sections of Fish Creek watershed.

The tailings storage facility would be located 2.5 km upstream of Fish Lake (Teztan Biny); therefore preserving Fish Lake and the lower portions of Upper Fish Creek (Teztan Yeqox) required for spawning and small tributaries that provide natural inflows to the lake

In its assessment of the Project effects on fish and fish habitat, Taseko separated the effects associated with the *Metal Mining Effluent Regulations* (MMER) from those under Section 35(1) of the *Fisheries Act* which included effects associated with project infrastructure such as embankments and non-potential acid generating waste rock stock piles. The compensation plans associated with these effects are detailed below. The following table summarizes the Project effects on Middle and Upper Fish Creek (Teztan Yeqox).

Table 6. Summary of Aquatic Effect of the New Prosperity Project on Middle and Upper Fish Creek

Habitat Type	Area (m ²)		Flow Duration (by % of year channel is wetted; m ²)	
	HADD ⁱ	MMER ⁱⁱ	HADD	MMER
Stream Habitat	47 219	20 262	39 777	8 322
Riparian Habitat	199 170	182 400	140 279	76 845

i. Harmful alteration, disruption and destruction of habitat (HADD), under section 35(1) of the *Fisheries Act*

ii. *Metal Mining Effluent Regulations* (Schedule 2)

Blasting Effects on Fish

In its assessment of the potential effects of blasting on fish and fish habitat, Taseko noted that no blasts are expected to be within a range of Fish Lake (Teztan Biny) that could cause a physical or chemical alteration to fish habitat.

In response to a Panel information request, Taseko stated that the closest blast was approximately 73 m from the edge of the designed pit, putting fish habitat approximately 373 m to the closest blast. Taseko confirmed that there would be no in-stream fish habitat (including spawning) between the open pit and the Fish Lake (Teztan Biny), including the area between the lake and the coffer dam. As a result, all fish habitat would be well outside the required setback for pressure (acoustic) effects. Taseko stated that based on pressure (acoustic) as well as peak particle velocity calculations, pit blasting was not predicted to negatively affect fish or fish habitat in Fish Lake. If monitoring indicated that a blast might affect fish or habitat, a number of easily adopted mitigation measures also could be implemented.

Wasp Lake, Big Onion Lake, Little Onion Lake and Beece Creek

Taseko's assessment indicated that Wasp Lake was non-fish bearing and that Big Onion Lake (Jidizay Biny) historically supported a rainbow trout fishery. Taseko's assessment of the Project's effects on Beece Creek (Bisqox), Wasp Lake, Little Onion and Big Onion Lake (Jidizay Biny) focused on water quality which was further discussed in Chapter 6.

Fish Habitat Compensation Plan

Taseko stated that loss of fish habitat would be offset by its programs for the enhancement of fish habitat in areas outside the Fish Lake (Teztan Biny) watershed. Taseko noted that the purpose of its fish and fish habitat compensation plan was to demonstrate the feasibility and scientific rationale for the successful compensation of unavoidable fish and fish habitat impacts associated with the Project. Given that affected habitat in Middle and Upper Fish Creek (Teztan Yeqox) supports a monoculture of rainbow trout, the principal focus of compensation planning would be on changes (losses) related to this species' habitat, populations and use. Taseko stated that the proposed compensation plans and mitigation measures utilize proven

methodologies and provided an overall compensation ratio of 5.2:1 for aquatic habitat. Taseko further noted that its compensation planning would address loss of low value salmonid habitat in Lower Fish Creek.

In a response to a Panel information request, Taseko stated that the mitigation and compensation measures being proposed to offset fisheries values were enhancements over the original value of these streams. Taseko further indicated that not only was the amount of fish habitat being more than tripled through barrier removals, passage restoration and construction of off-channel habitat, but the overall quality of each of these enhancements would greatly surpass the original habitat, fish use and recreational value of the streams being effected.

Taseko stated that fish salvage would be required in Little Fish Lake (Y'anah Biny) and Fish Creek (Teztan Yeqox) Reaches 4 to 6 and 8 prior to initiation of the pit and tailings storage facility main embankment construction. Fish salvage would help avoid direct and indirect mortalities of fish residing in the streams as a result of the Project.

For riparian habitat mitigation, Taseko stated that replanting with live cuttings of pioneer riparian species, such as willow or red-osier dogwood, is a common method of riparian zone rehabilitation. Combining riparian restoration with in stream fish habitat enhancement was recommended to increase fish productivity potential.

Taseko concluded that the loss of riparian habitat would be high magnitude, the area is presently undisturbed and the effect would be long-term. With implementation of the described mitigation and compensation measures, a ratio of 1.6:1 could be achieved. Taseko concluded that the environmental effects were not significant because the effect was local, would occur once, and was neutral in direction.

Taseko acknowledged that over time, there would be fewer fish in Fish Lake (Teztan Biny), but the remaining population would remain substantial in number and would be healthier and larger in size. Therefore, Taseko concluded that the magnitude of the effect on fish was not great and was localized in geographic extent. The effect also would be gradual as the result of natural attrition from the reduction in spawning habitat and would be mitigated by Taseko's proposed enhancement programs. Importantly, the effect would be neither irreversible nor permanent.

Taseko further concluded that with respect to the ecological context, the implementation of the fish compensation measures both in the vicinity of the Project area and distributed around the region, would provide a benefit for a number of fish species.

In its closing remarks, Taseko concluded that based on the application of the assessment factors under the CEAA 2012 and the requirements of section 35 of the *Fisheries Act*, there was clearly no significant adverse environmental effect in relation to fish habitat.

7.1.2 Views of Participants

Fisheries and Oceans Canada indicated that the habitat features and values in the Fish Creek (Teztan Yeqox) watershed were adequately characterized by Taseko. Fisheries and Oceans Canada noted that aquatic productivity was high in both Fish Lake (Teztan Biny) and its tributary streams, and this productivity level appeared to be a function of physical habitat characteristics and water chemistry.

In regards to Lower Fish Creek (Teztan Yeqox), Fisheries and Oceans Canada agreed that the surface flow contribution did not represent a critical loss for the Taseko River (Dasiqox). Lower Fish Creek had been shown to provide valuable rearing and overwintering habitat for juvenile

Chinook salmon; however, the reduction in water flow in Lower Fish Creek would not appear to represent a critical loss of habitat to the Taseko River Chinook salmon as similar rearing habitat could be provided by the proposed Taseko Lake off-channel compensation element.

Fisheries and Oceans Canada confirmed that the tailings storage facility would destroy portions of Upper Fish Creek (Teztan Yeqox) and all of Little Fish Lake (Y'anah Biny) and would require an amendment to the *Metal Mining Effluent Regulations* should the Project proceed. Specifically, Fisheries and Oceans Canada reported that over 50% of the upstream catchment area for Fish Lake (Teztan Biny) would be cut off due the development of the tailings storage facility, reducing the baseline catchment area of Fish Lake during the life of the mine and flows into Fish Lake by approximately 58%.

Fisheries and Oceans Canada noted that the total aquatic habitat loss in the Fish Creek (Teztan Yeqox) watershed associated with the construction and operation of the Project accounted for 11% of the total aquatic habitat available. Aquatic stream habitat would be reduced by 48% in the Fish Creek watershed which would result in substantial reduction in the amount of spawning and juvenile rearing habitat for rainbow trout. Most of that loss would occur as a result of the loss of the outlet stream and the headwaters of Upper Fish Creek, which is the largest inlet stream.

Fisheries and Oceans Canada noted that although the EIS focused on the loss of spawning habitat, evidence from the 1997 fence studies¹ suggested that it was likely that the availability of rearing habitat for age-0 and age-1 juveniles in tributary streams was the limiting factor affecting recruitment of the adult population in Fish Lake (Teztan Biny). The results of the studies clearly indicated the significance of both inlet and outlet streams as juvenile rearing habitats. Therefore Fisheries and Oceans Canada considered the effects of the Project on both spawning and rearing habitat.

Fisheries and Oceans Canada noted that Taseko used area calculations to determine the quantity of habitat affected and the Habitat Evaluation Procedure to assess the quality of habitat affected. Although Fisheries and Oceans Canada did not agree with all aspects of the specific methods used by Taseko to quantify fish habitat losses, it noted that utilizing areas (m²) and habitat units to communicate the Project effects had previously been accepted during other project reviews. Fisheries and Oceans Canada noted that the loss of flow downstream of the open pit was not accounted for in Taseko's assessment, and was a loss that Fisheries and Oceans Canada indicated should have been considered.

Due to redesign and relocation of Project components, Fisheries and Oceans Canada did not expect direct downstream effects on fish and fish habitat in Wasp Lake, Big Onion Lake (Jidizay Biny), and Beece Creek (Bisqox). However, Fisheries and Oceans Canada noted Natural Resources Canada concern that Taseko's overall estimate of seepage collection efficiency was overly optimistic and that due to the existing subsurface hydrology below the proposed tailings storage facility, there was potential for rapid contaminant transport along preferential groundwater flow paths that bypass interception wells. If this effect occurs, Fisheries and Oceans Canada noted that it could affect the water quality in Fish Lake (Teztan Biny) as well as Big Onion Lake, and consequently the ability of these lakes to support fish.

Fisheries and Oceans Canada generally agreed with Taseko's characterization of the effects of the Project including the mine footprint impacts and downstream flow impacts, and was of the

¹ Appendix 5-3-D Fish Creek Spawner Enumeration Project, prepared by Triton, 1999

view that conceptually, the direct and indirect Project effects could be offset through mitigation and compensation. However, Fisheries and Oceans Canada also stated that the numerous water treatment measures proposed by Taseko in a response to a Panel information request to address metal contamination in water and sediment were novel. However, Fisheries and Oceans Canada indicated that there were uncertainties regarding the treatment measures interactive effects with plankton and nutrient recycling as well as physical impacts on benthos, water turbidity and sediment-water nutrient fluxes which would affect aquatic life.

Fisheries and Oceans Canada concluded that Fish Lake (Teztan Biny) was part of a watershed and ecosystem that had a productive aquatic ecosystem as a result of complex interactions of biological and physical elements and processes. Fisheries and Oceans Canada noted that although the Project would retain Fish Lake a substantial portion of the associated stream network and wetlands would be eliminated which would have consequences and represents risks for ensuring that the Fish Lake aquatic ecosystem functions would be able to effectively support a minimum viable population of rainbow trout.

Environment Canada stated that potential seepage from the tailings storage facility could impacts the water quality in Big Onion Lake (Jidizay Biny), particularly with respect to mercury and selenium. Environment Canada noted that selenium was an essential micro-nutrient at trace levels, but at high levels, it may cause reproductive failure or serious birth defects leading to high mortality rates in fish offspring.

Environment Canada noted that sensitivities to elevated selenium concentrations tend to be higher in confined water bodies (e.g., small lakes) and that selenium cannot be effectively managed using conventional methods for the treatment of mine effluent, such as pH control.

The British Columbia Ministry of the Environment stated that the commitment of no change to water quality in the Taseko River (Dasiqox), which was included in the environmental assessment certificate for the previous project needed to be upheld to ensure the Taseko River maintained a high value fish habitat. The Ministry indicated that the Project would result in the loss of Lower and Middle Fish Creek (Teztan Yeqox), a portion of Upper Fish Creek, as well as Little Fish Lake (Y'anah Biny) and that these losses could not be mitigated, so compensation was required to maintain a healthy, self-sustaining trout population.

During the hearing the Panel heard from Dr. Craig Orr, who presented on behalf of the Tsilhqot'in National Government. Dr. Orr argued that there were several inadequacies in Taseko's assessment of baseline fish and fish habitat conditions, including unacceptable uncertainty regarding trout numbers, their ecology and their use of the watershed. Dr. Orr noted Taseko's error in assuming that the fish density in Little Fish Lake (Y'anah Biny) was the same as those in Fish Lake (Teztan Biny) since the respective lakes had much different physical conditions. Dr. Orr also questioned Taseko's biomass calculations, and indicated that the limited number of samples was inadequate to describe winter habitat and the assumed diets of trout.

Dr. Orr further stated that the open pit would virtually eliminate flows and rainbow trout habitat in Lower Fish Creek (Teztan Yeqox). He indicated that Taseko incorrectly discounted riparian losses, which are certain to occur due to reduced stream flows, and neglected the subsequent effects on fish in both Lower Fish Creek and the Taseko River (Dasiqox). Dr. Orr indicated that Taseko's calculations of losses in riparian habitat were inadequate and simplistic and that most riparian reclamation would only occur during mine closure, which would leave at least 22 years where riparian vegetation would be inadequate to contribute to fish habitat.

Dr. Orr stated that although Fish Lake (Teztan Biny) would still 'physically' exist, the suitability of the lake for rainbow trout would certainly be affected. He concluded that if the rainbow trout

population decrease from 85 000 to 35 000, the lake would not be able to support the current level of Aboriginal food fishery or recreational use.

The Panel also heard from Darren Brandt who stated that fish die off was likely to occur within a decade of Project implementation. This concern was also shared by several presenters and participants during the hearing including Mr. D. MacDonald, A. Schein, J.A. Sinclair and J. Stockner, all representing the Tsilhqot'in National Government who stated in their presentation, that the rainbow trout in the Fish Lake (Teztan Biny) watershed would virtually be eliminated. Mr. Stockner and Mr. Brandt concluded that Taseko had completely misunderstood the biological community of Fish Lake.

Numerous participants expressed serious concerns regarding the Project's effects on fish and fish habitat during the hearing. Many individuals, both Aboriginal and non-Aboriginal, shared concerns that the majority of spawning habitat available to the Fish Lake (Teztan Biny) rainbow trout population would be lost, resulting in the elimination of the population and permanent destruction of the fishery.

7.2 FISH LAKE RECIRCULATION

7.2.1 Proponent's Assessment

To protect Fish Lake (Teztan Biny) and maintain the viability of resident rainbow trout population, Taseko proposed to re-circulate the lake water. This would involve damming the outflow at the north end of the lake and installing a pumping system to convey water to the uppermost extent of the undisturbed tributaries of Upper Fish Creek (Teztan Yeqox), located immediately downstream of the tailings storage facility main embankment. Taseko acknowledged that the exact location of the lake withdrawal was still uncertain and that the distribution system might require the installation of several kilometers of pipeline following the right-of-way of the tailings pipeline.

In addition, a coffer/flood control two earth filled dam would be constructed in Middle Fish Creek (Teztan Yeqox) between Fish Lake (Teztan Biny) and the open pit, so that flows leaving Fish Lake could be managed and redirected back to the inlets of Fish Lake. The dam would be constructed across Middle Fish Creek approximately 90 m downstream from Fish Lake. The normal water level in Fish Lake is 1 456.5 m. The base of the dam would be 1 456 m and the crest 1 461 m. A second flood control dam designed to control a 1:1000 potential flood lake level would be constructed in a low lying area 100 m to the east and 144 m south of Fish Lake. Recirculation of Fish Lake water would provide a year round flow to the tributaries and it was estimated that the remaining habitat in the tributaries would support a spawning population of 6 200 rainbow trout.

Taseko predicted that year round flow in the tributaries was expected to have advantages to the overall health of the tributaries and lake ecology. Taseko indicated that at present, the tributaries were ephemeral and provided little in the way of habitat during the fall and winter. Year round flow would ensure that juvenile rainbow trout as well as other aquatic organisms would be sustained year round.

Taseko noted that recirculation of Fish Lake (Teztan Biny) outlet water to the tributaries had the potential to change the current thermal energy budget of the lake. The temperature profile data confirmed that the Fish Lake was stratified during the summer months and unstratified and completely mixed the remainder of the year. In general, recirculation to the tributaries would result in a reduction in water temperature entering the lake during the spring and summer

months, reducing lake temperatures and increase baseline temperatures during the fall and winter months. Temperature represents an important parameter that would influence many aspects of the aquatic environment and therefore would need to be actively managed to maintain optimal conditions for all life stages present in the streams. Taseko stated it would recirculate water from both the warmer surface waters and the cool bottom waters to maintain suitable cool water environment for rainbow trout embryo development.

Taseko acknowledged that the mitigation of flow temperatures was likely to have a small impact on the lake, as the predicted average end-of-pipe water temperatures at the head of the tributaries were anticipated to remain within 4°C on either side of the baseline throughout the year. Taseko indicated that the expectation was that water temperatures would balance with the ambient conditions as the water flowed to the lake, further reducing any temperature differences.

For dissolved oxygen, Taseko noted that consistent with many eutrophic, dimictic lakes, Fish Lake (Teztan Biny) naturally exhibited periods of depleted dissolved oxygen or anoxic conditions, particularly during the winter ice-covered period. Taseko noted that these conditions could result in high fish mortality during the winter. Taseko noted that the recirculation plan would maintain year round flows in the tributaries, which was expected to supply dissolved oxygen to the lake and mitigate the potential for eutrophication. Taseko concluded that provided a dissolved oxygen concentration of 10 mg/L was maintained, recirculation to the tributaries could result in enhancing habitat around the mouths of the creeks and off-setting the potential for winter kill.

Taseko acknowledged that the greatest risks associated with the proposed flow augmentation mitigation plan were primarily associated with mechanical failure of the pumps, loss of power, or damage to the pipelines. This would affect the volume of water being transported to augment flows in Upper Fish Creek (Teztan Yeqox) Reach 8 and Fish Lake Tributary 1. If loss or reduction of flow occurs, Taseko noted that fish could be stranded and that mortality or desiccation of eggs could result, depending on the time of year and severity of the flow reduction. Taseko indicated that the risk of failure of the proposed flow augmentation plan would be reduced to an acceptable level through mitigation and adaptive management.

To mitigate the risk of failure, Taseko indicated that backup pumps and generators would be installed at all pump houses and pipelines would be protected along the right-of-ways to limit the potential for disturbance associated with machinery. Taseko further noted that a fish salvage plan would be established in the event of prolonged shutdown which would include identification of all high risk stranding locations and safe release locations. Taseko acknowledged that the predicted end-of pipe dissolved oxygen concentrations could be below the identified minimum concentrations required for aquatic life. Based upon the results of monitoring, Taseko noted that it might be necessary to adaptively manage the situation by encouraging dissolved oxygen solution through physical mixing or mechanical aeration. Taseko stated that with effective onsite monitoring and the implementation of the proposed mitigation and adaptive management if required, the risk of failure of the proposed flow augmentation plan would be reduced to an acceptable level.

7.2.2 Views of Participants

Fisheries and Oceans Canada clarified that its review did not include an assessment of the inherent risks associated with the maintenance of the infrastructure itself such as the potential for pump or pipeline failures or the substantial costs associated with implementation and maintenance of the core plan plus the burden of ongoing management of the system. Fisheries

and Oceans Canada also indicated that its assessment did not include the water availability to maintain the system and assumed that adequate water would be available to sustain the system.

Fisheries and Oceans Canada recognized that Taseko's mitigation scheme of water recirculation aimed to provide an appropriate environment for the spawning of adult rainbow trout and successful incubation of eggs and alevins and to produce sufficient age-1 rainbow trout recruits to the lake, including habitats for both summer and winter seasons. However Fisheries and Oceans Canada raised concerns about the future biological productivity of Fish Lake (Teztan Biny), as the recirculation of lake water outflow to the inlet tributaries would likely affect the trophic status and ecosystem structure and functioning of Fish Lake and its tributaries. Fisheries and Oceans Canada stated that there were no precedents for lake watershed recirculation to aid in understanding the potential effects of the Project on the future food web and fisheries productivity in Fish Lake.

Fisheries and Oceans Canada also noted that Taseko would have to maintain flow continuity to the inlet streams in perpetuity for the system to function at its basic level. The plan would also result in the isolation of Fish Lake for at least 50 years.

Fisheries and Oceans Canada concluded that several risks associated with the proposed recirculation had not been addressed by Taseko and raised substantial uncertainty in the future habitat and fisheries productivity of Fish Lake (Teztan Biny) during and after mine development. In particular, Fisheries and Oceans Canada indicated that the maintenance of channel flows (specifically high flows), thermal regime, dissolved oxygen, eutrophication and nutrient limitations, and adaptive management were not identified or not fully addressed in the environmental impact statement by Taseko. Fisheries and Oceans Canada stated that while designed to regulate temperature, significant uncertainty exist in understanding the recirculation impacts on nutrient cycling and lake food webs supporting rainbow trout, as effects on lake nutrient cycling did not appear to have been accounted for by Taseko.

Fisheries and Oceans Canada stated that high flow events were necessary to maintain stream function. Fisheries and Oceans Canada stated that the removal of high flow events in Fish Creek (Teztan Yeqox) could quickly deteriorate the stream bed quality, greatly reducing its potential for fish production. Fisheries and Oceans Canada indicated that there were many examples of artificial spawning areas for rainbow trout consistent with Taseko's recirculation plan that had deteriorated without high flows or other forms of maintenance. Fisheries and Oceans Canada suggested that mechanical measures could be used to mitigate some of these effects although these were less effective than high flows and far more intrusive.

Fisheries and Oceans Canada noted that the thermal regime of Fish Lake (Teztan Biny) resulted in warmer flows in the fall and winter, and cooler in the spring and summer relative to baseline stream temperatures. Although the temperatures were often within the thermal tolerances of species, Fisheries and Oceans Canada stated that the altered thermal regime could have effects on stream fish that should be considered risks. For example, Fisheries and Oceans Canada noted that in the spring water temperature was predicted to be 2-3°C lower than baseline. This cooling as a result of the recirculated water could affect the growth and survival of juveniles. Similarly, recirculated water would have a major impact on overwintering rearing habitat in the streams, as flow augmentation was expected to increase winter temperatures which might prevent the formation of a surface ice layer on the creeks, leading to open water exposing fish to predation risk and creating bio-energetically challenging conditions.

Fisheries and Oceans Canada noted that the pumping of nutrient-rich hypolimnetic water from Fish Lake (Teztan Biny) into the inlet streams during the summer had the potential to stimulate primary productivity in the streams. Although enhanced primary productivity could increase food production for fish, it could also shift primary species composition and contribute to the accumulation and deposition of organic matter in the stream channel, leading to the deterioration of stream bed conditions for spawning and egg incubation.

Fisheries and Oceans Canada concluded that unless mitigation could ensure that flow temperatures mimic baseline temperatures, there were risks to the stream fish populations around Fish Lake (Teztan Biny) associated with the change in the thermal regime.

In its analysis of end-of-pipe oxygen concentrations Fisheries and Oceans Canada noted there was a high probability that dissolved oxygen levels would fall below acceptable values for much of the year. Fisheries and Oceans Canada indicated that it was unable to evaluate the mitigation of low dissolved oxygen due to a lack of information provided by Taseko. Given that the streams are short, and the short transit time of water, Fisheries and Oceans Canada stated that it might not be sufficient to rely on natural aeration to restore dissolved oxygen levels. Further, aeration during the winter months would require measures to avoid super cooling and the creation of frazil ice.

Fisheries and Oceans Canada predicted that the recirculation of the Fish Lake (Teztan Biny) watershed would impose several changes on the aquatic ecology of Fish Lake. Fisheries and Oceans Canada stated that eutrophication of the system was to be expected and would modify the structural and functional aspects of the lake ecosystem that support the rainbow trout population.

Fisheries and Oceans Canada concluded that it was unable to reach conclusions on the merit, technical feasibility and biological relevance of the plans and programs, even with the supplemental information provided by Taseko. While much of the focus of the Taseko's mitigation measures and adaptive management program was on Fish Lake (Teztan Biny), the goal of maintaining a viable ecosystem for the Fish Lake rainbow trout population could not be achieved unless a similar program for the tributary streams was in place in the adaptive management plan. Fisheries and Oceans Canada predicted that while Fish Lake itself would not be directly destroyed, the lake would experience eutrophication and contamination with development of the mine.

The British Columbia Ministry of the Environment noted several factors that could present challenges to the success of maintaining Fish Lake (Teztan Biny). The Ministry noted that the withdrawal of cooler, nutrient laden water from the bottom layers of Fish Lake and discharging it into the inlet tributaries could lead to several potential nutrient issues such as the destabilization of lake stratification and nutrient mixing, warming of water during transportation and subsequent algal blooms. Input of high nutrient water to the creeks could also result in algal blooms impacting organisms that fish feed on or potentially suffocate fish eggs. Additionally, as the blooms die off, their decomposition would consume large amounts of oxygen from the water column which could lead to fish kills. The Ministry stated that these could not be mitigated with absolute certainty.

Mr. D. MacDonald, Mr. A. Schein, Mr. J.A. Sinclair and Mr. J. Stockner, on behalf of the Tsilhqot'in National Government, stated that the recirculation scheme would result in the following effects:

- phytoplankton, zooplankton & benthic invertebrate communities would change in Fish Lake (Teztan Biny);

- algae blooms would likely increase;
- dissolved oxygen would decrease in late summer and under ice in winter;
- water temperature would increase and dissolved oxygen would decrease and subsequently affect aquatic life in Fish Lake; and
- rainbow trout would be virtually eliminated.

They also indicated that Taseko did not demonstrate how the multiple stressors associated with the recirculation plan would adversely affect the Fish Lake (Teztan Biny) ecosystem and resident fish.

Dr. Orr, on behalf of Tsilhqot'in National Government, indicated that the risk of pump malfunction represented a catastrophic potential loss to the Fish Lake (Teztan Biny) ecosystem. Dr. Orr further noted that Taseko could not guarantee that funds or a competent management body would exist to enable the pumping system to operate for hundreds of years into the future. The decline in oxygen and water levels in the lake would not provide the same quantity or quality of fish habitat.

Dr. Orr concluded by illustrating that a similar scheme was one of the primary reasons why the Joint Panel for Kemess North recommended against the mine project proceeding.

Dr. Tony Pearce, on behalf of the Tsilhqot'in National Government stated that there was serious risk associated with the proposed recirculation of Fish Lake.

Dr. Karen Hurley, on behalf of the Friends of Nemaiah Valley indicated that the recirculation of Fish Lake carried much greater risks than what had been reported. Dr. Hurley stated that the Project would purposefully destroy Little Fish Lake (Y'anah Biny) and the Fish Creek watershed, including wetlands and Nabas, which would result in a slow death to Fish Lake (Teztan Biny).

Numerous participants expressed skepticism about the pumping of Fish Lake (Teztan Biny) in perpetuity throughout the review. Several participants shared their fears that this unprecedented and untested technology would fail and result in catastrophic consequences to the Fish Lake watershed. Many participants questioned the feasibility of creating an "aquarium" or keeping an entire wilderness lake or watershed on "life support".

7.3 FISH AND FISH HABITAT COMPENSATION PLAN

7.3.1 Proponent's Assessment

Taseko indicated that the Fish and Fish Habitat Compensation Plan was intended to demonstrate the feasibility and scientific rationale for the successful compensation of unavoidable fish and fish habitat impacts associated with the Project. Since Middle and Upper Fish Creek (Teztan Yeqox) habitats affected by the Project support a monoculture of rainbow trout, the principal focus of compensation planning would be on changes related to rainbow trout habitat, populations and use. Taseko further noted that the compensation plan would also address the loss of low value salmonid habitat in Lower Fish Creek.

Taseko drafted the Fish Habitat Compensation Plan following its determination of environmental effects and application of mitigation measures and subsequently separated it into two distinct plans. One plan addressed effects associated with the tailings storage facility which are captured under the *Metal Mining Effluent Regulations* (MMER). The second plan deals with areas outside the tailings storage facility which are under the jurisdiction of the *Fisheries Act*. Taseko indicated that the purpose of MMER compensation plan was to offset for the loss of fish

habitat resulting from the deposit of a deleterious substance into the tailings storage facility. Taseko explained that where a HADD authorisation is required, Fisheries and Oceans Canada looks to achieve “no net loss” of the productivity of fish habitat as compensation under Section 35(2) of the *Fisheries Act*.

Furthermore, Taseko indicated that the Fish Habitat Compensation Plan took into account the Ministry of Forests, Lands and Natural Resource Operations’ 2008 Benchmark Statement for fish, fish habitat, and fisheries of the Fish Lake (Teztan Biny) watershed. Taseko also said that the needs of local First Nations and the public within and around the Project were also considered.

In response to a Panel information request, Taseko acknowledged that there might be a need to collect further baseline information to advance the compensation plans to the engineering design level; however this work is not needed until the environmental assessment had been approved. Taseko reiterated that the techniques and measures proposed were not new and had been proven to be effective.

The following table summarizes the aquatic effects of the Project on Middle and Upper Fish Creek after mitigation.

Table 7. Aquatic Effects of the Project on Middle and Upper Fish Creek after Mitigation

Habitat Type	Area (m ²)	
	HADD	MMER
Stream Habitat	47 219	20 262
Riparian Habitat	199 170	182 400
Mitigation (Stream Habitat)	16 887	0
Mitigation (Riparian)	0	0
Total Stream Effects (following mitigation)	30 322	20 262
Total Riparian Effects (following mitigation)	199 170	182 400

Metal Mining Effluent Regulation Overview

Taseko indicated that the proposed *Metal Mining Effluent Regulations* compensation plan comprised a single compensation element, the Taseko Lake Off-Channel. The Taseko Lake Off-Channel would be located outside the Fish Lake (Teztan Biny) drainage, about 8 km southwest of Fish Lake in the Taseko Lake floodplain adjacent to the Taseko River (Dasiqox). It is designed to address the harmful alteration, disruption, and destruction (HADD) of fish habitat as a result of the Project within the tailing storage facility.

Taseko stated that the intention of the Taseko Lake Off-Channel was to provide perennial off channel salmonid habitat (spawning, rearing, and overwintering) adjacent to Taseko Lake outlet which was known for Chinook and bull trout spawning grounds. The Taseko Lake Off-Channel would provide habitat for these species as well as for rainbow trout, mountain whitefish, and several non-salmonid species. Taseko noted that one of the key features of the design included the installation two or three intake pipes and groundwater infiltration collection galleries with flow control valves to regulate water discharge and temperature along the length of the channel, if it is required to maintain fish habitat.

Taseko stated that the direct effects of the Project associated with the tailings storage facility would result in the loss of 20 262 m² of rainbow trout stream habitat and 66 000 m² rainbow trout lake habitat (Little Fish Lake), equivalent. These unavoidable losses would be compensated for by implementing the Taseko Lake Off-Channel compensation which, according to Taseko, would result in a gain of 20 939 m² of in-stream habitat and 204 600 m² of riparian habitat, resulting in compensation ratios of 2.01:1 and 2.0:1. Taseko noted that this demonstrated the overall increase in productivity of the habitat created and also takes into account the fact that the Taseko Lake Off-Channel compensation provided multi-species habitat.

With regard to lake habitat, Taseko noted that the Taseko Lake Off-Channel compensation would not specifically result in the creation of lake habitat but would replace lake habitat with stream habitat, or like-for-unlike habitat. Taseko stated that the preliminary Taseko Lake Off-Channel design incorporated over 20 pools and alcoves (approximately 5.47 ha of pool-type habitat) to replace the loss of Little Fish Lake (Y'anah Biny) habitat resulting in a compensation ratio of 0.8:1. Further refinement of the Taseko Lake Off-Channel design would incorporate additional pool-type habitat to ensure a minimal 1.0:1 compensation ratio was achieved to offset Project effects on lake habitat.

In a response to a Panel's information request, Taseko stated that the implementation of the Taseko Lake Off-Channel compensation element would provide an abundance and diversity of perennial habitat types preferred by rearing, spawning, and overwintering Chinook salmon, steelhead/rainbow trout, bull trout, and mountain whitefish. Taseko expressed confidence in the population of the Taseko Lake Off-Channel given its close proximity to known Chinook and bull trout spawning grounds. Taseko predicted no adverse effects on fish habitat resulting from the implementation of the Taseko Lake Off-Channel element. Taseko committed to developing detailed follow-up, monitoring, and adaptive management plans for the Taseko Lake Off-Channel element to assist in the detection of unanticipated environmental effects.

As presented in Taseko's water quality model, changes in water chemistry were predicted which could lead to elevation of the metal concentrations in sediment. Taseko noted that the elevated metal concentrations in the sediment would have implications for bottom-dwelling (benthos) organisms and for fish contacting the sediment during spawning and egg incubation. Potential effects of increased sulphate and other elements on benthic invertebrates might include impaired growth of some of the more sensitive benthic organisms. Taseko indicated that even with the application of the appropriate mitigation measures and adaptive mitigation strategies to ensure the water quality of Fish Lake (Teztan Biny) was adequate to support rainbow trout the potential exists for residual adverse effects to sediment quality although no significant adverse Project effects are expected.

Fisheries Act Compensation Plan Overview

Taseko indicated that the *Fisheries Act* compensation plan addressed potential Project effects on fish and fish habitat outside of the tailings storage facility and comprised elements located on- and off-site. As a result, the compensation plan will have potential positive benefits for rainbow trout and other regionally important species such as the steelhead trout, bull trout, sockeye salmon, and Chinook salmon. The compensation plan would use a combination of the first three levels of the preferences hierarchy described in the Policy for the Management of Fish Habitat to achieve no net loss of productive capacity.

Taseko indicated that compensation would be initiated during the pre-construction phase to minimize potential short-term temporal losses of habitat productive capacity between Project construction activities (habitat loss) and compensation habitat functionality (habitat gain).

Taseko reported that the proposed *Fisheries Act* compensation plan would result in a gain of 307 546 m² of habitat and 216 000 m² of riparian habitat. The predicted in-stream effects of 46 703 m², assuming bankfull, year-round flow, and 36 735 m² based on existing stream flow duration, would result in a compensation ratio of 6.6:1 to 8.4:1 for stream habitat.

Taseko indicated that the *Fisheries Act* compensation plan had six elements. The implementation of these elements would replace rainbow trout habitat loss in Upper Fish Creek (Teztan Yeqox) with rainbow trout habitat in the same watershed, and would be consistent with the first level in the hierarchy of preferences and would also maintain recreational and Aboriginal fishing opportunities which are further detailed in the following sections.

Flow Augmentation

- Year round flow augmentation would mitigate the indirect effects of flow reduction on Fish Creek (Teztan Yeqox) Reach 8 and Fish Lake (Teztan Biny) tributary 1 and would enhance habitat by converting seasonal habitat into perennial habitat. Taseko reported that flow augmentation would result in a gain of approximately 19 026 m² of habitat in Reach 8, and 5 312 m² of habitat in Tributary 1, a 200% increase of intermittent habitat for both.

Barrier Removal

- Taseko indicated that opportunities existed in Tributaries 1 and 3 to enhance or increase spawning and rearing habitat to offset the losses associated with the Project. Taseko indicated that gravel placements, deep pool excavation, inactive beaver dam removal or modification, and large woody debris and boulder additions would all be technically and biologically feasible to benefit fish productivity and productive capacity within the two main Fish Lake (Teztan Biny) tributaries.

Fish Passage Restoration and Enhancement

- Taseko indicated that the restoration of fish passage identified at road crossing sites would expand the distribution of fish species and increase productivity in the region. Taseko stated that this restoration would partially replace Project related habitat losses in Upper and Lower Fish Creek (Teztan Yeqox) and tributary habitats. Taseko proposed fish passage enhancement at fifteen sites in the region, including five existing sites associated with the 4500 Road.

Haines Creek Diversion and Berm Construction

- Taseko proposed upgrades to the Haines Creek Diversion infrastructure to enhance rainbow trout habitat by increasing and maintaining flows over a longer duration in Haines Creek and in the inlets and outlets to one or more of the Eleven Sisters chain of lakes. Taseko noted that this measure would also mitigate the risk to potential loss of angler opportunity in Fish Creek (Teztan Yeqox) watershed.
- Taseko proposed the replacement or restoration of existing berms or the construction of new berms to prevent substantial seepage losses at several locations along the diversion channel and upstream from the Taseko Lake Road culvert crossing.

Elkin Creek Diversion Upgrade and Set-back Berm Construction

- Taseko stated it would upgrade the existing diversion structure and construct containment berms in upper Elkin Creek and stabilize banks in lower Elkin Creek. Taseko stated that the Elkin Creek compensation element would be to confine and maintain flood water discharge to the Elkin Creek watershed as well stabilize eroding banks in lower and upper reaches which had been negatively effecting Chinook salmon and steelhead trout spawning and rearing habitats due to increased sedimentation. Taseko predicted that the implementation of this compensation element had the potential to result in 4 100 m² (0.41 ha) of habitat.

Riparian Reclamation

- Taseko indicated that during the construction phase, drainage ditches would be installed along the new access road to transport surface runoff to Fish Lake (Teztan Biny). These ditches would have the potential to convey food, nutrients, and organic matter to fish habitat, resulting in new functional riparian habitat. Taseko noted that applying a 5 m buffer resulted in a gain of 15 000 m² of riparian habitat.
- During the closure phase of the Project, reclamation and re-establishment of the riparian zones of all affected streams and drainage ditches would be completed to ensure that natural drainage was restored. Taseko noted that a 10 m riparian buffer would also be created around the tailings storage facility and pit to create a functioning riparian zone at post-closure.

In addition to the compensation elements associated with the *Fisheries Act* and *Metal Mining Effluent Regulations*, Taseko indicated that additional components had been included in the compensation plan in an effort to provide cultural and regional value. These components included:

- re-commissioning of the Hanceville Hatchery to meet the British Columbia Ministry of Forests, Lands and Natural Resources Benchmark Statement objectives and to provide opportunities for Aboriginal and community employment, education and research;
- rainbow trout fry outplanting of Fish Lake (Teztan Biny) origin for genetic integrity to two recipient lakes, Slim and Lake 6267 to maintain the genetic integrity of that stock; and
- development of access road and camping facilities to satisfy the Ministry's Benchmark Statement objective and Transport Canada's request for compensation for loss of safe boating opportunities.

Taseko concluded that the combined *Fisheries Act* and *Metal Mining Effluent Regulations* compensation plans would result in a net gain of 281 781 m² of stream habitat and 221 430 m² of riparian habitat; a gain of 5.2:1 and 1.6:1 respectively. This outcome would result in no net loss in productive capacity associated with the Project. Taseko stated that the compensation elements maintain the genetic integrity of Fish Lake (Teztan Biny) rainbow trout, the archaeological values of the Fish Lake area to recreation and First Nations fishing opportunities and navigation.

7.3.2 Views of Participants

Fisheries and Oceans Canada provided an assessment of the fish habitat compensation plan proposed by Taseko that would offset direct losses to fish habitat associated with the Project. Fisheries and Oceans Canada focused on the conceptual merits of habitat compensation measures that had been proposed and generally agreed that the compensation plan was

consistent with the department's policies recognizing that if the Project proceeds to the regulatory stage, a more detailed plan and consultation would be required.

Fisheries and Oceans Canada stated that while the Taseko Lake Off-Channel component appeared to be a valuable compensation element it did not directly address the concerns raised by the Tsilhqot'in National Government on the loss of Little Fish Lake (Y'anah Biny).

Fisheries and Oceans Canada stated that from a preliminary assessment, it supported the conceptual plan and the potential benefits that could accrue but indicated that Taseko had yet to determine land tenures or conduct groundwater assessments, geodetic surveys and an archaeological assessment to confirm the feasibility of the Taseko Lake Off-Channel compensation element.

Fisheries and Oceans Canada stated that the lack of feasibility studies lead to uncertainties associated with the constructing the proposed Taseko Lake Off-Channel component. These include:

- a lack of hydraulic gradient between the lake and proposed channel would prevent groundwater movement within the pools/channel;
- a risk that the required flow gradient could not be realized based on the topography present at the site (assumptions are made for the adequacy of water supply to sustain the spawning habitat);
- the long term maintenance at the intake structure to ensure it functions;
- the long term maintenance if the blind pools experience sediment build-up and lack of flushing; and
- a risk that isolated pools could become depleted of oxygen in winter, resulting in fish mortality.

At a conceptual level, Fisheries and Oceans Canada recognized that the compensation plan and methods were generally well understood, technically feasible and would be beneficial to fish and fish habitats in certain circumstances.

Fisheries and Oceans Canada stated its review of the proposed compensation plan was based on;

- enhancement of Fish Lake (Teztan Biny) tributaries through barrier removal and habitat enhancement;
- fish passage restoration;
- upgrades to existing diversion structures in the Haines Creek and Elkin Creek watersheds;
- riparian planting along drainage ditches and replanting along all restored watercourses and around the tailings storage and open pit; and
- re-commissioning the Hanceville hatchery and recipient lake outplanting.

Fisheries and Oceans Canada noted that despite the relatively common, well understood and technically feasible measures associated with barrier removal and habitat enhancement more information would be required to quantify the direct benefits to fish and fish habitat in the receiving environments.

Fisheries and Oceans Canada indicated that channel excavation above Reach 1 of Fish Lake (Teztan Biny) Tributary 1 might allow fish access to Reach 2 which runs directly downstream of the proposed location of the western embankment of the tailings storage facility subjecting them

to potential seepage. Fisheries and Oceans Canada also noted that the removal of beaver dams had the potential to negatively affect fish and fish habitat by dewatering the upstream pond, stranding fish and releasing sediment and large volumes of water that could be devoid of oxygen, downstream.

Fisheries and Oceans Canada identified a risk that the resident fish might have a naturally small range which would reduce the effectiveness of Taseko's fish passage restoration objectives. Fisheries and Oceans Canada also noted that Taseko had not provided a detailed breakdown of habitat type, quality or quantity and relied simply on an assumed ratio of 40:20:40 of pool:riffle:run. Fisheries and Oceans Canada noted that these ratios were based on Taseko's observations in the Fish Creek (Teztan Yeqox) watershed, which was more than 30 km away from the proposed restoration sites, thus compromising Fisheries and Oceans Canada's ability to conclude the effectiveness of the potential benefits.

Fisheries and Oceans Canada agreed that the hatchery operations and outplanting were technically and biologically feasible; however both might be required in perpetuity to achieve the desired results. To determine the long-term sustainability and success of these activities Fisheries and Oceans Canada recommended that the British Columbia Ministry of Forest, Lands and Natural Resource Operations as well as Aboriginal groups be integral in the management of the hatchery and outplant operations.

In conclusion, Fisheries and Oceans Canada generally supported the habitat compensation measures and strategies proposed by Taseko. Fisheries and Oceans Canada recognized that the compensation and enhancement techniques were generally well understood and had been demonstrated in previous applications as technically feasible and beneficial to fish and fish habitats in certain circumstances.

The British Columbia Ministry of Forest, Lands and Natural Resource Operations indicated that the creation of off-channel habitats, similar to Taseko's proposed Taseko Lake Off-Channel habitats had proven to be successful in providing juvenile rearing and refugia habitat in rivers throughout British Columbia. However, despite the potential gain the Taseko Lake Off-Channel represents, the Ministry indicated that there was insufficient data to determine if it was technically feasible. The Ministry indicated that the enhancement of Fish Lake (Teztan Biny) tributaries through flow augmentation would result in the availability of perennial habitat which would provide rearing habitat through the critical low flow and overwintering periods.

The Ministry also supported outplanting of Fish Lake (Teztan Biny) rainbow trout fry from the re-commissioned Hanceville Hatchery to multiple recipient lakes. The Ministry indicated that given the uncertainty regarding long-term flows and trophic level status of Fish Lake, the development of the Hanceville hatchery and continued outplanting of Fish Lake Fry would be essential to preserve the genetic strain of Fish Lake rainbow trout.

The Ministry agreed that Taseko's proposed compensation elements were technically feasible with the exception of converting seasonal habitat in Fish Creek (Teztan Yeqox) Reach 8 and Fish Lake Tributary 1 Reach 2 to perennial habitat through year round flow augmentation. The Ministry questioned the long-term availability of adequate water quantity to maintain year round flow.

The Ministry concluded that Taseko's compensation elements would increase fish production; however these activities alone would be insufficient to adequately replace productive capacity loss as a result of the Project. The Ministry stated that they expected Taseko to commit to implementing compensation measures to enhance the regional fishery management initiative; to

conserve wild stock values and improve productivity to enhance Aboriginal and public fishing opportunities in the Chilko and Taseko watershed.

The Ministry stated that the objective of maintaining, a healthy, self-sustaining trout population would only be met when Fish Lake (Teztan Biny) rainbow trout were no longer dependent on flow augmentation. Therefore, given the uncertainties regarding the long-term environmental conditions of the lake, the Ministry insisted that Taseko would be required to maintain the effectiveness of the compensation elements.

Dr. Orr, on behalf of the Tsilhqot'in National Government, characterized Taseko's predictions of fish using replacement habitats as optimistic. Dr. Orr stated that creating year-round flow in an area where there would normally be flow for just four months per year would not be a valid compensation measure as rainbow trout would not use those streams because they would normally reside in the lake at that time of year. Dr. Orr also noted that Taseko's suggestion that there would be a 276 445 m² habitat gain was misleading, when almost half of that area already had some fish access.

With regards to the Haines and Elkin Creek diversion upgrade and berm construction, Dr. Orr noted that the exact area of habitat gain had not yet been estimated, thus it should not be proposed as a compensation measure. Dr. Orr stated that it was presumptuous to suggest that the First Nation's traditional uses of natural resources at the Fish Lake (Teztan Biny) site could be replaced by increasing access to or increasing the productivity of other lakes.

Some participants noted that the Taseko Lake Off-Channel development would increase the number of fish that would prey on sockeye smolts migrating down the Taseko River (Dasiqox). Several participants expressed their reservations regarding the effectiveness of the compensation elements, namely the proposed diversion and berm construction in Haines and Elkin Creek. The Panel heard from Mr. Holmes during the community sessions, who indicated that the Taseko Lake Off-Channel could have a negative effect on the salmon by enhancing the habitat of its predator, the bull trout.

7.4 SALMON HABITAT

7.4.1 Proponent's Assessment

Taseko noted that the Taseko River (Dasiqox) supported Chinook and sockeye salmon that had escaped fishing to spawn and that coho salmon were also thought to spawn in the watershed; however there had been no confirmed observations to substantiate this. Taseko reported that Chinook salmon spawned in Taseko River near the Taseko Lake outlet, Beece Creek (Bisqox), and in Elkin Creek. Taseko noted that the high levels of turbidity and total suspended solids had made annual estimates of fish escaping fishing to spawn in Taseko River incomplete and inaccurate. However earlier reports had indicated from 25 to "thousands" of Chinook spawn in Taseko River and Elkin Creek watersheds.

Taseko noted that no salmon were present in the proposed mine site.

Taseko indicated that the Project would not have an effect on salmon fisheries. Taseko supported this conclusion by indicating that the flow contribution of Fish Creek (Teztan Yeqox) to Taseko River (Dasiqox) discharge was greatest during the Fish Lake (Teztan Biny) freshet period (April – May; 5% - 12% contribution) but remained below 5% for the remainder of the year. As such, the estimated flow reductions as a result of the Project would not have an effect on salmon migration in the Taseko River.

Salmon could only access Lower Fish Creek (Teztan Yeqox) from the Taseko River (Dasiqox) for approximately two months per year, in the spring. Since salmon spawn in the fall, Taseko stated that flow reduction in these reaches would not have an effect on fish migration in Lower Fish Creek.

Taseko anticipated that the habitat created within the Taseko Lake Off-Channel would be used by salmon because there would be a general lack of off-channel habitat in the Taseko River (Dasiqox). Taseko further noted that colonization of the Taseko Lake Off-Channel element would be facilitated through its close proximity to the known major Chinook and bull trout spawning grounds. Therefore, the Taseko Lake Off-Channel would provide critical rearing, overwintering and spawning habitat for salmon, trout and char that is currently lacking.

Taseko stated that the Taseko Lake Off-Channel habitat compensation element focused on the creation of new instream and riparian habitat for rainbow/steelhead as well as for Chinook salmon and bull trout, all of which would maintain fisheries of cultural, recreational, commercial, and ecological importance within the region and the Province.

Taseko stated that additional elements such as the Elkin Creek compensation would confine water discharge in the watershed and stabilize bank erosion, eliminating sedimentation of Chinook salmon and steelhead trout spawning and rearing habitats. This increase in the productivity of habitats would benefit Chinook salmon and would contribute to the cultural, recreational, commercial, and ecological values within the region.

In response to concerns raised regarding the Project affecting the temperature regime within the Taseko Lake Off-Channel, Taseko noted that the augmentation of groundwater with surface water could be used to regulate these effects if required. Taseko indicated that Taseko Lake Off-Channel design would incorporate flow control structures to provide preferred depths and velocities for Chinook spawning, rearing and overwintering.

In response to concerns expressed by some participants that seepage or pollution from mine effluent might reach the Taseko River (Dasiqox) and affect salmon in the Chilko and Taseko Rivers, Taseko reported that its models indicated that the changes in water quality in the Taseko River were predicted to be not significant.

Taseko stated that the transmission line crossing of the Fraser River would have no effect on the salmon and salmon fisheries. Also no effects were predicted for any of the streams crossed by the line.

Taseko concluded that no adverse residual effects were expected for water quality offsite and therefore no adverse residual effects on salmon in the Taseko River (Dasiqox) following the implementation of proposed mitigation measures and water management plans. Taseko noted the perceptions about the impacts and potential loss of the ability to fish salmon, responding that no impact to Taseko River is expected from Project. Taseko noted that the preservation of Fish Lake (Teztan Biny) and fishery and the protection of water quality and salmon fisheries through a one watershed project design with zero discharge during operations, and implementation of fish habitat compensation plans, would be neutral in direction.

7.4.2 Views of Participants

Fisheries and Oceans Canada stated that Taseko River (Dasiqox) was a glacial stream that served as an important spawning, rearing and migration corridor for Chinook and sockeye salmon which supported valuable commercial, recreational, and Aboriginal fisheries.

Fisheries and Oceans Canada acknowledged that Chinook salmon were present in the Lower Fish Creek (Teztan Yeqox) reaches except during the summer and fall period where low flow conditions would prevent migration of fall-spawning salmon into Fish Creek from the Taseko River (Dasiqox).

Fisheries and Oceans Canada noted that Beece Creek (Bisqox) provided valuable spawning, rearing and overwintering habitat for Chinook salmon. Fisheries and Oceans Canada concluded that the loss of Lower Fish Creek (Teztan Yeqox) would not appear to represent a critical loss of habitat to the Taseko Chinook as similar rearing habitat might be provided by the proposed Taseko Lake Off-Channel element.

Fisheries and Oceans Canada stated that the Taseko sockeye return was very small in relation to the neighbouring sockeye runs (e.g., Chilko River), and on average makes up under 1% of the total Fraser River sockeye return. Fisheries and Oceans Canada did not provide an assessment on the Taseko sockeye.

The British Columbia Ministry of Forests, Lands and Natural Resource Operations indicated that it has not been able to evaluate the Taseko Lake Off-Channel as the feasibility/baseline assessment and final design of the Taseko Lake Off-Channel had not yet been completed by Taseko.

The British Columbia Ministry of the Environment noted that water from the seepage ponds were to be discharged to Big Onion Lake (Jidizay Biny) and Wasp Lake, which may deteriorate water quality. This water is expected to make its way to Beece Creek (Bisqox) and the Taseko River (Dasiqox) which were characterized as highly valuable fish streams, namely for salmon. The Ministry also noted that pit water was expected to be discharged to Lower Fish Creek at post-closure and that the water would receive little dilution in Lower Fish Creek before it entered the Taseko River. The commitment of “no change to water quality in Taseko River” as stated in the provincial environmental assessment certificate would need to be upheld to ensure Taseko River water quality would be maintained and that the high value fish habitat continued to exist.

The Ministry of the Environment stated that the commitment of no change to water quality in the Taseko River (Dasiqox) included in the environmental assessment certificate for the previous project needed to be upheld to ensure the Taseko River maintained a high value fish habitat. The Ministry indicated that the Project would result in the loss of Lower and Middle Fish Creek (Teztan Yeqox), a portion of Upper Fish Creek as well as Little Fish Lake (Y'anah Biny) and that these losses could not be mitigated, and therefore, compensation was required to maintain a healthy, self-sustaining trout population.

Dr. Orr, on behalf of the Tsilhqot'in National Government, stated that Taseko incorrectly discounted the Project effects to fish in both Lower Fish Creek (Teztan Yeqox) and Taseko River (Dasiqox) which includes salmon.

Dr. Rina Freed, on behalf of Tsilhqot'in National Government, stated that Taseko did not discuss the alternative of routing the flow around the open pit to Lower Fish Creek (Teztan Yeqox) instead of pumping the Fish Lake (Teztan Biny) outflow to the Fish Lake tributaries and the tailings storage facility. Dr. Freed stated that routing this flow around the open pit could reduce impacts to salmon. The concentration of cadmium predictions in Lower Fish Creek at post-closure was also identified by Dr. Freed as a very serious risk to salmon.

Mr. Holmes, on behalf of the Tsilhqot'in National Government stated that the Taseko Lake Off-Channel was poorly conceived and did absolutely nothing to enhance the well-being of the Taseko sockeye which was in dire need of assistance. He further noted that the Taseko Lake

Off-Channel would not enhance Taseko River (Dasiqox) sockeye habitat and instead would improve the habitat of the bull trout which would prey on sockeye smolts, thus resulting in a negative effect. Mr. Holmes indicated that the fragile Taseko sockeye stocks required ultimate protection.

Richard Holmes' presentation at the community sessions on behalf of the Tsilhqot'in National Government highlighted the Tsilhqot'in intimate relationship and dependency on salmon fisheries as well as the economic importance of the salmon fisheries. He presented pamphlets and samples of "Local Chilko River Salmon Products" which were being developed by the Tsilhqot'in National Government.

Chief Fred Robbins of Esk'etemc Chief David Archie of Stswecem'c Xgat'tem shared their concerns regarding the transmission line crossing through their main and preferred salmon fishing area.

Aboriginal community members the hearing sessions expressed concerns regarding the potential Project effects on salmon fisheries. Numerous concerns were raised regarding the potential effects on salmon and the fear that one of their primary food sources could be affected by the Project. Aboriginal participants reiterated the importance of salmon in their culture and their dependency on the salmon stocks for subsistence.

7.5 PANEL'S CONCLUSIONS AND RECOMMENDATIONS

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

Fish and Fish Habitat

- All 16 371 m² of in-stream habitat available in Lower Fish Creek (Teztan Yeqox) would be temporarily altered by the Project.
- The reduction of rainbow trout in Fish Lake (Teztan Biny) would result in a population of 35 000 individuals predicted to be larger in size.
- The Panel noted that the tailings storage facility would result in the permanent destruction of Little Fish Lake (Y'anah Biny) which represents 6.6 ha of lake habitat.
- The loss of Little Fish Lake would result in the necessary removal and subsequent relocation or disposal of the estimated 5 000 rainbow trout.
- The Project will affect the Fish Creek watershed that supports fish and fish habitat, which is an environmental effect captured under subparagraph 5(1)(a)(i) of CEAA 2012.
- The Tsilhqot'in National Government stated that the loss of Little Fish Lake was significant.
- At its closest point, blasting would occur approximately 373 m away from fish habitat.
- No direct downstream effects on fish and fish habitat in Big Onion Lake (Jidizay Biny), and Beece Creek (Bisqox) are expected.

The Panel notes that a significant amount of fish habitat would be lost due to the construction of the Project infrastructure including the open pit and the tailings storage facility. The required water management activities would result in the elimination of flows and the availability of rainbow trout habitat in portions of Middle and Upper Fish Creek (Teztan Yeqox). The Panel accepts that there would be fewer fish in Fish Lake (Teztan Biny).

The Panel is of the opinion that the loss of Little Fish Lake (Y'anah Biny) is an adverse effect, of medium magnitude and is irreversible. Further, the effect is local and the ecological context is sensitive. However, as the loss of Little Fish Lake will be compensated, the Panel concludes that the effect on fish is neutral.

The Panel acknowledges that Fisheries and Oceans Canada and the British Columbia Ministry of Forests, Lands and Natural Resource Operations agree with Taseko's description of the fish and fish habitat characteristics and generally support the proposed fish compensation measures. The Panel agrees with Fisheries and Oceans and Canada's assertion that the elimination of stream and wetlands elements will have consequences and represents risks for ensuring that the Fish Lake (Teztan Biny) aquatic ecosystem functions will be able to effectively support a minimum viable population of rainbow trout. The Panel believes this is an important matter as Fisheries and Oceans Canada notes the juvenile habitat, rather than the spawning habitat, was likely the limiting factor affecting recruitment of the adult population in Fish Lake. For this reason, the loss of important juvenile habitat in middle Fish Creek may well have adverse consequences for trout populations in Fish Lake.

The Panel has determined that the flow augmentation element of the compensation plan will not effectively preserve that aquatic environment in Fish Lake (Teztan Biny) and its inlet tributaries and therefore support a viable population of rainbow trout. The Panel agrees with the comments that the proposed mitigation and compensation measures to maintain Fish Lake are both uncertain and would require ongoing human intervention.

The Panel is unable to recommend any measures outside of those that have already been proposed by Taseko that would mitigate the significant adverse effects of the Project on fish and fish habitat in Fish Lake (Teztan Biny) if the Project proceeds.

Fish Lake Recirculation

Particularly relevant factors:

- Fisheries and Oceans Canada's concerns regarding the removal of stream and wetlands features and the effect this removal would have on the Fish Lake (Teztan Biny) aquatic ecosystem function.
- The indications that temperature and dissolved oxygen concentrations in Fish Lake would be important factors in the success to mitigate habitat loss.
- The possibility of mechanical failure of the pumps presents a substantial risk.
- The Panel agrees that Fish Lake would be isolated from Upper Fish Creek (Teztan Yeqox) upstream of the tailings storage facility for 50 years.
- Fisheries and Oceans Canada's was of the opinion that recirculation would be required in perpetuity and the inherent significant risks for the long-term viability of the functions of the streams and the productivity of the Rainbow trout population.
- Fisheries and Oceans Canada predicted that while the Project would not directly destroy Fish Lake, the lake would experience eutrophication and contamination should the Project proceed.
- Fisheries and Oceans Canada and the Ministry of Forests, Lands and Natural Resource Operations doubted the availability of adequate water quantity in the long-term to maintain year round flow.
- Several participants' fears regarding the isolation of Fish Lake, creating an unnatural closed system or 'aquarium'.

With regards to the Taseko's proposal to recirculate water from the outlet of Fish Lake (Teztan Biny) to the two Fish Lake tributaries, many participants, including federal and provincial experts questioned the feasibility and ultimate success of this mitigation measure.

The Panel notes that the proposal would create a closed system, resulting in the isolation of Fish Lake (Teztan Biny) for 50 years. The Panel recognizes that the proposed technology is untested and that both Taseko and Fisheries and Oceans Canada were not able to provide any examples of wilderness lakes or watersheds that have been subject to a recirculation program such as that proposed. The Panel agrees with Fisheries and Oceans Canada's indication that there are significant risks for the long-term viability of the functions of the streams and the productivity of the rainbow trout population that have not been identified or addressed by Taseko.

The Panel is persuaded that the recirculation plan would likely require pumping in perpetuity and both, Fisheries and Oceans Canada and the British Columbia Ministry of Forests, Lands and Natural Resource Operations raised uncertainties about the long term availability of water to accomplish this objective/requirement. The Panel is of the opinion that the recirculation of Fish Lake (Teztan Biny) would have long term negative effects on the biological productivity of the lake and is likely to impact the trophic status and ecosystem structure and functioning of Fish Lake and the tributary streams. The Panel agrees with Fisheries and Oceans Canada that the mitigation plan would have negative effects on the stream functions, the thermal regime, dissolved oxygen and eutrophication.

The Panel gives weight to the issues identified by the Tsilhqot'in National Government experts as well as experts from the governments of Canada and British Columbia regarding the lack evidence of a similar recirculation process being implemented at this scale. Like these experts, the Panel also questions the feasibility, cost and reliability of pumping in perpetuity that will also result in the following effects that could eliminate the rainbow trout population:

- changes in phytoplankton;
- zooplankton & benthic invertebrate communities;
- increased algae blooms;
- increased water temperature; and
- decreased dissolved oxygen.

The Panel is of the opinion that the information provided during the review did not provide enough convincing evidence that the proposed recirculation of Fish Lake (Teztan Biny) would be successful in maintaining the overall health of Fish Lake and its tributaries to enable the lake to support a viable rainbow trout population. The proposed mitigation plan also contains substantial uncertainties, liabilities and risks.

The Panel accepts the considerable body of credible analysis received from several participants which asserted:

- that water quality in Fish Lake (Teztan Biny) would exceed water quality guidelines for the protection of aquatic life as the Panel concluded in Chapter 6 (e.g., Selenium genetic effects on fish of concern);
- the likely eutrophication of Fish Lake; and
- the proposed adaptive management of eutrophication would exacerbate the conditions in the Fish Lake.

This evidence leads the Panel to conclude that the fish in Fish Lake (Teztan Biny) would be at “serious risk” as was stated by representatives of Environment Canada, Fisheries and Oceans Canada, the British Columbia Ministry of Forests Lands and Natural Resource Operations, the British Columbia Ministry of the Environment and the Tsilhqot’in National Government. The Panel is of the view that the sum of the evidence presented by the experts, and their depth of understanding regarding the likely effects associated with the recirculation of Fish Lake is more credible, sound and accurate than the evaluation and predictions made by Taseko.

The Panel concludes that the recirculation plan introduces multiple stressors that would affect the Fish Lake ecosystem. The Panel determines that the effects are localized, of extremely high magnitude and are long-term. The totality of the evidence presented regarding the Project effects on fish and fish habitat, leads to Panel to conclude that Fish Lake (Teztan Biny) will likely not be preserved as a functioning ecosystem. As a result, the Panel concludes that the fish and fish habitat will be significantly adversely affected.

Fish Habitat Compensation Plans

Particularly relevant factors:

- The proposed mitigation measures and compensation plans provided an overall compensation ratio of 5.2:1 for aquatic habitat.
- The Taseko Lake Off-Channel replaces lake habitat with stream habitat (like-for-unlike).
- The six elements of the *Fisheries Act* compensation would result in a gain of 307 546 m² of habitat and 216 000 m² of riparian habitat.
- Fisheries and Oceans Canada’s generally supports for the habitat compensation measures/strategies proposed by Taseko, which uses understood techniques that have been demonstrated in previous applications as technically feasible and beneficial to fish and/or fish habitats in certain circumstances, which the Panel acknowledged.
- The British Columbia Ministry of Forests, Lands and Natural Resource Operations was of the opinion that re-commissioning the Hanceville hatchery and continued outplanting of Fish Lake (Teztan Biny) fry are essential to provide a backup for preserving the genetic strain of Fish Lake rainbow trout.
- Numerous participants expressed concerns regarding the elimination of rainbow trout habitat and the permanent destruction of the fishery in Little Fish Lake (Y’annah Biny).
- The Province requires additional information to assess the Taseko Lake Off-Channel component and added that the completion of additional compensation elements located outside the local study area but inside the regional study area is crucial to meet their benchmark objectives.

The Panel notes Fisheries and Oceans Canada’s general support for the habitat compensation measures and strategies proposed by Taseko, recognizing that the techniques are generally well understood and have been demonstrated in previous applications as beneficial to fish and/or fish habitats in certain circumstances.

The Panel acknowledges that the Province requires additional information to assess the Taseko Lake Off-Channel component and added that the completion of additional compensation elements located outside the local study area but inside the regional study area is crucial to meet their benchmark objectives.

The Panel recognizes that the Fish Compensation Plans have been developed by Taseko to compensate for the losses to fish and fish habitat under the assumption that Fish Lake (Teztan Biny) will be preserved. The Panel acknowledges that the proposed compensation plans would

likely be effective under these assumptions. However, the Panel is of the view that the recirculation of Fish Lake may not preserve the lake ecology which will result in a residual adverse effect on fish and fish habitat which will not be compensated by the proposed plans.

Based on the multitude of factors identified regarding the Project effects on fish and the Panel's conclusion in Chapter 6 that water treatment options were unlikely to maintain water quality in the long term, the Panel is of the opinion that fish in the Fish Lake (Teztan Biny) would be adversely and significantly affected.

The Panel finds that the only reasonable conclusion that the hearing record supports is that the proposed water recirculation scheme is not likely to sustain a viable trout population in Fish Lake (Teztan Biny) in the long term. The Panel's lack of confidence in the proposed water recirculation scheme is exacerbated by significant risks to water quality in Fish Lake resulting from the predicted exceedances of contaminants that will contribute to the adverse effect on fish. While the mitigation measures Taseko proposed in the compensation plan are well understood, they will not compensate for the adverse effects to fish that will result from the Project's impacts on water quality and lake ecology from the recirculation of Fish Lake. The Panel finds that the restoration of the hatchery is an important element and could benefit from the involvement of Aboriginal groups in the management and outplant operations.

The Panel concludes that the effects are of high magnitude, regional, irreversible in the long term and that the ecological context is extremely sensitive. . Because the significant adverse effect on fish is caused mainly by poor water quality and because the poor water quality was determined to be immitigable, the effect on fish and fish habitat is also immitigable.

The Panel concludes that the Project would result in a significant adverse effect on fish and fish habitat. This effect cannot be mitigated.

RECOMMENDATION 6

The Panel recommends that, if the Project proceeds, Taseko be required to monitor and maintain all compensation elements of its fish habitat compensation plans and report to the appropriate government authorities.

Salmon Habitat

Particularly relevant factors:

- Taseko reported no salmon present in the proposed mine area;
- Taseko expects that the Taseko Lake Off-Channel will be used by salmon because there is no off-channel habitat in the Taseko River (Dasiqox);
- several participants held the view that the Taseko Lake Off-Channel would have a negative effect on the red listed Taseko River sockeye salmon stocks; and
- First Nations indicated some level of dependency on the salmon fishery as a primary food source and source of income.

The Panel accepts that salmon are not present in the proposed mine area. The Panel also accepts the potential for the Taseko Lake Off-Channel as well Haines and Elkin Creek

restoration compensation to improve critical rearing, overwintering and spawning habitat for salmon, trout and char.

The Panel heard concerns expressed throughout the hearing sessions regarding effects on the salmon habitat; however, the Panel determines that the proposed compensation elements would likely increase salmon habitat and that there would be no loss of salmon fishing opportunities for Aboriginal and non-Aboriginal peoples.

The Panel concludes that the Project would not result in a significant adverse effect on salmon habitat.

8 VEGETATION

In this chapter, the Panel considers the Project's effects on vegetation, first considering vegetation in the context of wetland and riparian ecosystems, and then for old forest and grassland ecosystems. Issues related to riparian ecosystems were also discussed in Chapter 7.

Taseko reported that its assessment of vegetation was largely informed by the following guidance:

- Federal Wetlands Policy;
- BC Forest and Range Practices Act;
- Land Use Plans; and
- Sustainable Resource Management Plans.

Issues relative to the Project's effects on vegetation, namely the loss of wetlands and riparian habitats, the loss of old forest habitat and concerns regarding grassland ecosystems were raised by participants throughout the review. As such, a discussion of those effects is carried forward in this report.

Issues related to the loss of country food plants were also raised by participants and will be discussed in Chapter 14.

8.1 WETLANDS AND RIPARIAN ECOSYSTEMS

8.1.1 Proponent's Assessment

Taseko indicated that the baseline data for wetlands was updated from the previous panel's review to include wetland functions, which were not part of the part of its previous EIS. Taseko's updated assessment of the habitat function included consideration of habitat for migratory birds and SARA or Committee on the Status of Endangered Wildlife in Canada (COSEWIC) listed species. Taseko noted that the federal wetlands policy of "no net loss" of wetland function was a key component that influenced its assessment of the Project's effects on wetlands.

Taseko noted that the federal wetland classification system indicated that the wetlands in the Project area would be generally characterized as slope fen forms and riparian fen forms and more specifically characterized as fens, swamps, marshes and shrub-carrs.

Taseko reported that 311 ha of wetlands and 317 ha of riparian ecosystems would be lost, post-closure, at the mine site due to clearing, grading and construction of the Project. Taseko further noted that these losses did not include reclamation or habitat compensation. Taseko highlighted that the loss of wetlands and riparian ecosystems predicted for the New Prosperity Project was less than the loss of 404 ha of wetlands and 353 ha of riparian ecosystems which was predicted for the original Prosperity project. Figures 11 and 12 illustrate the respective areas of disturbed wetlands and riparian ecosystems.

Taseko reported that the transmission line right-of-way would overlap with 10.5 ha of the 489.2 ha of largely forested swamp wetland ecosystems. Taseko also indicated that the transmission corridor would cross saline meadows which were considered important for wildlife habitat and limited in distribution in the province. Taseko further noted that the saline meadows were particularly vulnerable to livestock grazing damage and non-native grass species encroachment.

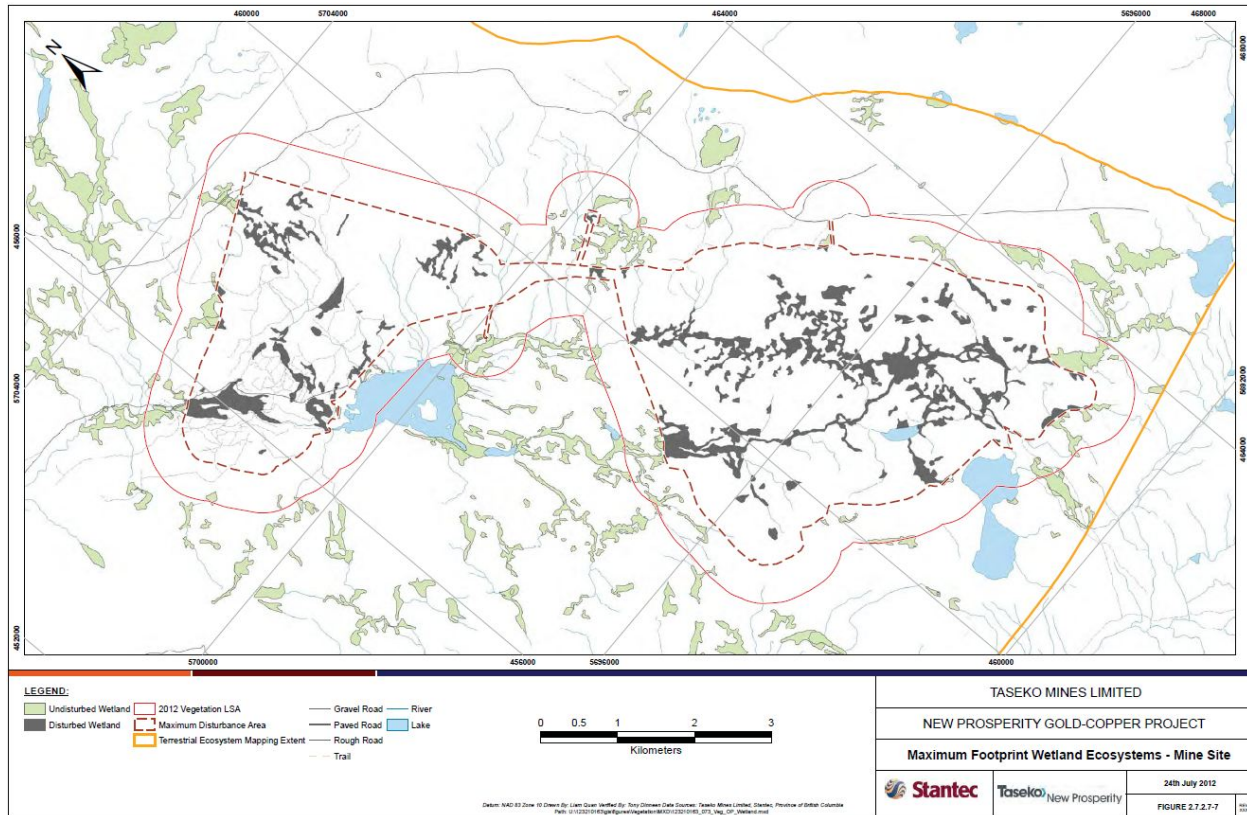


Figure 11. Maximum Footprint Wetlands Ecosystem – Mine Site (Source: Taseko)

Taseko stated that little to no loss of wetland ecosystems in the transmission corridor was expected, because of its commitment to avoiding sensitive areas such as wetlands, riparian habitat or unstable terrain. Taseko indicated that the avoidance of sensitive areas would be incorporated into its detailed planning and final design and alignment of the right-of-way, at which time it would select pole placement sites and use environmentally sensitive construction practices.

Taseko's assessment of the Project's effects on wetlands in the mine site focused on three main wetland functions: hydrological, biogeochemical and habitat.

Hydrological Function

Taseko noted that indirect effects on wetland functions could result from changes in surface or groundwater hydrology or water quality. In response to a Panel's information request, Taseko identified how the effects of the Project could impair the wetlands hydrological functions within the Fish Lake (Teztan Biny) ecosystem which includes the ability to:

- provide groundwater recharge to either the deep aquifer or to augment local surface base flows;
- provide peak flow attenuation and reduce force of erosion; and
- recharge the deep aquifer above Fish Lake (Teztan Biny).

Taseko indicated that all wetlands in the mine site could be affected by the Project and that all wetlands also had the potential to contribute to groundwater or surface water recharge. Taseko

indicated that wetlands that would be lost due to the Project had a moderate to high potential to provide groundwater recharge to either a deep aquifer or to augment local surface base flows.

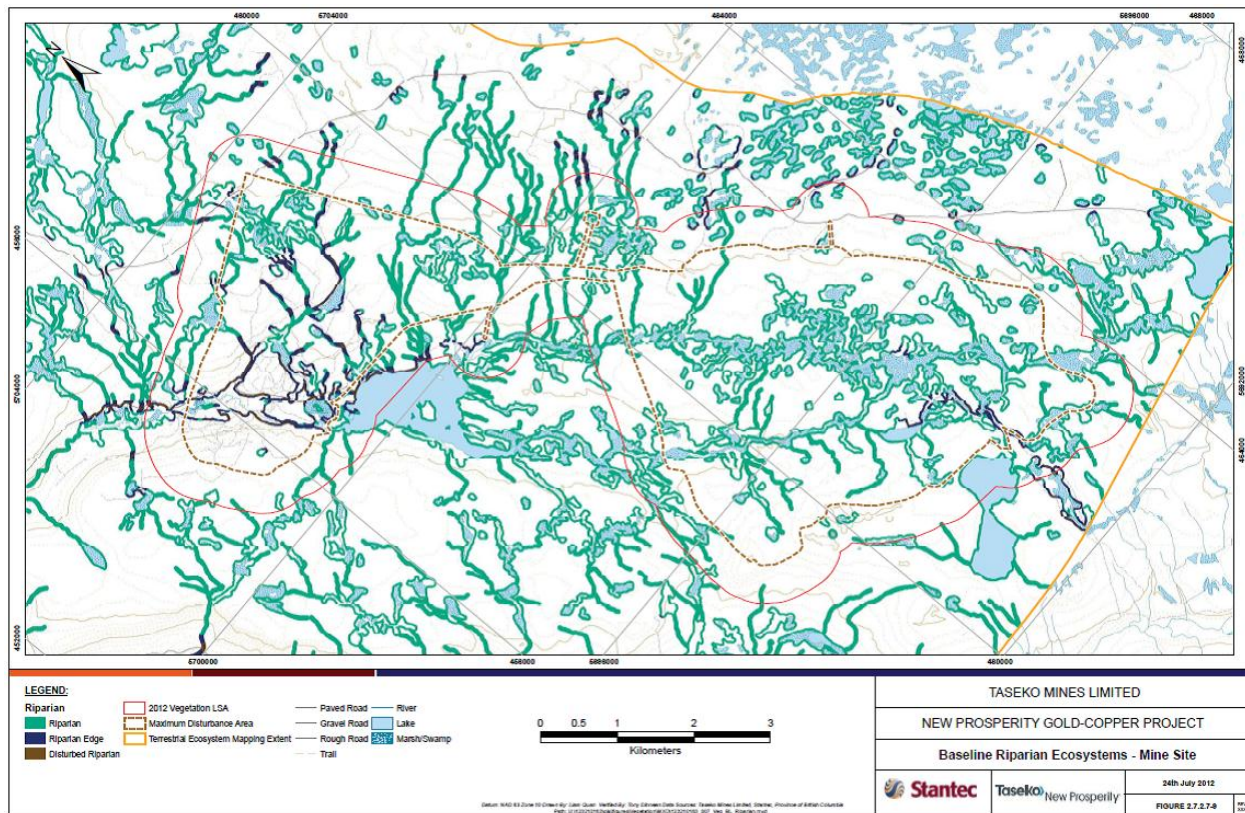


Figure 12. Baseline Riparian Ecosystems – Mine Site (Source: Taseko)

Taseko noted the high value of the wetlands in the mine site area, and the wetlands' potential (particularly the swamp ecosystems) to reduce the erosive force of surface flows due to their hydromorphic setting and treed vegetation structure. Taseko indicated that at post-closure, the Project would result in the loss of 279 ha of wetlands that had a moderate to high potential to provide peak flow attenuation and reduced force erosion.

Taseko indicated that the dewatering of the pit would result in the potential loss of hydrological functions for wetlands around and downstream of the pit for a 50 year period until the near surface groundwater elevations are restored. Taseko explained that the drawdown of the water table during mine construction and operation could result in a decrease in the water table by 30 cm to 1 m. Taseko noted that this decrease could affect wetland and/or peat soils, resulting in drier conditions that would cause peat to dry and oxidize, thereby influencing the type of vegetation that can be supported in the area. Taseko said that the extent of wetlands affected by changes in soil moisture could not be determined, but predicted the effect will be confined to the mine site local study area. Taseko committed to monitoring to determine the actual effect.

Taseko admitted that it had not investigated the effects of the recirculation of Fish Lake (Teztan Biny) on wetlands functions. Taseko conveyed that Ducks Unlimited had a substantial record of similar water and wetlands management systems that involved both holding back and potentially recirculating water.

Biogeochemical Function

Taseko acknowledged that wetlands played important biological, geological and chemical processes that govern the composition of the natural environment. Wetlands perform a recycling function as it relates to plants, animals, the earth's sediment and atmosphere. Taseko noted that long-term accumulation of metals or changes in acidity might affect the potential for wetlands to provide these biogeochemical functions. Compromising these functions might impair the ability of wetland ecosystems to improve water quality by removing toxic metals, which could result in less suitable habitat for wildlife species.

Taseko indicated that wetlands in the mine site local study area had the potential to remove sediment, reduce the velocity of surface flows and provide filtration by settling sediments. Based on discussion of attenuation of peak flows and reduction of erosion, Taseko noted that the fen ecosystems had a moderate potential to improve water quality by removing sediment.

Taseko noted that among wetlands in the mine site local study area with pronounced seasonal wetting and drying periods, the fen and swamp ecosystems located adjacent to streams or open water features had the potential to improve water quality by removing nitrogen.

Habitat Function

Taseko articulated that wetland ecosystems contributed to biological productivity and diversity of various faunal & floral groups. Taseko reported on wetland functions pertaining to the provision of wildlife habitat for five faunal groups: mammals; migratory birds; amphibians; fish; and aquatic invertebrates.

Taseko reported that the wetlands and riparian habitat would support mammals (including moose, grizzly bear, black bear, muskrat, otter, long-tailed weasel, mink, beaver and bats), migratory birds (including mallard, lesser scaup, bufflehead and American coot), and amphibians, including two SARA listed species (western toad and Great Basin spadefoot), fish and aquatic invertebrates.

Mammals

Taseko indicated that 311 ha of wetlands in the mine site had a moderate to high potential to support wetland-associated mammal habitat. Taseko noted that all classes of wetlands in the mine site were in close proximity to a large lake (Fish Lake (Teztan Biny)) and open fields which provided habitat for a significant number of mammals.

Taseko noted that wetlands provided habitat for mammals to forage, graze, prey on invertebrates, fish and amphibians and accommodate denning sites for large rodents.

Taseko noted that the 1997 field inventories in the Fish Lake (Teztan Biny) area identified six species of bat, while the 2006 bat inventory program detected three species in the mine site being the *Myotis spp.*, the long-eared myotis and a third larger species (either big-brown bat or silver-haired bat). Taseko confirmed that four little brown myotis, a species that has recently been listed as endangered by COSEWIC, were detected in 2006. Taseko indicated that bats forage and feed on flying insects over open water within wetlands.

Waterfowl and Migratory Birds

Taseko reported that 47 species of waterbirds (ducks, geese, wading birds, shorebirds and seabirds) and 137 species of passerines were recorded during field programs. Taseko advised

that its 2006 aerial surveys of migratory waterfowl recorded 15 species within all the entire Project area and that broods of the following species were observed in wetlands in the mine site: bufflehead; Canada goose; common loon; goldeneye; mallard; ring-necked duck; and scaup.

Taseko stated that late season moults were observed on several wetlands throughout the Project area suggesting these wetlands were used for all stages of the life cycle (breeding, moulting/pre-migratory staging and migration). Taseko noted that the Project would result in the loss of 311 ha of wetland and riparian areas which had a moderate to high potential to support migratory bird habitat by providing breeding and nesting habitat and areas for rest and refuge.

Amphibians

Taseko concluded that 211 ha of wetlands used for amphibian breeding habitat would be lost.

Taseko advised that the western toad (listed under *SARA Schedule 1: Special Concern*) was present and relatively common throughout the Project area. Taseko indicated that this species used a wide variety of wetland habitats for breeding, including both natural and human-made aquatic habitats, ponds, edges of streams, and the shallow margins of other water bodies such as ditches, tailing ponds, and road ruts.

Taseko maintained that Great Basin spadefoot toad (*SARA Schedule 1: Threatened*) was not observed in the mine site, although portions of the mine site regional study area located within the Montane Spruce ecological zone overlapped with the potential range of this species and that suitable breeding habitat existed.

Fish

Taseko states that 2.1 ha of wetlands with moderate to high potential to support fish would be lost. Taseko stated that the fen and swamp ecosystems connected to streams by surface water during seasonally flooded conditions had the potential to support fish. Taseko indicated that these wetlands had the potential to provide foraging and rearing for fish.

Aquatic Invertebrate Species

Taseko discussed that the flood-prone swamp ecosystems had the potential to provide habitat for aquatic invertebrates during flooded conditions. Taseko noted that aquatic invertebrate species would generally benefit from the permanent surface water, litter fall and woody debris inputs and aquatic vegetation provided by the swamp ecosystems.

Rare Plants or ecological communities of concern

Taseko indicated that the fen ecosystem was known to support the blue-listed rare plant *Ranunculus pedatifidus*, specifying that three known occurrences of the plant had been identified.

Taseko stated that the collective loss of wetlands functions in both the mine site and transmission line areas could be compensated with reclamation, and with appropriate on- and off-site wetland habitat compensation. Furthermore, Taseko noted that its habitat compensation plan included wetland and riparian functions.

In regards to potential increased accessibility to the land due to the new transmission line corridor, Taseko expressed its commitment to work with local ranchers to prevent cattle disturbance in wetland or riparian areas.

Taseko committed to protect wetlands in close proximity to the mine footprint by minimizing disturbances through avoiding vegetation loss, mitigating against invasive species, and maintaining natural drainage patterns.

Taseko indicated its commitment to monitor wetlands that were predicted to be indirectly affected by groundwater drawdown and by the implementation of the site water management plan.

Wherever practicable, Taseko committed to minimize the extent of grubbing and stripping in wetlands and riparian areas and to avoid vegetation loss within 30 m of wetlands through environmentally sensitive Project design and construction practices. Best management practices would also be implemented by Taseko wherever practicable, including the creation of buffer zones around wetland habitats, maintaining connectivity among wetlands within wetland complexes, and managing access to wetlands in the regional study area beyond the mine site footprint.

Taseko indicated it would mitigate against invasive species by minimizing areas of soil disturbance during construction and maintenance of roads, re-establishing vegetation on disturbed areas as soon as possible and implementing an invasive plant management plan.

Taseko determined that the Project was expected to have high magnitude residual effects on wetland and riparian ecosystems, as 311 ha of wetland and 317 ha of riparian ecosystems within the regional study area were expected to be lost at post-closure, prior to implementation of compensation measures. An example of a compensation measure would be to plant wetland vegetation species along the 100 m sand beach strip in the tailing storage facility at post-closure.

Taseko concluded that effects to wetland ecosystems were primarily limited to the mine site. However, when considered in the context of the large areas of comparable wetland habitat in the greater region, the areal extent of wetland ecosystems that would be affected was deemed to be relatively small. Road upgrades in the access road area and clearing the transmission line right-of-way would result in some very small wetland losses.

As the area is presently undisturbed, Taseko indicated that Project's effects on wetland ecosystems would be adverse, localized in extent, of high magnitude and would extend into the far-future. Taseko maintained that the loss of wetlands and riparian ecosystems would be reversible through implementation of the mitigation measures as detailed in its habitat compensation plan.

Given the implementation of the proposed mitigation and compensation measures, Taseko predicted that the combined residual effect of the Project on wetland functions would be not significant.

8.1.2 Views of the Participants

Environment Canada provided technical advice on implementing the federal wetland policy. In doing so, Environment Canada expressed concerns regarding the potential effects on wetlands and associated riparian habitat that support migratory birds and species at risk. Environment

Canada noted that the loss of wetlands, including fens, swamps, and shrub-carrs within the footprint of the open pit and the tailings storage facility would be permanent.

Additionally, Environment Canada indicated that the structure, composition and function of wetlands outside of the open pit and tailings storage facility footprints would also likely be affected due to proposed water management strategies for the mine site. It was highlighted that these effects could manifest in the longer term, during operations, closure and post-closure phases of the Project. Environment Canada conveyed that based on its review of the draft habitat compensation plan, it estimated that the water management strategies could potentially affect an additional 69 ha of wetlands than those estimated by Taseko.

Environment Canada also noted that the wetlands' ability to perform biochemical functions for downstream habitats could be negatively affected. In this regard, Environment Canada noted that it was important that the ecological interconnections between upstream and downstream habitats be thoroughly understood in assessing potential Project impacts and appropriate mitigation and/or compensation measures. Environment Canada further noted that a monitoring program that evaluates impacts to wetlands due to changes in hydrology would be one important component of the habitat compensation plan.

Environment Canada noted the absence of any technology and capability to recreate a number of the wetland habitats that are located within the Project area.

Environment Canada suggested that the habitat compensation plan provided an appropriate foundation for finalizing compensation details; however, in its view, Taseko failed to account for the potential impacts which could arise from the:

- development, operation and reclamation of the pit and tailings storage facility;
- water management strategies; and
- “zones of influence” effects arising from noise, light and other such effects.

Environment Canada recommended the development of a habitat compensation plan in support of the environmental assessment to address residual adverse environmental effects on wetland and riparian habitats that support migratory birds and species at risk.

Environment Canada suggested that Taseko commence migratory bird and species at risk pre-construction and operations monitoring to assess potential changes in function, in conjunction with pre-construction and operations wetland monitoring.

Furthermore, Environment Canada insisted that the submission of the final habitat compensation plan be a condition in any decision statement issued under CEAA 2012, should the Project proceed.

The British Columbia Ministry of Forests, Lands and Natural Resource Operations expressed concern regarding the potential for local wildlife populations to be reduced due to the Project's effects on wetlands habitat. The Ministry noted that the changes made to the New Prosperity mine design, which were intended to maintain the ecological viability of Fish Lake (Teztan Biny), might have an adverse effects on neighboring receiving environments, such as riparian and wetland habitats.

The British Columbia Ministry of Forests, Lands and Natural Resource Operations indicated that the consequences of losing or altering the functionality of wildlife habitat would be:

- a shift in plant communities from prolonged wetting or drying of wetland and riparian ecosystems due to changes in flow inputs; and
- reduced or lost productive capacity of habitats functioning as feeding habitat, wetland and riparian through contaminant loading delivered in the water column.

The British Columbia Ministry of Forests, Lands and Natural Resource Operations noted that 68 ha of wetlands might be indirectly impacted through prolonged drying from the drawdown of the groundwater table. The Ministry stated that this effect could have potential negative implications for the reproductive health of songbirds, raptors, waders and waterfowl due to elevated exposures to selenium.

The British Columbia Ministry of Forests, Lands and Natural Resource Operations stated that the wetlands and riparian ecosystems potentially affected by the Project are known to be used by a host of wildlife species including: beaver, river, otter, muskrat, elk, moose, grizzly and black bear, little brown myotis, bald eagle, mallard, barrows golden-eye, red-winged blackbird and western toad. The Ministry noted that that seven of these species had been named in the *Tsilhqot'in vs. British Columbia, 2007 BCSC 1700 (William case)* as important to the Tsilhqot'in First Nation.

The British Columbia Ministry of Forests, Lands and Natural Resource Operations maintained that the EIS did not consider the indirect effects of contaminant loading in wetlands and riparian habitat, the effects that loss of wetlands could have on the wildlife carrying capacity and that other wetlands in the area might be affected.

The British Columbia Ministry of Forests, Lands and Natural Resource Operations recommended that ongoing monitoring, mitigation and commitments to compensate should be incorporated into the habitat compensation plan. Consultation with government and Aboriginal groups to develop monitoring and compensation targets for the functional loss of Wasp Lake and Onion Lake (Jidizay Biny) areas' wetland habitats were also suggested. It was also recommended that Taseko consult on the development of a wildlife health monitoring plan targeting species representative of trophic guilds and those important to Aboriginal people as sustenance species.

Several participants, including the Grasslands Conservation Society of British Columbia and Wayne McCrory indicated that the loss of crucial wetland and riparian habitat as a result of the Project would be critical to the grizzly bear population. Several Aboriginal groups also explained that the loss of wetlands and riparian habitat would result in residual adverse effects on regional and local wildlife populations of migratory birds, species at risk, grizzly bear and several other species of importance to Aboriginal people.

Throughout the hearing sessions, several Aboriginal community members shared concerns about the loss of high value moose wetlands habitat. These concerns were further supported by a study completed in 2004 by the British Columbia Ministry of Water, Land, and Air Protection which established a preliminary list of "high value" wetlands for moose within the Cariboo Forest Region. The study highlighted the particular importance of the conservation of wetlands and riparian areas and recommended additional forested buffering of wetlands of up to 200 meters from any activities or development, particularly on the Chilcotin Plateau.

Tsilhqot'in community members also indicated that many generations of Tsilhqot'in had used the wetlands for hunting, gathering and cultural purposes.

8.2 OLD FOREST

8.2.1 Proponent's Assessment

In the previous EIS, Taseko said that the Project effects on old forest would be concentrated in the western end of the transmission line corridor and in the mine site. Taseko reported that the lodgepole pine and spruce species represented approximately 80% of the affected old forest. Sporadic stands of poplar, Douglas-fir and trembling aspen were also observed and considered in Taseko's assessment.

Regarding old forest in the mine site regional study area (Figure 13), Taseko indicated that 134 ha already had been harvested through forestry activities, and 5 107 ha were subject to severe mountain pine beetle infestation, leaving 672 ha remaining intact effectively all non-pine trees. Taseko estimated that clearing and grading in the mine site regional study area would result in the loss of approximately 177 ha of intact non-pine old forest at maximum disturbance. Taseko indicated that most mature and old pine forest in the mine site regional study area would be lost in the near future due to the mountain pine beetle infestation. As a result, Taseko asserted that the pine dominated old forest removed by the Project should not be considered an environmental effect.

Taseko noted that of the 5 810 ha of old forest reported in the transmission regional study area at baseline in the previous EIS, approximately 1 140 ha had been harvested by forestry activities, while approximately 3 352 ha were subject to severe mountain pine beetle infestation. The Project's incremental contribution to effects on old forest in the transmission line area would be the clearing of approximately 37 ha of non-pine old forest. Taseko identified that the direct tree removal associated with the construction of the transmission line would result in a loss or alteration of old forest habitat of importance to a host of wildlife species, including but not limited to the grizzly bear, the fisher and several SARA listed species.

Taseko identified eight SARA listed species that might interact with the transmission line aspect of this Project. However, Taseko indicated that only three species, the Lewis's woodpecker, flammulated owl and olive-sided flycatcher would use old forest habitat for key life history. Taseko also predicted 37 ha to be the maximum amount of old forest habitat that would be lost for species at risk that depended on old forest. Taseko committed to retaining highly suitable nesting habitat and avoidance through site-specific routing of the transmission line to mitigate the loss of this habitat.

Taseko said it would follow the federal SARA management plan and recovery plan developed for the Lewis's woodpecker and the flammulated owl. Taseko advised there was no recovery strategy or action plan for the olive-sided flycatcher.

Taseko maintained that the 80 m wide right-of-way had not been finalized within the 3 km wide economically and technically feasible route and that opportunities to minimize effects on species exist through avoidance.

In an effort to reduce the Project effects on old forest, the primary mitigation measure proposed by Taseko was avoidance. Taseko committed to protect existing non-pine and mature forest wherever possible by retaining single old trees, small old forest patches and snags, which would maintain some of the important features of old forest habitat.

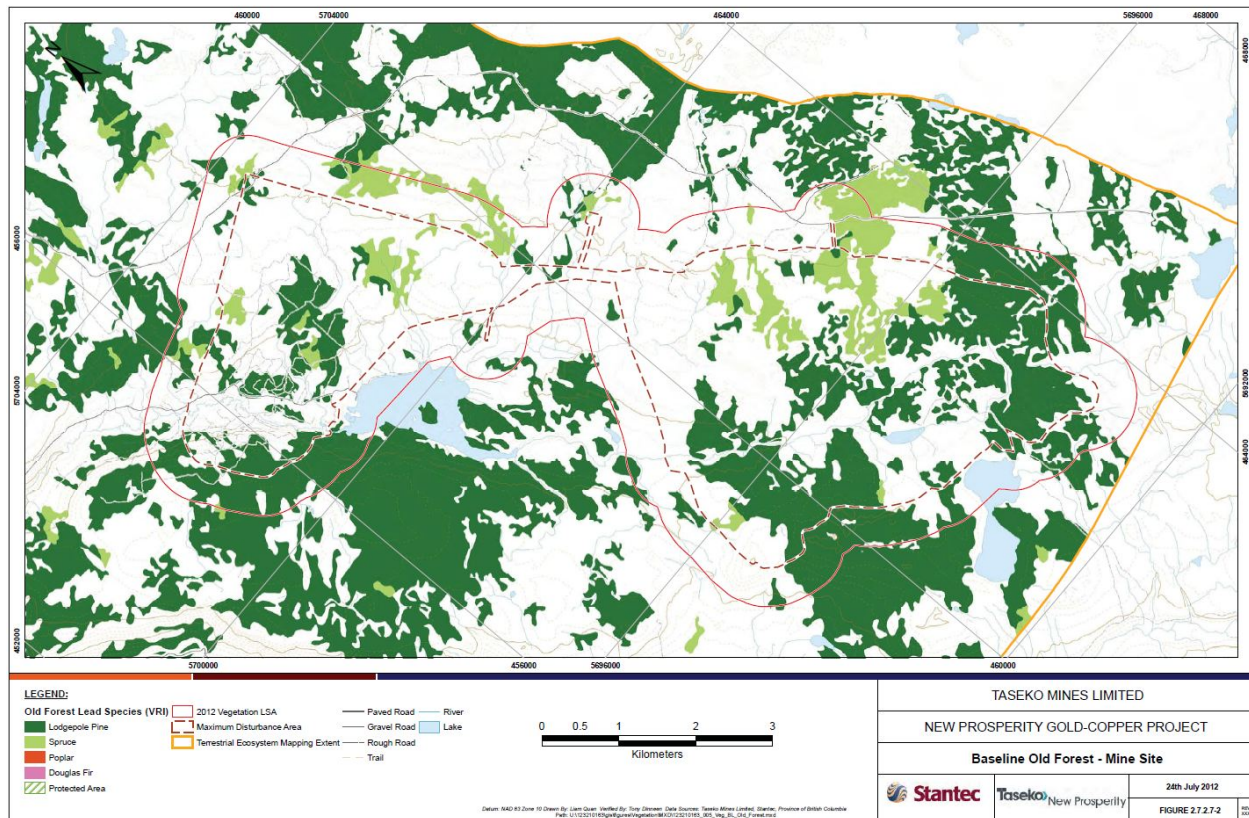


Figure 13. Baseline Old Forest – Mine Site (Source: Taseko)

Taseko said it would align the transmission line to avoid old non-pine forest and has proposed species-specific mitigation measures to retain and protect existing old forest as well as various wildlife features. Taseko also committed to site-specific routing of the transmission line to avoid high value nesting habitat for the SARA listed Lewis's woodpecker and flammulated owl.

Taseko stated that the effects to old forest would be less for the New Prosperity Project than the previous Prosperity project and reiterated that the previous panel determined that effects to old forest were not significant.

Taseko concluded that with the implementation of mitigation, the Project effect resulting in the loss of old forest would be long term, but low magnitude, with a local geographical extent. Taseko indicated that the environmental effect was not significant and was reversible.

Taseko committed to liaise with Aboriginal groups, tenure holders (e.g. cattle ranchers), other stakeholders, and government agencies to achieve the desired mitigation measures.

8.2.2 Views of Participants

Environment Canada stated that despite the mountain pine beetle outbreaks in old forest being a natural occurrence on the forest landscape, the scale of the current epidemic was unprecedented, due in large part to the volume of susceptible pine (of suitable age class) that arose from past forest management practices and climate change.

Throughout the review, a number of participants indicated that more information was required to adequately consider the effects of the proposed mine site and transmission line corridor on old

forest. However, during the public hearing, most of the issues related to old forests were raised by the Esk'etemc as the proposed transmission corridor would cross through their community forest.

During the community hearing sessions, the Esk'etemc Nation stated that the transmission line would cut through its old growth management area, which was a rare and unique habitat for mule deer and moose. The Esk'etemc community members indicated that the area in and around the community forest was a critical winter range for mule deer and moose and was relied upon as an important food source. Those concerns will be dealt with in Chapters 9 and 12 on Wildlife and Aboriginal matters respectively.

The Esk'etemc community members indicated that there were no sufficient mitigation measures that could compensate for the impacts on their rights in the area where the transmission line would pass through the community forest and that they had not been consulted on any of the transmission line corridors alternatives considered.

8.3 GRASSLAND ECOSYSTEMS

8.3.1 Proponent's Assessment

Taseko noted that there were no anticipated changes in grasslands baseline conditions from the previous assessment. Accordingly, Taseko said that much of the information presented on the Project's effects on grassland ecosystems were from the previous review. Taseko also emphasized that the previous panel found no significant effects on grassland ecosystems for the original Prosperity project.

Taseko clarified that the New Prosperity EIS included an assessment of the area of grasslands within Grassland Benchmark Areas, which were spatial boundaries established in 2011 by a Land Use Order under the 1994 the Cariboo Chilcotin Land Use Plan. Taseko explained that these areas, within the mine's maximum disturbance area, were predominantly to the northwest of Fish Lake (Teztan Biny). Taseko submitted that the Land Use Order stated that forest harvesting activities within these areas should aim to facilitate restoration of open grassland conditions.

In the previous 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. Taseko acknowledged that grassland ecosystems are highly visible and generate a significant amount of public concern and interest. In its assessment, Taseko also said that grassland ecosystems were important contributors to species, community and landscape level biodiversity, as they were used by many species.

Taseko predicted a loss of 4 ha of grassland ecosystems from the baseline in the Project's maximum disturbance scenario, compared to the loss of 9 ha that was predicted for the previous Prosperity project. At post-closure, Taseko further specified that 3 ha of grassland ecosystems may be lost at the mine site.

Based on the proposed alignment, Taseko estimated that the transmission line corridor would overlap with 88 ha of grassland ecosystems, representing 4.6% of the grassland ecosystems in the regional study area. Taseko indicated that a very small proportion of the 88 ha was expected to be affected, as it was assumed that there was flexibility in pole placement and access infrastructure which would allow Taseko to avoid environmentally sensitive areas, including grassland ecosystems. Taseko noted that the largest and greatest area of grassland

ecosystems are along the Fraser River which already have been affected by cattle grazing and forest harvesting activities.

Taseko indicated that its reclamation plan would incorporate the land use objectives of the Cariboo Chilcotin Land Use Order where feasible. Taseko said that its mitigation measures would also include avoiding removing trees that are of limited availability in these ecosystems. Taseko stated that it intended only to clear along the transmission line corridor if required to do so to ensure sufficient clearance for transmission lines. It also intended to avoid or minimize construction activities on >15% south-facing slopes, minimize excavation area for pole placement, minimize vehicle traffic in the grasslands and maximize the use of existing tracks/roads. Taseko stated that its proposed mitigation measures were developed to meet the Best Management Practices for Recreational Activities on Grasslands in the Thompson and Okanagan Basins.

Taseko described the overall environmental effect of the Project on grassland ecosystems as including minor losses of the Juniper-Kinnikinnik grassland ecosystem in the mine site regional study area and very small losses in the transmission line corridor and access road regional study area.

Taseko characterized the loss of grassland ecosystem loss due to transmission line construction as being of low magnitude, local in extent, occurring once during construction and was reversible at decommissioning. Assuming implementation of mitigation and environmental protection measures, in particular identifying the exact location of sensitive grasslands, Taseko concluded that the environmental effect of the Project on grassland ecosystems in the transmission line regional study area would be not significant.

8.3.2 Views of the Participants

The Grasslands Conservation Council of British Columbia noted that the conditions contained in the 2010 Province of British Columbia's Project Certificate for the Prosperity Project did not provide sufficient clarity, certainty or direction to ensure that the construction of the transmission corridor through the grasslands would not significantly damage the grassland habitat outside of wetland areas. As a result, the Grasslands Conservation Council of British Columbia maintained that the New Prosperity Project had the potential to have a negative effect on grassland ecosystems.

The Grasslands Conservation Council of British Columbia suggested that the conditions required by the Province of British Columbia for the transmission line to cross wetlands areas, also should be applied to transmission crossings through grassland areas. The Grasslands Conservation Council of British Columbia further submitted that the visual impacts of the transmission line crossing of the Fraser grassland areas be included as conditions in the federal approval certificate should the Project proceed.

Several other participants expressed concern about the Project's effects on grassland ecosystems, focusing primarily on the effects of the transmission line on grasslands ecosystems along the Fraser River, including invasive species, aesthetical value and effects on areas of cultural and traditional significance.

8.4 PANEL'S CONCLUSIONS AND RECOMMENDATIONS

Wetlands

In reaching its conclusions on the effects of the Project on the loss of wetlands and riparian ecosystems, the Panel considered the following factors to be particularly relevant:

- the Project would result in the loss of 311 ha of wetlands and 317 ha of riparian ecosystems at the mine site at post-closure;
- wetland hydrological, biogeochemical, and habitat functions are important aspects of the Fish Lake (Teztan Biny) ecosystem, in terms of its health and sustainability;
- the high value of wetlands and riparian habitat functions which support mammals (including moose, grizzly bear, black bear, muskrat, otter, long-tailed weasel, mink, beaver and bats), migratory birds (including mallard, lesser scaup, bufflehead and American coot), and amphibians, including two SARA listed species, fish and aquatic invertebrates;
- Environment Canada's concerns, which the Panel found convincing, about the permanent loss of wetlands within the footprint of the open pit and the tailings storage facility and the additional loss of 69 ha of wetlands outside the mine area due to the habitat compensation plan and water management strategies;
- the British Columbia Ministry of Forests, Lands and Natural Resources Operations concerns regarding the potential for local wildlife populations to be reduced due to the Project effects on wetlands habitat, which the Panel viewed as valid; and
- the concerns expressed by several Aboriginal groups that the loss of wetlands and riparian habitat would result in a residual adverse effects on regional and local wildlife populations of migratory birds, species at risk, grizzly bear and several other species of importance to Aboriginal peoples. The Panel shares those concerns based on its review of the information provided.

The Panel found Environment Canada's concerns about the loss of wetlands and associated riparian habitat that support migratory birds and species at risk to be convincing. The Panel also decided that Environment Canada's indication that 69 ha of wetlands outside of the pit and tailings storage facility footprints would also likely be affected due to proposed water management strategies and the implementation of the draft habitat compensation plan was valid. The Panel agrees with Environment Canada that the permanent loss of wetlands and riparian habitat due to the footprint of the open pit and tailings storage facility in addition to the indirect effects of the water management strategies and habitat compensation plan would have an adverse effect on wildlife habitat.

The Panel is especially concerned with the loss of biogeochemical function of wetlands lost near Fish Lake (Teztan Biny). The Panel agrees that the wetlands proximate to Fish Lake serve to protect and maintain water quality in the lake. The Panel has concluded that any change in the wetland ecosystems' ability to remove toxic metals and improve water quality in Fish Lake would increase the likelihood and intensity of the significant adverse effect on water quality in Fish Lake.

The Panel notes that should the Project proceed, Environment Canada would to the extent possible verify that its recommendations are included in the final habitat compensation plan and are implemented.

The Panel agrees with Taseko that the Project's effects on wetland ecosystems are adverse, of high magnitude and extend into the far-future. The Panel disagrees that these effects are local

and would categorize them as regional. It also believes the reversibility of the effects predicted by Taseko is questionable based on Environment Canada's observations that peat based wetlands take several decades to develop. The Panel believes that the ecological context of these changes is sensitive, given the importance of these ecosystems to wildlife, migratory birds and to Aboriginal peoples.

The Panel accepts the British Columbia Ministry of Forests, Lands and Natural Resource Operations recommendations that more details regarding ongoing monitoring, mitigation and commitments to compensate should be incorporated into the habitat compensation plan.

The Panel finds that the effects on wetlands downstream from the pit would not be significant. However, the Panel determines that the wetlands near Fish Lake and Wasp Lake would be subject to significant adverse effects from the Project.

The Panel concludes that the Project would result in a significant adverse effect on wetland and riparian ecosystems.

RECOMMENDATION 7

The Panel recommends that, if the Project proceeds, Taseko be required to investigate in much more detail the biogeochemical function of wetlands near Fish Lake (Teztan Biny) and determine how best to mitigate any loss in these functions. This work should be done collaboratively with government authorities and the results should form the basis of an adaptive management plan.

RECOMMENDATION 8

The Panel recommends that, if the Project proceeds, Taseko be required to conduct a monitoring program that evaluates the impacts on wetlands resulting from changes in hydrology. This work should be done collaboratively with government authorities.

RECOMMENDATION 9

The Panel recommends that, if the Project proceeds, Taseko be required to conduct pre-construction monitoring of migratory birds and species at risk to be able to assess potential changes in habitat function. Taseko should consult with government authorities on the duration and frequency of monitoring in relation to migratory birds and species at risk.

RECOMMENDATION 10

The Panel recommends that, if the Project proceeds, Taseko be required to consult with government authorities and Aboriginal groups to:

- a) develop monitoring and compensation targets for the functional loss of wetland habitats around Wasp Lake; and
- b) develop of a wildlife health monitoring plan targeting species representative of trophic guilds and those important to Aboriginal people as sustenance species.

RECOMMENDATION 11

The Panel recommends that, if the Project proceeds, Taseko be required to apply the relevant government authorities' conditions and requirements for the transmission line crossings through wetlands.

Old Forest

In reaching its conclusions on the effects of the Project on the loss of old forest, the Panel considered the following factors to be particularly relevant:

- the Project would affect 925 ha of old forest at the mine site, and 171 ha along the transmission line; approximately 80% of old forest affected would be lodgepole pine and spruce species;
- since 2009, 944 ha of old forest has been removed due to logging and mountain pine beetle infestations and that most mature and old pine forest in the mine site regional study area would be lost in the near future due to the effect of the mountain pine beetle infestation.
- the construction of the transmission line will result in the loss and alteration of 171 ha of old forest habitat which is of importance to several wildlife species including several species listed under the SARA; and
- Esk'etemc community members indicated that the transmission line will cut through their old growth management area, which is considered critical winter range for mule deer and moose.

After considering the differing views, the Panel finds that the primary concern regarding the loss of old forest is with respect to the routing of the proposed transmission line through the Esk'etemc Community Forest. This is discussed more fully in Chapters 12 and 14.

The Panel was persuaded by the uncertainties regarding the potential loss of most mature and old pine forest in the mine site regional study area to the mountain pine beetle in the near future.

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

Grassland Ecosystems

In reaching its conclusions with respect to Project's effects on grassland ecosystems, the Panel considered the following factors to be particularly relevant:

- the scarcity of grassland ecosystems in the province of British Columbia and its relative abundance along the proposed transmission line corridor;
- grasslands closest to the Fraser River are reported to have already been affected by cattle grazing and forest harvesting activities; and
- the request that specific conditions, similar to those required for the effects on wetlands be included in the approval for the transmission line crossing of grassland ecosystems near the Fraser River.

The Panel finds that the effects on grassland ecosystems are associated mostly with the transmission line corridor component of the Project. The Panel agrees that grassland ecosystems are sensitive and serve an important habitat function for several wildlife species.

The Panel agrees that construction of the transmission line would likely affect a relatively small area of grassland ecosystems due to the considerable flexibility in the final location of the centreline within the right-of-way and the placement of individual poles. The Panel has determined that with the implementation of the proposed mitigation and environmental management plan, the residual effects on grassland ecosystems are minor.

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

9 WILDLIFE

Taseko assessed the effects of the Project on wildlife through the use of key indicator species. The list of key indicators was based on the 2009 EIS and included 21 species. The 24 species that were identified in the *William Case* as being of particular importance to the Tsilhqot'in National Government were also considered in Taseko's assessment. Six of these species (moose, mule deer, California bighorn sheep, grizzly bear, black bear and fisher) were assessed directly and the other 18 were assumed to be inferable from the results of the effects assessment for another key indicator that was related or similar in behaviour and habitat use pattern. Of the 47 listed vertebrate wildlife species at risk identified as occurring within the original Prosperity project area, all were considered to have the potential to occur within the New Prosperity Project area. Key indicators were assessed through evaluation of: loss of habitat, disruption of movement patterns, increased direct mortality risk, and reduction in wildlife health.

9.1 GRIZZLY BEAR

9.1.1 Proponent's Assessment

Taseko assessed the effects on grizzly bear as a result of concerns expressed during the federal review of the original Prosperity project with respect to project-related effects on grizzly bear habitat.

The Project would be located in the northwestern quadrant of the South Chilcotin Ranges Grizzly Bear Population Unit (GBPU). Taseko recognized that this GBPU is designated as threatened by the Province of British Columbia and stated that its status reflects the effects of past logging activities. However, Taseko explained that the threatened designation was a concern mostly in the southern and eastern portions of the GBPU, and the Project would be located in management units which had the highest grizzly bear densities in the GBPU (between 14 and 22 bears per 1 000 km²). Taseko also noted that grizzly bear hunting is not permitted in this GBPU.

Taseko noted that the maximum disturbance area for the Project would be less than the area that was predicted to be impacted in the original Prosperity project and therefore there would be a greater availability of effective grizzly bear habitat in the mine site regional study area at maximum disturbance. The increase in habitat for grizzly bear was attributed to the preservation of Fish Lake and the surrounding area, including meadows and riparian areas used by grizzly bears. Taseko stated that with the implementation of the proposed mitigation measures, including minimization of clearing area, reforestation of reclaimed areas, avoidance of non-pine forest types and wetlands, the residual loss of grizzly bear feeding habitat was predicted to be not significant.

Furthermore, Taseko noted that because wetlands located in the immediate vicinity of Fish Lake (Teztan Biny) would be preserved, this habitat would still be available for use by grizzly bears. In response to concerns that the Project would impact the movement of grizzly bear through the area of Fish Lake, Taseko noted that grizzly bears are wide-ranging and opportunistic. Taseko proposed mitigation measures during operations that would minimize activities in the Fish Creek (Teztan Yeqox) area upstream of Fish Lake during spawning time when bears would be present. It noted that reducing the level of activity and controlling human access would prevent disturbance to the movement patterns of grizzly bear and their use of the area. Taseko further explained that these mitigation measures would be outlined in its wildlife management plan and developed prior to construction.

Taseko assessed the Project effects on grizzly bear health because of the bears presence in the Project area and their reliance on spawning rainbow trout in Fish Creek (Teztan Yeqox). Taseko stated that current cadmium levels exceed water quality guidelines at baseline and cadmium and selenium would exceed water quality guidelines in the early spring in at least one phase of mine operation. As a result, Taseko noted that bioaccumulation may be a concern, but that there was no guide for appropriate levels in fish tissue. Taseko further concluded that grizzly bears foraging in the Project area would be exposed to cadmium and selenium while consuming spawning fish in Fish Creek during the spring, with or without the Project. Taseko stated that it would monitor these metals.

In its mortality risk assessment, Taseko determined that the increase in logging and associated road development in the regional study area since 2009 might result in increased human access and potential for human-bear conflicts. Effects on grizzly bear as a result of direct mortality were assessed by Taseko through a core secure habitat analysis and linear feature density analysis. Taseko noted that the Project would create a large opening and the transmission line would contribute 46.3 km of right-of-way through the grizzly bear regional study area, but that in a regional context the availability of core secure habitat for grizzly bears would not be substantially affected (1.6% decrease at maximum disturbance). Taseko also noted that linear feature density would increase minimally by 1.3% in the regional study area at maximum disturbance.

Even though Taseko noted that the potential effect of the Project on grizzly bear mortality would not differ from that predicted for the original Prosperity project, it noted that there was concern in the previous review about the risk or mortality from human-bear interaction, in combination with other activities, such as vehicle traffic, logging and ranching. Taseko stated that the previous proposal did not include mitigation measures and had a significantly larger footprint in terms of the impact on bear habitat and that both of these issues were addressed in this Project. Furthermore, Taseko stated that the Province's midterm timber supply report demonstrated that logging activities are in decline.

Taseko determined whether there was a significant effect based on one versus more than one death. Taseko stated that the significance of effects on grizzly bear would be contingent upon strict enforcement of proposed mitigation measures to avoid direct mortality as a result of road incidents and poaching due to increased public access.

Detailed mitigation measures would be outlined in the grizzly bear mortality risk reduction plan which was designed to: minimize grizzly bear direct mortality risk associated with vehicle traffic along the access road, minimize grizzly bear indirect mortality risk associated with increased access along the transmission line, minimize the direct and indirect adverse effects related to grizzly bears at the mine site and planning post-closure reclamation to reduce grizzly bear mortality at the mine site. In addition, Taseko proposed to work with Aboriginal groups and the Province of British Columbia to contribute to the Province's grizzly bear population monitoring program, including DNA sampling, to determine effects and monitor trends more effectively. Taseko also proposed to work with Aboriginal groups and the Province of British Columbia to develop a public education and awareness initiative regarding grizzly bears. Taseko noted that implementing the Bear Aware program and bear safety information and training to all Project personnel would be highly effective in minimizing grizzly bear mortality risks at the mine site. Taseko stated that by increasing the awareness of the potential for bear-human conflicts and the methods for avoiding them, this would increase compliance with other aspects of the grizzly bear mortality risk reduction plan.

To recognize that increased grizzly bear mortality was an indirect result of increased backcountry motorized use, Taseko proposed mitigation measures specifically designed to reduce access to the Project area. Taseko noted, as part of the habitat compensation plan, it would close many of the access roads that remained from previous activities, follow existing linear features in locating the transmission line, and physically remove roads and trails in the three landscape units intersected by the transmission line corridor to increase core grizzly bear security habitat. Taseko identified in the public hearing a target of 0.6 km² reduction in access to be able to achieve the core habitat for the grizzly bear.

In response to concerns about the effectiveness of the proposed mitigation measures, Taseko noted that when mitigation measures were combined, they were predicted to have medium to high effectiveness in minimizing adverse effects on the South Chilcotin GBPU. In addition, Taseko noted that referenced case studies had confirmed success elsewhere. In particular, Taseko noted that the Cardinal River coal mine operation employed an extensive grizzly bear mitigation plan (including posted speed limits, wildlife warning signs, radio communications and the Bear Aware program) and no grizzly bear had been killed in the 30 years of mine operation. Taseko also noted that access management efforts in the United States had resulted in positive grizzly bear population trends in northern Montana and Idaho. Taseko noted that it would consider adding to the habitat compensation plan a variety of techniques identified in the literature as potential access management and linear features removal compensation actions.

Taseko noted that access control measures that required greater planning and execution were the most effective but that traffic barriers could also be effective if used in the right topographical locations. Empirical evidence for the effectiveness of specific techniques was explained to be still relatively limited, but there was a general understanding of the effectiveness of broad techniques and greater attention is now being paid to monitoring and reporting on effectiveness.

9.1.2 Views of Participants

Many participants referred to the Project area as a wildlife sanctuary and voiced concerns related to, in particular, Project effects on grizzly bears and their survival in the region. In particular, participants expressed strong concerns about the existing activities that affected grizzly bears such as hunting, recreational use, logging and mining. Aboriginal participants, particularly of the St'at'imc Government and the Tsilhqot'in National Government, noted that the grizzly bear was an important part of their culture.

Participants recommended that the previous panel's conclusions should still apply to the Project because the current mine proposal would still impact the landscape and the wildlife in a similar fashion. Ms. Sadie Parr of the Valhalla Wilderness Society noted that there were no substantive changes to the Project that would alter the previous panel's finding of significant adverse effects, as the Project would still be in the same location. She stated that the Project area was surrounded by three large provincial parks and therefore, the unprotected but largely intact mid-upper Taseko provided natural cross-valley corridors that allowed grizzly bears and other wildlife to travel virtually unhindered between these major parks. She stated that these large tracts needed protection in the absence of provincial species at risk legislation which would protect threatened species and its habitat. Ms. Parr further noted that any additional resource development in the mid-upper Taseko, including the Project, would reduce the cross valley connectivity and block grizzly bears' access from the east side of the access mine highway to salmon-bearing areas to the west of the mine.

Wayne McCrory, an expert consultant speaking on behalf of the Tsilhqot'in National Government, noted that although Fish Lake (Teztan Biny) and some of the spawning habitat for

rainbow trout would be left intact, most grizzlies would be displaced. He noted concerns that Taseko's compensation measures to offset reductions in the trout population and loss of some spawning habitat did not offer viable replacement of spawning habitat suited to specialized grizzly bear feeding behaviour.

The Province of British Columbia did not agree with the statement made by Taseko that "the mine development is not located in high value Grizzly bear habitat". The Province explained that at the within-stand, microsite level, there were some high value habitats within the maximum disturbance area of the Project, but that the seasonal importance of these small habitats was unknown. The Province noted that Taseko's conclusions were likely representative of the scale of the assessment and that the small patches of habitat lost may not have been noted at the local or regional scale. The Province predicted that there would likely be time to mitigate the impact of this lost habitat on individual bears later in the process, should the Project be approved.

The Province of British Columbia noted a real potential for a loss or drop in the productive capacity of Fish Lake, given the uncertainties surrounding prediction accuracies of hydrologic, geohydrologic, and water quality models. The Province predicted that a loss or drop in the productive capacity of the lake would result in substantially greater impacts to wildlife supported by the lake and associated aquatic, wetland and riparian habitats than what was predicted by Taseko. Accordingly, the Province recognized the need for rigorous environmental monitoring to determine actual (versus predicted) impacts, contingency planning for potential negative impacts beyond expected thresholds and compensation where impacts could not be mitigated.

Ken Dunsworth, on behalf of Fish Lake Alliance, also expressed concern with the conclusions drawn by Taseko with respect to water quality as a result of the Project and potential effects on the Fish Lake (Teztan Biny) ecosystem and wildlife use of that system, particularly as it related to grizzly bear. He noted that a high degree of uncertainty in whether Taseko could maintain the ecological integrity of the Fish Lake ecosystem and avoid Project effects on other neighbouring receiving environments. In support of the Province's and the Fish Lake Alliance's claims that effects on the Fish Lake ecosystem would affect supported wildlife, other participants noted that any effects on salmon would result in effects on the grizzly bear.

Participants also stated concerns related to mortality as a result of Project construction and operation. Mr. J.P. Laplante, on behalf of the Tsilhqot'in National Government, demonstrated that the Nabas region had a low road density when compared with other areas east of the Taseko River. He stated that additional roads would be constructed for the Project and that those additional roads had not been considered in the assessment. He noted that upgrades to existing roads were equally important. Mr. McCrory concurred, noting that an indirect effect of improving the Taseko/Whitewater road to industrial standards would be facilitating increased public access to the area for recreational purposes. He predicted that the increased population of construction and mineworkers for the 20-year life of the Project would contribute significantly to increased motorized access to the backcountry. Ms. Parr noted that the expected decline in logging activity in the future would have a beneficial effect on the grizzly bear population, but feared that once the road for the Project was upgraded and a transmission line was installed, other major resource development would follow in the area.

Ms. Sue Senger, of the St'at'imc Government Services, noted that the issue was not one of direct mortality, but explained that when road density increased, bear populations declined. She further expressed concerns that the Project would limit opportunities for recovery in the threatened GBPU by increasing access and human use of the area. Participants noted that

access as a result of past and future resource development has and would continue to have an adverse impact on the grizzly bear population in the GBPU.

Grizzly bear population estimates provided to the Panel by participants for the South Chilcotin Grizzly Bear Population Unit ranged from approximately 125 to just over 200. Ms. Senger demonstrated that since 2006, there have been 14 human-caused grizzly bear mortalities (five human-bear conflict, five livestock-bear conflicts, two poaching cases and two accidental hunting cases) and that additional deaths were likely unreported. As a result, she stated that there was already a high existing mortality rate in the population unit. Participants noted that the determination for significance, according to Taseko, was one bear kill during the life of the Project and participants stated that access management would be critical to prevent a significant effect.

Mr. McCrory noted that referenced literature on the effectiveness of access control measures in the United States involved strong federal laws concerning the recovery of endangered species and adequate funding for trained staff to manage, monitor, and regulate access. Mr. McCrory noted that these conditions would not apply to Taseko's proposed access management prescriptions. In addition, Ms. Parr stated concerns that downloading responsibility for mitigation measures to the Province would be insufficient and Mr. McCrory stated that the Province had not managed access effectively in the Chilcotin region in the past. Other participants expressed concerns that Taseko would not be able to control access on roads and trails that it did not control.

However, in specific response to the Bear Aware program, Mr. McCrory noted that such a program had been a successful means of education in communities. He also noted that it was a successful mitigation program because it allowed for financial contribution to specific mitigation measures (such as electric fence workshops and bear proof containers).

The Province stated it was largely in support of the conclusions drawn by Taseko on grizzly bear, and the proposed mitigation and monitoring.

9.2 MOOSE

9.2.1 Proponent's Assessment

Taseko noted that at closure, there would be a permanent loss of 469 ha of upland habitat and 311 ha of wetland habitat to support moose. In addition, Taseko stated that at maximum disturbance during operations, there would be a 174 ha reduction in the availability of winter feeding habitat and a 162 ha reduction in winter shelter habitat in the mine site regional study area. Taseko also identified a long-term loss of 192 ha of suitable winter habitat in the transmission line regional study area for this species. Taseko noted that the Project area had not been identified as regionally important moose winter range because there were no wetlands identified as suitable moose winter habitat in the local study area and few important wetlands in the regional study area. However, Taseko noted that moose were a key reclamation species and the majority of the post-closure mine footprint would fall within a wildlife capability category that would include moose.

Taseko further stated that the Project would have a smaller impact than the previously proposed project and because the previous panel for that project did not identify a significant adverse effect on moose, the same should be true of this Project.

Taseko noted that moose habitat could be greater than the current baseline after implementing the mitigation measures relating to reducing road and trail access near the transmission line, reclaiming the upland areas for moose post-closure, and habitat compensation proposed. Therefore, the residual loss as a result of the Project was not predicted to be significant.

Taseko evaluated effects on moose health because moose were present year-round and common in the spring and summer, observed feeding at Fish Lake (Teztan Biny) and in the alluvial flats along the Taseko River, and known to feed on aquatic plants and ingesting water by which metal intake could occur. Taseko determined that concentrations of sulfate, cadmium and selenium in the water were predicted to occur at concentrations well below the Canadian Drinking Water Guidelines. It was determined that, in the absence of species-specific guidelines, these guidelines were a conservative estimate for moose and therefore no effects to moose health were anticipated as a result of the Project. Furthermore, Taseko explained that because moose are a wide-ranging species, they would not be consuming only the vegetation from the Project area. Taseko committed to monitoring the cadmium and selenium concentrations in the vegetation in the Project area to determine if the moose population or individuals were at an increased risk from consuming this vegetation.

Taseko evaluated the residual loss of moose winter habitat as a result of the Project, since this would act cumulatively with similar effects from forest harvesting, including salvage logging of areas affected by mountain pine beetle. Taseko noted that the effect of forest harvesting on moose winter habitat is a concern in Region 5, and is being addressed through a regional management strategy. In response to concerns during the public hearing about the decline in the moose population, Taseko suggested that the effect was not related to the loss in habitat but to increased hunting as a result of increased access. Taseko noted that it did not believe that the Project acted cumulatively with that effect. Taseko noted that the Region 5 moose population is currently considered harvestable by the Province.

Taseko stated that no species-specific mitigation measures were proposed for moose habitat. However, the general wildlife mitigation measures, and others identified for other key indicators such as old forests and wetlands were noted to be applicable to moose. In particular, it noted that the access management plan proposed for grizzly bears would help address many concerns unrelated to the Project, such as moose hunting and traffic impact on traditional use areas. Taseko noted in the public hearing that its plans to work on access road decommissioning and access planning was consistent with the plans of the Tsilhqot'in National Government in other portions of its traditional territory.

9.2.2 Views of Participants

Many Aboriginal participants involved in the environmental assessment of the New Prosperity Project and the previously proposed project expressed concerns about declining moose populations in the region and the effects that continuing moose declines would have on their right to hunt moose. Participants noted concerns with the loss of habitat, and that increased human use as a result of the Project would contribute to further decline.

In response to questions posed by the on the decline in moose populations, the Province of British Columbia submitted two studies that had been completed on moose since the original Prosperity project review.

One study (McNay *et al.*, 2013) was commissioned by the Province of British Columbia based on a 1998 provincial level review that demonstrated declining moose numbers in the Cariboo region from 1985 to 1997 and a bull:cow ratio that was below provincial standards. This study

determined that moose densities had declined between 1995 and 2012 survey periods, and this decline was statistically significant for the 5-D Management Unit. The other (Davis, 2012) was also funded by the Ministry of Forests, Lands and Natural Resource Operations to evaluate moose density in the 5C and 5D management units. The Davis, 2012 study tested the population abundance between 2005 and 2012 and also found that population components had decreased significantly between in this time period (56% decrease in bulls, 40% decrease in cows and 52% decrease in calves). The two studies concluded that evidence demonstrated a regional-level decline in moose. The Tsilhqot'in National Government referenced these studies, saying that they demonstrated that moose populations are in substantial decline in the vicinity of the proposed mine. Mr. J.P. Laplante stated that the reports demonstrated a 51% decline in total population level in the 5D management unit (Figure 14) over the study period. The McNay *et al.* study further stated that even though an explanation for the decline was difficult to pinpoint, the most plausible explanation was an increase in vulnerability of moose to human-caused and other sources of mortality coincidental with the mountain pine beetle epidemic and related forest harvesting. While the report noted that the effect from hunters was partially controlled by regulation, unregulated hunters and/or predators could increase moose vulnerability.

Many participants indicated there were existing cumulative effects on moose because of the use of roads in the area and the resulting access to hunting locations. As a result, they claimed that the moose had been hunted extensively and no longer frequented the area. Mr. David Setah of the Tsilhqot'in Nation noted that a lot of industrial activity, particularly related to forestry, had occurred in the region and that there did not seem to be an end. Mr. Laplante illustrated the land use planning in the region on several maps and the past level of activity. Mr. Luke Doxator stated that "it staggers [him] that people are proposing more activity within the territory" based on the level of activity exhibited by the maps. He explained that since the mountain pine beetle epidemic, the members of the Tsilhqot'in First Nation felt that there had been more harvesting in the areas and as a result, there have been fewer moose. He noted that, as a result, moose corridors were identified and the Tsilhqot'in National Government had an agreement with forest licensees to keep those areas intact, or to compensate the removal of these corridors with another corridor. He noted that this agreement was considered a "huge win".

Mr. Laplante, Mr. Doxator, and Mr. Setah stated that Aboriginal hunting, other harvesting, road access and predation could be the causes of the moose decline but that there was no clear cause. Mr. Laplante noted that members of the Tsilhqot'in Nation were uncertain about how serious the decline is or if the population could be recovered. Mr. Setah stated that many members of the Tsilhqot'in Nation were concerned with the level of the moose population and suggested that less hunting of moose should occur. He further noted that some members stated that the moose hunt should be completely shut down.

Mitigation measures were proposed by the aforementioned studies to improve the moose status in the region. The McNay *et al.* report stated that broad changes to moose management in the Cariboo Region were required. The report listed mitigation measures that might help in restoring the declining moose population, including:

- reducing access on roads and trails to limit hunting;
- reducing kills of cows and calves by: encouraging voluntary reduction in Aboriginal harvests of cows and calves; and
- targeting management of wolf populations where cow:calf ratios continue to be low.

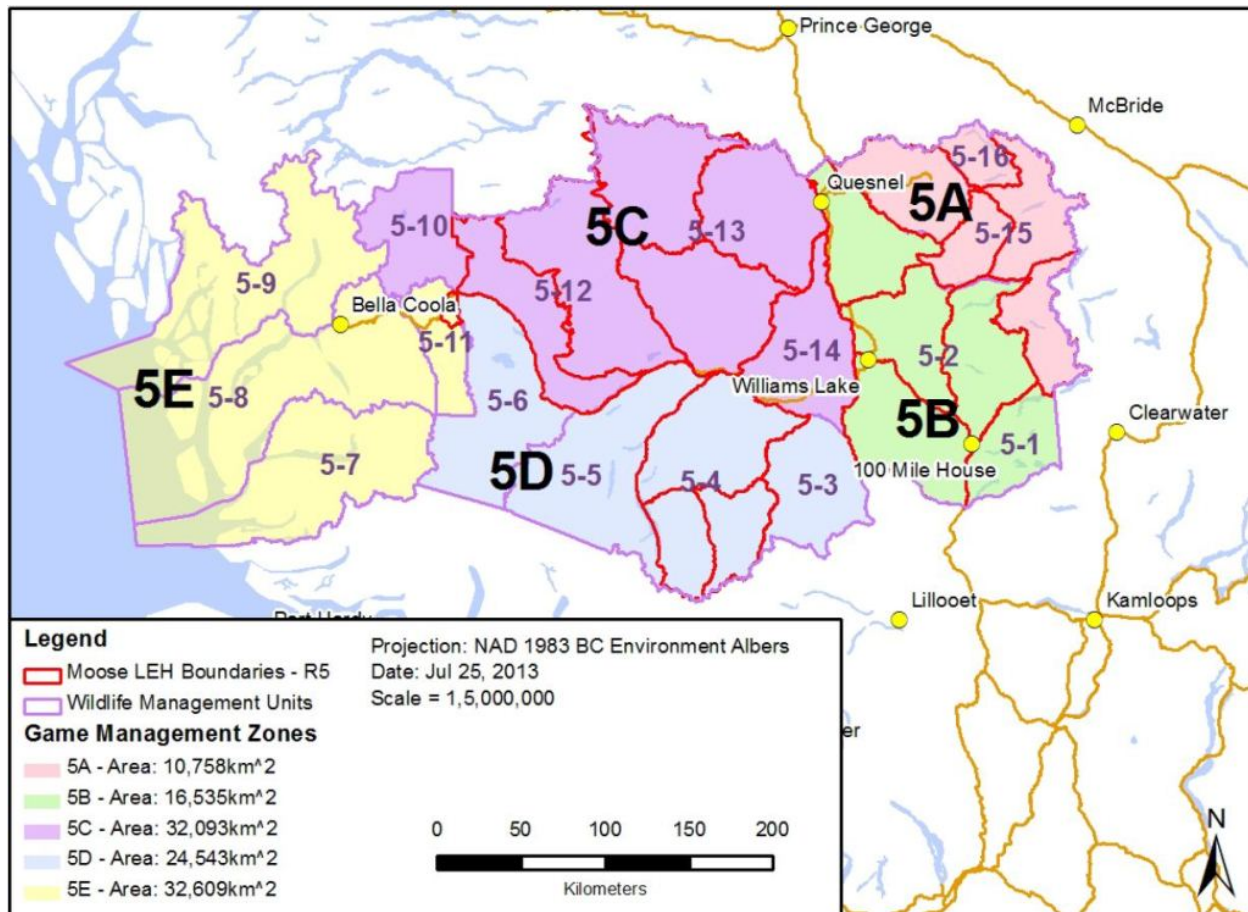


Figure 14. Location of Moose Management Zone 5D (Source: McNay *et al*, 2013)

However, the report also noted that, to respond effectively to threats to moose populations, those threats must first be understood and a designed approach to obtaining such information. The report emphasized the need for effective monitoring, collection of basic inventory, and designed research to improve understanding of moose mortality rates.

9.3 MULE DEER

9.3.1 Proponent's Assessment

Taseko noted that at closure, there would be a permanent loss of 469 ha of upland habitat that would support mule deer. In addition, Taseko stated that at maximum disturbance during operations, there would be a long-term loss of up to 124 ha of effective winter habitat and less than 1 ha of effective winter feeding habitat in the mine site regional study area. Taseko also identified a long-term loss of 192 ha of mature and old non-pine leading forest types in the transmission line regional study area for this species. Taseko noted that the Project area had not been identified as regionally important mule deer winter range. However, Taseko noted that moose were a key reclamation species and that the majority of the post-closure mine footprint would fall within a wildlife capability category that would include mule deer.

Taseko evaluated the residual loss of mule deer winter habitat as a result of the Project, as it would act cumulatively with similar effects from forest harvesting, including salvage logging of areas affected by mountain pine beetle. Taseko noted that the effect of forest harvesting on

mule deer winter habitat is as a concern in Region 5, and is being addressed through a regional management strategy. Taseko noted that the Region 5 moose population is currently considered harvestable by the Province and any contribution to existing cumulative effects as a result of the Project would be small.

Taseko predicted that with the implementation of the proposed general wildlife mitigation measures, the residual loss of habitat would be not significant.

9.3.2 Views of Participants

The potential effect that the Project would have on mule deer was of most concern to members of the Esk'etemc and the Stswecem'c Xgat'tem communities. Chief Fred Robbins of the Esk'etemc Nation expressed concerns that the transmission line would interfere with the Esk'etemc Community Forest, the management of old growth trees, and the habitat for mule deer. He further noted that, because the transmission line would be the largest linear clearcut through the community forest, it would have a direct impact on wildlife important to the Esk'etemc. He stated that the area where the transmission line would be located was very important for mule deer and moose and that in order to preserve habitat for these species, the Esk'etemc selectively log. He explained that there was no other area close to Esk'etemc where mule deer and moose could migrate, breed, and remain close to the Community for hunting purposes. He concluded that the loss of approximately 30% of winter habitat was not a significant effect, but that the Esk'etemc rely on this habitat for the exercise of harvesting and cultural rights.

Chief Robbins also noted that Taseko identified cumulative impacts on mule deer which could have a significant effect on the sustainability of the regional population, and that these effects had not been mitigated with the Project design. He further noted that Taseko determined that the habitat loss would be reversible when the transmission line was de-commissioned but that no date for decommissioning had been proposed.

Many Aboriginal participants noted that there has been an increase in hunting of deer by Aboriginal and non-Aboriginal people. Increased access as a result of an existing transmission right-of-way and BC Hydro tower presence was also noted as a primary issue. When asked about the best solution for bringing deer back into the area if there were no transmission line, Chief David Archie of Stswecem'c Xgat'tem said that there were many additive components to the problem and a solution would require a partnership of, for example, hunters, politicians, industry but that it would be challenging to get these organizations to work together.

Several Aboriginal participants proposed limiting access. In particular, Mr. Gord Chipman, a Registered Professional Forester with Esk'etemc, suggested that the transmission line could be located next to the existing Place Lake Road and that using this existing road would not create new access through the mule deer winter range. When asked if the community had reviewed this suggestion, Mr. Chipman stated that it had not.

9.4 MIGRATORY BIRDS

9.4.1 Proponent's Assessment

Taseko assessed the Project effects on waterfowl based on Environment Canada's focus on waterfowl and wetlands in the review of the original Prosperity project. Taseko noted that the Project would result in the permanent loss of 311 ha of wetlands, but that this was markedly less disturbance than what was predicted with the original Prosperity project. Taseko identified two

waterfowl (mallard and Barrow's goldeneye) and one wader (great blue heron) as key reclamation species. Taseko noted that the significance of the Project's effects on waterfowl habitat was directly related to the findings presented for wetland ecosystems and function, for which Taseko determined that there was no significant effect as a result of the Project.

During the public hearing, Taseko suggested that the Panel consider recommending a follow-up plan on the effectiveness of wetland habitat compensation to the regulatory agency in the Province of British Columbia responsible for issuing permits.

9.4.2 Views of Participants

Environment Canada and the Province of British Columbia noted the effects of the Project on wetlands and the indirect effects on wildlife that would be supported by those wetlands. The Province stated that potentially 68 ha of wetlands might be indirectly affected through prolonged drying, resulting from a drawdown of the groundwater table. Environment Canada explained that the Project was located in Bird Conservation Region 10 and that many priority species (four land bird species, five water bird species, eight waterfowl species, and two shorebird species) in this region were associated with wetlands, water bodies and/or riparian habitats. The Province further noted that because uncertainties around the groundwater modelling still existed, the magnitude of indirect effects on wetlands was uncertain.

Environment Canada noted that the Federal Policy on Wetland Conservation applied to the Project. The objective of this policy is to promote the conservation of Canada's wetlands to sustain their ecological and socio-economic functions now and into the future. Environment Canada further explained that the policy committed all federal departments to the goal of no net loss of wetland functions. The department stated that while there were still challenges with creating usable wetland habitat, it was confident that birds that would be displaced by Project activities could be compensated for through restoration and enhancement-type activities.

Environment Canada recommended that it be consulted with a final wetland compensation plan at least 3 months prior to construction. It also recommended that Taseko conduct migratory bird and species at risk pre-construction and operations wetland monitoring to assess potential changes in the wetland function. It noted that Taseko should consult with Environment Canada on the duration of pre-construction monitoring through the use of indicator species that would be identified in the plan and to address changes or impaired function in the habitat compensation plan. Environment Canada also requested it, as well as the provincial department, receive and approve that any follow-up plan.

Environment Canada also noted that the *Migratory Birds Convention Act* applied to the Project. That Act prohibits the inadvertent harming, killing, disturbance or destruction of migratory bird nests and eggs (incidental take). The department noted that there were currently no permitting authorizations or measures available under this Act to allow for or permit incidental take. Environment Canada noted that it had developed guidance to help proponents minimize and avoid potential harm to migratory birds, their eggs and nest as they planned project activities. Environment Canada recommended that Taseko develop risk management plans regarding incidental take by developing and implementing a management plan that would effectively avoid or minimize the risk, detrimental effects to migratory birds, their nests and eggs.

9.5 SPECIES AT RISK

9.5.1 Proponent's Assessment

Taseko assessed the effects of the Project on federal and provincially listed species at risk directly, by selecting them as a key indicator, or indirectly through inference from surrogate key indicators. Taseko noted the potential effects of the Project on habitat availability for all species listed under the *Species at Risk Act* (SARA) and found in the study area, including those species whose status had changed since the previous review.

Of the species identified by Taseko in its EIS that could possibly interact with the Project, three bird species (common nighthawk, Lewis' woodpecker, and olive-sided flycatcher) and one amphibian species (great basin spadefoot toad) are threatened according to Schedule 1 of SARA and one bird species (burrowing owl) is listed as endangered.

Taseko stated that the general approach for assessing disturbance of habitat for SARA-listed species involved determining if and where habitat disturbance was likely to occur as a result of the Project; whether direct or indirect loss of suitable habitat may occur for each key indicator; and, whether the loss of habitat was significant. Taseko compared this information to a prescribed threshold or standard or through qualitative determination where such standards were not available.

Taseko considered the conservation status of these species when developing mitigation measures to avoid or minimize effects on their habitats. Because these species were listed in SARA, Taseko proposed additional mitigation measures to account for their status. As a result of the additional planned mitigation measures for species at risk, Taseko determined that no significant effects would occur on SARA-listed species as a result of the Project.

Taseko further noted that it was committed to respecting the intent of provincial and federal species at risk legislation and recovery strategies and believed that its commitments to the minimizing the potential effects of the Project on species at risk were consistent with them.

9.5.2 Views of Participants

Environment Canada noted that the SARA applies to the Project. As a result, it recommended that Taseko continue to track the status of species as assessed by COSEWIC and those listed under Schedule 1 of the SARA and refine Project management plans to ensure appropriate protective measures are taken. In addition, it recommended that, Taseko consult with the appropriate jurisdictions involved and the Species at Risk recovery plan in processes relative to the Project, including the identification of critical habitat.

9.6 PANEL'S CONCLUSIONS AND RECOMMENDATIONS

Grizzly Bear

In reaching its conclusions on effects of the Project on grizzly bears, the Panel considered the following factors to be particularly relevant:

- The previous review panel concluded that there was an existing significant adverse cumulative effect on grizzly bears and the Project would contribute to that effect.
- Grizzly bears were identified by Aboriginal people as a culturally important species and are therefore captured under CEAA 2012 paragraph 5(1)(c).

- The Project would be located in the management units which have the highest grizzly bear densities in the grizzly bear Population Unit.
- A small amount of grizzly bear core habitat would be disturbed.
- Taseko and other participants identified access as a key concern related to grizzly bear mortality and noted that access management would be critical.
- In a population that is considered threatened by the Province of British Columbia, 14 human-caused grizzly bear mortalities in 7 years represent 2 deaths per year.
- Mitigation measures proposed by Taseko have been demonstrated as effective elsewhere and participants noted that Bear Aware was a particularly effective program.

The Panel agrees with Taseko that the Project would affect a small amount of high value grizzly bear habitat. The Panel recognizes that Taseko plans to ensure that bears are minimally displaced during construction by limiting construction in the Project area when grizzly bears are likely to be present. The Panel believes that the Province of British Columbia is best placed to determine how to mitigate for the loss in habitat and the potential change in use of the area by grizzly bears.

The Panel concludes that the Project alone would not result in a significant adverse effect on the South Chilcotin grizzly bear population.

RECOMMENDATION 12

The Panel recommends that, if the Project proceeds, Taseko be required to implement any other mitigation measures, including habitat compensation if appropriate, to allow grizzly bears to use Fish Lake (Teztan Biny) and the surrounding area.

Because the Project will disturb a small amount of habitat, and because of the mitigation measures proposed by Taseko to alleviate the Project effects, the Panel believes that the effect of the Project on grizzly bear would be an acceptable one if the South Chilcotin grizzly bear population was healthy.

However, that population has been determined by the Province of British Columbia to be threatened. The Panel takes this determination to be an indication that the population has undergone significant adverse effects in the past and therefore, there is an existing (before any effects of the proposed New Prosperity Project) significant adverse cumulative effect on grizzly bears. According to Taseko, the Project, with standard mitigation measures, would have an adverse effect on grizzly bear in the area. This effect would combine with the effects of previous human activities and exacerbate the existing significant adverse cumulative effect. Thus, without additional mitigation, significant adverse cumulative effects are likely to continue and would not be reduced.

This conclusion was recognized by the previous panel and by Taseko. Accordingly, Taseko proposed to undertake further mitigation measures to reduce the Project's contribution to the existing cumulative effects, including public education, assistance with bear monitoring, reduce access to existing roads and trails in the region, and other measures.

The Panel notes that education and monitoring programs may be generally helpful but they do not directly benefit the South Chilcotin grizzly bear population. The Panel notes that participants

identified the Province's Bear Smart Community Program in the Project area as one program that may have direct benefits for this grizzly bear population unit. Taseko has committed to use this program.

The Panel has determined that the mitigation measures proposed by Taseko have the potential to reduce the cumulative effects on grizzly bear and to fully offset the Project effects. That is, if these measures were effectively implemented, the South Chilcotin grizzly bear population would be in better shape after the Project than before it. However, effectively implementing these measures could be challenging. This point was addressed by many participants, including Taseko. The Panel believes that the most challenging task would be to effectively control access to existing roads and trails in the region to restore secure grizzly bear core habitat. The Panel believes this will be challenging for two reasons: 1) Taseko does not have control over those roads and will therefore need to negotiate their closure with other operators; and 2) controlling access generally can be difficult. The Panel finds that there is a need to control enough access so that, in combination with the other mitigation measures proposed by Taseko, the Project effects are offset and that the access control measures alleviate some of the cumulative effect.

The Panel concludes that the Project would result in a significant adverse cumulative effect on the South Chilcotin grizzly bear population unless necessary cumulative effects mitigation measures are effectively implemented.

The Panel believes that wildlife experts from the Province of British Columbia and in Canada are best placed to determine if the measures proposed by Taseko would be effective in reducing the cumulative effect.

RECOMMENDATION 13

The Panel recommends that, if the Project proceeds, Taseko be required to work with the appropriate government authorities to determine if the cumulative effects mitigation measures are sufficient to offset the Project effects and some of the cumulative effects on the South Chilcotin grizzly bear population and adapt these measures as necessary to achieve this objective. The Panel is of the view that, if the proposed measures prove to be inadequate, they may be expanded to become adequate by controlling more access to roads and trails farther from the transmission line.

The Panel recognizes that the only way to determine the effectiveness of the mitigation measures proposed is through comprehensive monitoring.

RECOMMENDATION 14

The Panel recommends that, if the Project proceeds, Taseko be required to develop a follow-up and adaptive management plan to ensure the effectiveness of the proposed access control measures. The Panel recommends that Taseko be required to include in its follow-up plan a monitoring system to determine if the roads and trails for which controlled access is proposed are being used and use the road use data to measure the success of controlling access (i.e. non-use would mean that mitigation is successful, use would mean the mitigation is unsuccessful and adaptive management would be required before success is achieved).

Moose

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

- The previous review panel concluded that there was no significant adverse project or cumulative effect on moose.
- Moose were identified by Aboriginal people as a resource currently used for traditional purposes and are therefore captured under CEAA, 2012 paragraph 5(1)(c).
- The magnitude of habitat loss for moose would be high, and the duration, medium-term.
- Moose were demonstrated by the Province of British Columbia to be in serious decline. References provided pointed to access and hunting as primary factors related to the decline.
- Access and hunting were also noted as a primary concern by participants (similar to grizzly bear). Participants also expressed concern about the loss of habitat.
- The mitigation measures for grizzly bear related to access management would be applicable to moose.

For moose, the Panel has reached a similar conclusion to Taseko and the previous panel.

The Panel concludes that the Project alone would result in an adverse, but not significant effect on moose.

However, the Panel, in its review of the transcripts for the original Prosperity hearing and during the hearing for this Project, found many references related to the effects of recent forestry operations and the related road network. In particular, participants in both hearings noted that the declines in moose population as a result of these operations may have affected the abundance of moose and, therefore, the ability of Aboriginal people to hunt moose.

Accordingly, the Panel requested information from the Ministry of Forests, Lands and Natural Resources Operations and received reports that confirmed a substantial decline in regional moose populations – generally about 50% in recent years. The Panel believes that this effect is caused by hunting related to access afforded by past forest harvesting practice (i.e. the use of the road network created by forestry operations and hunters). The Panel determines that this effect is high in magnitude; is regional in scale; is long-term in duration (decades); is reversible; and has an ecological context which is less important than the fact that this resource is used by Aboriginal peoples for food. In the Panel's view, this is an existing significant adverse effect acting cumulatively with the Project's effects.

The Panel finds that the Project would add to the existing cumulative effect and would make that effect worse.

Because the road network appears to be the key to the identified effects, the apparent mitigation for these cumulative effects is access management for the roads and trails in the region. The overlap in mitigation between moose and grizzly bear was discussed by many participants during the hearing, including Taseko. The key for moose management, as for grizzly bear, is to ensure the mitigation is effective and sufficient so the cumulative effects mitigation will at least offset the adverse effects of the proposed Project so that the Project does not contribute to the cumulative effect.

The Panel concludes that the Project would result in a significant adverse cumulative effect on the regional moose population unless necessary cumulative effects mitigation measures are effectively implemented.

The Panel believes that wildlife experts from the Province and Canada are best placed to determine if the measures proposed by Taseko will be effective in reducing the cumulative effect.

RECOMMENDATION 15

The Panel recommends that, if the Project proceeds, Taseko be required to work with the appropriate government authorities to determine if the cumulative effects mitigation measures are sufficient to offset the Project effect and some of the cumulative effects on moose and adapt these measures as necessary to achieve this objective. The Panel is of the view that, if the measures proposed prove to be inadequate, they may be expanded to become adequate by controlling more access to roads and trails farther from the transmission line. Note that the amount of access control needed to deal with moose may be greater than, less than, or equal to that required to deal with grizzly bear.

The Panel recognizes that the only way to determine the effectiveness of the mitigation measures proposed is through a comprehensive follow-up plan.

RECOMMENDATION 16

The Panel recommends that, if the Project proceeds, Taseko be required to develop a follow-up and adaptive management plan to ensure the effectiveness of the proposed access control measures. The Panel recommends that Taseko be required to include in its follow-up plan a monitoring system to determine if the roads and trails for which controlled access is proposed are being used and use the road use data to measure the success of controlling access (i.e. non-use would mean that mitigation is successful, use would mean the mitigation is unsuccessful and adaptive management would be required before success is achieved).

Mule Deer

In reaching its conclusions on effects of the Project on mule deer, the Panel considered the following factors to be particularly relevant:

- The previous review panel concluded that there was no significant adverse project or cumulative effect on mule deer.
- Mule deer were identified by Aboriginal people as a resource currently used for traditional purposes and are therefore subject to inclusion in an environmental assessment under paragraph 5(1)(c) of CEEA 2012.
- The placement of the transmission line corridor and the potential effect on mule deer habitat continues to be an issue of concern to the Esk'etemc and the Stswecem'c Xgat'tem First Nations.
- The magnitude of habitat loss for mule deer would be high and medium-term.

- The amount of mule deer habitat lost was not a primary concern to participants.
- Access and hunting were also noted as a primary concern by participants (similar to moose and grizzly bear).
- The mitigation measures for grizzly bear related to access management would be applicable to mule deer.

Some participants expressed similar concerns related to the effects of the Project on mule deer as were expressed for moose. However, it appears to the Panel that concerns related to mule deer were not as significant as those related to moose. The Panel recognizes that the proportion of deer habitat 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, the Panel agrees with Taseko's findings that the effect of the transmission line corridor on mule deer would not be significant. The Panel further notes that the previous panel did not determine a significant adverse project or cumulative effect on deer.

The Panel concludes that the Project alone would result in an adverse but not significant effect on mule deer. Similarly, the Panel also concludes that the Project would result in an adverse but not significant cumulative effect on mule deer.

Because the effects on mule deer are assumed to be the result of similar projects and activities that result in effects on moose (i.e. excess hunting as a result of increased access), the Panel believes that the mitigation measures proposed for moose will also help mitigate the adverse effects on mule deer.

Migratory birds

In reaching its conclusions on effects of the Project on migratory birds, the Panel considered the following factors to be particularly relevant:

- The Panel's assessment of effects of the Project on migratory birds is limited to the definition of migratory birds under the *Migratory Birds Convention Act*.
- Wetland lost as a result of the Project would be high magnitude and permanent.
- No birds as defined under the *Migratory Birds Convention Act* would be directly harmed if timing of construction and operation took into consideration critical times for nesting.
- Few participants raised concerns regarding migratory birds.

The Panel's mandate with respect to migratory birds under CEAA 2012 is limited to the assessment of effects on "a migratory bird referred to in the Convention, [including] the sperm, eggs, embryos, tissue cultures and parts of the bird". The Panel finds that the Project will adversely effect on migratory bird habitat, but the information does not indicate that birds will be directly harmed during construction and operation. The Panel believes that Taseko can mitigate the effects of the Project on migratory birds by implementing the mitigation measures suggested by Environment Canada.

No participant expressed concerns during the environmental assessment related to direct effects on migratory birds as a result of the Project.

The Panel concludes that the Project would not result in significant adverse Project and/or cumulative effects on migratory birds.

RECOMMENDATION 17

The Panel recommends that, if the Project proceeds, Taseko be required to develop risk management plans regarding direct effects on any migratory birds (e.g. incidental take). The Panel believes that a monitoring and follow-up program would be helpful in achieving this objective and recommends that Taseko be required to include this program in any risk management plan regarding incidental take.

Species at Risk

In reaching its conclusions on effects of the Project on species at risk, the Panel considered the following factors to be particularly relevant:

- Taseko proposed mitigation measures for species at risk, in addition to the standard mitigation proposed for wildlife, to account for their status.
- Taseko committed to operate in a manner that was consistent with recovery strategies.
- Few participants had concerns.

The Panel believes that Taseko's assessment of Project and cumulative effects on species at risk was comprehensive and fair. The Panel notes that no participant expressed concerns with the effects assessment on species at risk and that the previous panel concluded no significant adverse effects. The Panel agrees with the previous panel's assessment.

The Panel concludes that the Project would not result in significant adverse Project and/or cumulative effects on species at risk.

RECOMMENDATION 18

The Panel recommends that, if the Project proceeds, Taseko be required to continue to track the status of species as assessed by COSEWIC and those listed under Schedule 1 of the *Species at Risk Act* and refine project management plans to ensure appropriate protective measures are taken. It further recommends that if the status of any wildlife species known to occur in the Project area changes during the life of the Project, that Taseko be required to consult with Environment Canada and any other appropriate jurisdictions on mitigation measures to avoid or minimize potential effects.

10 ATMOSPHERIC ENVIRONMENT

10.1 AIR QUALITY

10.1.1 Proponent's Assessment

Taseko completed various analyses to assess the potential effects of the Project on the atmospheric environment during the three main phases: 1) construction and commissioning; 2) operations; and 3) closure. Project activities or physical works that had not changed from the previous assessment were not carried forward in Taseko's atmospheric environment assessment if there were also no changes in regulatory requirements.

Taseko claimed that none of the changed Project activities and physical works for New Prosperity were key changes in Project design, and there were no new atmospheric environment issues raised by the amended mine plan. Taseko stated that there would be no changes to the atmospheric environment key indicators and assessment requirements from the original Prosperity proposal. Taseko submitted that the mitigation measures proposed in the previous assessment would still apply for New Prosperity.

Taseko noted that changes to the spatial boundary for the New Prosperity Project altered the findings of the effects assessment for the atmospheric environment. Effects that previously occurred on the mine site would be offsite and therefore included in the atmospheric environment.

In the previous EIS, Taseko submitted a full analysis of Project-related greenhouse gases emissions. Taseko stated that it would not be possible to attribute potential effects to the greenhouse gases emissions from any specific project, including the New Prosperity Project.

Construction Phase:

Taseko stated that during construction, the maximum predicted ground-level concentrations for most criteria air contaminants would occur on the northern extremity of the mine disturbance boundary; however, for PM_{2.5}, PM₁₀, TSP and dustfall predictions, the maxima would shift to a location on the northern shore of Fish Lake (Teztan Biny).

Taseko stated that for PM_{2.5}, PM₁₀, TSP and dustfall, the maximum predicted ground-level concentrations were greater than the applicable objectives or standards. Taseko submitted that the area over which the predicted exceedances would occur would be small but larger than in the previous proposal.

Operational Phase:

Taseko indicated that during the operational phase, the longer haul roads and changes to the stockpile locations would have insubstantial effects on the predictions. During the operational phase of the Project, Taseko submitted that the maximum predicted ground-level concentrations for most criteria air contaminants would also shift to the northern shore of Fish Lake (Teztan Biny), and for PM_{2.5}, PM₁₀, TSP and dustfall, the maximum predicted ground-level concentrations were reported to be greater than the applicable objectives or standards.

Taseko stated that for a receptor (e.g. resident population, sensitive vegetation) to be negatively affected, it would need to be present at the location of the maximum predicted concentrations

(whether they exceeded the ambient air quality objectives or not) to be a determination of a significant effect.

Closure Phase:

Taseko stated that the post-closure activities associated with the Project were expected to have minimal potential effects on the atmospheric environment.

Taseko concluded that due to the generally conservative nature inherent in dispersion modelling exercises, and the location and limited areas over which predicted concentrations exceeded the objectives, residual Project effects for all phases of the Project would not be significant. Taseko noted that where the effects would be adverse, the magnitude would generally be moderate to low, local in extent, and reversible.

10.1.2 Views of Participants

Health Canada noted that Taseko did not submit the results of the updated and revised air dispersion modelling to the Panel. Further, it suggested that Taseko re-examine its conclusions regarding potential human health risks due to inhalation of contaminants of potential concern, in light of the revised air dispersion modelling.

Health Canada submitted that the closest receptors to air emissions from the mine were the employee camp, the proposed Fish Lake (Teztan Biny) dock and recreation site, and the Taseko Lake Lodge, located approximately 3 km, 2.5 km and 9.5 km, respectively from the centre of the mine pit. Health Canada noted that these receptors were located well within the areas where dust might travel from the mine pit, the tailings storage facility, waste rock storage and access roads.

Health Canada submitted that concentrations of particulate matter in dust were predicted to equal or exceed air quality guidelines at the employee camp and at Fish Lake (Teztan Biny). Health Canada indicated that potential adverse health impacts might occur from inhalation of particulate matter.

Health Canada was satisfied that exposure to polycyclic aromatic hydrocarbons over the lifetime of the mine would not result in exposures that would exceed acceptability limits for carcinogenic effects.

The Tsilhqot'in National Government expressed concerns with dust and the effects of harvesting country foods. More information on this can be found in Chapter 11 of this report.

10.2 NOISE

10.2.1 Proponent's Assessment

Taseko submitted that the effects assessment methods for the acoustic environment were the same as those used in the previous Prosperity project. Taseko's noise assessment focused on potential effects of noise on the general public located outside the Project mine site area and excluded potential effects that might occur within the mine site footprint. Taseko submitted that the mine site footprint had been reduced and now excluded Fish Lake (Teztan Biny). As a result, those noise effects at Fish Lake that had been previously excluded were included for New Prosperity. Taseko stated that there were no new noise issues raised by the amended mine plan.

Taseko expected that the traffic volume change for New Prosperity would be marginal. Taseko submitted that traffic noise associated with Project-related vehicle traffic would not result in substantive changes in the existing acoustic environment along Highway 20 or the Taseko Lake and 4500 Roads.

Taseko submitted that the existing acoustic environment for a remote, rural area would be expected to be quiet and dominated by sounds of nature. The existing night-time acoustic environment was expected to be similar to the average night-time ambient sound level for a remote rural area established by the *British Columbia Oil & Gas Commission Noise Control Best Practices Guideline*.

Taseko stated that the key acoustic environmental issue for the Project would be the likelihood that the activities associated with the Project would increase sound in the existing acoustic environment during construction, operations, and closure.

During the construction phase, Taseko submitted that the highest predicted sound level, at a distance of 1.5 km from the boundaries of the Project maximum disturbance area would be 47 dBA $L_{eq}(15)$ Day as compared to 45 dBA predicted in the previous Prosperity project. Taseko stated that there were no sensitive human dwelling locations within the local study area. Taseko predicted that the highest sound level around Fish Lake (Teztan Biny) would be 57 dBA $L_d(16)$ Day located at the northern tip of the lake.

Taseko noted that during operation, the maximum predicted sound level at 1.5 km from the boundaries of the Project maximum disturbance area would be 42 dBA, 2 dB above the *British Columbia Oil & Gas Commission Noise Control Best Practices Guideline's* night-time permissible sound level. Taseko stated that there was no receptor² located within the LSA or along the 1.5 km boundary. Taseko predicted that the highest sound level around Fish Lake (Teztan Biny), 56 dBA $L_d(16)$ Day, would be located at the northern tip of the lake.

Taseko did not predict nighttime noise levels and submitted that since Fish Lake (Teztan Biny) was a passive recreation area, it was assumed to be occupied during the daytime period only. Taseko stated that the effect would be adverse, high magnitude, continuous, long-term, and reversible.

Taseko indicated that individuals who chose to recreate by water craft near the northern end of Fish Lake (Teztan Biny) would experience higher noise levels than those who would use the southern side of the lake. Taseko submitted that most users would not use the northern end of the lake.

Taseko submitted that users would experience some noise and visual/aesthetic impacts and it would be unlikely that the majority of Fish Lake (Teztan Biny) users would use this area for traditional or recreational purposes if there were alternatives available to them. Taseko stated that other areas had been identified in the general region where these activities were and could continue to be conducted.

Taseko stated that during operations, the Fish Lake (Teztan Biny) area would be in proximity to haul roads and mine infrastructure and operational noise would be heard by individuals using

² A receptor is defined as, for facilities in remote areas where a receptor is not present, a permissible sound level (PSL) limit of 40 A-weighted decibels equivalent sound level (dBA Leq) during night time period (22:00 to 7:00 hr) should be met at 1.5 km from the facility boundary. During the day time period (7:00 to 22:00 hr), a PSL limit of 50 A-weighted decibels equivalent sound level (dBA Leq) should be met at 1.5 kilometers (km) from the facility boundary.

the site. As the mine would be a 24-hour operation, noise would be present during both day and night.

Taseko submitted that overnight use of Fish Lake (Teztan Biny) would be permitted. In response to a Panel information request, Taseko stated that changing its assumptions so that “occupied periods” included continuous (day/night) and extended periods would result in increased apparent sound levels.

Taseko noted that the forestry campsite at the north end of Fish Lake (Teztan Biny) was established in the 1970s after the mine exploration road was constructed and was used occasionally for hunting, fishing, and gathering activities. Taseko submitted that hunting activities in the vicinity of the mine site might be impacted by site noise as a result of wildlife disturbances due to noise.

Taseko noted that industrial noise would be foreign to the area and the area surrounding the mine site would be altered for users who were accustomed to the relative quiet and exclusively natural sounds that existed currently. Taseko anticipated that operational noise would not be excessively loud such that use of the Fish Lake (Teztan Biny) area could not continue.

Taseko submitted that Aboriginal people and recreational users of the Fish Lake (Teztan Biny) area would experience ambient noise from operations, but blasting would require a cleared zone of approximately 1 km for safety reasons. In all instances, Taseko expected that blast noise would be below 115 dBA at a distance of 1 km and be of short duration. Taseko submitted that blasting would take place approximately four times per week and would be held during daylight hours, generally closer to the end of the day on weekdays.

Taseko stated that workers on duty at the mine site would have noise monitoring, hearing protection, and noise exposure regulation as per section 2 of the *Health, Safety, and Reclamation Code for Mines in British Columbia*. While off duty, workers would reside in a company camp, which would be configured to maintain noise within the camp at or below normal tolerable levels. Blasting noise could occur daily or semi-daily, and under certain weather conditions, blast noise at the worker’s camp could approach 115 dBA.

10.2.2 Views of Participants

The Tsilhqot’in submitted that the noise effects, which Taseko had characterized as adverse, high magnitude, continuous in frequency and long-term, would be significant. The Tsilhqot’in expressed concerns that the noise from the mine would affect the Tsilhqot’in, largely or wholly, by eliminating its use of the area for fishing, gathering plants and medicines, teaching the youth, community gatherings, and spiritual ceremonies. The Tsilhqot’in also raised concerns regarding the effects of noise on wildlife populations in the mine area.

During the public hearing, Chief Percy Guichon asked, “[w]ho wants to go to a lake with a mine next door? You know, it would be just a huge industrial zone in the middle of nowhere. You have noise, and trucks and dust, and keep out signs, no hunting signs...”

The Tsilhqot’in noted that Taseko’s effects assessment considered noise effects during the daytime period only and submitted that Fish Lake (Teztan Biny) and the surrounding area were used by the Tsilhqot’in and others for overnight occupation.

The Tsilhqot’in noted that Taseko measured the predicted noise levels at 1.5 km from the Project area against maximum regulatory standards and submitted that these maximum noise levels were based on the assumption that the receptors were within a dwelling and the walls

would provide a barrier against sound. The Tsilhqot'in submitted that the noise effects for outdoor users of the area would be significantly higher than Taseko predicted. The owners of Taseko Lake Lodge also expressed concern that the effects of noise from the Project would affect their family and guests.

10.3 LIGHT POLLUTION

10.3.1 Proponent's Assessment

Taseko stated that light impacts would be primarily associated with the operational phase. Taseko submitted that individuals who chose to use the site at night might be able to see lights from the mine site depending on where they chose to camp. Light from haul roads, the mill complex and office buildings might have an impact on the camping experience and might interfere with views of the night sky.

10.3.2 Views of Participants

The Panel heard a variety of participants, including the Tsilhqot'in express concerns that the experience of using the Fish Lake (Teztan Biny) area would be negatively affected. The Taseko Lake Lodge owners also voiced concerns about the effects of light from the Project.

10.4 PANEL'S CONCLUSIONS AND RECOMMENDATIONS

The Panel recognizes that the presence of a mining operation would eliminate much of the wilderness experience for users, including overnight campers, due to a reduction in aesthetic value, annoyance from increased noise levels, and light pollution.

The Panel is of the view that current users of the Fish Lake (Teztan Biny) area would be unlikely to continue using the area due to sensory disturbance and the altered experience of being in the vicinity of a mining operation.

The Panel recognizes that if the Project were to proceed, those choosing to use the area would be aware of the Project effects and would not be expecting to have a pristine wilderness experience. If potential users were not willing to use the area, the Panel notes that there are other opportunities for wilderness recreation in the region.

Air Quality

In reaching its conclusion on air quality, the Panel considered the following factors to be particularly relevant:

- the limited areas over which predicted concentrations of criteria air contaminants would exceed objectives or standards;
- the mitigation measures proposed in the previous assessment would still apply;
- Health Canada was satisfied that exposure to polycyclic aromatic hydrocarbons over the lifetime of the mine would not result in exposures that exceeded acceptability limits for carcinogenic effects; and
- Aboriginal users expressed a range of concerns that a reduction in air quality would reduce their use of the site.

The Panel believes that the emissions of particulate matter would be concentrated at the north end of Fish Lake (Teztan Biny) during construction and operation, and the Panel expects that most users would use the new recreation site at the other side of the lake.

The Panel concludes that changes in air quality resulting from the Project would not result in a significant adverse effect on recreational users of the area or Taseko Lake Lodge.

Noise

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

- Taseko submitted that traffic noise associated with Project-related vehicle traffic would not result in substantive changes in the existing acoustic environment along Highway 20 or the Taseko Lake and 4500 roads.
- Taseko expected that operational noise would not be so loud that use of the Fish Lake (Teztan Biny) area could not continue.
- Taseko submitted that most users would not use the northern end of the lake.
- The Tsilhqot'in expressed concerns that the noise from the mine would affect the Tsilhqot'in, largely or wholly, by eliminating its use of the area for fishing, gathering plants and medicines, teaching the youth, community gatherings, and spiritual ceremonies.

The Panel believes that noise exceedances outside of the mine site area would be restricted to the north side of Fish Lake (Teztan Biny) during construction and operation and most users would use the recreation site at the other end of the lake.

For Tsilhqot'in users of the area, the Panel heard that the noise generated by the Project's activities would affect their use of the area. However, the Panel believes that the effect of noise would be limited to areas adjacent to the mine site, the access road and along the transmission line during construction.

The Panel concludes that Project-related noise would not result in a significant adverse effect on users of the area.

Light Pollution

With regards to light pollution, the Panel notes that some visual disturbance would be expected by users of the Fish Lake (Teztan Biny) area and Taseko Lake Lodge.

The Panel concludes that light pollution from the Project would not result in a significant adverse effect.

11 HUMAN HEALTH

11.1 DUST AND COUNTRY FOOD CONSUMPTION

11.1.1 Proponent's Assessment

Taseko noted that the previous panel did not find significant environmental effects associated with country food consumption, soils, or dust deposition.

In response to a Panel's information request, Taseko submitted a human health risk assessment (HHRA) in June 2013. This assessment used the same consumption rates from the previous EIS, which were specific to the Tahltan people in the Galore Creek Mine project located 800 km from the Project area. When comparing different consumption rates, Taseko reported several exceedances for hazard quotient and incremental lifetime cancer risk: arsenic in fish for the assumed consumption rate; arsenic and chromium in fish for 10 times the assumed consumption rates. Taseko's June 2013 HHRA assumed that Aboriginal people would be expected to consume fish from Fish Lake (Teztan Biny) for 60 days per year.

Taseko also submitted a human health risk assessment in July 2013. The July 2013 HHRA used the *First Nations Food, Nutrition and Environment Study* (FNFNES) to substitute Tsilhqot'in consumption rates with the Lower Nicola and Splatshin consumption rates.

Taseko submitted that within the environmental assessment process, soil ingestion rates used to estimate exposures were applied equally in the baseline and post-closure evaluations, and changing the soil ingestion rate would not alter the relative change in exposure and risk between baseline and post-closure conditions.

Taseko noted that, because the predicted post-closure metal concentrations for soils around Fish Lake (Teztan Biny) were below the levels that would be a concern for direct human contact, they were removed from the comprehensive site-specific risk assessment as not being pathways of concern for the HHRA. Taseko supported removing the direct soil contact exposure pathways from the site-specific HHRA based on the observation that the predicted post-closure concentrations of the metals would be lower than typical background concentrations reported in soils in Canada.

Taseko noted that the current soils were not contaminated, but that they had naturally elevated levels of metals. Taseko stated that the natural exceedances in the soil were not bioavailable, as vegetation did not show a correlation in trace element exceedances with soil concentrations.

Taseko stated that the amount of dust emitted was reduced by 75% in the 2013 dust emission model compared to the 2009 dust emission model by using more realistic assumptions. Taseko stated that conservatism was built into the predicted effects and air quality modelling carried out in the previous EIS used particularly conservative assumptions.

In its 2012 modelling, Taseko incorporated the natural suppression of road dust by rain and snow cover for up to 209 days of the year, partial retention of dust within the open pit, and a reduction of silt content used in the construction of haul roads.

Taseko stated that road dust outside the mine footprint was not assessed and explained that there were no predicted effects on the terrestrial environment from mine dust. Taseko stated that dustfall deposition rates from extra mine traffic were expected to be low and localized to the

areas immediately adjacent to the roadways and submitted that there was no need to model the impact on the regional area.

11.1.2 Views of Participants

Health Canada noted that while Taseko's risk assessment methodologies were generally acceptable, the conclusions were based solely on the increase in potential human health risk over baseline conditions. Health Canada submitted that assessing incremental effects was not suitable to assess overall health impacts on human receptors. Health Canada stated that the key indicator for human health impacts is the total health risk from pre-existing conditions in combination with the incremental increase in risk from the Project.

Health Canada disagreed with Taseko's criterion for significance of adverse impacts in its revised June 2013 HHRA. Health Canada stated that from a public health perspective, the human health risk should be assessed by considering the totality of risks from pre-existing conditions in combination with the incremental increase in risk from the project. Health Canada submitted that because of high mineralization in a project area, it would not be uncommon for some metals with high baseline levels to have the potential for adverse human health effects.

Health Canada noted that Taseko arrived at different conclusions on health risks depending on the consumption rate assumption used in the HHRA. When questioned by the Panel as to whether the diet of the Xeni Gwet'in would be more representative of the Tahltan or the Lower Nicola and Splatshin, Health Canada stated that by relying on the comments of the Xeni Gwet'in that their food consumption rates were higher than the Tahltan, then probably neither the Tahltan nor the Lower Nicola and Splatshin would represent Xeni Gwet'in food consumption.

Dr. Jamie Doyle, on behalf of the Tsilhqot'in National Government, prepared an analysis of the human health risk assessment of the EIS. Dr. Doyle, submitted that Taseko had not provided a compelling case that the Project had been assessed using a conservative approach or in a careful and precautionary manner.

Dr. Doyle submitted that the EIS did not fully consider or assess the risks to human health, which could be significantly higher for the Aboriginal peoples in the area as a result of their traditional lifestyle. Dr. Doyle stated that because local human receptors might already be exposed to toxic contaminants in excess of guidelines, any changes to the environment resulting from Project activities would increase the potential for adverse health effects.

Health Canada stated that the changes in Taseko's modelling assumptions may have reduced the level of conservatism in the predicted results to a level that may be inappropriate for human health risk assessments, and the potential adverse effects on human health could have been underestimated. Health Canada noted that it did not have the expertise to verify these assumptions, but it based its review on the assumption that the results of dispersion modelling were accurate and had been appropriately and conservatively derived by Taseko.

Health Canada submitted that the predicted concentrations of airborne contaminants from the mine would influence the predictions for dust deposition to soil, water and plants and, consequently, the results of the human health risk assessment. Health Canada stated that confidence in Taseko's air dispersion modelling results would also be necessary to rely on the conclusions of the human health risk assessment.

Health Canada submitted that adverse health effects due to the consumption of country foods, including fish from Fish Lake (Teztan Biny), were not identified as a major issue in the previous review because Fish Lake would have been removed from use. With the continued availability

of Fish Lake as a source of fish, and given the proximity to mine operations, the consumption of potentially contaminated fish from Fish Lake and the inhalation of air contaminants (e.g. particulate matter) would be more important human health issues than they were in the previous proposal. Health Canada maintained that a Xeni Gwet'in-specific total diet study would provide the most accurate data on Xeni Gwet'in food consumption rates.

Health Canada submitted that the exceedances of hazard quotient and incremental lifetime cancer risk benchmarks in Taseko's June 2013 HHRA were suggestive of potential health impacts. Health Canada stated that uncertainty in the Tsilhqot'in food consumption rates lead to uncertainty in the levels of risk due to arsenic and chromium in fish.

Dr. Doyle agreed with Health Canada and submitted that the ingestion of contaminants of concern via the consumption of traditional foods might be underestimated due to uncertainties in Taseko's dispersion model for dust, uptake in traditional food items and exposure via soil adhering to food.

Dr. Doyle submitted that the assessment of exposure of human receptors to contaminants of potential concern in the EIS and supplemental information did not include ingestion of dust adhering to traditionally prepared and preserved country foods. Dr. Doyle submitted that a recent ethno-cultural survey conducted in 2012 found that the Xeni Gwet'in are highly dependent upon locally sourced country foods from their traditional lands for their economic and spiritual well-being. Dr. Doyle also observed that traditional foods were consumed throughout the year and in all seasons by the Xeni Gwet'in community, with 12 of 14 interviewees reporting that 50% or more of their diet was traditional food. Dr. Doyle stated that all interviewees in the study reported eating traditional foods throughout their lives.

Health Canada referenced Dr. Doyle's work with Xeni Gwet'in participants that determined that soil ingestion rates of the Xeni Gwet'in were higher than the estimates typically used in HHRAs for adults. Dr. Doyle's report noted that recent work with Aboriginal communities indicated that soil ingestion rates for Aboriginal people were postulated to be higher than the soil ingestion rates currently recommended by Health Canada, and as a result, Health Canada's recommended soil ingestion rates would underestimate potential exposures to metals in soil for Aboriginal people and the associated health risks.

Dr. Doyle submitted that the effect of large-scale land clearing and exposure of soil would likely result in the redistribution of smaller size fractions of soil. Dr. Doyle stated that smaller particle size fractions more readily adhere to hands, thus exposing receptors to dermal absorption of contaminants or ingestion by hand-to-mouth transfer of soil particles, and would be more readily ingested via ciliary-mucosal clearing.

Dr. Doyle noted that Taseko's EIS stated that several metals, including arsenic, copper, nickel, and selenium were present in baseline soils at concentrations that exceeded their respective federal water quality guidelines. Taseko also stated that a metal for which the baseline or background concentration exceeded its respective federal water quality guideline was not considered to be an environmental concern because the local environment (human and ecological) was considered to have adapted to the elevated presence of the metal.

Dr. Doyle submitted that federal water quality guideline screening levels were based on a few studies of children, and to a lesser extent, adults, living in suburban or urban environments, and the federal water quality guideline screening levels did not reflect the lifestyle practiced by Aboriginal peoples, which could substantially enhance contact with soil. Dr. Doyle submitted that Taseko's use of soil quality guidelines for residential/parkland and the assumption that adults

and children would not be exposed over a 365 day period was not substantiated and precluded a situation where a family would live in the immediate area.

Dr. Doyle raised concerns related to the evaluation of dust dispersion from mining operations and the potential for long-range transport of metal bearing dust from the mine to the surrounding environment. Dr. Doyle submitted that while the majority of fugitive dust particles between 2.5 and 10 µm would be deposited within tens of kilometers of the Project, some <75 µm dust would be transported greater distances in the dry conditions that are typical of the Nemiah Valley and Chilcotin Plateau. Dr. Doyle noted that Taseko's assessment did not consider the dusts that would be generated from increased road traffic over the entire region.

Health Canada submitted that potential impacts on human health might occur, most likely due to changes in water quality based on the consumption of untreated water from Fish Lake (Teztan Biny) and adjacent creeks and lakes by Aboriginal and recreational users. Health Canada considered the potential adverse impacts on human health from consumption of water to likely be low provided that the quality of drinking water was maintained throughout the life of the Project.

Relative to this, Health Canada noted the uncertainties in Taseko's seepage estimates from the tailings storage facility. The actual seepage rate and the effectiveness of mitigation measures would have considerable implications for the potential health risks from consuming untreated water from Fish Lake (Teztan Biny) and other surface waters downstream from the mine pit and tailings storage facility.

Health Canada noted that the concentration of contaminants of potential concern in Fish Lake (Teztan Biny) were not predicted to exceed the *Canadian Drinking Water Guidelines*. Health Canada submitted that the *Canadian Drinking Water Guidelines* were generally intended to be used to evaluate treated drinking water. Because Taseko reported only mean yearly-averaged concentrations of contaminants of potential concern, Health Canada stated that it was not known whether there might be any exceedances of the *Canadian Drinking Water Guidelines*.

11.2 PERCEPTION OF CONTAMINATION

11.2.1 Proponent's Assessment

Taseko noted that even if the water in the tailings storage facility was within applicable water quality standards, Aboriginal people would not eat fish downstream of the mine due to the perception of contamination. Taseko stated that this was a hard issue to address as it was not based on reality. Taseko suggested that this concern was due to Aboriginal peoples being filled with false information. Taseko described the fear of contamination of fish as something irrational that would have to be addressed through education.

In response to a Panel's information request, Taseko stated the area likely to experience the highest metal deposition would be located on the northern side of Fish Lake (Teztan Biny). Current uses of the area for traditional purposes include trout fishing, trapping muskrat, hunting deer and moose, and gathering soopalallie, lily pad and Labrador tea. Taseko expected that during mine operations, the frequency of use of this area would be low due to its close proximity to active mine operations. Taseko submitted that hunting would not occur as it would be in the no-shooting zone (Figure 15). Taseko predicted use of the area would increase post-closure; however, it was predicted that this may "take a few generations due to the Aboriginal people's concerns over perceived contamination and lack of traditional knowledge of the site."

Taseko submitted that a lag in the use of the mine site and areas immediately adjacent for traditional purposes might occur due to concerns over potential impacts on country foods and lack of traditional knowledge of the area passed on to youth.



Figure 15. No Shooting Zone and Location of the proposed Fish Lake Recreation Site. (Source: Modified from Taseko)

11.2.2 Views of Participants

Health Canada noted that the retention of Fish Lake (Teztan Biny) and relocation of the tailings storage facility in the New Prosperity proposal would allow for fishing to continue at Fish Lake and people may be spending time in closer proximity to the mine site compared to the original Prosperity proposal.

Dr. Doyle submitted that the EIS did not provide a sufficient assessment to conclude that Project activities would not contaminate the land, food and sources of medicine of the Xeni Gwet'in people, so that they could continue to practice their traditional lifestyle unimpeded in the future, without significant and reasonable concerns about contamination of these traditional resources. Dr. Doyle stated that the lack of a detailed risk assessment or establishment of measures to mitigate soil exposure did not provide sufficient confidence that adverse effects to human health might be detected in the future. It was suggested that this could result in the curtailment of traditional food consumption and activities for the Xeni Gwet'in in their traditional lands.

Dr. Doyle submitted that there would be very real potential for contamination from dust generated by mining activities or contamination of the watershed, and this could be expected to discourage members of the community from gathering medicines, catching fish or hunting in the area.

Health Canada stated that it was not an unusual occurrence that, where there could be contamination, Aboriginal people might choose to avoid certain areas. Health Canada submitted that if Aboriginal people avoid certain areas where they gather their food, by not having that food, they switch to less nutritious commercial foods, which could lead to indirect health effects. Health Canada, during the previous public hearing, stated that it had witnessed Aboriginal communities where a perception of contamination had resulted in complete avoidance of traditional foods from a certain area, and the resultant substitution of less nutritional food from the supermarket, which could cause health problems, such as an increased prevalence of diabetes.

Taseko noted that it had some experience at the Gibraltar mine with local people involved in monitoring programs during mine operations to help mitigate the perception of contamination through education and awareness. Health Canada, in response, stated that while it was good practice to have an educational component, it was not believed to be a complete solution.

The Panel heard from many Aboriginal presenters that believed the Project would result in contamination of traditional foods and medicinal plants.

Chief Bernie Mack, of ?Esdilagh, stated that there were areas where a lot of members were told not to fish or drink water from the local lake. Chief Mack stated that deer and smaller game that likely used the same watershed were still being hunted, but a study on deer and plants was desired by his community to determine if there was a human health risk. Chief Mack also expressed concerns with Taseko's ability to properly monitor and mitigate effects to water bodies. Up to the present there has been no study of the safety of traditional foods for Aboriginal people in the Gibraltar mine area.

During the previous review, Shari Hughson highlighted the importance of traditional foods for the Xeni Gwet'in community and estimated that traditional foods made up 50% of their diet and up to 75% for elders. At least one Xeni Gwet'in community member, Mr. Alex Lulua, noted that he lived off the land, only purchasing a minimal number of items from grocery stores.

During the public hearing, Ms. Catherine Haller, stated:

If we don't have clean water our Chilcotin people will die... We need to work together as Chilcotin people. We are like water and we belong to the land. If we don't know this story, how do we know our grass roots? This will affect everybody if the mine is approved. It will affect our way of life. We won't go there to utilize the land because of the contamination the mine will do.

Councillor Loretta Williams of the Xeni Gwet'in stated "[t]o us nothing has changed from the project that was initially presented the first time. In our eyes, Fish Lake will still not be saved and we will still not use that area if the proposed project was to go ahead."

Ms. Lois Williams also expressed concern with contamination due to the Project, and she stated that "[o]ur people will not want to practice hunting, fishing, gathering medicines and plants in the Teztan Biny, Nabas and surrounding areas because of contamination. Our people are worried about the water, animals, our fish. They're worried about getting sick, diseases, cancers."

Elder Mabel Solomon shared the concern that if the Project were to proceed:

the result of the mine will cause contamination to our food sources. The trout, salmon, wildlife, plants, berries and water will no longer be fit to consume. [New] Prosperity Mine representatives say they will be able to contain the toxins but my knowledge of natural water sources in the area, both above ground and underground, lead me to think otherwise.

During the public hearing, the Panel also heard from many Aboriginal youth. One Aboriginal youth stated that "the pollution of the area will also be bad. No one will want to live in the area where the water and environment is bad. If it was you being affected, would be you happy?"

Aaron Lulua, an elementary school student, stated:

For our next generation we need to look after the water and the land. I think that the mine will only pollute the earth around the area. We want to keep our traditions of hunting and fishing alive for our children. We want to see the bear, deer and moose in the valley. We want to be able to fish and hike and be able to horseback ride. We are the Chilcotin people. Without our land we are nothing.

The previous panel submitted that due to the perception of contamination, it was 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 previous panel found that the Project's impacts on the physical and mental health of the Tsilhqot'in communities would be negative and long term.

The previous panel reported that 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.

The Panel heard that Aboriginal people would be unlikely to harvest traditional foods along the transmission line due to potential contamination, and contamination to the food supply might adversely affect the ability of the Aboriginal people to access nutritious foods.

11.3 PANEL'S CONCLUSIONS AND RECOMMENDATIONS

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

- Taseko submitted that within the environmental assessment process, soil ingestion rates used to estimate exposures are applied equally in the baseline and post-closure evaluations, and changing the soil ingestion rate would not alter the relative change in exposure and risk between baseline and post-closure conditions.
- Health Canada noted that while Taseko's risk assessment methodologies were generally acceptable to Health Canada, the conclusions were based solely on the increase in potential human health risk over baseline conditions.
- Health Canada submitted that assessing incremental effects is not suitable to assess overall health impacts on human receptors.
- Health Canada stated that the key indicator for human health impacts is the total health risk from pre-existing conditions in combination with the incremental increase in risk from the Project.
- Health Canada maintained that a Xeni Gwet'in-specific total diet study would provide the most accurate data on Xeni Gwet'in food consumption rates.
- Dr. Doyle submitted that because local human receptors may already be exposed to toxic contaminants in excess of guidelines, any changes to the environment resulting from Project activities would increase the potential for adverse health effects.
- Dr. Doyle noted that Taseko's EIS stated that several metals, including arsenic, copper, nickel, and selenium are present in baseline soils at concentrations that exceed their respective CCME guidelines.
- The Xeni Gwet'in people are highly dependent upon locally sourced country foods from their traditional lands for their economic and spiritual well-being.
- Dr. Doyle observed that traditional foods are consumed throughout the year and in all seasons by the Xeni Gwet'in community, with 12 of 14 interviewees reporting that 50% or more of their diet was traditional food, and all interviewees in the study reported eating traditional foods all of their lives.

The Panel believes that there are uncertainties regarding the effects of country food consumption on human health. There were several human health risk assessments completed, and the results varied depending on the consumption rates of country food consumed by the Tsilhqot'in. The uncertainty was compounded by the assumptions used in Taseko's dust emission modelling, which may have underestimated risks to human health. The Panel believes that some of the uncertainty could be reduced if Taseko completed a site specific health assessment in cooperation with the Tsilhqot'in.

The Panel is of the view that Aboriginal people consuming country food in the Project area may already be exposed to toxic contaminants that exist naturally at levels above current guidelines. The effects of the Project on human health may be relatively small, but they would increase the potential for adverse health effects.

If the Project proceeds and the consumption of country food in the Project area by Aboriginal people continues, the Panel expects health risks to Aboriginal people will increase. However, the Panel is of the view that if the Project proceeds, Aboriginal people may avoid the Project area and the consumption of country food in the Project area would decrease substantially or cease.

The Panel believes the avoidance of the Project area and the consumption of country food in the Project area could result in an increased reliance on store-bought foods by Aboriginal people. The Panel is of the view that for the Tsilhqot'in, relying on store-bought food could present health risks and would not be culturally fulfilling. However, other areas are accessible for gathering country food.

The Panel concludes that the Project would not result in a significant adverse effect on human health.

RECOMMENDATION 19

The Panel recommends that, if the Project proceeds, the responsible agencies work with Taseko to verify its dust emissions modelling assumptions.

RECOMMENDATION 20

The Panel recommends that, if the Project proceeds, Taseko be required to work with the Tsilhqot'in to conduct a site-specific risk assessment using actual country food consumption rates of the Tsilhqot'in. The results of this assessment should be made available to the Tsilhqot'in National Government.

12 ABORIGINAL MATTERS

The Panel's Terms of Reference require the Panel to consider the environmental effects of the Project, including with respect to the Tsilhqot'in and Secwepemc peoples, any effect of any change that may be caused to the environment on:

- health and socio-economic conditions;
- physical and cultural heritage;
- current use of lands and resources for traditional purposes; or
- structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

This chapter provides a brief historical context of the Aboriginal groups within the Project area, followed by a discussion of current use of land and resources for traditional purposes, archaeological and historical resources, and cultural heritage. The discussion includes a summary of the views of the parties who submitted information to the Panel, as well as the views and information obtained during the original Prosperity review panel assessment. The effects on health are presented in Chapter 11, and the effects on socio-economic conditions in Chapter 14.

12.1 HISTORICAL CONTEXT

The original Prosperity panel's report included a historical overview of Aboriginal issues using information provided by Taseko, Aboriginal groups and other participants. This information was mainly repeated in the hearing for the New Prosperity Project. To provide the necessary context for readers, this Panel essentially repeats the historical context presented in the original Prosperity panel report. Some more current information that was provided by all parties during the current Project review is added, notably the follow-up to the *William* case and the subsequent appeals to BC Court of Appeal and the Supreme Court of Canada.

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 Xenigwet'in 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, Governor of the Colony of British Columbia began the process of establishing reserves in British Columbia. His successor, Joseph Trutch, altered the provincial policy when British Columbia joined Confederation in 1871, no longer recognizing Aboriginal title to the land and providing reduced reserves for the Aboriginal peoples.

In 1863, Alfred Waddington began building a road that would have passed through the Nemah 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 – an event

now known as the Chilcotin War. The Chilcotin War was considered to be the greatest act of violence in Aboriginal peoples 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, five warriors were convicted of murder and hanged in Quesnel. During both public hearings, 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 Aboriginal groups. An estimated 70% of the Tsilhqot'in Nation died during the epidemic. During the community hearing sessions in 2010 and again in 2013, many of the Aboriginal 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. The Fraser Canyon Secwepemc were devastated by it. The Esk'etemc reported that smallpox wiped out entire villages. The Esk'etemc related how entire families died in their pit houses, which would collapse overtop of them, or be burned. Others would dig their own graves to avoid infecting their family members. During the environmental assessment process, many people spoke of how the impact of the smallpox epidemic and the Chilcotin War continued to shape current Tsilhqot'in and Secwepemc culture and their relationships with settlers and governments.

Prior to contact with Euro-Canadian explorers and settlers, First Nations in Canada were self-governing bodies. 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. 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 passed a significant amendment to the *Indian Act* in 1985 with Bill C-31, which changed the meaning of "status" to allow for the reinstatement of Indians, especially women, who were denied or had lost their status due to previous versions of that Act.

In 1864, the first reserve for the Esk'etemc (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 Indian Band), Tl'esqox (Toosey Indian Band), and Yunesit'in (Stone Indian Band). In 1909, Tsi Del Del (Alexis Creek Indian Band) and Xeni Gwet'in (Nemiah Indian 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 a solely traditional economy to a mix of ranching and traditional subsistence.

In the late 1800s, the Indian residential school system was established, and eventually, sixteen schools operated in British Columbia. Aboriginal children were taken from their homes and confined in schools operated by the Government of Canada, and the United, Anglican and Roman Catholic churches. Students were isolated from their families and cultures, and instructed in Christianity, mathematics, farming and ranching. In the 1960s, as many as 10 000 First Nation children were attending residential schools in Canada.

During the public hearing, many individuals from all of the Aboriginal communities recounted stories of their experiences in the residential school systems. The Esk'etemc noted that the trauma from residential school had left a deep imprint on most former students, and that it had been described as having a similar impact to post traumatic stress disorder. Many Secwepemc and Tsilhqot'in members also noted that the residential school experience 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 Esk'etemc asserted that re-traumatization 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 process. During the original Prosperity hearing session in Esk'etemc, councillors were on hand in the event that any individuals experienced re-traumatization. The St. Joseph's Mission Residential School at Williams Lake was closed in 1981 after 95 years of operation.

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, as well as the forest industry in the 1970s led to an increased displacement of Tsilhqot'in from their asserted traditional lands and a decreased availability in the natural resources that the Tsilhqot'in depended upon.

In 1973, a road was built into the Nemiah Valley, which resulted in changes to traditional land use activities, culture, and the way of life for the Xení Gwet'in. 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, after the 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.

In 1989, the Xení Gwet'in issued a declaration that established the Nemiah Aboriginal Wilderness Preserve in the area of Tachelach'ed (Brittany Triangle). 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. The proposed Project area lies to the east of the Brittany Triangle in an area described by the Tsilhqot'in National Government as the Eastern Trapline Territory.

In 1990, the Tsilhqot'in Nation began a court action that sought declarations of Aboriginal rights, including title in the area of Tachelach'ed (Brittany Triangle) and the Western and Eastern Trapline Territories. In November 2007, the BC Supreme Court released its decision, finding that the Tsilhqot'in had Aboriginal rights throughout the Claim Area. The trial court declined to make a finding of Aboriginal title. All parties to this case appealed the BC Supreme Court decision to the BC Court of Appeal. On June 27, 2012, the British Columbia Court of Appeal issued its decision, which upheld the Aboriginal rights findings of the trial judge (accepting that the Tsilhqot'in has proven Aboriginal rights to hunt and trap birds and animals for specified purposes, capture and use horses and trade in skins and pelts "as a means of securing a moderate livelihood" in the Claim Area). The Court of Appeal found that the Tsilhqot'in had failed to prove Aboriginal title having relied on an incorrect theory of title. The Court of Appeal's decision on Aboriginal title alone has been appealed to the Supreme Court of Canada, and is scheduled to be heard on November 7, 2013. Chapter 13 provides further information on Aboriginal rights and title and other matters related to the court cases of the Tsilhqot'in.

In the period from 1993 to 1994, the Northern Shuswap Tribal Council and the Esk'etemc 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 Chapter 13 along with broader issues regarding Aboriginal rights and title.

In recent years, 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 1994 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.

12.2 CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES

This section provides a general overview of the information presented by the participants on current use of land for traditional purposes, followed by discussions on fishing, hunting and trapping, and plant gathering by the Tsilhqot'in and Secwepemc Nations.

In the previous panel report, it was noted that the current use of lands and resources by the Aboriginal groups were often linked to potential or established Aboriginal rights, pursuant to section 35 of the *Constitution Act*, 1982. In 2013, this Panel noted that similar connections about Aboriginal rights were raised, although in the case of the Tsilhqot'in some of these rights have now been proven. Aboriginal rights and title will be discussed in Chapter 13.

12.2.1 Overview

As introduced in section 2.1, for the purposes of this report, when referring to Nabas, the Panel is referring to the area south of Fish Lake (Teztan Biny), including Little Fish Lake (Y'anah Biny), Upper Fish Creek (Teztan Yeqox) and adjacent wetlands and meadows, as well as Wasp Lake.

12.2.1.1 Proponent's Assessment

Tsilhqot'in

Taseko's views of Tsilhqot'in use of Fish Lake (Teztan Biny), Little Fish Lake (Y'anah Biny) and Nabas have not changed materially since the original Prosperity project was reviewed. Taseko recognized that the Tsilhqot'in have a history of use for traditional purposes in the Fish Lake and Nabas areas. Their traditional land use was historically based on subsistence activities such as fishing, hunting, trapping and gathering of berries, plants and medicines that were determined by the seasons, and was based on maintaining the sustainability of resources.

Taseko noted that regular habitation and use by Tsilhqot'in of Fish Lake (Teztan Biny) and Nabas since European contact have been documented. In its previous EIS, Taseko reported that ethnographic records demonstrated that the historical settlement at Little Fish Lake (Y'anah Biny) dated back to the 1920s, and that some records stated that the area had been used since 1860 or earlier. The William family lived there year round at the cabins at Nabas from the 1920s until the 1970s. The Solomon family lived in the eastern trapline area in the 1980s to 1990s, and they continue to visit the area each year. The William family and other families used Nabas for trapping and fishing, grazing cattle and horses, and harvesting hay. Fish Lake and Nabas were reported to have been important fishing and hunting camps for the Tsilhqot'in people in the 20th century. The continued development that took place since the late 1880s led to a decrease in the resources that the Tsilhqot'in depended upon. In the last 20 to 30 years, the Tsilhqot'in have actively hunted and trapped in the Fish Lake area.

The Tsilhqot'in have asserted that the land and resources of the Fish Lake (Teztan Biny) and Nabas area were currently used for traditional purposes such as hunting, fishing, camping and

gathering of berries, plants and medicines. Taseko submitted that the current modern day use of Fish Lake and Nabas for traditional purposes had changed from that of the historic past with a shift away from traditional uses. Most people now travel to Williams Lake to buy their food. The use of the area is currently relatively infrequent and generally related to activities such as camping, family fishing trips, ceremonial gathering and teaching.

With regards to Nabas, Taseko submitted that while there was evidence of historical occasional use of Nabas for traditional purposes, that use was relatively infrequent. According to Taseko, there was virtually no evidence that Nabas is currently used for traditional purposes considering that the area is and remains largely inaccessible; therefore Taseko submitted that the current use of the area was very limited.

Taseko indicated that the Project would preserve Fish Lake (Teztan Biny), but recognized that the loss of access to Fish Lake during the Project construction and operations was a concern for the Tsilhqot'in. To address this concern, Taseko proposed to maintain and enhance the access to Fish Lake and some of the surrounding meadow area for the Aboriginal groups to continue to use the land for traditional purposes throughout the life of the Project (during construction, operation and after closure and reclamation). The access to Fish Lake and its camp site would be moved to the east side of the lake, and would be controlled at the mine site for safety purposes (Figure 15). People would be escorted throughout the mine site, or access would be maintained without a gate via multi-plate tunnels. A 1 km no-shooting zone would also be established around the Project site.

With the changes from the original Prosperity mine plan, Taseko would preserve more areas for gathering and trapping and provide access with the current proposed Project. Taseko submitted that the effect of the Project on the current use for traditional purposes would be substantially reduced from the original proposal. It pointed to the following as support for that conclusion: the preservation of Fish Lake (Teztan Biny); the reduced effect on total hectares of water and land affected, including fish and fish habitat, vegetation and wildlife habitat; planned fish and fish habitat compensation; and continued commitments for environmental management and reclamation.

Taseko reported that the Tsilhqot'in indicated that the Project would provoke the displacement of the Tsilhqot'in people from the area around Teztan Biny (Fish Lake), Y'anah Biny (Little Fish Lake) and the Teztan Yeqox (Fish Creek) watershed during mine construction, operation and decommissioning, induced by the avoidance of the areas due to perceptions of contamination. Taseko acknowledged that the perception of contamination from the Project in the area during the lifetime of the Project, and even after closure and reclamation, was a concern for the Tsilhqot'in.

Taseko predicted that while the duration of effects on the current use of Nabas for traditional purposes would be long term or irreversible, given the infrequent use of the area, the low magnitude and small geographic extent of the effects, they would be minimal. Taseko submitted that many other places would remain for which aboriginal current use of lands is much more significant, and that the residual effects from the permanent loss of habitat within the mine development area could be offset through compensation plans.

Taseko argued that the Project effects on the current use of Fish Lake (Teztan Biny) for traditional purposes would be relatively minor, local and reversible because they would only happen once and for a limited time. The use of the area would increase during post-closure; however it may take a few generations, due to people's fears of contamination and lack of traditional knowledge of the reclaimed site. Given the limited area of the mine footprint relative

to the expanse of the traditional territory, Taseko concluded that the effects of the mine on current and future use of the land and resources and on traditional uses would not be significant, and stated it would be open to discussing with the Tsilhqot'in any additional mitigation measures of interest.

Secwepemc

In its previous EIS, Taseko reported that the Secwepemc followed an annual seasonal round of subsistence activities for thousands of years which were based on fishing, hunting and gathering. This nomadic lifestyle allowed for travel among fishing grounds, lakes, berry picking, cambium collecting, root digging locations, and hunting grounds in the river valleys. Taseko noted that the Fraser River Valley was very important for fishing base camps and hunting/butchering spots, similar to the Tsilhqot'in's reliance on the Chilcotin River.

The Secwepemc continue today to have a strong connection to their traditional territory. They continue their traditional subsistence activities, which include berry picking, dip netting during salmon season, fishing for traditional ceremonial lake fish, hunting and trapping, and using resources for medicinal purposes; however many staple foods are now bought in stores. Taseko noted that the New Prosperity hearing record disclosed very little evidence to indicate that the area in which the transmission line would be situated was currently used for traditional purposes.

With the implementation of proposed mitigation and considering the development of an appropriate compensation plan, Taseko predicted the combined residual environmental effect of the Project on the sustainability of the land and resources would not be significant because these effects would be local, would occur once, and would be reversible.

Taseko indicated that it attempted to engage or consult with the Tsilhqot'in and the Secwepemc in both the original Prosperity and New Prosperity projects with no success. Taseko stated it would be open to discussing with the Secwepemc any additional mitigation measures of interest.

12.2.1.2 Views of Participants

Tsilhqot'in

The Panel received a substantial amount of information from both the original Prosperity review process and the 2013 public hearing, regarding the Tsilhqot'in's use of 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.

The Tsilhqot'in, especially people from Xeni Gwet'in, explained that they were charged to protect and defend the land for future generations. The proposed Project area falls within the Xeni Gwet'in's Caretaker Area, which they manage and protect on behalf of the whole Tsilhqot'in Nation. They have been maintaining and protecting their traditional territory and resources in a sustainable way for future generations as taught by their elders and ancestors.

The Panel heard from members of the Tsilhqot'in communities that they live off the land, and it is their chosen and valued way of life. They eat berries, fish, wild chickens, moose, deer and goat meat. They gather berries, teas and medicine from the land. They drink the pristine water in the area. Ms. Hughson told the original Prosperity panel that the perception that food sources might become contaminated could lead people to avoid food from the Project area. Dr. Alleyne of Health Canada shared the same observation with the Panel.

On behalf of the Tsilhqot'in National Government, Patt Larcombe further explained that due to the strong concerns expressed about contamination and disturbance, the Tsilhqot'in traditional use in the area would decline precipitously or perhaps entirely. The loss of Little Fish Lake (Y'anah Biny) and the surrounding meadows, and the loss of important traditional use areas in the Fish Lake (Teztan Biny) area would have effects beyond the loss of harvesting opportunities as a consequence of displacement and avoidance. She noted that the loss of close contact with the land was a primary reason for degradation of traditional systems. Since the landscape would change as a result of the Project, the Tsilhqot'in history and connection to the area would be lost. Many members from both the Tsilhqot'in and Secwepemc Nations indicated that they would not use the Project area (the mine site and transmission line corridor) for food gathering nor for other traditional activities.

The Tsilhqot'in indicated that the Project would substantially reduce and in some cases, entirely eliminate harvesting areas actively used by many Tsilhqot'in members for a wide range of critical plants and animal species. The Tsilhqot'in National Government submitted: "[t]his would extend across multiple generations and almost certainly much longer, given the almost certain need for perpetual water treatment, recirculation, monitoring and maintenance, effectively severing the connection to these lands that dates back centuries, prior to contact with Europeans."

The Tsilhqot'in had indicated that they would be willing to meet with Taseko for discussions only if Taseko would agree to consider not going ahead with the Project as an option.

Secwepemc

Members of the Stswecem'c Xgat'tem and Esk'etemc communities explained that they practice their traditional way of life on the land, and that the proposed transmission line would go through their preferred area for fishing, hunting and gathering areas that are pristine and untouched. Esk'etemc disagreed with Taseko's assessment that effects to hunting, harvesting of plants and fish would be reversible and only occur once. Chief Robbins stated that these impacts would occur every time that an Esk'etemc member would want to go out for harvesting, fishing, hunting or any cultural activities.

The Esk'etemc submitted that Taseko has made no substantial efforts to engage the Secwepemc in working together on reviewing the transmission line corridor to avoid areas of significant importance and for the Project not to result in significant adverse effects on current use of land and resources for traditional purposes. This was recommended by the previous panel. The effects on their traditional use of land would be irreversible, long term, and cannot be mitigated by shifting the location of the transmission line within the selected corridor. The transmission line would result in local but direct and significant effects to habitat, resources and harvesting areas for the Secwepemc.

The Secwepemc indicated that they were open to discuss the routing location of the transmission line and possible options; however, they stated that they were not engaged by Taseko.

12.2.2 Fishing

12.2.2.1 Proponent's Assessment

Tsilhqot'in

Taseko reported that the Tsilhqot'in have actively used and continue to use Fish Lake (Teztan Biny) for fishing, and they described the area, along with the upper and lower reaches of Fish Creek (Teztan Yeqox) and Wasp Lake, as important fishing locations. Taseko noted that fishing was historically conducted in proximity to trapping or over-wintering of cattle and that fishing by the Xení Gwet'in at Fish Lake has declined since the William and Solomon families left the Nabas settlement in the early 1970s.

Taseko reported that lake fishing, particularly at Fish Lake (Teztan Biny), was currently important for the Tsilhqot'in for food purposes in the event that the salmon runs are low or insufficient in the Daisqox (Taseko River) and Tsilhqox (Chilko River) during the summer. While a portion of the Tsilhqot'in's total annual fishing activities comes from lake fishing, the bulk of their annual catch likely comes from salmon fishing.

Tsilhqot'in past and current fishing activities occur year round in different locations in the Project area for trout, whitefish, suckers, and sturgeon, which constitutes an important portion of the Tsilhqot'in diet. Trout fishing may also occur in the winter on Fish Lake (Teztan Biny), whereas in the spring, rainbow trout is fished in many water bodies in the region, including Fish Lake. During the summer, Tsilhqot'in fish for salmon in the larger rivers and lakes of the region; however there is no salmon in the Project area.

Taseko stated that the proposed Project would result in the loss of Little Fish Lake (Y'anah Biny) and parts of the upper portion of Fish Creek (Teztan Yeqox), but would allow for the preservation of Fish Lake (Teztan Biny) as well as parts of middle and lower portion of Fish Creek, although the latter would be temporarily altered by the Project. The loss of the ability to fish in the affected stream habitats and in Little Fish Lake would be felt by the Xení Gwet'in and Yunesit'in communities permanently.

In response to a request from Fisheries and Oceans Canada made in advance of the public hearing, Taseko indicated that based on the sparse records of Aboriginal fishing activity in Little Fish Lake (Y'anah Biny), there was no fishery value associated with that lake. Taseko considered that the loss of the ability to fish in Little Fish Lake would cause a minor effect because the lake is small, shallow and subject to winter kill.

In addition to fishing for food purposes, Taseko noted that the Tsilhqot'in identified fishing at Fish Lake (Teztan Biny) to be strongly connected to other cultural practices, such as gatherings of Elders and youth, teaching and recreation. Lake fishing was identified by many Tsilhqot'in as a method to teach the youth different fishing methods before they become ready to fish for salmon in the rivers.

Taseko explained that the Project would maintain access to Fish Lake (Teztan Biny) for Aboriginal as well as non-Aboriginal people during all mine phases, and that fishing opportunities would be maintained for current and future generations. With the mitigation measures in place, jointly with the Fish Compensation Plans (for fish, fish habitat and for access to fishing), and after reclamation, Taseko predicted that the effects would be of low magnitude, permanent, site specific with the loss of Little Fish Lake (Y'anah Biny) and neutral in direction. The fish compensation plan presented by Taseko is further discussed in Chapter 7 of this report. Taseko mentioned it was open to discussing with the Tsilhqot'in the elements of Fish

Compensation Plans that would be of interest to Aboriginal people in the territory that could improve fish populations, habitat, and opportunities for fishing.

Secwepemc

Taseko predicted that the Project would not have an impact on the Fraser River, (neither on the water nor on salmon), and therefore should not affect the Secwepemc's ability to fish at their traditional fishing sites along the Fraser River.

12.2.2.2 Views of Participants

The Panel received a large quantity of information related to the importance of fishing for subsistence for both the Tsilhqot'in and Secwepemc Nations from the original Prosperity project review and throughout the New Prosperity Project review. In all Tsilhqot'in and Secwepemc communities, speakers explained that many people were fishing on the rivers at the time of the New Prosperity Project hearing sessions. They were gathering salmon for subsistence for the rest of the year, for their families and their elders. Participants identified fishing as part of their way of living to provide food to their families.

Tsilhqot'in

In the previous Prosperity review, Fisheries and Oceans Canada noted the use of Fish Lake (Teztan Biny) by the Tsilhqot'in as a reserve food supply in the event of poor salmon runs. Throughout the New Prosperity public hearing, the Tsilhqot'in confirmed that Little Fish Lake (Y'anah Biny) and the upper and lower reaches of Fish Creek (Teztan Yeqox) were also extremely important fishing locations and a critical food supply when salmon runs are low or insufficient. The Tsilhqot'in people mentioned that they fish in the lakes and rivers all year long. Fish species harvested in the area include trout, suckers, Dolly Varden, mountain whitefish and steelhead. Chief Joe Alphonse, Chair of the Tsilhqot'in National Government and Chief of Tl'etinqox-t'in, reported that Fish Lake is well-known for being one of British Columbia's top fishing lakes and is highly-productive.

The Tsilhqot'in demonstrated through stories, testimonies and pictures presented to the Panel that they have gone to Fish Lake (Teztan Biny) and Little Fish Lake (Y'anah Biny) to fish for generations, and continue to fish there. The Tsilhqot'in stated that historically, their ancestors and elders travelled to Fish Lake by horseback to hunt, trap and fish. Several Tsilhqot'in members also explained to the Panel that Little Fish Lake has been used by Tsilhqot'in people continuously for many generations. The families who lived there to raise cattle would also fish in Little Fish Lake and Fish Lake for subsistence. During the hearing sessions, the Panel heard stories about several families and people of all ages continuing to fish in Little Fish Lake. Linda Smith from Yunesit'in provided a submission to the New Prosperity Panel that documented over 700 combined descendants of two early Tsilhqot'in families, with names and dates, who had a direct connection with the Little Fish Lake and the Nabas area.

The Panel also heard stories from Tsilhqot'in members travelling to Fish Lake (Teztan Biny) to go camping and fishing in the area with their grandparents, parents and children. They explained that they would fish using different methods such as nets, rafts and fish traps. Lake fishing is important for subsistence purposes, but is also a method to teach the youth how to fish and practice traditional ceremonies.

Jessica Setah-Alphonse from Xeni Gwet'in and many others explained to the Panel that community gatherings have occurred at Fish Lake (Teztan Biny) for generations up to the present day. The Panel heard from Tsilhqot'in members of all ages, including many of the youth,

who talked about these gatherings and their meaning. Fishing was presented as another opportunity for the intergenerational transmission of traditional knowledge and skills. Further information related to cultural activities and traditional values is presented in Section 12.4.

The Tsilhqot'in expressed their concerns about Taseko's predictions of the fish being healthier, but less in quantity. They explained that this result would cost them substantially more time and effort to catch the same amount of food as currently. Even though Taseko stated that the fish would remain healthy, that water quality would follow guidelines, and that monitoring would be conducted for both water quality and fish, the Tsilhqot'in predicted that they would stop fishing in Fish Lake, because the lake would be situated within a continually operating industrial site. It would be surrounded by an open pit to the north, the tailing storage facility to the south, and mine infrastructure, ore stockpiles, waste rock dumps and industrial traffic to the east.

Patt Larcombe, on behalf of the Tsilhqot'in National Government, submitted that "the proximity of the lake to the open pit, mining operation infrastructure, and tailing storage facility, combined with Tsilhqot'in concerns about contaminants, suggests Tsilhqot'in would be highly unlikely to continue to harvest fish from Teztan Biny, the lower reach of Middle Teztan Yeqox, or the lowest reach of Lower Teztan Yeqox". As a result of avoidance of fishing at Fish Lake, the Tsilhqot'in expressed concerns about the increased competition for food resources from other lakes.

Secwepemc

The Secwepemc explained that fishing is an important part of their way of life. They reported that the location of the proposed transmission line crossing at the Fraser River, namely Little Dog, was an historical and currently important fishing site. The Panel heard stories from several Esk'etmec Nation members relating that they camped at Little Dog with their parents and grandparents, and started fishing there. The Esk'etmec indicated that they have been using the rocks by Little Dog for fishing for generations.

Francis Johnson Junior from Esk'etmec told the Panel that the transmission line would be visible from both of his fishing sites and explained: "While fishing at these sites it gives me a great sense of peace and a sense of spirituality knowing that you're fishing at the very place your ancestors did. This area is pristine, timeless, and tranquil. In my mind it's a spot worth protecting for our children and future generations."

12.2.3 Hunting and Trapping

12.2.3.1 Proponent's Assessment

Tsilhqot'in

Taseko reported that hunters in the Tsilhqot'in communities indicated that the area surrounding Fish Lake (Teztan Biny) and in the Fish Creek (Teztan Yeqox) watershed were excellent hunting and trapping territories. Historically, hunting grounds were a major consideration in decision making for the location of winter home sites. From pre-European contact times until the mid-20th century, the area of Fish Lake, Big Onion Lake (Jidizay Biny) and Little Fish Lake (Y'anah Biny) was a winter hunting and trapping ground. All the wildlife species harvested by the Tsilhqot'in were in this area. At that time, deer was the basis of the Tsilhqot'in diet.

Taseko mentioned that the Tsilhqot'in have actively hunted and trapped in the Fish Lake (Teztan Biny) area in the last 20 to 30 years. The most abundant species trapped in the mine site footprint are muskrat, cougar, bobcat, fisher, wolverine, rabbit, squirrel, weasel, lynx,

beaver, coyote and marten. The most abundant species hunted in the area include moose, mule deer, grouse and squirrel.

In comparison to the original mine proposal, Taseko submitted that the New Prosperity Project would result in less trapping areas being affected for all species, including those species historically targeted in the Fish Creek (Teztan Yeqox) watershed, such as marten, coyote, beaver and muskrat. The cougar trapping area would be an exception since its presence seems to be limited to an area immediately downstream of Little Fish Lake (Y'anah Biny). The Project would also affect fewer hunting areas for all species assessed, including moose, mule deer and grouse, except for the squirrel whose hunting area is entirely located within the Project footprint.

Taseko noted that the Tsilhqot'in were concerned about the access to Fish Lake (Teztan Biny) during the construction and operation of the mine. Although a no-hunting zone would be established for safety purposes around the mine site, Taseko assured that access to Fish Lake would be provided to Aboriginal and other users during mine construction and operations, enabling opportunities for trapping in the immediate area of Fish Lake and the adjacent meadows during all phases of mining. Taseko indicated that they would impose a no-hunting policy to the mine workers. No increase in non-Aboriginal hunting activities is expected, and therefore there would be no increased hunting pressure in the area.

Hunting activities in the vicinity of the mine may be affected by noise which could temporarily disturb wildlife. Taseko submitted that the effects of the Project on hunting and trapping would be low and short term, and would be reversible. With the implementation of associated mitigation and reclamation plan, no potential residual effects were expected on the resource available for hunting and trapping. In addition, Taseko stated it would be open to discussing with the Tsilhqot'in additional mitigation measures, as part of the New Prosperity Habitat Compensation Plan that would enhance wildlife and waterfowl habitat, and improve abundance and diversity of wildlife species of interest to Aboriginal peoples.

Taseko also noted that the Project would be located in the Xeni Gwet'in/Sonny Lulua Trapline area, and submitted the Project would not have significant adverse effect on furbearers, although there would be local effects on trapping at the Project site during construction, which would continue until mine closure when reclamation for fur-bearer habitat would be completed. Taseko submitted that negotiations with the Xeni Gwet'in licencees may find a suitable solution to the local effects on the trapline.

Secwepemc

In its previous EIS, Taseko noted that the proposed transmission line would run west through the Secwepemc traditional territories, including the traplines of the Esk'etemc and Stswecem'c Xgat'tem on the east side of Fraser River, and through the Tl'esqox trapline on the west side of the river.

Taseko submitted that the construction design of the transmission corridor right-of-way would avoid long straight-line sight distances which would reduce the negative effect of the right-of-way on predator-prey relationships. The centerline of the transmission line would be determined in cooperation with the Secwepemc to avoid construction in sensitive locations. Taseko noted that the Secwepemc have concerns about increased access and increased non-Aboriginal hunting that transmission line could bring. Taseko indicated that they would use existing clearing for the final alignment, and avoid sensitive ecosystems and use existing roads to access and build the transmission line. Taseko committed to decommissioned roads, when possible arrangements could be made with the owners, after the construction.

Taseko concluded that the effects on Aboriginal use for hunting and trapping would be of low magnitude and of short term. With the implementation of the mitigation measures and reclamation, the Taseko concluded that the effects would be non-significant because they would be local, occur once and would be reversible.

12.2.3.2 Views of Participants

The Tsilhqot'in and the Secwepemc explained to the Panel the importance of hunting for wild game for food subsistence for their families, elders and for those in the communities who cannot hunt. Aboriginal groups stressed that wild game provided meat for their family that would otherwise be impossible to purchase because of their low incomes. Many members of all ages and from each of the eight communities visited explained to the Panel that children go hunting with their families, parents, grandparents, uncles and community members.

The Tsilhqot'in and Secwepemc Nations told the Panel that hunting is important to teach the ceremonies and rituals related to hunting and trapping, as well as the techniques such as the conservation of meat and the use of the skin. The knowledge of hunting has been passed on from generations to generations, along with the traditional values, cultural practices and language. The effects related to cultural heritage are further discussed in Section 12.4

Tsilhqot'in

Hunters from all the Tsilhqot'in communities at both the previous and current Project hearings indicated that Fish Lake (Teztan Biny) and Nabas were excellent hunting territories. They have extensively used the proposed Project area for hunting and trapping purposes since time immemorial up until today. The BC Court of Appeal, in the *William* case, has recognized that the Tsilhqot'in have proven Aboriginal rights to: hunt and trap birds and animals for the purposes of securing food, clothing, shelter, mats, blankets and crafts, as well as for spiritual, ceremonial and cultural uses; capture and uses horses for transportation and work; and trade in skins and pelts as a means of securing a moderate livelihood.

Many of the Tsilhqot'in members explained to the Panel that their ancestors had trails that they used to access the different areas of the territory to hunt and trap and which are still used today. Several of them have been transformed into the existing roads. Tsilhqot'in members related current stories about travelling the territory by horse back to practice hunting and trapping. Ms. Mabel Solomon, elder of Xeni Gwet'in told the Panel that Fish Lake (Teztan Biny) and Nabas were heavily used for trapping and hunting by the William and Solomon families while they lived there all year round. She further reported that other families, such as the Seymour, Hance, Baptiste and Setah families, also lived there during the winter and trapped fur animals.

The Panel heard information concerning the *William* case and the Tsilhqot'in's proven Aboriginal rights. In the Xeni Gwet'in community hearing, the Tsilhqot'in National Government noted that the New Prosperity Project would be entirely located in the claim area where the Xeni Gwet'in hold statutory trapline which also correspond to traditional trapping areas. The community trapline, which was established in the 1990s and amalgamated all of the individual lines, overlaps with the Project area.

The Panel heard that Tsilhqot'in members, such as the Solomon family, still trap at Fish Lake (Teztan Biny) and Nabas in the winter months today. Species that are trapped include squirrels, beavers and coyotes. Many other Tsilhqot'in members indicated that they still go to Fish Lake to hunt notably moose and deer. They explained that the Project area is located on the migration route of deer. Mr. Cooper indicated that many of their hunts were done in the fall. The Tsilhqot'in explained that they were taught by their elders to hunt different areas and rotate them to avoid

overhunting certain areas. They learned from elders and family members the best time and location for hunting, the techniques to prepare and use the game they harvested.

Councillor Marilyn Baptiste indicated that Nabas is a prime hunting territory. Linda Smith reported that most Tsilhqot'in know Nabas to be one of the best areas for year-round moose habitat. The Tsilhqot'in members indicated that it is important to protect the wetlands in Nabas since they are one of the last important winter range for moose as a result of the continued logging in the Yunesit'in caretaker area. They fear that the loss of this habitat would put further pressure on the moose population already in decline. In support, the Tsilhqot'in National Government presented a report of the British Columbia government which indicated that the moose population in the region has declined by 50% in recent years. Aboriginal presenters submitted that with the Project, the moose habitat at Nabas would be largely destroyed. They reiterated that the animals would become scarce, and those that would not be displaced might become contaminated and therefore unfit for human consumption.

In all Tsilhqot'in communities, members expressed concerns about the pressure on the resources due to the logging activities around Nabas. They explained that forestry roads gave easier access to the Tsilhqot'in territory, resulting in more pressure on the resources by non-aboriginal hunting for recreational purposes. The Xeni Gwet'in members explained to the Panel that forestry activities were limited in the past as a result of the *William* case, which restricted the construction of logging access roads. With the proposed New Prosperity Project, the upgrading of the access roads to the Project area would open the territory to all-terrain vehicles, snowmobiles and recreational hunting, and poaching, which would further limit the availability of wild foods for the Xeni Gwet'in community members.

The Tsilhqot'in submitted that in addition to the destruction of habitat as a result of the Project, the noise, light and industrial activities would result in displacement of the wildlife population, a significant concern for Xeni Gwet'in community members. They also expressed their concerns regarding the controlled access to Fish Lake (Teztan Biny) and the 1 km no-shooting zone around the mine site (Figure 15). They explained that this would result in a loss of areas for hunting, and would also affect their trapping activities at Fish Lake as the trapping of some species requires the use of a gun when the animals trapped were not dead.

Patt Larcombe, on behalf of the Tsilhqot'in National Government, submitted that notwithstanding Taseko's proposal of maintaining access to the area for the Tsilhqot'in to harvest plants and animals within the proposed "no shooting zone", it is expected that Tsilhqot'in traditional use in the area would decline precipitously or perhaps entirely, due to strongly expressed concerns about contamination and disturbance. The Tsilhqot'in National Government considered that in addition to the loss of harvesting areas and disturbance of harvesting activities, the Tsilhqot'in fears of contamination and the avoidance of the area as a consequence of the presence of a continually operating industrial site, would substantially increase the effects on hunting, gathering and trapping activities.

Secwepemc

The proposed transmission line for the Project was also reported to be a concern to both the Tsilhqot'in and Secwepemc Nations on the issue of access and subsequent decline of animal populations.

During the original Prosperity review, 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. The Secwepemc members of Stswecem'c Xgat'tem and Esk'etemc indicated that the transmission line corridor goes directly through their

traditional hunting grounds. They also indicated that Little Dog crossing, where the transmission line corridor would cross the Fraser River, is their traditional hunting ground, and for many their preferred one. The Secwepemc submitted that the Project would disturb the migration patterns further in an area where the deer and moose populations are already disturbed by development, and displace Esk'etemc hunters from their preferred locations. The Esk'etemc submitted that there is no similar habitat that is available to Esk'etemc for harvesting mule deer and moose. During the community hearing in Esk'etemc, Ms. Beverley Chelsea-Hutchinson told the Panel that the transmission line would run through their hunting spots across the Fraser River. It is the closest hunting area to their home which allows them not to travel far and to be able to go fishing and hunting for deer at the same location and provide food support for them throughout the year.

The Secwepemc expressed their concerns about this continuous power line which would increase the access to their territory to other non-resident hunters, which would result in more hunting activities and poaching, and which would result in an increased pressure on big game, notably on the already decreasing moose and deer populations. They also mentioned that the proposed transmission line right-of-way would be crossing the area in an east-west axis, and would allow access into an area that would otherwise not be readily accessible.

The Secwepemc also expressed their concerns regarding the decreasing population of moose. Before 1900 the most commonly hunted game was deer, elk and caribou; today moose and deer were the most commonly hunted species by their Nation. Chief Robbins mentioned that the mule deer and moose habitat in and around the community forest, was rare and unique, and a critical habitat for the wildlife they rely on as a food source.

The Esk'etemc explained that the power line would constitute the largest clear-cut in its community forest, and would go through the mule deer winter range. The area is also frequented by cougar, bear and wolf and the Esk'etemc expressed the concern that the predator/prey relationship would be affected by the transmission line. The line could give the predator the ability to take advantage of the line of sight that the power line provided, increasing the predation on the mule deer. The Secwepemc reported that the current BC Hydro transmission main line, with its four lines, has created major access routes for all-terrain vehicles and snowmobiles, and therefore for hunting and poaching. Adding another line going from east to west would create additional access and more pressure on resources.

The Esk'etemc submitted that as a result of clear cutting for the transmission line in a traditional harvesting area, which is an important and unique habitat for the mule deer winter range, there would be an adverse effect on hunting. The Secwepemc indicated that the mitigation measures proposed by Taseko would not be sufficient. Esk'etemc submitted that regardless of the location of the transmission center line selected, the adverse effects would continue to exist throughout the Project life and beyond with respect to hunting. The transmission line corridor would result in habitat fragmentation, interfere with migration patterns, and negatively impact the predator-prey relationship. Given that the life of the transmission line could be indeterminate, the duration of the effects would be long term or permanent. In addition, the Panel heard that the Secwepemc would avoid traditional activities in the transmission line area. The Secwepemc submitted that the effects on hunting in areas of cultural importance would not be reversible, and therefore significant.

12.2.4 Plant and Medicine Gathering

12.2.4.1 Proponent's Assessment

Tsilhqot'in

Taseko indicated that historically, plants were a basic element in the Tsilhqot'in diet. The Tsilhqot'in traditional land use was historically based on subsistence activities that were determined by the seasons. Vegetation was also used for many other purposes, such as for fire wood, and construction of fish nets, poles, pit house frames, bridges, racks, snowshoes. Pine gum was used to seal containers.

Taseko reported that the Fish Creek (Teztan Yeqox) watershed area is currently used by many Tsilhqot'in members, especially members from Xeni Gwet'in for plant gathering. Taseko noted that the main species for berry picking were soopalallie, blueberries, chokecherries, crowberries, frog berries, huckleberries, raspberries, saskatoon berries, soap berries, strawberries. Tsilhqot'in gather medicine species, such as Indian Hellebore, pine pitch, dark willow, scrub birch or dwarf birch, alder, juniper, aspen and Fireweed root. Other plants are also harvested, such as balsam fir, bear tooth, cottonwood, kinnikinnick, Labrador tea, pine mushrooms, wild onion and wild potatoes).

According to Taseko, the New Prosperity Project could affect plant gathering both through loss or alteration of vegetation species of interest for the Aboriginal people, and through the loss of access. Taseko submitted the Project would have significantly less effect on Saskatoon, gooseberry, raspberry, soopalallie thimbleberry and Labrador tea than its previous proposal. Lily pad harvesting was identified as occurring almost entirely in the Fish Lake (Teztan Biny) area, and therefore would be preserved in the New Prosperity Project. Taseko noted that there would be little change to the impact on balsam, cottonwood, blueberry, strawberry and crowberry; these species would be included in the reclamation planning for mine disturbances. Therefore with the implementation of mitigation measures and reclamation, the effects of the Project on plant gathering would not be significant.

In its previous EIS, 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. The same argument was made in 2013.

Secwepemc

Taseko reported that over 200 indigenous species of plants were known to the Secwepemc, and approximately 50 of these were used as food items, including plants, roots and berries. Berries were reported as being very important and appreciated by the Secwepemc, and traditional medicines remain an important part of the culture of the Secwepemc people. Taseko reported "that until changes were made to the *Indian Act* in 1951, community members from Esk'etemc relied solely on traditional medicines except in the case of tuberculosis." Plants used as medicine include Labrador tea, juniper, balsam bark, soap berry sticks and fir pitch.

Taseko stated that with implementation of the mitigation measures and reclamation, the conclusions were that although the magnitude would be low and the effect would be medium term, the effects on aboriginal use for plant gathering, including country foods and access, would be non-significant because they would be local, occur once and would be reversible. Taseko stated that it was open to discussing with the Aboriginal groups additional mitigation measures of interest to them.

12.2.4.2 Views of Participants

Tsilhqot'in and Secwepemc members reported that plant gathering was historically important part of their way of living off the land.

Tsilhqot'in

In the Xeni Gwet'in community hearing session, the Tsilhqot'in National Government noted that in the *William* case, the Court found the Tsilhqot'in people have been present in the Eastern Trapline Territory at the time of first contact with Europeans, and the territory has since been used by the Tsilhqot'in for traditional activities including gathering roots and berries. Members from several Tsilhqot'in communities confirmed past and current plant gathering activities in or around the Project area.

Plant gathering continues to be an important part of the Tsilhqot'in and Secwepemc way of life. They gather berries, teas, roots, medicine and other plants for food, construction purposes, as well as for ceremonies and spiritual rituals. During the hearing, participants repeatedly mentioned the use of Fish Lake (Teztan Biny) and Nabas areas for plant, berries and medicines gathering. Several Tsilhqot'in people specified that the elders still go to Fish Lake and Fish Creek (Teztan Yeqox) to collect their medicine.

Linda Smith explained that the Tsilhqot'in cannot just go anywhere to harvest plant medicines. She presented documented information on the historical use of Nabas that incorporated traditional and community knowledge, which she collected notably through interviews with elders. She submitted that Nabas was chosen as a central location for living, as well as for gathering and holding ceremonies, for the following reasons: because it is a place of fertile meadows, a major migratory route for large game and a place for fishing; and because it provides a the wide variety of medicinal plants. Since medicinal plants are so closely related to their healing practices, there is a spiritual element drawn up by plants which grow in higher elevations.

People go to Fish Lake (Teztan Biny) and Nabas "to harvest these pure medicines because of the spiritual power of the Nabas region". Patt Larcombe noted that Alex Lulua of Xeni Gwet'in told the previous panel how much Labrador Tea there was at Fish Lake and how this was one of the few places that he was able to harvest pine mushrooms, and that the pine pitch was especially good there because of the wetlands.

The Panel heard people from many Tsilhqot'in communities other than Xeni Gwet'in explaining that because of the development around their communities, they felt that medicines in the areas around their communities were contaminated. Others reported that there are areas where they used to gather berries or specific plants, where plants don't grow anymore. In the previous Prosperity panel review, the Tsilhqot'in National Government pointed out that as logging and land disturbance increased in the region, Aboriginal groups would rely more heavily on the plants and berries growing in the Fish Lake (Teztan Biny) area, as this area was considered one of the few remaining pristine areas east of Taseko River (Dasiqox). In 2013, people from as far as ?Esdilagh reported getting their medicine plants from Fish Lake, Nabas and surrounding mountains because they felt the medicines there were healthier and had more strength. The Panel heard that the elders were concerned about areas being opened by roads and by the plants being overgathered.

The Tsilhqot'in submitted that if the Project was to proceed, the Aboriginal groups would avoid harvesting traditional plants and medicines, in the Project area and surrounding region due to a

fear of potential contamination by the dust, industrial chemicals and water seepage that would result from the Project.

Secwepemc

The Secwepemc indicated that the previous panel had noted the transmission line would have a negative effect on the Secwepemc people's ability to harvest culturally-significant plants. The Secwepemc identified Little Dog as an important place that has been used to gather plants and medicine for generations. The Esk'etemc submitted that the increased traffic due to the accessibility to the territory through the transmission line corridor would increase the introduction of invasive plants into the area, notably in the Community Forest and grasslands ecosystems. The use of herbicides along the transmission line was also a concern identified for the grassland ecosystems and the contamination of harvested traditional foods.

The Esk'etemc reported that as a result of logging activities and due to the presence of the existing BC Hydro transmission line in the area, the land tended to dry up and the vegetation was no longer growing in these areas. As a result, they have lost the ability to gather medicines and berries. They expressed concerns that the effect of the New Prosperity Project would prevent them from being able to pass these traditional activities to the next generation, and they would not benefit from the nutritional, cultural and spiritual value of gathering plants and resources.

12.3 ARCHAEOLOGICAL AND HISTORICAL RESOURCES

This section addresses the tangible aspects of archaeology and historical resources (e.g. the archaeological finds, ancestry and historical artifacts). The intangible and cultural issues are discussed further in Section 12.4.

12.3.1 Proponent's Assessment

Tsilhqot'in

Taseko conducted a comprehensive archaeological impact assessment for the previously proposed Prosperity mine footprint as part of the original Prosperity review, with a firm recommended by the Tsilhqot'in. Taseko indicated that the Tsilhqot'in collaborated in the design and implementation of the fieldwork carried out in 2006; however the Tsilhqot'in participation in the survey ended prior to the completion of the work and that the Nation had not indicated its acceptance of the report findings.

The assessment covered an area of 3 476.5 ha and included all components of the New Prosperity Project. Taseko conducted an extensive field program as part of the archaeological impact assessment, and used an intensive grid method to accommodate Aboriginal groups' interests. Taseko indicated that the New Prosperity Project would preserve Fish Lake (Teztan Biny) and the island in the lake, and would therefore result in 84 percent reduction in the number of known archaeological sites potentially affected compared to the original Prosperity project. As a result, of the 79 protected (pre-1846) archaeological sites noted in the 2010 archaeological impact assessment, only twelve sites would now be affected.

Of the sites within the New Prosperity Project area, five were located within the area of the proposed pit development, and therefore could not be avoided. Four of these five sites were ranked by Taseko as having low scientific value and were found to contain lithics. One was ranked as having moderate scientific value, and contained formed tools. These sites have

already been recovered and preserved. None of the sites were recommended for further systematic data recovery by the provincial Archaeology Branch and, hence, no further mitigation measures were proposed.

Three sites ranked by Taseko as having high scientific value would be located within the New Prosperity Project area. Two of these sites, one of which was a potential historic human burial site, would not be directly affected or disturbed by any clearing or grubbing or the placement of permanent structures, but they would be part of the buffer areas around the mine features that may be subject to potential indirect effects associated with mine activities. The third one would be located within close proximity to proposed water management infrastructure and its location would be considered during detailed design of the infrastructure in order to ensure avoidance of the site. Monitoring and mitigation measures, such as clear marking of boundaries around each of these sites, would be implemented to avoid disturbance of these sites throughout all phases of the mine development activities.

Based on the artifacts found and feature assemblage identified, the area was used on a temporary or seasonal basis for activities that included hunting, fishing and plant gathering and processing. The information collected (wide range of dates obtained through cross-dating of diagnostic artifacts, the presence of historic resources including hunting and fishing sites, burials, trails and cabins, as well as information provided by Aboriginal groups communities) suggests the use of the Fish Lake (Teztan Biny) locality from approximately 5500 BP to present, but the majority of archaeological sites that were identified date back to approximately 5500 BP. 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.

Taseko recognized that the cremation sites, burial sites and pit houses in the area of the proposed mine site, particularly on the island in Fish Lake (Teztan Biny), were of importance to the Tsilhqot'in, and the Tsilhqot'in had expressed concerns about whether sites with no physical evidence were identified in the archaeological studies. During the 2009/2010 review, Taseko indicated that its archaeological impact assessment showed no evidence of cremation sites that were of concern to the Tsilhqot'in within the Project area. In the 2010 public hearing Kevin Twohig of Terra Archaeology who completed the assessment for Taseko, concurred that some important sites for spiritual activities, including sacred sites or cremation sites, would not necessarily leave physical evidence that could be found during field surveys, or evidence could have been removed or obscured. 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.

In response to the confidential results of some new research work conducted by the Tsilhqot'in National Government in 2013 and presented, in confidence, at a community hearing session in Xeni Gwet'in, Taseko indicated that the sites identified in the Tsilhqot'in National Government report were located within the footprint of the original Prosperity project and were already identified in the archaeological impact assessment, and would be avoided with the New Prosperity Project. Taseko also submitted that because of a lack of testing or physical evidence, the other sites proposed by the Tsilhqot'in National Government confidential report should only be considered "possible" or "potential" evidence. Of these sites, only one new possible burial site was located on the extreme perimeter of the New Prosperity maximum mine footprint. Taseko indicated that the area could be avoided through minor adjustments during final engineering design and field testing.

Taseko disagreed with the Tsilhqot'in National Government that the new report suggested that there were many more sites of archaeological significance in the area of the mine footprint. While Taseko noted it was possible that additional burial sites may be in the vicinity of the New Prosperity Project area, they indicated that the archaeological impact assessment was informed by and benefited from the local knowledge of Aboriginal groups participants obtained through interviews with elders, and the study revealed no evidence of human burials around the cabins at Little Fish Lake (Y'anah Biny) nor in the remainder of the study area. Taseko submitted that therefore, it was unlikely that any unidentified burial or cremation sites would be affected by the Project.

To ensure avoidance, minimum disturbance and protection of the sites, Taseko committed to develop an archaeological and heritage resources protection procedure for the New Prosperity Project. Final details of this and any other such measure would form part of an Impact Management Plan approved by the provincial Archaeology Branch, and be attached to all subsequent permits and authorizations. Taseko recognized that the Aboriginal groups had concerns with unidentified sites that could be disturbed, and accepted the previous Panel's recommendation to establish a chance-find procedure with the Province and Aboriginal groups to avoid or minimize damage to archaeological finds. Taseko also mentioned that it committed to working with the Aboriginal groups to look at further agreements should they be interested in dealing with artifacts.

Taseko submitted that the negative implications of the Project for archaeological sites were relatively small. In light of the characterization of the heritage resources that would actually be affected by the Project, along with the limited number in a site-specific area, the effects would not be significant. The Project would result in residual effects that include the loss of cabins in the vicinity of Little Fish Lake (Y'anah Biny) to the tailing storage facility; Taseko indicated it was open to discussing mitigation or compensation with the Tsilhqot'in, specifically with the William family.

In its previous EIS, Taseko indicated that Aboriginal participants in the previous review panel hearing had a strong historical and cultural connection to Fish Lake (Teztan Biny) and Nabas, and part of it was due to the belief that many of their ancestors have been buried or cremated there. Taseko also noted that the cabins in Nabas, which are historic resources, also contribute to the connection the Tsilhqot'in have with the past and to the land. This connection is further discussed in Section 12.4.

Secwepemc Nation

In the original Prosperity review, Taseko presented the results of an archaeological overview assessment of a portion of the transmission line. Taseko reported that there were 31 archaeological sites located within 1 500 m of the proposed transmission line right-of-way. Of these sites, only two were located within 250 m of the right-of-way. Taseko had indicated that more work would be done when the centerline would be selected within the proposed corridor right-of-way. Taseko committed to conduct an archaeological impact assessment of the 30 m to 80 m transmission line right-of-way prior to permitting, and noted that Aboriginal groups would be invited to provide input into pole placement and other mitigation plans.

In the Project hearing, Taseko indicated that because there were many archaeological sites identified during the previous Panel review, it started an archaeological assessment in 2010 to ensure that it was feasible to avoid archaeological sites at the major crossings (the Fraser River and the Big Creek). Taseko indicated that it completed the general assessment of the major crossings and was confident that the pole placement would avoid any known or newly identified

archaeological sites. However, Taseko had not finished the entire assessment, and indicated its intention to work cooperatively with the Secwepemc communities on these matters.

During the community hearing session in Esk'etemc, Taseko indicated that it had contacted the community in 2010 to involve them in a follow up archaeological study, but that the Esk'etemc had decided not to participate. Nevertheless, Taseko indicated that it committed to working with the Esk'etemc to select a final centreline of the transmission line in the proposed corridor to avoid specific sites of cultural or archaeological significance. Taseko recognized that the Secwepemc had concerns related to the fact that unidentified sites could be disturbed, and accepted the previous Panel's recommendation for a chance-find procedure with the Province and Aboriginal groups to avoid or minimize damage to archaeological finds. As a result, Taseko submitted that there would be very little impact, if any, on sites of cultural or archaeological significance for the Secwepemc Nation.

12.3.2 Views of Participants

Tsilhqot'in

During the Project hearing, Tsilhqot'in members from all six communities expressed strong concerns regarding sites of archaeological importance that could potentially be disturbed as a result of the New Prosperity Project. This includes the ones that are known as well as the ones that were not identified by the archaeological impact assessment of the mine site conducted by Taseko. During the original Prosperity review, the Tsilhqot'in had indicated that a pit house located on the island of Fish Lake (Teztan Biny) was missed, as well as numerous burial sites located in Fish Lake and the Nabas areas.

During the Xení Gwet'in hearing session on August 8, 2013, the Tsilhqot'in National Government presented a confidential report that identified graves at Fish Lake (Teztan Biny) and Nabas. That report was prepared by Dr. Darcy Mathews and Emily Benson in collaboration with Xení Gwet'in elders. The study was oriented around oral history, elders' knowledge of specific historic burial sites and archaeological field methods.

The Tsilhqot'in National Government reported that they identified, on the field trip, three burial features and one possible burial feature located at Fish Lake (Teztan Biny) and in Nabas that had not been previously documented by archaeologists. In addition, Tsilhqot'in elders identified five areas where there would be multiple Tsilhqot'in graves in the area of Nabas and Fish Lake, which yet have to be documented in the field.

The Tsilhqot'in National Government noted that of all the archaeological sites reported by Taseko from previous archaeological studies, only two burial sites were identified in the Nabas and Fish Lake (Teztan Biny) area, one of which was visited during their site visit and would be affected by the New Prosperity Project. The Tsilhqot'in National Government indicated that the results of its research suggested that many historic burials and cremation sites in Nabas and at Fish Lake (Teztan Biny) have not been documented in the previous archaeological studies, and that it was likely that many other undocumented burial and cremations sites would be disturbed by the Project.

The Tsilhqot'in National Government noted that the information received from the Tsilhqot'in elders as part of their research may not have been accessible to Taseko's previous archaeological consultants; different individuals were interviewed in 2013; and some elders interviewed in the past have indicated they had not wanted to share all the information they had with Taseko in the first study. The Tsilhqot'in National Government indicated that Terra

Archaeology had acknowledged that cremation sites, for example, may be difficult to identify through material remains. The Tsilhqot'in National Government also noted that many ancestral burial locations and cremation sites were unlikely to be located without the direction of Tsilhqot'in elders.

The Tsilhqot'in National Government expected that numerous burials and burial features would be known by Tsilhqot'in members around Little Fish Lake (Y'anah Biny) and the Nabas meadows, because of the several generations of Tsilhqot'in active occupation in this area. The Panel heard about many Tsilhqot'in members from several communities who have grand-parents, parents and children buried at Nabas. Some of them indicated that they never had the chance to go and visit these burial sites, and this opportunity would be lost if the mine was built.

The Panel heard the Tsilhqot'in noted the spiritual importance of the burial and cremation sites, as well as the pit house located at Fish Lake (Teztan Biny), and the importance of the connection to their ancestors. This is further discussed in Section 12.4.

In a letter of May 22, 2009, the Archaeology Branch of the British Columbia Ministry of Tourism, Culture and the Arts indicated that several actions needed to be taken to avoid effects on archaeologically identified places at the mine site. In particular, the Branch stated that systematic data recovery (excavation) needed to be undertaken for the sites found to be of moderate and high importance. Further study of cultural depressions was also required, and that exhumation of burial features should not occur unless they were believed to be from the historic period.

During the previous hearing, the Tsilhqot'in expressed the view that methods of protection provided by the provincial *Heritage Conservation Act*, such as excavating artifacts and storing them in a repository, did not constitute protection or mitigation from the Tsilhqot'in point of view.

During the New Prosperity Project hearing, Linda Smith reiterated that graves are sacred sites to Tsilhqot'in people: "Tsilhqot'in customs dictate that historic human remains be untouched and undisturbed. A grave is sacred in itself and no Tsilhqot'in will touch grave nor agree to remove the human remains therein to another location. The destruction and/or removal of the grave would be extremely appalling and would greatly distress Tsilhqot'in."

The Tsilhqot'in also raised concerns about the lack of protection under provincial legislation for historic sites more recent than 1846, and therefore the lack of protection of the historic burial sites, ceremonial sites and spiritual places which were also of importance to Tsilhqot'in.

The Tsilhqot'in National Government submitted that while they recognized that physical remains of such burials may be difficult or impossible to identify without traditional Aboriginal knowledge identifying the sites, and in some cases such knowledge may be all that remains, this does not reduce the "cultural heritage" value of the area to the Tsilhqot'in people. The disturbance, destruction or delocalization of ancestral Tsilhqot'in burials, as well as the loss of free access to the sites as a result of the New Prosperity Project were likely to cause adverse and irrevocable effect to the heritage of the Tsilhqot'in.

The Tsilhqot'in National Government submitted that the New Prosperity Project was likely to affect both tangible heritage through disturbance of burial sites, and intangible heritage such as spiritual and historical values associated with these burial sites. The Tsilhqot'in indicated that the destruction or desecration of the ancestral spiritual and sacred places or values could not be mitigated.

Secwepemc

The Secwepemc stated that the transmission line corridor proposed for the New Prosperity Project was the same as the one presented in the original Prosperity project, therefore their concerns regarding the archaeological sites were the same as indicated in the previous panel review. The Secwepemc submitted that the transmission line would potentially disturb their sacred sites, and therefore would result in significant adverse effects on archaeological and sacred Secwepemc sites.

The Secwepemc noted that the previous panel recognized that the area of the proposed transmission line crossing over the Fraser River was an area that rich in archaeological and burial sites. However, Chief Robbins of Esk'etemc indicated that the effects of the Project on their sacred areas, burial grounds, village sites and fishing rocks cannot be mitigated by simply moving the location of the transmission line within the proposed corridor and indicated: "The entire corridor proposed by Taseko goes right over the Fraser River by Little Dog where the history and culture of our identity as Esk'etemc peoples is stored. Our history, our identity, and our culture is rooted in the lands and waters that the Transmission Line crosses." These sacred sites have incredible importance to Esk'etemc's culture and heritage. The Esk'etemc indicated that seven sacred areas and nine protected areas would be affected by the Project.

During the original Prosperity hearing, Patrick Harry, councillor for the Stswecem'c Xgat'tem, presented a map which he reported to be from the province of British Columbia. He indicated numerous archaeological sites were registered by the province to the north of the transmission line corridor area where it would cross the Fraser River; however he suggested no sites were recorded on the map at the location of the transmission line corridor because no study had covered the area of the proposed crossing.

During the New Prosperity community hearing sessions with the Esk'etemc and Stswecem'c Xgat'tem, the Secwepemc reiterated that a substantial number of archaeological sites were present along the proposed transmission line corridor, notably at the Fraser River crossing, on both sides of the river. At the Little Dog site visit, Patrick Harry from Stswecem'c Xgat'tem mentioned that at least 125 archaeological sites of different types were known and registered on the terraces on the edge of the Fraser River, within a couple of kilometres of Little Dog, and pointed out numerous locations where there are villages, pit houses, burial sites, including large cemeteries from the small pox episodes. Chief Robbins of Esk'etemc indicated that many gravesites were unmarked and the community cannot find them themselves. He also expressed concerns about the spiritual sites that do not present physical evidences and therefore could not be uncovered during archaeological work.

The Secwepemc noted that Taseko had not conducted an archaeological impact assessment on the transmission line yet, and that no discussions had occurred regarding any relocation of the transmission line corridor since the original project review.

The Secwepemc indicated to the New Prosperity Panel that archaeological sites and cultural and sacred sites have extreme spiritual significance. They noted that remains are sacred because of what they represented, and reiterated the importance of the area remaining as it was and not being disturbed so that the ancestors could rest. With regards to potential mitigation measures for archaeological sites, the Esk'etemc indicated that the remains do not have the same cultural power when stored within a museum, and it does not represent Esk'etemc values nor respect Esk'etemc rights to their culture and cultural practices to move them.

Some fear was also expressed that increased access that would be provided by the transmission line corridor would also make their sacred sites and artifacts more vulnerable. The Esk'etemc described that the loss of such sites would be unquantifiable and beyond the reach of any mitigation measures.

12.4 CULTURAL HERITAGE

The following section presents the effects of the Project on areas of cultural heritage for the Tsilhqot'in and the Secwepemc.

12.4.1 Proponent's Assessment

Tsilhqot'in

Taseko reported that the Tsilhqot'in have a strong connection to their lands, which are a key source of subsistence activities and a vital part of their culture. The previous EIS reported that Aboriginal participants in the previous review panel hearing had a strong historical and cultural connection to the Fish Lake (Teztan Biny) and Nabas area, and part of it was due to the belief that many of their ancestors have been buried or cremated there.

Taseko noted that the Tsilhqot'in have a specific relationship to Nabas. The area is of significant historical value, as it has been continuously used for at least the last 150 years. In its previous EIS Taseko noted that according to the 1994 Ehrhart-English report commissioned by Taseko, spiritual significance is a measure of the depth of emotion people feel for an area, and people who have heavily used Nabas have a strong spiritual attachment to the cabins at Little Fish Lake (Y'anah Biny). The cabins have provided a home base for the cultural and economic lifestyles and contribute to the connection the Tsilhqot'in have with the past and the land. This area is considered home to certain families from Xeni Gwet'in, notably the William family, and from Yunesit'in communities.

Taseko indicated that the New Prosperity Project tailing storage facility and other related infrastructure would be built in the Nabas area, and would result in the loss of Little Fish Lake (Y'anah Biny), the surrounding meadows, the cabins and other structures near Little Fish Lake, and the limited uses associated with those features.

With regards to Fish Lake (Teztan Biny), Taseko reported that the Xeni Gwet'in members have a history of use in the area, which has been documented historically from archaeological sites and from the stories specific to the area. The area is currently less used for sustenance reasons, but is still important for a variety of traditional uses.

In its previous EIS, Taseko reported that the Tsilhqot'in stated that the Fish Lake (Teztan Biny) area had substantial cultural value. The Tsilhqot'in talked about the importance of cremation sites, burial sites and pit houses in the area of the proposed mine site, particularly on the island in Fish Lake. Taseko noted that Tsilhqot'in had identified the island on Fish Lake as a site of spiritual power where present-day and past generations of Tsilhqot'in conducted ceremonies to receive their spiritual powers.

During the Project hearing, Taseko noted that the Fish Lake (Teztan Biny) and Nabas area are important for the teachings and gatherings. Fish Lake in particular was identified, notably by educators in many of the communities, as an important environment where events are organized to teach youth traditional values, cultural practices and the Tsilhqot'in language. The

previous EIS indicated that the area is also used by some people for personal renewal and to gain spiritual power.

Taseko noted that the previous panel determined that the loss of the Fish Lake (Teztan Biny) and Fish Creek watershed areas for cultural and spiritual practices would be irreversible, of high magnitude, and have a long-term effect on the Tsilhqot'in, but that New Prosperity would preserve Fish Lake and the island in Fish Lake, which are of significant cultural and historical value to Aboriginal groups. The access to Fish Lake and the island would be maintained during all phases of mining for the Aboriginal groups to practice their cultural activities. However, it would be controlled at the mine site for ensuring the safety of the users. Taseko acknowledged that the Tsilhqot'in expressed fear of contamination as a result of the Project, discomfort and distrust of mining, and fear of disturbance of important sites which would affect memories and teachings.

During the Project hearing, Taseko questioned whether the Panel had the authority to determine the "spiritual significance of a place" under the CEAA 2012. Taseko stated in its Closing Remarks that the claims of spiritual specialness that the Panel heard were not supported by evidence of the Tsilhqot'in National Government and others.

Taseko submitted that there would be an adverse effect on cultural heritage values for the Tsilhqot'in people as a result of disturbances from the Project and loss of access. Although they would be permanent, irreversible, and of low magnitude, the effects of the Project on cultural heritage would be non-significant. In addition, Taseko pointed out that as indicated in the Nemiah Declaration, the Tsilhqot'in consider their entire traditional territory as culturally and spiritually important. Therefore, the Project area may not have had any more or less spiritual significance than other land.

The residual effects would include the permanent loss of cabins in the vicinity of Little Fish Lake (Y'anah Biny) but Taseko remained open to discussing with the Tsilhqot'in or the William family about their interest in moving the cabins to another site as part of plans to enhance the value of such a site for purposes of occupancy, recreation, or gatherings, or any other means by which the adverse effects could be further minimized. The effects of the proposed Project on the cultural effects with the loss of stream habitat and Little Fish Lake would be felt by the Xeni Gwet'in and Yunesit'in permanently, but would be site specific with the loss of Little Fish Lake.

According to Taseko, the transmission line would likely affect cultural heritage values both for the Tsilhqot'in and the Secwepemc. While the ethnographic information for the corridor was well documented in the mine site area, it was not as well documented for the Fraser River Crossing.

Taseko noted in its previous EIS that the *William Case* identified the grizzly bear and the moose as being two of the twenty-four species of particular importance to the Tsilhqot'in National Government. Taseko's assessment of the effect of the Project on the grizzly bear is presented at Chapter 9.

Secwepemc

Taseko indicated that the transmission line corridor had not changed since the previous project. In its previous EIS, Taseko noted that the line would run west from the BC transmission line through the Secwepemc traditional territories, and cross the Fraser River at Little Dog continuing to the mine site. The line would traverse traditional travel routes, and as it proceeds west, move gradually through more intensive traditional use zones. Taseko noted that the density of cultural sites in the grasslands was low, but some preferred campsites could have seen reuse for a variety of gathering, procurement and ceremonial purposes. These sites would

have supported trade activities and a wide variety of social activities. Higher up on the terraces above the Fraser River is where the winter villages of the Secwepemc would have been located.

In its previous EIS, Taseko noted the transmission line was likely to affect cultural heritage values both for the Tsilhqot'in and the Secwepemc, but the ethnographic information for the proposed corridor was not as well documented in the Fraser River crossing area as it was for the Fish Lake (Teztan Biny) area.

Taseko indicated that the New Prosperity hearing provided very little evidence to indicate that the area in which the transmission line would be situated is currently used for traditional purposes. Taseko noted that the Esk'etemc and Stswecem'c Xgat'tem provided a map showing areas claimed to be of cultural significance as part of their Treaty negotiations, and indicated that those areas run generally on a relatively long but narrow north – south axis near the Fraser River. Taseko submitted that the proposed transmission line would run generally east – west across that axis and, in relative terms, would affect only a tiny portion of that area.

Taseko recognized that the transmission line corridor has archaeological and cultural heritage value for the Secwepemc, and committed to working with the Esk'etemc and Stswecem'c Xgat'tem to select a final routing of the centreline in the proposed corridor that would avoid specific sites of cultural or archaeological significance. This collaborative approach was recommended by the previous panel.

With regards to traditional use and cultural values, in addition to the mitigation measures already proposed, Taseko indicated that they would be able to minimize the effects of the transmission line if Taseko could have active involvement with the community. The transmission line would have a visual impact and that mitigation would be done through design and pole placement to minimize the effect, although some of it would be unavoidable. As a result, there would be very little effect, if any, on the current use of the area for traditional purposes, and minimal impact on sites of cultural or archaeological significance.

12.4.2 Views of Participants

Tsilhqot'in

Patt Larcombe, on behalf of the Tsilhqot'in National Government, emphasized that particular places are critical to cultural identity and cultural continuity. She specified that “engaging in traditional activities in the very places that one’s parents, grandparents, and earlier ancestral generations did, ensures continuity in traditional knowledge and transmission, and promotes and maintains social, cultural and spiritual relationships with both the human and non-human dimensions.” This was underscored by many Tsilhqot'in who told the Panel that, historically, their ancestors and elders travelled to Fish Lake (Teztan Biny) by horseback to hunt, trap and fish.

The New Prosperity Panel also heard many stories from current days describing Tsilhqot'in community members travelling to Fish Lake (Teztan Biny) to go camping and fishing there with their grandparents, parents and children. They have gatherings there with elders and the youth where they do rituals, ceremonies, and sweat lodges. These are opportunities for intergenerational transfer of culture, traditional values, skills and language.

Several Tsilhqot'in members also explained that Little Fish Lake (Y'anah Biny) has been used by Tsilhqot'in members continuously by many generations. The families lived there to raise cattle. During the Hearing sessions the Panel heard stories about several families and people of

all ages continuing to go at Little Fish Lake to fish, hunt, gather plants and pass on traditional knowledge and skills to their children.

As in the previous panel review, the Tsilhqot'in people from all six communities gave oral, pictorial and written testimony to the New Prosperity Panel concerning the major importance of Fish Lake (Teztan Biny) and Nabas areas to them. Through personal stories, photographs, and videos from events that took place in the area, they demonstrated and documented that they have gone to Fish Lake, Nabas, Little Fish Lake (Y'anah Biny) and other nearby places within their traditional territory. For instance, Linda Smith from Yunesit'in (Stone) provided a submission to the New Prosperity Panel that documented over 700 combined descendants of two early Tsilhqot'in families, with names and dates, that had a direct connection with Little Fish Lake and the Nabas area. She emphasized that the "families that originally resided at Y'anah Biny (Little Fish Lake) and the Nabas area came from several different Tsilhqot'in communities, anchoring the entire Tsilhqot'in Nation to this area."

In a letter to the Panel, Cindy English-Ehrhart explained:

What is important is the pattern of being able to stay in an area that has important cultural values, with children and grandchildren, aunts and uncles, cousins or friends, learning how to use the area, knowing how to survive there, practicing this way of life, using Tsilhqot'in language and the belief systems that go along with that.

She stated that this happened notably at Little Fish Lake (Y'anah Biny) and Fish Lake (Teztan Biny) since at least 1860, and continues today. She indicated that the patterns of Tsilhqot'in using the Fish Lake area for supporting their way of life, for living their cultural ways is a very old pattern, and as such is of crucial importance to them as a people. She went on to explain the connection between place and cultural continuity as follows:

If you take that and layer a measure of spiritual connection, an extremely long time depth for certain families, and groups of people to have used an area for generations, knowledge is gained of how to use that environment in different seasons for different reasons, that cannot be altered, and it cannot be replaced or moved elsewhere.

Dr. Bhattacharyya explained to the Panel on behalf of the Tsilhqot'in National Government, that the Tsilhqot'in culture, knowledge, and language are inextricably linked and inherently related to specific places throughout the traditional territory. This point was supported by Linda Smith, who stated that the loss of culture and language is directly related to the loss of traditional modes of life. Ms. Smith submitted that without the opportunity to practice culture, the language is not meaningful, words are lost, and the culture is weakened.

The Tsilhqot'in National Government and many individuals wanted the Panel to understand that the activities of the mine would have a negative effect on Tsilhqot'in current use of the Fish Lake (Teztan Biny), and Nabas, which includes the meadows and Little Fish Lake (Y'anah Biny). It is in these places that they hunt, trap, fish, gather plants and medicines, camp, have community gatherings, give honour to the cremation and burial sites of their ancestors, hold spiritual ceremonies, and teach younger generations the skills and cultural values that are their cultural heritage. Together, these are activities that are a part of what Dr. Nancy Turner (University of Victoria School of Environmental Studies) on behalf of the Tsilhqot'in National Government, defined as a "Cultural Keystone Place".

Dr. Turner presented evidence about the importance of Nabas for the Tsilhqot'in people to the New Prosperity Panel, as well as the previous Panel. She used the phrase "Cultural Keystone

Place” to examine places of special significance and identifies ways to describe, document and assess them. She defined these places as:

a given site or location with high cultural salience for one or more groups of people which plays, or has played in the past, an exceptional role in a people’s cultural identity, as reflected in their day to day living, food production and other resource-based activities, land and resource management, language, stories, history, and social and ceremonial practices.

Dr. Turner’s conclusion was clear: “There is no question, from our definition, that Fish Lake, and adjacent areas, including Y’anah Biny (Little Fish Lake) and the Nabas meadows region, constitute a “Cultural Keystone Place”, a place of unique and special significance for the Xeni Gwet’in and other Tsilhqot’in peoples.”

Dr. Turner also submitted that the mining Project would change the character of Fish Lake (Teztan Biny) and the entire surrounding area permanently and irreversibly, and that some of the cumulative effects of the Project would include:

- the loss of access to and declines in valued and healthy traditional food;
- the loss of spiritual places and the ability to practice stewardship of the area;
- the loss of places to educate children and youth (with consequent impacts on Tsilhqot’in language retention); and
- the loss of places to gather and share stories and cultural events.

She further noted that even if people still used the area, the disturbance caused by the mine activities and their fear of contamination would negatively affect people’s experiences at gatherings, and spiritual, ceremonial and educational events. The cultural and spiritual value of this area to the Tsilhqot’in would be largely or wholly negated by them.

In summation, she stated that the Fish Lake (Teztan Biny) and Nabas area is unique and unlike any other Tsilhqot’in territory, a special area that if it was destroyed would have significant effect on the people’s ability to live the culture that they have chosen for themselves.

The Tsilhqot’in National Government reinforced this statement by noting that the previous panel indicated that the Fish Lake (Teztan Biny) area had substantial cultural value for the Tsilhqot’in. The Tsilhqot’in National Government submitted that “it is unrealistic to expect the Tsilhqot’in could continue to use Teztan Biny for spiritual and ceremonial purposes while surrounded by a massive operating mine, with all of the noise, light, and disturbance this would entail.”

It was the view of another Tsilhqot’in National Government consultant, Patt Larcombe, that even if Fish Lake (Teztan Biny) continued to exist:

there is a high probability that the combined impacts of the proposed New Prosperity Project on Tsilhqot’in use of lands and resources for traditional purposes would lead to the same socio-cultural, physical and mental health, and economic impacts identified by the Panel for the first Prosperity proposal and characterized by the Tsilhqot’in and the 2010 Prosperity panel as high-magnitude, long-term, irreversible, and immitigable.

The Tsilhqot’in spoke of Fish Lake (Teztan Biny) as a sacred site. Together with Nabas, the area carries significance far beyond its physical reality. Catherine Haller explained:

We get more help from our ancestors when we pray where they used to live, and do 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.

Ms. Haller further explained that what their ancestors taught was what makes them Tsilhqot'in.

The Panel heard that as Aboriginal communities seek to heal from events that have already affected their traditional land and their traditions, the work of deepening their connection with their cultural heritage is urgent and on-going. They have been arranging gatherings, notably at Fish Lake (Teztan Biny) and also at Nabas and other areas, with the elders and the youth where they do rituals, ceremonies and sweat lodges. At other times, skills and the spiritual foundation of cultural practices are passed along as family and community groups move across the landscape while picking berries, harvesting country food, or coming to know the cultural place of the grizzly bear through songs, legends and stories. Language learning also takes place as place names and previous events are shared in their language. These are all opportunities for teaching and learning the Tsilhqot'in way.

To the Tsilhqot'in people, life and land are directly connected. For them, Fish Lake (Teztan Biny) and Nabas are a profound source for healing and renewal. The Tsilhqot'in National Government stated that cultural heritage encompasses sites, landscape features and even cultural landscapes of historic value that hold spiritual or cultural meaning for the Tsilhqot'in people. They argued that contrary to the Taseko's statements, the spiritual or cultural meaning of such sites and places to the Tsilhqot'in is directly relevant to identifying effects on cultural heritage and assessing the significance of such effects.

The Tsilhqot'in National Government stated that the cultural heritage value of the Little Fish Lake (Y'anah Biny) and Nabas area is substantial and incontrovertible, and that the destruction or disturbance of these cultural heritage sites would represent a significant, permanent, and immitigable environmental effect of the Project on the Tsilhqot'in culture and cultural heritage.

The Tsilhqot'in National Government also submitted that the mine's activities would have a significant, high magnitude, long-term and immitigable effects on Tsilhqot'in use of the Fish Lake (Teztan Biny) community gatherings, teaching younger generations, spiritual ceremonies, including use of the island in Fish Lake for spiritual and ceremonial purposes.

The Tsilhqot'in referred to the importance of the animals in their culture. They explained that they are part of their stories, their legends and their songs. Throughout the public hearing, the Panel heard notably the Tsilhqot'in's great concerns about the effect of the Project on the grizzly bear. Mr. Wayne McCrory, also on behalf of the Tsilhqot'in National Government, indicated that the Tsilhqot'in have a strong cultural connection to the grizzly bear. He made a correlation between how the Tsilhqot'in ancestors survived in underground dwellings during winters, and how the grizzly bears survived in underground dens they dig themselves.

Dr. Sue Senger, on behalf of the Tsilhqot'in National Government, presented that S't'at'imc elders explain how watching the grizzly bears taught people the seasonal timing of harvesting, the type of plants to eat and how to prepare them. She noted that the grizzly bear diet has a tremendous overlap with the people diet: they eat the same plants, roots and berries, medicine, fish, deer and ungulate species, and water. She explained that they use grizzly bear as an umbrella species.

The Tsilhqot'in National Government submitted:

Tsilhqot'in culture and language is remarkably vibrant and intact in Xeni Gwet'in (and the Tsilhqot'in generally) despite decades of adversity and external pressures, in large part because of a remoteness and ethic of stewardship that its leaders and membership have made tremendous sacrifices to preserve. Dropping a massive open-pit mine into the backyard of the Xeni Gwet'in people, over their objections, would be a devastating blow to a culture that is struggling for survival.

The Tsilhqot'in described that the mine would leave the landscape changed and the environment would never return to its current pristine state. The disturbance of their traditional lands and of the sacred sites would destroy their culture and identity, and would be beyond comprehension for the Tsilhqot'in. It would be immitigable, irreplaceable, and would destroy them as Tsilhqot'in.

Secwepemc

The Secwepemc members of Esk'etemc and Stswecem'c Xgat'tem indicated that the proposed transmission line goes directly through their traditional hunting grounds. The Project would not only affect hunting, trapping, fishing as well as berries picking and medicines gathering activities on the land, but would also threaten the intergenerational transfer of the associated cultural knowledge that is done through harvesting activities on the land.

The Secwepemc indicated that there has been no change with regard with the transmission line with the New Prosperity Project from the previous version, and that neither Taseko nor the government had engaged in any discussion on the location of the corridor. They noted that the previous panel had recommended that Taseko collaborate with the Secwepemc in determining the final alignment of the transmission line centerline to minimize disturbance resulting from the Project to areas of importance to the Esk'etemc and Stswecem'c Xgat'tem so the potential adverse effects on cultural heritage do not become significant.

Chief Robbins of Esk'etemc emphasized that the proposed transmission line at the Fraser River crossing goes directly through one of the most important parts of the Secwepemc territory where there are sacred village sites, pit houses and graveyards of spiritual importance and which define their identity. Therefore, it would be impossible to avoid sacred areas by moving the location of the transmission center line within the proposed corridor.

The Secwepemc indicated to the Panel that the corridor proposed by Taseko crosses the Fraser River by Little Dog, which is an important area of their history, culture and identity because of the many connections they have to their ancestors. During the site visit, the Secwepemc pointed out numerous sites to the Panel where there are burials, historic villages on both side of the Fraser River at Little Dog. Many Secwepemc of both communities indicated that Little Dog is their traditional hunting grounds and one of the most important parts of their territory, but also a place where they go to teach youth about their culture, and about their way of life on the land.

In the previous review, Dr. Andie Palmer, on behalf of the Esk'etemc, also indicted that the transmission line effects on the archaeological sites would be a potential interference with spiritual practice and intergenerational transmission of culture. The Esk'etemc submitted that the Project would result in an alteration of patterns of land use.

Several Secwepemc members indicated to the Panel that the transmission line would change the landscape of the corridor indefinitely wherever forestry clearing would be required. It would also change the grasslands area at Little Dog where the line would cross over the Fraser River. The transmission line would disrupt the peace and privacy people need for ceremonies as well as for hunting, fishing and gathering. It would affect the sense of spirituality people experience

when doing these traditional activities at sites adjacent to where their ancestors lived and are buried. The loss of the capacity to use the lands for traditional purposes would affect their ability to teach future generations their traditional values, language and their way of life on the land, which defines their culture and identity.

Dr. Palmer indicated that disruptions to accustomed fishing places through overhead distractions from the proposed powerline, both visual and auditory, could distract from this sacred activity. The Secwepemc noted that the location of the transmission line within fasting areas would negatively affect their spiritual qualities and values, rendering them unusable.

The Esk'etemc and Stswecem'c Xgat'tem submitted that the effects on sacred values would be adverse effects that could not be mitigated. The effects to hunting and harvesting, and on cultural areas of importance would be significant, and would result in a loss of traditional knowledge, skills and culture. Chief Robbins indicated that if the transmission line went through these lands within the proposed corridor, it would reduce the value of the lands to them from a cultural and spiritual perspective.

During the Project hearing, the Secwepemc members expressed concern about the uncertainties of the length of time the transmission line would be in place, and noted that it could be in perpetuity should the Project require ongoing water treatment post closure. They submitted that the effects should be assessed as if the transmission line would never be decommissioned.

The Secwepemc indicated the danger for traditional knowledge related to this area being compromised or lost. Chief Robbins submitted that the effects of the Project would be permanent, and the loss to their culture would be irreversible. He stated that these impacts would not occur only once, but every time that an Esk'etemc member would want to go out for harvesting, fishing, hunting or any cultural activities. He also indicated that moving the location of the transmission line within the proposed corridor would not allow avoiding their sacred areas. Chief David Archie confirmed his support of the views presented: "we've seen the effects of large transmission lines". He further noted: "we do not support the transmission line going through our territory".

The Secwepemc noted that their lands have already been disturbed, notably by the other transmission lines (BC Hydro and its four lines) on their territory. Chief Robbins said: "With every slice into our traditional land we'll lose more of our ability to pass on our traditions and maintain our way of life."

12.5 PANEL'S CONCLUSIONS AND RECOMMENDATIONS

The Panel sets out its conclusions with respect to the Tsilhqot'in first, followed by its conclusions with respect to the Secwepemc.

Tsilhqot'in

In reaching its conclusions on the effects of the Project on the current use of lands and resources for traditional purposes, archaeological and historical heritage, and on cultural heritage for the Tsilhqot'in, the Panel considered the following factors to be relevant:

- Dr. Nancy Turner defined Fish Lake (Teztan Biny) and adjacent areas, including Nabas, as a "Cultural Keystone Place", a place of unique and special significance for the Tsilhqot'in;

- the Tsilhqot'in described Fish Lake as a very important area of traditional activities such as fishing, hunting, trapping, berries and medicine plants gathering, as well as for ceremonies and spiritual activities, intergenerational teaching of traditional values and culture;
- the Tsilhqot'in described the Fish Lake, Little Fish Lake (Y'anah Biny) and Nabas area as important for the Tsilhqot'in cultural identity and cultural heritage; these areas have substantial cultural and spiritual value for the Tsilhqot'in, due to the historic occupation, the pristine environment and to the strong connection to their ancestors they feel in the area;
- the profound importance of the Tsilhqot'in cultural and spiritual connection to the Fish Lake and Nabas areas was recognized by several experts who presented on behalf of the Tsilhqot'in National Government, and by Cindy Ehrhart-English in a study commissioned by Taseko in 1994, and as an independent participant in the Project review;
- the Tsilhqot'in described Fish Lake, Little Fish Lake and Nabas area as one of the few remaining areas of cultural and spiritual importance to their people that have not been greatly affected by development or activities such as logging;
- the Tsilhqot'in history and culture is passed on orally, along with the language and place names, which are intimately bounded to the practice of their traditional activities on the land;
- the Tsilhqot'in described the importance of animals in their lifestyle and culture; notably the moose and deer as a hunted resource, and the grizzly bear as a culturally important species;
- Taseko recognized the Fish Lake, Little Fish Lake and Nabas areas as being culturally important to the Tsilhqot'in and affirmed the New Prosperity Project was redesigned to minimize adverse effects on the Tsilhqot'in current use of land for traditional purposes, archaeological sites and cultural heritage;
- the Tsilhqot'in emphasized the spiritual importance of the burial and cremation sites at Fish Lake, Little Fish Lake and Nabas area and indicated that there were burial sites identified by the Elders that have not been documented in Taseko's archaeological impact assessment; and
- Taseko conducted a comprehensive archaeological impact assessment in the Fish Lake and Nabas area that would be affected by the New Prosperity Project. Taseko noted that although the archaeological impact assessment would only find evidence of past activity if physical evidence remained, they were confident in their results since the study was extensive and conducted in collaboration with the Tsilhqot'in.

The information provided in the community hearing sessions of the original Prosperity project gave an overview of Aboriginal current use of lands and resources, archaeological and historical resources, as well as on cultural heritage. In light of the changes Taseko made to the New Prosperity Project, the information provided by all parties during the Project review, complemented the original project information.

The Panel recognizes that various Aboriginal issues are inherently interlinked. The use of lands and resources is very closely tied to cultural uses of the land. The presence of archaeological and historical resources is what makes the places culturally special. The Canadian Environmental Assessment Agency *Reference Guide on Physical and Cultural Heritage Resources (1994)* notes that "a cultural heritage resource is a human work or a place that gives evidence of human activity or has spiritual or cultural meaning." This definition, clearly includes things spiritual, something Taseko said the Panel should not consider.

The Panel includes spiritual meaning in its understanding of cultural heritage. While information on the spiritual importance of certain areas or sites could not be quantified in the same way that some environmental effects were quantified, the Panel found this information useful to

understand the context in which it examined the value of cultural heritage resources and determined the significance of the effects on cultural heritage.

Taseko indicated it designed the New Prosperity Project in a manner that would preserve Fish Lake (Teztan Biny) and access to the area for Aboriginal traditional uses to address the significant adverse effect on current use of land and resources for traditional purposes and cultural heritage determined by the previous panel,

On the other hand, the Tsilhqot'in viewed the changes to the New Prosperity Project, compared to the previous Prosperity project, as inconsequential. The Tsilhqot'in expressed their concerns about the potential for the integrity of Fish Lake (Teztan Biny) being jeopardized, which would result in contamination of the watershed water and fish. They argued that it is an unproven approach to saving Fish Lake and, even if it worked, the entire area would have been changed drastically. The Panel notes that changes to the land as a result of the Project were seen by Taseko as relatively modest and partially reversible, while seen as catastrophic by virtually all of Aboriginal participants.

The Panel heard that the Fish Lake (Teztan Biny) and Nabas areas are some of the last of Tsilhqot'in lands that are still relatively untouched, natural and available to pursue their historic and traditional way of life. The Panel recognizes that the area is used by the Tsilhqot'in to practice their traditional fishing, hunting, trapping, as well as harvesting of berries, plants and medicines plants. The Panel heard that Fish Lake and Nabas are important for the Tsilhqot'in cultural identity and cultural heritage, because while they practice their traditional activities, they pass on traditional knowledge, culture, values to the next generations in the places where their parents, grandparents and ancestors did before them.

The profound importance of the Tsilhqot'in cultural and spiritual connection to the Fish Lake (Teztan Biny) and Nabas areas was also recognized Cindy Ehrhart-English for Taseko in 1994, and as an independent participant in the Project review, as well as Dr. Bhattacharyya and Dr. Turner. In her 2013 submission to the Panel, Ehrhart-English expressed the inextricable connection between place and cultural continuity well as follows:

If you take that and layer a measure of spiritual connection, an extremely long time depth for certain families, and groups of people to have used an area for generations, knowledge is gained of how to use that environment in different seasons for different reasons, that cannot be altered, and it cannot be replaced or moved elsewhere.

This input was based on her Traditional Knowledge studies done with the Tsilhqot'in in 1993 and 1994.

The information received during the New Prosperity Panel review on the historical and cultural importance of the area, and the spiritual connection the Tsilhqot'in have with Fish Lake (Teztan Biny) and Nabas convinced the Panel that the area is unique and of special significance to the Tsilhqot'in.

The Panel heard that the presence of the mine and related infrastructure would destroy this pristine and spiritual area which would never return to its original state. The changes to the environment caused by the Project would reduce the area where the Tsilhqot'in can practice their traditional land use and resource harvesting activities and disturb burial and cremation sites that are of great importance to them.

The Panel acknowledges that even if access to Fish Lake (Teztan Biny) was maintained, the Tsilhqot'in would most likely avoid using the area for traditional harvesting activities because of

the disturbance from the mine related to noise, light, dust, traffic, along with the fear of contamination of fish, waters, wild game, berries and medicines and the controlled access to Fish Lake.

For the same reasons, the Panel is convinced the changes to the environment caused by the Project, including the long term presence of the mine, the permanent loss of Little Fish Lake (Y'anah Biny) and parts of Nabas and the permanent change to the landscape, would interfere substantially with the spiritual and cultural connections that the Tsilhqot'in have with the area. The Panel is also of the view that the Tsilhqot'in would most likely stop using Fish Lake (Teztan Biny) for spiritual and ceremonial purposes. Consequently, the Panel concludes that the Project would affect future opportunities for Tsilhqot'in people in teaching youth and children about traditional activities on the land, as well as cultural values. The Panel is of the opinion that the loss of this cultural heritage is substantial and would impair their ability to sustain their cultural identities and ways of life.

In summary, the Panel finds that Project effects on the environment would be so substantial that they would impair the Tsilhqot'in's ability to use the area for traditional activities, cultural and spiritual practices, intergenerational transfer of culture and knowledge, and traditional values. The Panel accepts that the Tsilhqot'in would likely avoid the area for these uses if the Project proceeds. These effects on the Tsilhqot'in would be irreversible, of high magnitude, and long-term, despite all the mitigation measures and commitments made by Taseko because the heritage value to the Tsilhqot'in cannot be replaced.

The Panel concludes that the Project would result in significant adverse effects on the Tsilhqot'in:

- **current use of lands and resources for traditional purposes, and**
- **on cultural heritage.**

These effects cannot be mitigated.

The Panel is convinced that the Tsilhqot'in cultural attachment to Fish Lake (Teztan Biny) and the Nabas areas is so profound that they cannot reasonably be expected to accept the conversion of that area into the proposed New Prosperity mine or to accept other areas as an adequate replacement. The record before the Panel from the Tsilhqot'in and the experts in this subject area, including Taseko's past expert Cindy English-Ehrhart, was aligned and clear. Thus, the Panel considers that the environmental effects on the current use of lands and resources for traditional purposes by the Tsilhqot'in and on cultural heritage, including its transference to future generations, are immitigable.

The Panel heard the Tsilhqot'in concerns about many burial and cremation sites that may be present in the Project area, based on information recently provided by Xení Gwet'in Elders, and that have not been identified in the previous archaeological studies. The Panel also heard many concerns about Tsilhqot'in use of the area surrounding Little Fish Lake (Y'anah Biny) and portions of Nabas, and the importance of that area to them. This area would be buried under 100 m of tailings if the Project proceeds.

For the area around Fish Lake (Teztan Biny) and the proposed pit, the Panel notes that Taseko has carried out a high quality archaeological study in part in cooperation with the Tsilhqot'in. In the Fish Lake area, most archaeological sites that would have been lost under the original

Prosperity mine are no longer at risk of being lost with the Project. Others sites may well be avoided by Taseko when planning the work, with the cooperation of Tsilhqot'in elders.

The Panel has identified the effects of the Project on archaeological and historical resources as being of a high magnitude because of the great importance to the Tsilhqot'in people from whom we heard. The Panel concludes this effect would be regional in scale. The effect on the area around Little Fish Lake (Y'anah Biny), including portions of Nabas, would be permanent. The effect on the area around the proposed pit and around Fish Lake (Teztan Biny) would be reversible but only after several decades, and therefore Panel views this effect as long term.

The Tsilhqot'in view is that such changes are unacceptable. Primarily because of the loss of the very important area around Little Fish Lake (Y'anah Biny), including portions of Nabas, the Panel concludes that the Project would result in a significant adverse effect on Tsilhqot'in archaeological and historical resources.

The Panel concludes that the Project would result in a significant adverse effect on Tsilhqot'in archaeological and historical resources.

RECOMMENDATION 21

The Panel recommends that, if the Project proceeds, Taseko be required to collaborate with the Tsilhqot'in in identifying the potential archaeological and historical sites to minimize disturbance resulting from the Project, and to provide protection for areas of major importance to the Tsilhqot'in where possible.

Secwepemc

In reaching its conclusions on the effects of the Project on the current use of lands and resources for traditional purposes, archaeological and historical heritage, and on cultural heritage for the Secwepemc, the Panel considered the following factors to be particularly relevant:

- the New Prosperity Project presented no changes to the transmission line routing from the original Prosperity project;
- the Secwepemc indicated that the proposed transmission line corridor goes directly through their traditional territory and sacred areas of important cultural significance;
- the Secwepemc described the spiritual importance of the burial sites, villages sites, pit houses and graveyard that are within the transmission line corridor at the Fraser River crossing, and noted that no archaeological studies have been done at these locations;
- the Secwepemc described the importance of the Little Dog area for traditional activities for subsistence, as well as for ceremonies and spiritual activities, intergenerational teaching of traditional values, culture, language and history;
- the Secwepemc noted that uncertainties exist about the length of time the transmission line would be in place;
- the Secwepemc described that their traditional territory has already been disturbed by other developments, including four BC Hydro lines, leaving only a few areas where they can practice their traditional activities and culture;

- Taseko committed to working with the Secwepemc to select the centreline of the transmission line within the selected corridor, that would avoid specific sites and areas of cultural significance for the Secwepemc;
- Taseko committed to a comprehensive archaeological study of the area that could include the Fraser River Crossing at Little Dog.
- Taseko committed to applying the chance-find procedure with the Province and Aboriginal groups to avoid or minimize damage to archaeological finds; and
- Taseko committed to apply a series of mitigation measures to minimize the effect of the project on wildlife.

The Panel heard that the Secwepemc reiterated the importance of current use of lands and resources for traditional purposes within the transmission line corridor included fishing, hunting, trapping, gathering berries and traditional medicinal plants. The Panel heard that development such as logging roads, forestry, BC Hydro transmission lines, and ranching on their traditional territory have already affected traditional activities, notably gathering of berries, plants and medicines.

The Panel determines that the effect of the Project on the Secwepemc current use of lands and resources for traditional purposes would be adverse and high in magnitude, regional in scale, long-term in duration (decades) and reversible. If Taseko implements the mitigation measures it proposed to mitigate the effect of the Project on wildlife, including the measures to fully offset the effects on moose, and if Taseko works with the Secwepemc to enhance and implement the mitigation measures and wildlife compensation plan, the effects on the Secwepemc current use of land and resources for traditional purposes would be mitigated to an acceptable level.

The Panel also notes that Recommendations 15 and 16 relating to wildlife would increase moose population with the Project compare to without it, and would have a similar benefit for deer. This would assist in mitigating the effects on current use of land and resources for traditional purposes.

For the Project effects on the Secwepemc current use of lands and resources for traditional purposes:

- **two members of the Panel (Bill Ross and Ron Smyth) find the proposed transmission line would not result in significant effects; and**
- **one member of the Panel (George Kupfer) finds that the proposed transmission line would result in significant effects.**

The Panel heard that the transmission line corridor at the Fraser River crossing would go through one of the most important traditional areas of the Secwepemc territory where they hold ceremonial and spiritual activities, and intergenerational teaching of traditional values, knowledge, skills and culture. The Panel heard that it is important for the Secwepemc history, culture and identity that these activities occur in sacred areas where they have connections with their ancestors.

The Panel acknowledges that the effect on the cultural heritage for this part of the transmission line is the main concern, because it would pass through a site of high archaeological potential

where, according to traditional and community knowledge heard by the Panel, the ancestors of the present people of Esk'etemc and Stswecem'c Xgat'tem lived.

The Panel notes that the Secwepemc people disagreed with the previous review panel's recommendation that significant adverse effects could be avoided if the final alignment of the transmission line centerline was selected in a way that would avoid areas of importance to the Esk'etemc and Stswecem'c Xgat'tem. The Panel heard that if built within the proposed corridor, the transmission line could not avoid the sacred sites.

The Panel acknowledges that the proposed transmission line corridor would constitute an interference with the spiritual nature of the area, and would disrupt cultural and heritage activities on these lands. The Panel determines that the proposed transmission line corridor would result in an adverse effect on the Secwepemc archaeological and historical sites, and on their cultural heritage.

The Panel accepts the assertion from the Esk'etemc and the Stswecem'c Xgat'tem that the area is very important to them. Taseko indicated that the transmission line would be there for several decades, and would be removed when it would no longer be needed for the Project. Because the transmission line would remain in place for several decades at a minimum, the Panel determines that the effects would be of high magnitude, of long term duration, and of local extent. Since the transmission line would be removed after decades, the effects would be reversible in the long term with the proper reclamation of the transmission line corridor, especially at the Fraser River crossing.

In determining the significance of the effects, the Panel also considered the information provided by those whose physical and cultural heritage is being affected. The Panel would not be accepting of disturbance to culturally important sites if there was any reasonable way to avoid doing so. However, the Panel is of the view that if no reasonable alternative was available, some disturbance could be acceptable. On the other hand, the Secwepemc people made it clear to the Panel that such disturbance was not acceptable to them.

The result of combining the analysis of these factors leads the Panel to a very difficult decision in the determination of the significance of the effects on archaeological and historical resources and on cultural heritage.

In light of what the Panel heard during the hearing, the Panel is of the view that the proposed transmission line corridor would cause adverse effects on the Secwepemc archaeological and historical sites, and on their cultural heritage. However, the Panel is of the opinion that if the Project proceeds, Taseko should look at other alternative routes or feasible options that could avoid areas of cultural and archaeological significance to the Secwepemc. If Taseko found another feasible alternative that would meet this purpose, the Panel believes that Taseko could further mitigate the effects caused by the Project to the physical and cultural Secwepemc heritage by pursuing that alternative.

If Taseko found no other alternatives that could avoid areas of significance to the Secwepemc, the Panel conclusions are the following:

For the Project effects on the Secwepemc archaeological and historical sites, and on their cultural heritage:

- **two members of the Panel (Bill Ross and Ron Smyth) find the proposed transmission line would not result in significant adverse effects,**
- **one member of the Panel (George Kupfer) finds that the proposed transmission line would result in significant adverse effects.**

The Panel notes that the main difference in the determination of the significance of the effects on archaeological and historical sites, and on the cultural heritage, resides in the weight placed by Panel members on Canadian cultural values compared to the weight put on the cultural values of the Secwepemc.

To minimize any loss of cultural values in crossing the Fraser River, the Panel makes the following recommendations:

RECOMMENDATION 22

The Panel recommends that, if the Project proceeds, Taseko be required to re-examine the transmission line corridor alignment in collaboration with the Esk'etemc and Stswecem'c Xgat'tem to further reduce any disturbance resulting from the Project to areas of importance to the Secwepemc for cultural use and current use of lands and resources for traditional purposes, especially around the Fraser River crossing at Little Dog.

RECOMMENDATION 23

The Panel recommends that, if the Project proceeds, Taseko should collaborate with the Esk'etemc and Stswecem'c Xgat'tem to reconsider the transmission line route in the area between the BC Hydro transmission line and the Fraser River crossing at Little Dog with a focus on the community forest.

RECOMMENDATION 24

The Panel recommends that, if the Project proceeds, Taseko be required to complete an archaeological impact assessment with the involvement of the Secwepemc for whatever route is chosen.

13 ABORIGINAL RIGHTS AND TITLE

This chapter outlines submissions received by Panel on Aboriginal rights, including Aboriginal title, and then discusses the Panel's conclusions and recommendations.

13.1 PROPONENT'S ASSESSMENT

13.1.1 Taseko's Comments on Aboriginal Rights and Title Generally

Taseko submitted that an Aboriginal right is a practice, custom or tradition integral to the distinctive culture of an Aboriginal community that was exercised prior to contact with the European settlers, being 1793. Taseko elaborated that Aboriginal title is an interest in land, and for land to be subject to Aboriginal title, it must have been the subject of regular and exclusive occupation by Aboriginal people at the time of the assertion of British sovereignty, being 1846 in British Columbia. Taseko also stated that seasonal or periodic use of land for the exercise of Aboriginal rights was not sufficient to demonstrate Aboriginal title.

Taseko stated that the Supreme Court of Canada had been clear that while Aboriginal groups have constitutionally protected rights, those rights do not give them a veto over land use. Taseko submitted extracts of cases that it said supported the conclusion that Aboriginal groups do not have a veto over project development in areas for which they have asserted rights, including the Supreme Court of Canada's decision in *Haida Nation v. British Columbia (Minister of Forests)*, [2004] 3 SCR 511 (*Haida Nation*).

Taseko argued that the United Nations Declaration on the Rights of Indigenous Peoples is not the law of Canada nor is it binding in international law. Taseko referred to Canada's Statement of Support on the United Nations Declaration on the Rights of Indigenous Peoples from November 12, 2012 and highlighted the statement that "Canada can interpret the principles expressed in the Declaration in a manner that is consistent with our Constitution and legal framework". Taseko further argued that the concept of free, prior and informed consent does not apply in Canada.

13.1.2 Taseko's Comments on Rights and Title of Tsilhqot'in Nation

Taseko pointed to the fact that 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). It noted that 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. Taseko also noted that these findings of Aboriginal rights were recently upheld by the BC Court of Appeal in the *William* case (2012 BCCA 285).

Taseko argued that no court has made a legally binding ruling to establish Aboriginal title in any area of British Columbia, and as a result of the *William* case, the area of the Project is one of the few areas of British Columbia where the courts have determined that Aboriginal title does not exist. Taseko said that the Project is in a location for which the court has noted, in *William*, that the Tsilhqot'in could not meet the test for Aboriginal title and there is no reasonable basis to suggest that the finding would be changed by the Supreme Court of Canada in its review of the *William* case this autumn.

Taseko's view was that the Project's "reasonably anticipated impact on the established aboriginal rights of the Tsilhqot'in (specifically, the rights to hunt and trap, including the rights to the capture and use of wild horses and to trade in skins and pelts as a means of securing a

moderate livelihood) will be extremely modest”. In support of this view, Taseko stated that the New Prosperity Project has a reduced footprint from its previous proposal, and thus reduced impact on wildlife and wildlife habitat. Access would be provided to the Fish Lake (Teztan Biny) area and adjacent meadows during operations.

For other asserted Aboriginal rights and title, Taseko submitted the impacts would be minimal with the mitigation measures that have been proposed. Taseko claimed that the modification to the mine plan to preserve Fish Lake (Teztan Biny) represents probably the greatest accommodation measure ever undertaken by a proponent in respect of asserted Aboriginal rights.

13.1.3 Taseko’s Comments on Rights and Title of Secwepemc Nation

Taseko reported that the Stswecem’c Xgat’tem was part of the Northern Secwepemc te Qelmucw (Northern Shuswap Tribal Council), which also includes the Xat’sull/Cmetem and T’excelcemc. Taseko acknowledged that the Secwepemc Nation and member bands claim Aboriginal title to areas that would be affected by the proposed transmission line, but noted that no finding of Secwepemc title has been made by the courts.

Taseko accepted that the Project could impact the Secwepemc’s asserted Aboriginal title. The extent of such impact would depend on the degree to which the transmission line limited the Secwepemc right to otherwise determine the use of any title land during the period of time that the powerline remains in place and before decommissioning. Taseko stated that any such impact on asserted Aboriginal title would need to be assessed by the Crown, using the analysis set out in the Supreme Court of Canada’s *Haida Nation* decision.

Taseko stated that all components, features and activities associated with the transmission line are the same as those described in the previously assessed Prosperity project. Taseko has committed to the previous panel’s recommendations to minimize or eliminate the effects of the transmission line on the potential Aboriginal rights of the Secwepemc, as follows:

- finalize the alignment such that it minimizes disturbance in wetland ecosystems and other sensitive habitat: avoids important wildlife features and known archaeological or cultural sites; and, utilizes to the extent possible existing clearings and roads;
- develop an access plan in consultation with First Nations, regulatory agencies and stakeholders;
- construct during weather windows to minimize disturbance to wildlife, grazing cattle and grassland ecosystems; and
- utilize existing roads to access the transmission line corridor during construction.

Taseko referred to the previous panel’s conclusion 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”. Taseko noted that nothing in the proposed Project had changed in that regard and Taseko remained willing to implement the planned mitigation measures in cooperation with the Secwepemc.

Taseko is of the view that the effects of the Project on potential Secwepemc Aboriginal rights would be minimal.

13.2 VIEWS OF PARTICIPANTS

13.2.1 Tsilhqot'in Nation on its Rights and Title

Overview

The Panel heard that the Tsilhqot'in Nation has, in the Project area:

- proven Aboriginal rights to: (a) hunt and trap birds and animals 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; (b) capture and use wild horses for transportation and work; and (b) trade in skins and pelts as a means of securing a moderate livelihood;
- asserted Aboriginal rights to fish and gather plants and medicines (tantamount to proven);
- asserted Aboriginal rights to conduct cultural and spiritual ceremonies at and around Fish Lake (Teztan Biny); and
- asserted Aboriginal title to specific sites.

Proven Aboriginal Rights

The Tsilhqot'in National Government stated their nation's proven Aboriginal rights were not under review by the Supreme Court of Canada in the *William* case, and therefore were conclusively established. Accordingly, the Claim Area, including the lands around Fish Lake (Teztan Biny) and Little Fish Lake (Y'anah Biny), were one of the few areas in Canada subject to a declaration of proven Aboriginal hunting and trapping rights.

The Tsilhqot'in National Government stressed the court's findings in the *William* case, that a declaration of proven Aboriginal rights is not intended to be "hollow or short-lived" and the "recognition of such rights will serve to prevent incompatible uses of land". The Tsilhqot'in further submitted that the purpose of Aboriginal rights is to protect cultural continuity and security of culture. The Panel heard that when the Tsilhqot'in people are talking about Aboriginal rights, they are talking about the ability to sustain their culture through these interrelated activities.

The Tsilhqot'in stated that the Project's cultural impacts and the permanent destruction of, or displacement of Tsilhqot'in from, critical hunting and trapping grounds, represented a severe infringement of their proven Aboriginal rights. The significance of this impact would be magnified substantially because these lands represent one of the last intact areas in their traditional territory that supports unimpeded Tsilhqot'in exercise of their hunting and trapping rights (Figure 16).

The Tsilhqot'in submitted that the Project, if it were to proceed, would result in significant and immitigable adverse effects on proven Tsilhqot'in rights to hunt, trap and trade, established Tsilhqot'in rights to fish and gather plants and medicines, and asserted Tsilhqot'in title and rights to conduct cultural and spiritual ceremonies at and around Fish Lake (Teztan Biny). The Tsilhqot'in also submitted that the Project would result in significant and immitigable adverse effects on incidental Aboriginal rights to instruct youth in these cultural activities in a highly valued and actively used cultural training ground.

In response to Taseko's assertion that Aboriginal rights do not give First Nations a "veto" over development, the Tsilhqot'in argued this assertion is a political (and inaccurate) statement that has no relevance to the mandate of the Panel. The Tsilhqot'in stated that the Supreme Court of

“Established” and Asserted Rights

The Tsilhqot'in National Government also stated that although Aboriginal fishing and gathering rights were not at issue in the *William* case, the court findings meet the criteria for proving these Aboriginal rights. The court held that “Tsilhqot'in people were present in the Eastern Trapline Territory at the time of first contact” and that “[t]he area has been used by Tsilhqot'in people since that time for hunting, trapping, fishing and gathering of roots and berries”. The court also specifically affirmed that Nabas including Little Fish Lake (Y'anah Biny) were used for hunting, trapping and fishing and gathering prior to first contact with Europeans.

The Panel heard that the Aboriginal fishing and gathering rights asserted by the Tsilhqot'in have sufficiently strong support that they should be treated as tantamount to proven Aboriginal rights. The Tsilhqot'in National Government submitted that these rights should be considered “established” Aboriginal rights. The Panel also heard that lake fisheries were an essential survival strategy for the Tsilhqot'in in the face of periodic salmon shortages. Lake fishing for the Tsilhqot'in people was said to be integral to cultural security and food security. The importance of gathering to the Tsilhqot'in people was also recognized at trial.

The Tsilhqot'in also assert Aboriginal rights to conduct spiritual and cultural ceremonies at and around Fish Lake (Teztan Biny), including the island in Fish Lake where present-day and previous generations of Tsilhqot'in people have conducted rituals to receive their spiritual powers. The Tsilhqot'in submitted that displacement of the Tsilhqot'in from this sacred site, and the practical impediments to conducting cultural and spiritual ceremonies at and around Fish Lake (e.g. loss of pristine environment to mine-related noise, blasting, light, dust, activity and other sensory disturbance) would amount to a severe infringement of this asserted Aboriginal right.

The Tsilhqot'in submitted that their Aboriginal rights include the incidental Aboriginal right to pass on these spiritual and cultural practices to younger generations through on-site cultural instruction. The Panel heard that teaching these practices on-site or on the land is also important for passing on the Tsilhqot'in language. The Panel heard that there was a close connection between language and culture. The Tsilhqot'in explained that even if Fish Lake (Teztan Biny) were physically preserved, its value as a cultural school would be eliminated. The Tsilhqot'in submitted that the loss of such a valuable, accessible and actively utilized place for cultural instruction (along with the broader area that would be destroyed or subject to the controlled access no-shooting zone and other mine-related displacement) would further magnify the significance of the impacts that the Tsilhqot'in would experience to each of the Aboriginal rights.

Asserted Aboriginal Title

The Tsilhqot'in National Government responded to Taseko's suggestion that the Project area is one of the few areas of British Columbia where the courts have determined that Aboriginal title does not exist. It told the Panel that the BC Court of Appeal in the *William* case had expressly ruled that the Tsilhqot'in were at liberty to bring new actions for Aboriginal title to specific sites within the Claim Area, and had rejected both Canada and Taseko's argument that the Tsilhqot'in should be barred from ever claiming Aboriginal title in the Claim Area. The Tsilhqot'in continue to assert Aboriginal title to the Project area. Although the Tsilhqot'in are not seeking a declaration of Aboriginal title to the Project area in the upcoming appeal to the Supreme Court of Canada, they say the question of Aboriginal title to these lands and waters is not resolved.

The Tsilhqot'in also submitted that the Supreme Court of Canada's future decision in *William* could conceivably result in a new trial to resolve the Tsilhqot'in's claim to title (as ordered in

Delgamuukw, a leading case on Aboriginal title), or in negotiations with the Crown to resolve the outstanding issue of Tsilhqot'in Aboriginal rights and title (as in *Calder*, resulting in the Nisga'a Treaty). In any negotiations, the preservation of Fish Lake (Teztan Biny), Little Fish Lake (Y'anah Biny) and the Nabas area would be of prominent interest to the Tsilhqot'in.

13.2.2 Secwepemc Nation on its Rights and Title

13.2.2.1 Stswecem'c Xgat'tem

The Stswecem'c Xgat'tem stated that it was part of the larger Secwepemc Nation and part of the Northern Secwepemc te Qelmucw, which means the Shuswap people of the North. The Stswecem'c Xgat'tem stated that Stswecem'c Xgat'tem's Aboriginal rights include proven, established or recognized Aboriginal rights to hunt and fish (citing *R. v. Alphonse* (1993), 29 BCAC 161, at paras. 5, 6, and 85 and *R. v. Kapp*, 2008 SCC 411, at paras. 4 and 7), an uncontested Aboriginal right to trap and gather plants, and a strong claim to Aboriginal title.

Chief David Archie stated that the Stswecem'c Xgat'tem were in stage 4 of the BC treaty process and were currently negotiating an Agreement-in-Principle with the Governments of Canada and British Columbia. The previous panel heard that this fact by itself established a strong *prima facie* case for Aboriginal title.

For the Stswecem'c Xgat'tem, the question of whether the Project is likely to result in a significant adverse environmental effect under the CEAA 2012 differs from whether the Project has the potential to infringe Aboriginal rights and title. A conclusion by the Panel that the Project is not likely to result in a significant adverse environmental effect would not necessarily mean that the Project would not infringe Stswecem'c Xgat'tem rights.

The Stswecem'c Xgat'tem stated that the Panel can and must make findings regarding the significance of effects of the New Prosperity Project on established and asserted Aboriginal rights and title. The Panel heard that the asserted rights of the Stswecem'c Xgat'tem could be adversely affected and infringed upon as a result of the Project.

The Stswecem'c Xgat'tem expressed concern that the current Project proposal had not changed relative to the original Prosperity project, and councilor Patrick Harry said that Taseko had done nothing to act on the recommendations of the previous panel.

The previous panel concluded 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 Stswecem'c Xgat'tem disagreed that moving the centreline of the transmission line would mitigate the majority of adverse environmental effects.

13.2.2.2 Esk'etemc

Asserted Rights and Title

The Esk'etemc assert Aboriginal rights to:

- travel and to collect foods, medicines and materials as they require;
- hunt and fish and use water resources as needed;
- gather in sacred areas;

- self-determination and the right to govern themselves and to choose their own preferred way of life;
- a traditional diet and to eat preferred foods;
- health; and
- use these rights to make a livelihood.

The Panel heard that these rights relate to the Esk'etemc's relationship to the land as a steward and that the Esk'etemc had a responsibility to protect the land for current and future generations. Therefore, these rights of access, use and care were described as self-evident to the Esk'etemc. The Esk'etemc relationship to the land was also stated to have cultural, sacred, spiritual and historic dimensions.

The Esk'etemc stated that Aboriginal rights were cultural safeguards, and that they protect the culture of Aboriginal people and their ability to continue to engage in traditional lifestyles. The Esk'etemc noted that, as indicated by the court in the *William* case, Aboriginal rights allow for cultural security and continuity. The Esk'etemc submitted that activities which interfere with and negatively affect habitat, and reduce the availability of species in particular locations, or make it more difficult to exercise rights and culture are adverse effects to Aboriginal rights.

Chief Fred Robbins told the Panel that their lands are of central importance for Esk'etemc people because the lands give them their identity and hold their creation stories and the lessons of their ancestors. The Panel heard that their lands are the foundation of their society and their living culture, and without those lands, they would not be Esk'etemc. The Esk'etemc also submitted that the treaty process was progressing, but that the Esk'etemc had unresolved issues relating to land use in its traditional territory.

Project Impact

The Esk'etemc stated that the area where the transmission line would cross the Fraser River overlaps directly with the area where the Esk'etemc claim Aboriginal title (Figure 17).

The Esk'etemc noted that the previous panel said that the adverse impacts to their cultural areas, hunting rights and gathering rights could become significant and would be long term and potentially irreversible if there was no progress made on rerouting the transmission line to avoid areas of importance to the Esk'etemc. They submitted that there had been no progress made with Taseko to date on the relocation of the route.

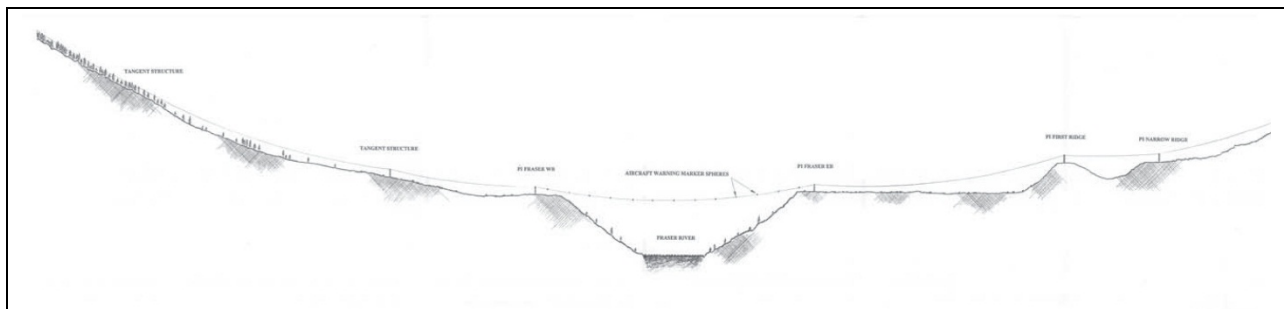


Figure 17. Conceptual Centreline Cross Section – Fraser River Crossing (Source: Modified from Taseko)

The Esk'etemc submitted that none of its concerns, which were raised in the previous assessment respecting adverse effects to Esk'etemc rights and title, were addressed by Taseko and, thus, there was no impact assessment of Project effects on the Esk'etemc's rights and title

in Taseko's application. The Esk'etemc also submitted that the proposed mitigation was not specifically linked to addressing any potential adverse effect to the Esk'etemc's rights and title.

The Esk'etemc submitted that the Project would affect local areas where they exercise their rights, and as a result, the impacts would be significant, direct and adverse. The Esk'etemc also stated that the Project may have a significant adverse impact on title because it falls within their traditional lands that are also identified in their Statement of Intent in the BC Treaty Process where they seek a declaration of title. The Esk'etemc also said that the transmission line would devalue the lands that they claim title to and destroy their ability to make different land use decisions. They characterized this effect to be an adverse impact on their asserted Aboriginal title. It was clarified that the impact to Esk'etemc title lands in the area would be significant regardless of whether Aboriginal title was recognized through the treaty process or the courts because it would reduce the value of the lands from an economic, cultural, spiritual and hunting perspective.

The Esk'etemc stated that Taseko's commitment to implement the previous panel's recommendations does not eliminate nor accommodate the loss to their Aboriginal rights and title. Esk'etemc disagreed with Taseko that impacts to hunting, harvesting of plants, fishing and the impacts to areas of cultural importance are reversible. The Esk'etemc maintained the impacts to their Aboriginal rights and culture would be irreversible, long term, and they could not be mitigated by shifting the location of the transmission line within the proposed corridor. The Esk'etemc submitted that shifting the location of the transmission line within the 500 m wide right-of-way would not avoid any of the areas that were identified as sacred and critical to the Esk'etemc title claim and their ability to exercise their rights.

The Esk'etemc submitted that the seriousness of the impacts of the transmission line on Esk'etemc rights and title has increased, given that the line could be in place for an extended duration. The transmission line would result in extended interference with Esk'etemc's ability to exercise their rights, and to make decisions respecting land use pursuant to their asserted Aboriginal title. Esk'etemc's rights and title and culture could be affected for a longer duration than was considered previously given that there is no set date for decommissioning the transmission line. This interference with the land, in turn, would interfere with the inter-generational transfer of knowledge and affect cultural identity.

Chief Robbins explained that adverse impacts to access for the purpose of exercising harvesting and cultural/spiritual rights do not happen only once; they happen each time there is interference with the ability of an Esk'etemc member to exercise their rights and they are deterred from harvesting or going on the land due to adverse impacts from the transmission line.

The Panel also heard that the Esk'etemc 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 Esk'etemc pointed out that a potential extended mine life proposal considered in the cumulative effects assessment of the previous Prosperity review was not considered for the New Prosperity Project. The Esk'etemc stated that a 13 year mine life extension or an unspecified closing date would result in an increased duration of both the mine and the transmission line, which could extend and increase the significance of the adverse impacts of the Project on Esk'etemc's rights and title.

13.2.3 Other Participants

During the public hearing, Shane Gottfriedson, Chair of the Shuswap Nation Tribal Council, made up of 17 bands, and two other elders, supported the Esk'etemc and Stswecem'c Xgat'tem First Nations in their opposition to the New Prosperity Project.

Chief Gottfriedson stated that “[t]his Project will impede on traditional and cultural use activities in the area. It will have long-lasting, negative impacts on surrounding communities. The environmental concerns aren’t limited to a specific area or region, but affect all the communities and First Nations in this province, especially when it comes to our wildlife and fish.”

At the public hearing, the Northern Shuswap Tribal Council also offered support to the Esk'etemc and Stswecem'c Xgat'tem and opposition to the Project as did two member Aboriginal groups: Chief Bev Sellars and councillors from Soda Creek and Chief Ann Louie and councillors from Williams Lake.

Grand Chief Stewart Phillip, President of the Union of the Union British Columbia Indian Chiefs also presented to the Panel and supported the opposition to the Project. He stated “[t]he first and foremost issue before this Panel is the environmental integrity of Teztan Biny or Fish Lake and the whole of the Tsilhqot'in watershed. It is not about jobs. Clearly, it is about water and fish.” He went on to say:

Like in 2010, this decision to approve this proposal would greatly increase the alarm and anxiety, tension, and suspicion and mistrust in indigenous communities. The decision to approve would confirm that once third parties economic interests are granted, unfettered access in our respective territories, governments will protect the economic interests of companies like TML at an appalling, long term cost to the land, waters and wildlife.

Dr. Marc Pinkoski stated that Taseko did not answer how the proposed mine would infringe upon proven Aboriginal rights or offer insights as to how these infringements would be mitigated.

MiningWatch Canada stated that the overall trend internationally, as in British Columbia and Canada, is clearly in favour of greater recognition of Aboriginal rights. MiningWatch Canada submitted that any project, including this Project, that opposes the trajectory of human rights and seeks to impose itself on unwilling host communities is more than just a breach of an international legal standard, it is an act of oppression and confrontation. MiningWatch Canada stated that the review of the Project's effects must therefore consider more than just its material impacts, but also the psychosocial and political implications of this oppression and confrontation.

MiningWatch Canada also stated that “given the previous rejection of this project, given the very cultural and ecological values identified through the previous review process, given the strong rights and title assertions of the Tsilhqot'in and the Secwepemc people, and given their strong opposition to this project, this project is not the straightforward, low-risk project that Taseko likes to portray it as.” MiningWatch Canada submitted that the Project was a high-risk, highly sensitive endeavour.

Amnesty International stated that while human rights are rarely absolute, a very high and strict standard of precaution is always required in any decision that has the potential to infringe, limit or undermine human rights. Amnesty International submitted that this was especially true in any context where: a particular group such as indigenous nations had already been marginalized, impoverished or disadvantaged by the historic violation of their human rights; or ongoing serious

human rights violations such as the denial of their land rights have yet to be addressed and where systemic discrimination continues to bar families and communities from enjoying a standard of living and quality of life comparable to other communities around them.

Amnesty International, like the Tsilhqot'in, underlined that free, prior and informed consent in international law was not a veto. Amnesty International submitted that free, prior and informed consent as it is understood and has been applied in international law, is consistent with the leading *Delgamuukw* and *Haida Nation* Supreme Court of Canada decisions which identify consent as being within the spectrum of substantial accommodation required by the constitutional protection of Aboriginal rights. Amnesty International also noted that the *Haida Nation* decision affirmed the words of the *Delgamuukw* decision, which recognized that the consent of Aboriginal peoples was a valid, and often necessary, form of accommodation on very serious issues.

The Fish Lake Alliance submitted that if the Project were approved against the will of the Tsilhqot'in people, multiple articles of the United Nations Declaration on the Right of Indigenous Peoples would be violated.

13.3 PANEL'S CONCLUSIONS AND RECOMMENDATIONS

The previous panel found that the original Prosperity project "would infringe on established Aboriginal rights, as per the *William* case [trial judgment] and the *Alphonse* case...". The previous panel was of the view that typical mitigation measures would be unable to provide accommodation for this infringement. Since the previous panel issued its decision, the BC Court of Appeal has affirmed the findings of the trial judge on the question of the Tsilhqot'in's Aboriginal title. That issue is not under review by the Supreme Court of Canada.

The previous Panel also found the original Prosperity project would result in significant adverse effects on the asserted Aboriginal title of the Tsilhqot'in.

The previous panel found that the original Prosperity project also would have a direct effect on the Aboriginal title claims of the Esk'etemc and the Stswecem'c Xgat'tem because the transmission line would reduce the potential availability of land for selection during the BC treaty process. The previous panel concluded that, depending on the size of the land settlement through the treaty process, the original Prosperity project may result in a significant adverse effect on any such title that could be granted to Esk'etemc and the Stswecem'c Xgat'tem.

With respect to the Secwepemc Nation and member bands' asserted Aboriginal rights and title, the previous panel found that:

- The Prosperity project would have a direct effect on the Aboriginal title claims of the Esk'etemc (Alkali Lake Band) and the Stswecem'c Xgat'tem (Canoe Creek Band) because the transmission line would reduce the availability of land for selection during the treaty process and would affect traditional uses. The previous panel concluded 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 Esk'etemc and the Stswecem'c Xgat'tem".
- "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."

- Because the Secwepemc 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 effects of the transmission line on the Secwepemc may be long-term and potentially irreversible.
- Taseko had not proposed any compensation to offset these losses and no alternate routing had been suggested for the Secwepemc.
- “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.”

In its September 21, 2012 letter, the Canadian Environmental Assessment Agency noted that Taseko, in its draft EIS, had failed to indicate all potential impacts to potential or established Aboriginal rights and title, as well as measures to mitigate these impacts and, where mitigation may not be sufficient to prevent impacts to potential or established Aboriginal rights and title, any further measures that may be considered. The Agency also suggested that Taseko clearly articulate the identified potential impacts from the previous review, and how these impacts to rights and title from the prior review had been or would be addressed.

The Agency stated that, in response to Taseko's submission that the previous panel's findings regarding Aboriginal title claims of the Secwepemc Nation or member bands were of limited applicability to the New Prosperity environmental assessment, “while the proposed transmission line has not changed in the New Prosperity proposal, that the findings with respect to the previous panel on this issue are still relevant and applicable in the context of the New Prosperity EA”. The Panel agrees that the findings of the previous panel with respect to the Aboriginal title claims of the Secwepemc are relevant and applicable in the context of the Project.

In reaching its conclusions on the Project's effects on Aboriginal rights and title, the Panel considered the following factors to be particularly relevant:

- The Panel understands that the claim area, including the lands around Fish Lake (Teztan Biny) and Little Fish Lake (Y'anah Biny), represents one of the few regions in Canada subject to a judicial declaration of proven Aboriginal hunting and trapping rights.
- The Tsilhqot'in stated that the Project's cultural impacts and the permanent destruction of, or displacement of Tsilhqot'in from, critical hunting and trapping grounds represented a severe infringement of their proven Aboriginal rights. The Panel agrees that the significance of this impact would be greater since these lands are one of the last intact areas in their traditional territory that supports unimpeded Tsilhqot'in hunting and trapping.
- The Tsilhqot'in also submitted that the Project would result in significant and immitigable adverse effects on incidental Aboriginal rights to instruct youth in these cultural activities in a highly valued and actively used cultural training ground. The Panel agrees that these effects could last for decades.
- The Panel agrees with the Tsilhqot'in, who submitted that displacement of Tsilhqot'in from this sacred site, and the practical impediments to conducting cultural and spiritual ceremonies at and around Fish Lake (Teztan Biny) (e.g. loss of pristine environment to mine-related noise, blasting, light, dust, activity and other sensory disturbance) would amount to a severe infringement of Tsilhqot'in Aboriginal rights.
- The Panel agrees with the Tsilhqot'in, who stated that even if Fish Lake (Teztan Biny) were physically preserved, its value as a cultural school would be eliminated. It was submitted that

the loss of such a valuable, accessible and actively utilized place for cultural instruction (along with the broader area that would be destroyed or subject to the controlled access “no-shooting” zone and other mine-related displacement) would further magnify the significance of the impacts that the Tsilhqot’in would experience to each of their Aboriginal rights.

- The Stswecem’c Xgat’tem stated that their Aboriginal rights included a proven or recognized Aboriginal right to hunt, an accepted Aboriginal right to fish, an uncontested Aboriginal right to trap and gather plants, and a strong claim to Aboriginal title.
- The Stswecem’c Xgat’tem expressed concern that the current Project proposal had not changed with respect to the original Prosperity project, and Taseko had done nothing to act on the recommendations of the previous panel. With regards to the transmission line, the Panel is not persuaded that Taseko has adequately addressed the previous panel’s issues.
- Stswecem’c Xgat’tem disagreed that moving the centreline of the transmission line would mitigate the majority of the impacts to their asserted Aboriginal rights and title.
- The Esk’etemc stated that the area where the transmission line crosses the Fraser River directly overlaps with the area where the Esk’etemc claim Aboriginal title. Chief Fred Robbins told the Panel that these lands are of central importance for Esk’etemc people because these lands give them their identity, held their creation stories, and the lessons of their ancestors. The Panel heard that these lands are the foundation of Esk’etemc society and their living culture, and without those lands, they would not be Esk’etemc. The Panel was persuaded to believe that these lands were integral to Esk’etemc culture.
- The Esk’etemc stated that Taseko’s commitment to the previous panel’s recommendations do not eliminate or accommodate the loss to Esk’etemc asserted Aboriginal rights and title. The Esk’etemc disagreed with Taseko that impacts to its hunting, harvesting of plants and fish and impacts to areas of cultural importance are reversible. The Esk’etemc stated the impacts would be irreversible, would be long-term impacts to rights and culture, and they could not be mitigated by shifting the location of the transmission line within the proposed corridor.
- The Panel agreed that the transmission line would devalue the lands that the Esk’etemc claim title to and reduce their ability to make different land use decisions.
- Amnesty International submitted that free, prior and informed consent as it is understood and has been applied in international law, is consistent with the leading Supreme Court of Canada decisions in *Delgamuukw* and *Haida Nation*, which identify consent as being within the spectrum of substantial accommodation required by the constitutional protection of Aboriginal rights.

Aboriginal Rights to Traditional Uses Associated with Land:

All parties accepted that:

- the Tsilhqot’in National Government has proven and asserted Aboriginal rights related to their use of the Project area; and
- The Project would occupy lands over which the Tsilhqot’in exercise their Aboriginal rights to practice those traditional uses of land.

The debate focused on the extent, if any, to which, the Project would affect these proven and asserted rights.

The Panel finds that the alteration and development of the land associated with the Project would be substantial. This substantial Project footprint would interfere with the ability of the Tsilhqot’in to exercise these rights because they would be prevented from hunting, trapping and

trading in the area for decades. Therefore the Panel concludes the Project would interfere with Tsilhqot'in Aboriginal rights.

In the Panel's view, the loss of Nabas and the changes to the environment caused by the mine components would reduce the area where the Tsilhqot'in can practice their traditional harvesting activities, disturb burial and cremation sites that are of great importance to them and endanger their ability to sustain their way of life and cultural identity. The Panel has determined that the Project would have adverse effects on the Tsilhqot'in current use of lands and resources for traditional purposes, archaeological and historical sites, and cultural heritage and that these adverse effects could not be mitigated and therefore would be significant.

The Panel concludes that the Project would interfere with Tsilhqot'in proven and asserted Aboriginal rights.

All parties accepted that:

- the Esk'etmc and the Stswecem'c Xgat'tem have asserted Aboriginal rights related to the use of land in which the Project transmission line is proposed; and
- The Project would occupy lands over which the Esk'etmc and the Stswecem'c Xgat'tem exercise their Aboriginal rights to practice those traditional uses of land.

The debate focused on the extent, if any, to which, the Project, and the transmission line in particular, would affect these asserted rights.

The Panel finds that the alteration and development of the land associated with the Project transmission line would be substantial. The Panel finds this substantial Project footprint would interfere with the ability of the Esk'etmc and the Stswecem'c Xgat'tem to use these lands in a manner consistent with the exercise of their Aboriginal rights.

The Panel concludes that the Project would interfere with Esk'etmc and Stswecem'c Xgat'tem Aboriginal rights, asserted or otherwise.

Aboriginal Title:

All parties accepted that:

- the Tsilhqot'in, the Esk'etmc and the Stswecem'c Xgat'tem assert Aboriginal title in the Project area.
- The Project would occupy lands over which the Tsilhqot'in, the Esk'etmc and the Stswecem'c Xgat'tem claim Aboriginal title.

The debate focused on the extent, if any, to which, the Project would affect the asserted Aboriginal title rights.

The Panel finds that the alteration and development of the land associated with the Project would be substantial. This substantial Project footprint would interfere with land over which the Tsilhqot'in, the Esk'etmc and the Stswecem'c Xgat'tem assert Aboriginal title because the lands would be dedicated to Taseko's use for decades. The dedication of the lands to this use

will interfere significantly with the settlement of those outstanding Aboriginal title claims by altering the land that forms part of those claims.

The Panel concludes that the Project would interfere with lands over which the Tsilhqot'in, the Esk'etemc, and the Stswecem'c Xgat'tem assert Aboriginal title.

14 SOCIO-ECONOMIC CONDITIONS

This Chapter deals with the effects on socio-economic conditions that would result from a change to the environment caused by the Project. This chapter first discusses the effects of the Project on land and resource uses (other than for Aboriginal traditional uses), considering effects on outdoor recreation and tourism, agriculture and ranching, hunting and trapping, and forestry. Next, this chapter discusses socio-economic effects associated with the harvesting of country foods, and then the effects on navigation.

14.1 LAND AND RESOURCE USES

Taseko conducted an assessment on the Project's potential effects on land use, outdoor recreation and tourism, hunting, trapping and guiding and forestry. Taseko noted that the previous review found that the Project would not result in a significant adverse effect to these components. However, the previous panel deemed that significant adverse effects existed for certain individuals, including the owners of Taseko Lake Lodge, Sonny Lulua trapline and for individuals grazing cattle at the meadows near Fish Lake (Teztan Biny). As a result, in the assessment of the New Prosperity Project, Taseko gave specific consideration to the Project's effects on these individuals.

14.1.1 Outdoor Recreation and Tourism

14.1.1.1 Proponent's Assessment

Taseko indicated that recreation and tourism infrastructure, including parks, recreation sites and trails and travel routes are unchanged in the last five years. Due to the remote conditions of Fish Lake (Teztan Biny), Taseko noted that recreation use at and around Fish Lake was negligible.

Taseko stated that the construction and operation of the mine, in addition to road improvements, would have a positive effect on accommodation, food, beverage and miscellaneous services due to business travel and the potential for increased mine related traffic both regionally and locally.

Taseko stated that some visitors to Fish Lake (Teztan Biny) might be displaced by the Project, which could have a minor adverse effect on tourism in the local study area, but that substitute experiences were available at other lakes in the region. Taseko noted that improved road conditions might actually increase the use of the new Fish Lake recreation site, noting the increased use of recreation sites around the Mt. Polley mine as an example. In general, Taseko suggested that the tourism industry would benefit from increased hospitality spending by the mine and its contractors.

Taseko acknowledged that the Project might displace some recreation activity by boaters and hikers, but based on discussions with government agencies and some user groups, use levels were very low and there was ample capacity at other recreation sites and parks in the area.

Taseko submitted that the effects would not be significant, because the Project was not expected to alter the quality of recreation or tourism in the area.

With regards to the Project's effects on commercial recreation tenures, Taseko acknowledged that one licensee; Taseko Lake Lodge could be affected. Taseko Lake Lodge's ecotourism business consisted of a guide outfitting component and an ecotourism component, the latter of which the previous panel concluded "would likely not be able to continue". Taseko questioned

how the previous panel reached the conclusion that Taseko Lake Lodge might be adversely affected by the mine, arguing that the findings were not supported by evidence. Taseko submitted the mine would be more likely to have a positive impact on the lodge, submitting that the potential new business opportunities presented by a mine would not have the effect concluded by the previous panel.

Taseko noted that only 0.58% of the Taseko Lake Lodge's commercial recreation licence area was within the Project's maximum disturbance area (748 hectares of a total licence area of 128,078 hectares). Taseko acknowledged that the main lodge was within 5 kilometers of the mine site and that the owners maintained that they frequent the Project area with clients for day trips on horseback or cross country skiing. Taseko noted that the mine site was located in the very fringe of the area covered by the lodge's permits and licenses, and the lodge had indicated it only visited Little Fish Lake (Y'anah Biny) and Fish Lake (Teztan Biny) 5 or 6 times in 2012.

Taseko also maintained that the lodge owners knew, or certainly ought to have known when they purchased the lodge in 2002, that a mine would be opened in the area at some point. At that time, the lodge owners were aware of mining claims in the area. Taseko further stated that Taseko Lake Lodge had no secure tenure and operates on temporary licenses or permits, each of which is subject to other competing rights that might be granted by the government, including the mining lease held by Taseko.

Taseko noted that it was unknown what proportion of Taseko Lake Lodges' business was attributable to ecotourism, rather than guide outfitting or other sources of revenue. Thus, it was impossible to determine the Project's effect on the lodge's ecotourism business. Taseko indicated that its discussions with Taseko Lake Lodge owners focused on determining potential losses and remedies in both the short and long term.

Taseko indicated that the lodge owner, Mr. Reuter, had communicated frequently with Taseko, expressing concerns about the Project's impact on his guided horse rides in his commercial recreation tenure area being compromised by any development. Mr. Reuter also raised concerns that the development of logging/roads would negatively affect his ability to manage his horses on his Crown grazing license tenure area.

Taseko indicated that it was working to ensure Mr. Reuter's concerns were considered. However, Taseko characterized a recent proposal from Mr. Reuter for compensation as "quite a high price". Taseko indicated that the mitigation measures would take into account the province's Commercial Recreation Policy and that it intend to discuss fair and reasonable mitigation and/or compensation for verifiable losses should the mine proceed. Taseko said it remains open to discussing and supporting business plans, including Taseko Lake Lodge, that may be harmed by or benefit from the Project.

With regards to the water levels and quality in Beece Creek (Bisqox), Taseko accepted the previous panel recommendation to monitor these components and implement appropriate action in order to minimize flooding at Taseko Lake Lodge.

Taseko also submitted that while some might consider the mine to be undesirable, others might be interested in seeing and learning about mining. As a result, on a net basis, Taseko stated that there might well be a positive impact on Taseko Lake Lodge's business while the mine was operating. Therefore, no significant residual effect on the Taseko Lake Lodge's ecotourism business was expected.

With regards to tourism generally, Taseko maintained that the Project would result in road improvements and positive effects on accommodation, food, beverage and miscellaneous services due to increased mine related traffic.

14.1.1.2 Views of Participants

During the public hearing sessions, several individuals raised concerns about the loss of the Fish Lake (Teztan Biny) recreation site. Many individuals described their recreational experiences on Fish Lake and their connection to the natural beauty of the area.

Throughout the review process and the public hearing sessions, Taseko Lake Lodge owners, the Reuter family, expressed several concerns about the Project's effects on their business, livelihood, living environment and health. If the Project proceeds, Taseko Lake Lodge said that the entire area would be unusable for wilderness tourism and that they would have to leave the area because the two operations could not co-exist.

The Lodge owners reported that their operating area consists of 1300 km² of land with the lodge located on the north end of that area. The lodge owners indicated that they have developed a trail system and network of camps in their licenced area which could no longer be used if the mine proceeded. Taseko Lake Lodge stated that the surrounding meadows, which would be lost, are frequented by their customers and used for grazing their horses.

Taseko Lake Lodge owners reported a recent decline in visitors coming into the area and guests staying at their lodge, which they said was due to the potential of the mine. Mr. Reuter stated that people were staying away and avoiding this area of contention. The Reuter family further indicated that potential visitors and investors would no longer have interest in the lodge because it would be positioned next to the mine.

The Taseko Lake Lodge owners maintained that the mine would compromise their tourism business, which includes canoeing, hiking, and natural wilderness sightseeing. The mine and increase in human traffic would disrupt wildlife such as the grizzly and wild horses and have effects on fish. Mr. Reuter indicated that the Project would have an effect on the species that they hunt including moose, mountain goats, mule deer and black bear. During the hearing, Mr. Reuter stated that the lodge "sell[s] wilderness" and that the mine would essentially eliminate their ability to do so.

Mr. Reuter expressed serious concern about the Project's effects on Beece Creek (Bisqox), which is the lodge's source of water. Mr. Reuter raised concerns regarding overflow of the tailings impoundment flowing into and affecting the meadows, Wasp Lake and most importantly, Beece Creek.

The Taseko Lake Lodge owners stated that they have never been invited by Taseko to discuss the company's plans or to consider the mine's impacts or mitigation proposals. The Reuter family maintained that they had to initiate all communications with Taseko and they were negatively received. They expressed their frustration regarding the lack of consultation on mitigation and/or compensation regarding the Project's impacts on their operation. During the hearing, Mr. Reuter indicated that Katherine Gizikoff "was pretty much the only person who has ever been out there representing Taseko Mines".

The Reuter family indicated that they would be forced to leave the area if the Project proceeded because they could not live or operate a business next to a mining operation that would pollute the air and water around their home.

During the community hearing sessions, the Tsilhqot'in indicated that they were considering Aboriginal tourism opportunities on their territories. The Xeni Gwet'in community shared their branding campaign "Xeni, Nature as Created" and future plans to expand their tourism infrastructure. Ms. Loretta Williams mentioned that the Xeni Gwet'in had plans in the Project area to expose tourists to their spiritual connection to the Fish Lake (Teztan Biny) area. A presentation was given by John Lerner on the Xeni Gwet'in vision for how they wanted their land used, which was based on historical use and on ecologically sustainable practices. Consistent with their role as caretakers for the area, the Xeni Gwet'in were pursuing opportunities such as tourism which allowed them to maintain self-reliance and ecological integrity. Mr. Lerner noted that the proposed Project did not honor their vision and would restrict their abilities to further develop their tourism industry. Mr. Lerner stated that the Project would harm the existing wilderness tourism sector, draw labour from local projects, reduce ecological diversity and weaken local food security.

Nancy Oppermann, project manager for the Xeni Gwet'in cultural tourism partnership program, and Councillor Marilyn Baptiste submitted that the New Prosperity Project would be contrary to their community's tourism goals. They suggested that wilderness tours depended on entire watersheds, and the mine would destroy the tourism and sustainable economic opportunities.

The Friends of the Nemaiah Valley submitted that the Project would compromise the efforts of the Xeni Gwet'in to develop high-quality wilderness tourism in the area. Although the Project would improve road access and tourism interest in the area, the Friends of the Nemaiah Valley were concerned that the intensity and type of recreation would degrade the pristine wilderness experience that the Xeni Gwet'in would depend upon.

Alice William stated that she had plans for an eco-tourism business, Spirit Horse Trails, which would specialize in Tsilhqot'in traditions, culture, horse rides, hiking, and other low environmental impact activities.

During the community hearing sessions, Chief Russell Myers Ross indicated that Yunesit'in First Nation had moved towards a cultural tourism enterprise, and intended to sign a Memorandum of Understanding with Taseko Lake Lodge to advance their partnership. Chief Myers Ross said this example illustrated a shared vision for the area and their productive relationship with Mr. Reuter, of Taseko Lake Lodge.

The Panel also heard that the Yunesit'in and Xeni Gwet'in have been discussing future plans for the Nabas area and it was mentioned that Little Fish Lake (Y'anah Biny) and the Fish Lake (Teztan Biny) area could be developed into a Tsilhqot'in cultural interpretation site for local schools and universities where courses would be offered for Tsilhqot'in culture. During the hearing, Mr. Reuter also mentioned that the Xeni Gwet'in planned to build a village at Fish Lake (Teztan Biny) for tourists. Mr. Reuter expressed his confidence that the Xeni Gwet'in would consult with him regarding this endeavour.

14.1.2 Agriculture and Ranching

14.1.2.1 Proponent's Assessment

Taseko indicated that the proposed mine site did not contain any agricultural land reserve designations and its agriculture capability was primarily in forage crops, of which only 11 ha were considered suitable for forage crops improvement practices.

Taseko reported that there were two grazing licences in the maximum disturbance area. One of the grazing licences had a total tenure of 20 832 ha, of which just over 1 ha would be affected by the Project. The second grazing licence totaled 1 853 ha and was located between Fish Lake (Teztan Biny) and Wolftrack Lake, of which 12.3% would overlap with the Project. Taseko noted that the Xeni Gwet'in rancher who had 30 cattle/calf pairs in the Fish Lake and Onion Lake (Jidizay Biny) area on this second tenure did not have a registered range agreement with the Ministry of Forests, Lands and Natural Resource Operations.

Taseko indicated that the licensee and the Xeni Gwet'in rancher who were grazing their animals in the meadows at Fish Lake (Teztan Biny) would have to alter their grazing patterns. Taseko stated its commitment to work with the licensee, the Xeni Gwet'in and the Province to access replacement forage elsewhere in the area, or discuss mitigation/compensation for lost productivity if the Ministry of Forests, Lands and Natural Resource Operations was unable to offer replacement opportunities. Taseko indicated that compensation would not be required for this licensee as the tenure was for grazing horses and not cattle and that the horses could be repositioned.

If the Project is approved, Taseko committed to work with the Province and those who use the meadows in the Fish Creek (Teztan Yeqox) watershed to discuss further mitigation, potential replacement opportunities in adjacent areas, and compensation for any lost forage productivity that cannot be mitigated.

Taseko noted that New Prosperity Project would preserve more of the tenure area for the grazing of horses or cattle than the original Prosperity project. However, that grazing would require fencing to enable efficient use of the remaining tenure area. Taseko concluded that the Project would have an adverse effect on one range licensee and one rancher. However, that effect would be minimal in relation to overall range and forage availability. It also would be reversible after closure and not expected to give rise to a significant adverse effect.

14.1.2.2 Views of Participants

The Taseko Lake Lodge owners expressed several concerns regarding the loss of their grazing areas. Mr. Reuter noted that all camps along their pack trails had licensed grazing through a forestry grazing tenure. The Reuter family indicated that they owned and grazed horses on the grazing tenures that enabled hunting and tourism which was the foundation of their business. The Reuter family stated that the loss of the grazing lands would have a significant effect on their livelihood, stating that grazing was very valuable.

In a letter, Cindy Ehrhart-English stated that Taseko had minimized the importance of the hay meadows to the Tsilhqot'in people. In her opinion the value of wild hay meadows for grazing and for producing hay could not be underestimated. She indicated that the Tsilhqot'in had developed ways of maintaining their horses and cattle in the small meadows and various haying areas in the region. Ms. Ehrhart-English argued that as generations of Tsilhqot'in had traditionally hayed and grazed their animals in the area, it was understandable that they do not have any formal haying or grazing permits in the area. She stated that these haying methods do

not cost money and that the cattle grow well, thus, the feed the cattle get from foraging for hay must be nutritious for wild and domesticated animals.

During the community hearing sessions, several Aboriginal presenters also expressed the importance of the meadows in the Fish Lake (Teztan Biny) area for horses, cattle and wildlife for grazing.

14.1.3 Hunting and Trapping

14.1.3.1 Proponent's Assessment

Taseko noted that overall land disturbance for the New Prosperity Project was less than the original Prosperity project, resulting in less impact on local wildlife populations that are historically targeted for trapping in the Fish Lake (Teztan Biny) watershed. Taseko stated that the maximum disturbance area would occupy two traplines, overlapping with 1 722 ha of the Xeni Gwet'in/Sonny Lula trapline and 879 ha of the Gutfrucht's trapline. Taseko stated that there would be local effects on the trapline held by Xeni Gwet'in/Sonny Lulua during construction until closure when reclamation of fur-bearer habitat is restored. Taseko further noted that the average harvest from this trapline was well below \$500 and that only 4% of the total trapline overlapped with the Project.

Taseko also noted that the mine site is within the Eastern Trapline Territory area described in the *William* case. In this case, the BC Court of Appeal recognized the Tsilhqot'in people had Aboriginal rights to hunt and trap birds and animals in this territory.

Taseko maintained that access to the Fish Lake (Teztan Biny) area would be provided during construction and operation, thus enabling the opportunity to continue trapping in the immediate area of Fish Lake and the adjacent meadows.

Taseko stated they were open to discussing mitigation measures with the Tsilhqot'in as part of the New Prosperity habitat compensation plan to enhance wildlife and waterfowl habitat, and to improve abundance and diversity of wildlife species of interest to Aboriginal people.

With regards to the trapline held by Xeni Gwet'in/Sonny Lulua, Taseko anticipated a remedy being negotiated by the licensees themselves in cooperation with the appropriate government ministries. Taseko concluded that the effect would be adverse in direction, but that compensation would result in the effects being neutral.

Taseko noted that mine construction and operation would affect hunting and guiding; namely, the maximum disturbance area would overlap with four registered guide-outfitters territories with a total of 2,601 ha affected by the mine footprint. Taseko stated that three of the guide outfitters would lose access to part of their registered territories, but in all cases the losses would be minimal in proportion to each licence area and that wildlife studies showed that the effect on the key target species, moose and mule deer, would be minimal.

If the Project proceeds, a no-hunting ban would be instituted around the maximum disturbance area resulting in the loss of this area for resident hunters. Taseko indicated that a hunting ban for mine employees would be also imposed during the construction and operations phases of the mine. Taseko stated that resident hunters and guided non-resident hunters would have to make spatial changes to their hunting behaviour. Taseko further predicted that the Project would likely not result in a reduction in tags or quotas in the area issued by the Ministry of Forests, Lands and Natural Resource Operations.

Taseko argued that the limited area of land lost in the no-hunting zone and the implementation of mitigation measures meant that the Project would not result in significant negative effects on hunting to registered guide-outfitters and resident hunters. Effects on the registered guide-outfitters and the resident hunters would be adverse in direction but with compensation, the effects would be neutral. Taseko also concluded that there would be local effects on trapping in the mine development area during construction until mine closure when reclamation of fur-bearer habitat is restored. Taseko noted that negotiations with the Xeni Gwet'in may result in a suitable solution to the local effects on the traplines.

14.1.3.2 Views of Participants

During the community hearing sessions, several Aboriginal participants expressed concerns regarding the likely increase in non-Aboriginal hunters in the area due to improved access from the transmission and road improvements.

In a written submission, Cindy Ehrhart-English expressed concerns regarding the cumulative effects of the Project on traplines. Ms. Ehrhart stated that the transmission line corridor could have impacts on Aboriginal communities including the Tl'esqox, Stswecem'c Xgat'tem, Esk'etemc, Yunesit'in, and Xeni Gwet'in given that they all had traplines through which the transmission line corridor would cross.

On the subject of the value of traplines, Ms. Ehrhart-English explained that:

"it's not so much how much money one derives from trapping, or ranging cattle, or haying, it's the fact that you can do this and still be on the land hunting and fishing and using traditional knowledge that has been transferred to you from your Elders and that you will hopefully transfer to others in the future. It provides a way of earning income while still connecting with and being on the land."

Additionally, two non-aboriginal trappers, Frederick Deet and Wolfgang Shoenberger shared their concerns at community hearing sessions regarding the impact of the Project on traplines.

14.1.4 Forestry

14.1.4.1 Proponent's Assessment

Taseko reported that the timber lands in the area were managed as part of the Williams Lake timber supply area and that there were no community forest tenures in the mine site area. The proposed transmission line passes through the 30 000 hectare Esk'etemc Community Forest, a forestry operation run by the Esk'etemc First Nation. Taseko noted that the previous panel did not find any significant effects on forestry in its review of the previous project; however, that panel did recommend that Taseko consider relocating the transmission line to avoid effects on the Esk'etemc Community Forest.

Taseko noted that despite 83% of the mine site area being considered capable of producing merchantable timber within a defined time period, the forest land in the mine site area had relatively poor growth potential. Taseko indicated that the lodgepole pine was the predominant species in the mine site and was highly susceptible to attack by the mountain pine beetle.

Taseko stated that Tolko Industries operated in the general area and was holding a cutting authority that extended over the eastern boundary of the mine site covering a small portion of the maximum disturbance area; however no harvesting had occurred in recent years because of weak market conditions.

With respect to the Esk'etemc Community Forest, Taseko indicated that it would continue to consider final alignment options of the transmission line to avoid or minimize interference with the harvestable timber and sensitive biophysical and cultural features Esk'etemc holds for the community forest. If interference could not be avoided, provincial policies would contain provisions to compensate the licensee, Alkali Resources Ltd, the operator of the Esk'etemc Community Forest. Taseko noted that it met with the Alkali Resources Ltd. to propose a preferred alignment to minimize impacts on the community forest by routing the alignment through existing disturbance and cleared areas. Taseko indicated that options for routing the line to the south of the community forest licence were also discussed; however, this option might facilitate all-terrain-vehicle and truck access off the grasslands on the southern border into the community forest, creating problems associated with invasive weeds.

Taseko stated that it would continue to extend invitations to Alkali Resources Ltd. to finalize the route of the alignment, and to present the options formally to Esk'etemc Chief and Council. Taseko further noted that the Esk'etemc could go to the Province to get their boundaries expanded for the community forest to compensate for any potential losses from the Project.

Taseko stated that standard logging practices would be followed for all logging activities associated with the Project which would also result in the immediate effect of increasing harvest volume and economic activity when the footprint is cleared. The reclamation would return a large proportion of the footprint to a productive forest status. Taseko indicated that it would commit to accommodating the interests of the Esk'etemc Community Forest.

Taseko concluded that the Project's effect on forestry was relatively short in duration and low in magnitude in the regional context; thus, the residual effects of the Project on forestry were determined to be not significant.

14.1.4.2 Views of Participants

During the public hearing, the Esk'etemc raised several concerns regarding the proposed transmission line corridor crossing through their 30 000 hectare community forest. Chief Frederick Robbins indicated that the Esk'etemc selectively logged the community forest to preserve the unique habitat for the mule deer and moose habitat.

Gord Chipman of Alkali Resource Management, who manages the Esk'etemc Community Forest, stated that it was a jewel which was carefully harvested to leave enough trees standing to provide forest cover for wildlife. Mr. Chipman illustrated that the Caribou Chilcotin Land Use Plan required these areas to remain forested. During his presentation, Mr. Chipman suggested an alternative route for the transmission line along an area called Place Lake Road, which would still be within the community forest, but would minimize the amount of community forest affected. He indicated that it would traverse through less controversial ground, cross the Fraser River in a section not considered as sacred land and be in an area with fewer fishing sites. Mr. Chipman stated that he was willing to work with Taseko to discuss alternative routes.

The Esk'etemc indicated that mitigation measures could not compensate for the impacts to their rights in the area and that they had not been consulted on any alternatives either for the proposed Prosperity or the New Prosperity project.

The Tsilhqot'in National Government stated that activities such as forestry were putting increased pressure on the resources available to support their current use of the land.

14.1.5 Panel's Conclusions and Recommendations

In reaching its conclusions on the effects of the Project on land and resource use, the Panel considered the following factors to be particularly relevant:

Outdoor Recreation and Tourism

- the Project would displace some recreation activity by campers, boaters and hikers in the Fish lake (Teztan Biny) area;
- the remoteness of Fish Lake area minimizes the use of the site at Fish Lake;
- the mine would have an adverse effect on the business of Taseko Lake Lodge and on its owners; and
- Aboriginal tourism opportunities in the Project area are in the early stages planning stage.

The Panel accepts that some individuals use and value the Fish Lake (Teztan Biny) recreation site for recreation; however, the numbers are relatively small. Therefore, the loss of the Fish Lake recreation site would have a negative but not significant effect on tourism in the immediate region. The Panel accepts that the existing camp site is used, but expects that the new recreation camp site, constructed on the east side of Fish Lake, would offset this loss.

The Panel concludes that the Project would result in an adverse, but not significant, effect on the recreational users of Fish Lake (Teztan Biny) during the time the mine is operating.

The Panel believes that tourism opportunities in this area could provide Aboriginal people with socio-economic benefits for generations in a manner that allowed for the maintenance of their traditional lifestyle. However, some of the Aboriginal tourism planned in the Project area would be unable to exist in the presence of an open pit mining operation. The Panel is of the view that the Xeni Gwet'in tourism initiatives planned in the Project area would likely not proceed if the Project proceeds.

The Panel agrees with Taseko that road improvements could have a positive effect on tourism. The Panel also finds that there are additional tourism opportunities in the region that would not be adversely affected by the Project.

After considering the different views, the Panel believes that the Project effects on Aboriginal tourism would be of medium magnitude, long-term, but local.

The Panel concludes that the Project would result in an adverse, but not significant, effect on Aboriginal tourism opportunities.

Taseko Lake Lodge has a License of Occupation for Guide Outfitting and operates a wilderness adventure business (horse riding, camping, big game hunting) over a large territory. The operating area is centred on the lodge located near the outlet of lower Taseko Lake (Dasiqox Biny) and extends from Fish Lake (Teztan Biny) to the Chilcotin Mountains. Mr. Reuter, owner of the lodge, stated that he runs day trips to Fish Lake and Little Fish Lake (Y'anah Biny) area. Longer, multi-day, overnight trips are operated in the mountains well to the south of the project

area. The Panel finds that much of the wilderness operating area of Taseko Lake Lodge is distant from the Project and will not likely be affected by it.

The Panel notes Taseko Lake Lodge concerns about how the Project would compromise its ability to operate a “wilderness” business and agrees that the New Prosperity Mine would adversely affect the operation of a nearby lodge selling wilderness.

The Panel finds that while the New Prosperity Project would adversely affect the ability of the Lodge to sell wilderness, the effect would not be significant because most of the lands used by Taseko Lake Lodge are not near the mine area. Taseko Lake Lodge operation makes only limited use by of lands near the proposed mine site. Therefore, the overall impact of the Project on the Taseko Lake Lodge would not be significant.

The Panel concludes that the Project would have an adverse, but not significant, effect on Taseko Lake Lodge.

The Panel believes that this effect is not one that can be considered under CEAA 2012.

Agriculture and Ranching

- 11 ha of the mine site are considered suitable for forage crops improvement practices;
- local ranchers use the meadows in the Project area as forage areas for their livestock and horses; and
- the meadows in the Project area have historically provided productive foraging for Aboriginal's livestock and horses;

The total size of forage areas lost is minor and the area does not contain any Agricultural Land Reserve designations. However, the area that is lost within the maximum disturbance area is used by owners of livestock and horses in the area, under either formal grazing leases such as Taseko Lake Lodge or traditional use areas utilized by Xeni Gwet'in community members.

The Panel heard that Taseko Lake Lodge relies on the meadows to graze horses for significant portions of the year, which is necessary to maintain their guiding activities and business. Taseko has indicated a willingness to work with the licensees, the Xeni Gwet'in and the Province to find replacement forage elsewhere in the area, or discuss mitigation/compensation for lost productivity. The Panel is of the view that the effect on these local users would be modest and that the willingness of Taseko to assist with finding replacement forage or to provide appropriate compensation is a satisfactory response.

The Panel concludes that the Project would not result in a significant adverse effect on the users of the meadows in the Fish Lake (Teztan Biny) area due to the loss of the grazing lands.

Hunting and Trapping

- the mine site and the no hunting buffer zone would reduce the area available for hunting;
- the number of hunters is likely to increase due to increased access provided by the transmission line right-of-way and road improvements;
- four guided outfitters in the areas would lose access to part of their registered territories; and
- two commercial traplines will intersect with the maximum disturbance area.

The Panel notes that the hunting ban in the maximum disturbance area would remove a small area for registered guided outfitters and resident hunters which may result in spatial changes to their hunting behaviour. The Panel observes that there will be no additional hunting pressure added by the mine employees because they will be subjected to a hunting ban. The Panel agrees that the construction of the right-of-ways and road improvements could increase the number of hunters in the area due to improved access. The question of access control is dealt with in Chapter 9. The Panel also notes that three of the guide outfitters would lose access to part of their registered territories, but that in all cases the losses are a small proportion of the licence area. In conclusion, the Panel finds that the Project would have a modest long-term adverse effect on both resident and guided outfitter hunting.

The Panel concludes that the Project would not result in a significant adverse effect on guides and outfitters for hunting.

Some trappers (those using the Xeni Gwet'in/Sonny Lulua trapline) are Tsilhqot'in. Their use of the lands for traditional purposes (including trapping) has been dealt with in Chapter 12 where the Panel determined a significant adverse effect. The Aboriginal rights of the Tsilhqot'in have also been dealt with in Chapter 13 where the Panel determined the Project would adversely affect Tsilhqot'in Aboriginal proven rights (including trapping). In this chapter, the Panel deals with trapping as a socio-economic endeavour.

The Panel notes that the Project footprint overlaps with existing traplines in the area, negatively affecting one specific trapper's ability to continue trapping. In terms of the commercial value of the trapline, the Panel notes that the average harvest is low. The Panel does believe that the effect on the trappers' lifestyle and ability to take fur for traditional purposes would be adversely affected by the Project. The licensees will bear the greatest impact. If a remedy is negotiated by the licensees in cooperation with the appropriate government ministries, the adverse effect would be further mitigated, but that outcome is speculative.

The Panel concludes that the Project would result in an adverse, but not significant, effect on trapper licensees in the region.

RECOMMENDATION 25

The Panel recommends that, if the Project proceeds, Taseko be required to provide some form of compensation to assist in offsetting the losses for trapper licensees, should a remedy not be negotiated between the licensees and the appropriate government authorities.

Forestry

- there are no community forest tenures in the mine site area;
- the lodgepole pine was the predominant species in the mine site which is highly susceptible to attack by the mountain pine beetle; and
- the transmission line will cross through the Esk'etemc Community Forest which is selectively logged to preserve the unique habitat for the mule deer and moose habitat.

The Panel notes that the Project would result in the loss of small area that could be available for forestry in the future. However, forest land in the mine site area has relatively poor growth potential and is predominantly lodgepole pine which is highly susceptible to attack by the mountain pine beetle.

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

The Panel accepts the Esk'etemc submission that the transmission line traversing through the Esk'etemc Community Forest is an area that is important for sustainable forest harvesting and wildlife habitat. The Panel also accepts that the transmission line corridor would become one of the largest clear cuts within the community forest, which would conflict with the Esk'etemc selective logging to preserve the unique mule deer and moose habitat which is used for traditional purposes by the Esk'etemc. The Panel finds the effect is localized but is of high magnitude.

The Panel believes this effect would be mitigated by Taseko's commitment to reconsider the final alignment options of the transmission line to avoid or minimize interference with the harvestable timber and sensitive biophysical and cultural features for the Esk'etemc. The Panel agrees with Taseko that reclamation would return a large proportion of the footprint to a productive forest status.

The Panel concludes that the Project would result in an adverse, but not significant, effect on the Esk'etemc Community Forest.

RECOMMENDATION 26

The Panel recommends that, if the Project proceeds, Taseko be required to re-examine the transmission line corridor alignment in collaboration with the Esk'etemc to further reduce the effects on the Esk'etemc Community Forest.

14.2 HARVESTING OF COUNTRY FOOD

The harvesting of country food (hunting, fishing, plant and berry and medicine gathering) was addressed in Chapter 12 and the associated health effects were presented in Chapter 11. This

section deals with the effects on the Aboriginal socio-economic conditions due to a potential reduction in the harvesting of country food.

14.2.1 Proponent's Assessment

In its EIS, Taseko noted that a road to the Nemiah Valley was built in 1973. Prior to this road being constructed, it was reported that community members ran cattle and trapped through the winter, and harvested vegetation, hunted, and fished in the summer months. Once per year, community members would make a week-long trip by horse and wagon to Williams Lake to buy goods.

Taseko submitted that after the completion of the road, weekly trips to Williams Lake via vehicle became common. Subsistence livelihoods were no longer a matter of survival because of access to the stores in Williams Lake.

In its EIS, Taseko provided a summary of the social and economic implications of the Project for Aboriginal people, including the economic impact of purchasing store-bought food and the increased costs associated with travelling to other locations for harvesting and hunting.

Taseko stated that it remained open to discussing mitigation measures with the Tsilhqot'in, such as building new, or improving existing access to, harvesting and hunting areas within the territory to compensate for the loss of opportunity in the Nabas area.

14.2.2 Views of Participants

During the public hearing, the Panel heard many Tsilhqot'in and Secwepemc participants emphasize that their community members continued to rely on country foods for subsistence. The Panel heard that country foods were important for nutritional, cultural, physical, and social values. Presenters expressed concern about the Project's impact on hunting, fishing and gathering practices.

Dr. Doyle, on behalf of the Tsilhqot'in National Government, stated that the Xeni Gwet'in were highly dependent upon traditional foods. Several Aboriginal community members spoke about how the Tsilhqot'in would depend on fish from Fish Lake (Tektan Biny), Nabas, and neighbouring lakes when the salmon run was poor.

The Friends of the Nemaiah Valley noted that the Project could negatively affect the ecological integrity of the Project area, which might reduce the food security of the Xeni Gwet'in. As a result, the Xeni Gwet'in might become more dependent on a cash economy and store-bought foods.

Many participants noted that the unemployment rate was high within the communities and income was generally low amongst community members. Store-bought foods from Williams Lake were described as costly and a considerable distance from the communities. Patt Larcombe, on behalf of the Tsilhqot'in National Government, during the original Prosperity project public hearing, also stated that it would be more expensive to travel further to harvest country foods and people might discontinue harvesting as a result.

During the public hearing, many Aboriginal people emphasized that it was more expensive to purchase food and medicine from a store compared to harvesting country foods and traditional medicines. Ms. Alphonse from Xeni Gwet'in explained to the Panel that the land was like a grocery store itself. She noted that her community was "a long way from the nearest grocery store... because of that, we rely on traditional foods. Ms. Alphonse also stated that "the

medicines in town are expensive. And we find our traditional medicines seem to work for us just as good, if not better.”

The Panel heard many Tsilhqot'in and Secwepemc community members explain that they depend on harvesting wildlife and fish to feed their family and to reduce the costs of buying meat, fish and berries from stores. Jacqueline Merritt from Xeni Gwet'in told the Panel “my dad didn't always have a job, but he made it through. He definitely -- I learned how to appreciate that money isn't everything, that I can still live off the land hunting and fishing and gathering berries and medicines.”

Patt Larcombe, during the previous Prosperity hearing, reported that the cost of buying berries from the store, instead of harvesting them, would be \$6-\$7/kg. The Panel also heard during the New Prosperity hearing that it would cost \$1 000 to replace meat from one deer, and \$3 800 for a moose. Replacing salmon for a family was estimated to cost \$6 000 per year. Esk'etemc councillor Irvine Johnson stated: “when we say that we're poor monetarily, or financially, but we're rich because we have everything, that's because we're able to hunt, or we must hunt, in order to survive. We must gather our medicines in order to survive.”

Allan Adams of the Stswecem'c Xgat'tem community stated that many community members still harvest country foods along the proposed transmission line “just to provide for the families because here there's a lot of people, you know, struggling financially and the only way they could feed themselves with food is to go out and hunt, especially with fish. You know, the only way we could survive is off our own land.”

14.2.3 Panel's Conclusions and Recommendations

In reaching its conclusions on the effects of the Project on the harvesting of country food by Aboriginal peoples, the Panel considered the following factors to be particularly relevant:

- Participants indicated that Aboriginal community members relied on country food, which is less expensive than store-bought food, for sustenance.
- Unemployment was high within Aboriginal communities and incomes were generally very low.
- Aboriginal community members noted that store-bought food or medicine in Williams Lake was costly and time consuming to obtain.

The Panel accepts that for Aboriginal community members, the cost of harvesting country foods is relatively low, and harvesting areas are relatively accessible at present. The Panel heard many Aboriginal community members speak about high unemployment rates and low-incomes within the community. The Panel heard that if community members were to consume less country food, then the costs associated with switching to store-bought foods may be prohibitive.

If the Project were to proceed, it would reduce the ability of Aboriginal people to harvest country food in the Project area, which would likely increase reliance on store-bought foods. This may be due to the perception of contamination; actual contamination of country food or avoidance of traditional hunting areas due to noise, artificial light, and dust. The Project therefore would adversely affect the Tsilhqot'in and Secwepemc people by increasing food and medicine costs.

The Panel has determined that this adverse effect would be irreversible, of medium magnitude and have a long-term effect on the Tsilhqot'in and Secwepemc community members. The Panel notes that, to some degree, the consumption of store-bought food has been occurring for decades within the communities. Aboriginal peoples in the area do not rely completely on

country food, and there are other areas within the region where country foods are, and could continue to be, harvested. The Panel also notes that Taseko's proposed mitigation measures for wildlife would mitigate much of the effects to country food, and that Taseko remains open to discussing mitigation measures, such as building new, or improving existing, access to harvesting and hunting areas.

The Panel concludes that the Project would result in an adverse, but not significant socio-economic effect, on Aboriginal peoples regarding the harvesting of country food.

14.3 NAVIGATION

14.3.1 Proponent's Assessment

Taseko listed Fish Lake (Teztan Biny) and Little Fish Lake (Y'anah Biny) as the specific water bodies and Fish Creek (Teztan Yeqox) watershed, Fish Creek main stem (divided into 10 reaches), Taseko River, Fraser River, Big Creek (Dediny Qox) and roughly 125 smaller stream crossings as the waterways that would be directly affected by the Project. Taseko indicated that the proposed mine would have little impact on water bodies and waterways with respect to navigation, because the creeks and streams that would be affected by the Project were considered as not navigable.

Taseko reiterated that the Project preserves Fish Lake (Teztan Biny), thus addressing the previous panel finding that the project would have a significant adverse environmental effect on navigation. Taseko stated that the redesign would enable future generations to use these waters for navigation, fishing and recreational activities. Taseko also indicated that the Project's impacts on current land use by Aboriginal and non-Aboriginal people had been reduced.

Taseko acknowledged that the construction and operation of the mine, with its proposed ancillary works and temporary activities would include specific features which could interfere with navigation. Namely, several mine infrastructure components including the TSF main embankment, Fish Lake (Teztan Biny) outlet flow control structures and the open pit might obstruct or adversely affect navigable waters and the public's use of and right to navigate on Fish Creek (Teztan Yeqox), Fish Lake and Little Fish Lake (Y'anah Biny).

Taseko indicated that in the initial construction period, a coffer dam would be placed across Fish Creek (Teztan Yeqox) at the north end of Fish Lake (Teztan Biny) near the natural outlet as part of the Fish Lake flood control dam and had been optimized to avoid impacts on Fish Lake. Taseko demonstrated that the outlet control structures and coffer dam on portions of Fish Creek would result in longer term but site specific and reversible interference with navigation. Taseko said that the affected portions of Fish Creek were considered to be a minor waterways and thus not subject to approval under the *Navigable Waters Protection Act*.

Taseko also suggested that:

- the public's right to navigate on portions of Fish Creek (Teztan Yeqox) upstream of the inlet of Fish Lake (Teztan Biny) would be enhanced due to water management operations and the implementation of fish and fish habitat flow mitigation measures;
- there were no predicted changes to Beece Creek (Bisqox) during operations and would create a positive effect as a result of slight increase in closure and post-closure flows;

- during year 1 of operation, Little Fish Lake (Y'anah Biny) would be infilled and subsequently lost as it would become part of the tailing storage facility.

Initially, Taseko acknowledged that the loss of Little Fish Lake (Y'anah Biny) was unavoidable and would permanently interfere with the public's right to navigate on that water body. However, in subsequent submissions, Taseko insisted that the loss of Little Fish Lake happened once, had a limited duration and that the effect was reversible, not permanent and limited in ecological context.

Taseko also presented information concerning visitor and sport fishery's use of Fish Lake (Teztan Biny) and Little Fish Lake (Y'anah Biny) which was collected during two separate periods: surveys carried from 1995 to 1997 and aerial boat counts conducted during 2006 and 2007. The initial surveys revealed that Fish Lake (Teztan Biny) was frequented by small groups who used the lake for short visits, primarily through July and August and that there was no evidence of use of Little Fish Lake (Y'anah Biny) by non-Aboriginal people. Taseko noted that the subsequent aerial boat count of Chilcotin Region lakes did not observe any boats on Little Fish Lake. Taseko maintained that other than photos submitted by Transport Canada of a canoe being used on Little Fish Lake during a site visit, there was no evidence of any boating on Little Fish Lake.

Having reviewed previous studies on the current use of Little Fish Lake (Y'anah Biny), Taseko concluded that the Tsilhqot'in fished opportunistically for rainbow trout at Fish Lake (Teztan Biny) and Little Fish Lake. Taseko reiterated that the Project would not impair Fish Lake and maintained that there was no observed evidence of the use of watercraft or navigation by anyone on Little Fish Lake. Taseko argued that despite repeated efforts by Transport Canada during the community hearings to establish the use of Little Fish Lake, the information provided by community members did not support the conclusions that Little Fish Lake is currently used for navigation. Taseko reported the limited evidence on the use of Little Fish Lake for navigation as follows:

- Ms. Lulua made a general reference to her parents using a raft for fishing while they lived in Nabas;
- Ms. Setah, Ms. Cook and an unidentified youth referred to children using a raft built by Cecil Grinder while attending a gathering; and
- Ms. Williams said that boats, canoes and rafts were used in Fish Lake (Teztan Biny) and Little Fish Lake (Y'anah Biny) for fishing.

Taseko stated that the 125 km transmission line with its 30-80 m wide transmission line right-of-way would not directly affect navigable waters at the following crossings:

- the 142 m wide Fraser River crossing;
- the 20 m wide Big Creek (Dediny Qox); and
- the approximate 125 unnamed smaller stream

Taseko clarified the final design of the transmission line crossing of the Fraser River would be subject to Transport Canada's review and determination to see if lighting or marking of transmission line structures would be required to meet safety standards. Taseko also noted that in the previous review neither Transport Canada nor the previous panel offered comment or reached any findings or conclusions regarding the environmental effects of the proposed transmission line on waterways.

In response to Transport Canada's concerns about the Project's effects on navigation, namely on Fish Creek (Teztan Yeqox) and Little Fish Lake (Y'anah Biny), Taseko claimed an absence of evidence of the current use of Little Fish Lake and Upper Fish Creek for navigation. Taseko maintained that the limited extent the lake was used in ordinary course of navigation was when rafts were constructed onsite. Taseko further characterized Little Fish Lake as virtually inaccessible, rendering transporting a canoe or boat to the lake difficult and the lake was used on a very infrequent basis for navigation or other cultural purposes.

Taseko acknowledged that there was an impact on potential use to Little Fish Lake (Y'anah Biny) for navigation during operation, but considered the loss of navigation as being of a small magnitude with a limited geographic extent. Taseko contended that impact was temporary as at closure and post-closure, two much larger new bodies of water, the pit Lake and tailings storage facility Lake would be created, substantially increasing navigation opportunities in the watershed.

14.3.2 Views of Participants

Transport Canada explained that the *Navigable Waters Protection Act* ensured the public's right to safe and unobstructed navigation of Canada's waters. Navigable waters would include all bodies of water capable of being navigated by any type of floating vessel for transportation, recreation, or commerce. The purpose of the *Navigable Waters Protection Act* is to minimize interference with navigation on navigable waters and to ensure a balance between the public right to navigate and the need to build structures such as dams, bridges, or docks.

In its review of the available information, Transport Canada identified potential issues with respect to Project's effects on navigation of Fish Creek (Teztan Yeqox), Little Fish Lake (Y'anah Biny) and Beece Creek (Bisqox). Transport Canada expressed concern about the limited information available on the current navigational use by Aboriginal groups and the public.

Some of the outstanding technical information was subsequently provided by Taseko during the hearing. However Transport Canada noted that information gaps remained, which impeded its ability to reach final conclusions on the degree to which the Project would affect navigation.

Transport Canada conveyed that more information was required on the proposed structures and locations of the Project's coffer dams and flood control dams in order to fully assess the potential indirect effects on Fish Creek (Teztan Yeqox) downstream of Fish Lake (Teztan Biny). Transport Canada explained that information pertaining to the use of Fish Creek for navigation and the impacts of the works on navigation as they relate to the exercise of potential or established Aboriginal rights were required to select appropriate mitigation measures or to accommodate for any adverse impacts.

Transport Canada affirmed that the proposed deposition of tailings into Little Fish Lake (Y'anah Biny) as a portion of the tailing storage facility would require Taseko to apply for a Governor in Council Proclamation of Exemption under section 23 of the *Navigable Waters Protection Act*. Transport Canada noted that information and responses presented in the review process by Taseko did not give appropriate attention to Little Fish Lake.

Transport Canada asserted that Little Fish Lake (Y'anah Biny) was navigable and that its destruction by the proposed tailing storage facility would extinguish navigation. Based on its onsite visits and information obtained through the community hearing sessions, Transport Canada insisted that Little Fish Lake was currently used by Aboriginal groups for navigation for the purposes of fishing or setting traps and nets.

Transport Canada emphasized that the information provided during the community hearing sessions indicated that Little Fish Lake (Y'anah Biny) was likely important for Aboriginal groups in conducting traditional activities, some of which were supported by navigation. This information presented during the hearing provided some detail on how the infilling of Little Fish Lake might affect navigation relating to the exercise of a potential or established Aboriginal right. Transport Canada acknowledged the absence of information regarding the frequency or types of navigation currently occurring on the lake.

Transport Canada conceded that Little Fish Lake (Y'anah Biny) did not appear to be an important waterway for navigation by non-Aboriginal people.

Transport Canada submitted that the proposed mitigation measures were not adequate to address the effects to navigation on Little Fish Lake (Y'anah Biny) and adjoining sections of Fish Creek (Teztan Yeqox). These measures did not provide the means for Aboriginal groups to exercise their rights and engage in traditional activities. Transport Canada maintained that the impact of the tailing storage facility on navigation was irreversible and that appropriate mitigation measures for some of the effect might not exist. Transport Canada indicated that it was highly unusual for it to consider the creation of a new lake(s) as a form of mitigation for the loss of navigation.

In its technical analysis submitted to the previous panel, Transport Canada noted that off-site construction of the transmission line crossings over Big Creek (Dediny Qox) and the Fraser River could interfere with navigation. Transport Canada reiterated before this Panel that the statements and conclusions drawn by the department in the previous review had not changed because the design of the transmission line for the New Prosperity Project remained the same.

Transport Canada indicated that it expected to work with Taseko to ensure any impacts on navigation posed by the Project are reviewed and minimized through appropriate mitigation measures.

Representatives of the Friends of Fish Lake expressed concerns and skepticism regarding the ability to maintain water levels in Fish Lake (Teztan Biny) during the different phases of the Project. They questioned the reliability and feasibility of the water pump and circulation system proposed by Taseko. Furthermore, the group feared that, as a result of the potentially high hydraulic conductivity between Fish Lake and the open pit, Fish Lake levels could not be maintained to original levels. They also expressed the view that the loss of navigation in Little Fish Lake (Y'anah Biny) would be significant. It was their understanding that the lake had been used by boats both in the past and present, especially by Aboriginal people.

The Tsilhqot'in National Government provided evidence during the community sessions regarding the recreation, fishing and navigation activities currently undertaken by its members at Fish Lake (Teztan Biny) and Little Fish Lake (Y'anah Biny). More specifically, Ms. Linda Smith from Yunesit'in provided a written submission during the hearing which included pictures of a community member on a raft and of another carrying a rainbow trout at Little Fish Lake. Furthermore, Ms. Smith indicated that a number of Tsilhqot'in community members would raft, canoe or boat on Little Fish Lake to hunt moose or fish for rainbow trout. During the community hearing, several Tsilhqot'in participants mentioned that if the proposed mine were to proceed, they would no longer visit or navigate on Fish Lake and could not use Little Fish Lake.

14.3.3 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 Little Fish Lake (Y'anah Biny) and portions of Fish Creek (Teztan Yeqox).
- The Panel agrees that navigation in Little Fish Lake appears to be modest.
- Navigation in the Taseko River (Dasiqox), Fraser River, Big Creek (Dediny Qox) and roughly 125 smaller stream crossings were not predicted to be affected by the transmission line.
- Taseko proposes to mitigate the loss of navigation in the Fish Creek watershed by providing additional recreational and Aboriginal access points to the tailings storage facility and the pit lakes at appropriate times post-closure and to enhance access to other navigable lakes as part of the fish habitat compensation plan.
- Transport Canada indicated that mitigation measures have not adequately addressed effects on Aboriginal people who currently navigate on Little Fish Lake.
- Transport Canada indicated that the effect of the tailings storage facility on navigation within the Project area is irreversible and mitigation measures may not exist.
- Tsilhqot'in community members indicated that their current use of both Fish Lake (Teztan Biny) and Little Fish Lake to recreate, fish, hunt and for cultural purposes would be lost.
- The Panel accepts that Aboriginal peoples ability to navigate in the Little Fish Lake area will be extinguished by the Project, which is an environmental effect under section 5(1)(c) of CEAA 2012.

The Panel notes Transport Canada's concerns about the Project, namely that the tailings storage facility would interfere with navigation and that suitable mitigation to compensate for these losses may not exist. The Panel agrees with Transport Canada's assertion that Little Fish Lake (Y'anah Biny) is likely important for Aboriginal people in conducting traditional activities, some of which are supported by navigation. The Panel accepts Transport Canada's view that the Project's effects on navigation on Little Fish Lake and portions of Fish Creek (Teztan Yeqox) would be irreversible but are small in magnitude with a limited geographic extent. As a result, the Panel determines that the Project would have an adverse but not significant effect on navigation.

The Panel accepts the information provided during the community hearing sessions indicates that Little Fish Lake (Y'anah Biny) is likely important for Aboriginal people in conducting traditional activities, some of which are supported very modestly by navigation. The Panel also accepts that Aboriginal peoples will have less ability to navigate in the area around Little Fish Lake for traditional purposes.

The Panel accepts that Transport Canada will ensure any effects on navigation posed by the Project are minimized through appropriate mitigation measures.

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

RECOMMENDATION 27

The Panel recommends that, if the Project proceeds, Taseko be required to hold joint discussions with Transport Canada and Aboriginal groups to determine whether access to other navigable lakes would be acceptable as part of the fish habitat compensation plan and if so, to determine the measures to be developed to minimize the environmental effects of increased access to navigation and related fishing opportunities to these other sites.

15 OTHER ISSUES

15.1 CAPACITY OF RENEWABLE RESOURCES

The Panel has determined that the Project would result in significant adverse environmental effects on fish and has focused the following discussion on the capacity of this renewable resource to meet the needs of the present and those of the future.

15.1.1 Proponent's Assessment

Taseko assessed the Project's impact on the following renewable resources: atmospheric environment, surface and ground water, water quality and aquatic ecology, fish and fish habitat, soils, vegetation and wildlife.

Taseko determined that the Project would not have significant adverse effect on all renewable resources after consideration of the Project's design, the best management practices that would be employed, and the Project-specific mitigations developed where needed. None of the Project's residual effects exceeded regulatory standards or thresholds and were therefore determined to be not significant.

15.1.2 Views of Participants

The views of the Participants are summarized in Chapters 7, 8 and 9 and are not repeated here.

15.1.3 Panel's Conclusions and Recommendations

In reaching its conclusions on the capacity of renewable resources, the Panel considered the following factors to be particularly relevant:

- The Panel concluded that the Project would result in a significant adverse environmental effect on fish and fish habitat as well as wetland and riparian ecosystems.
- The Panel concluded that the effects of the Project on mule deer, moose and grizzly bear would be adverse but not significant. The Panel also concluded that the cumulative effects would be adverse but not significant.

The Panel considers that grizzly bear and moose have likely experienced significant adverse effects from past activities. Whether they have the capacity to meet the needs of future generations is not certain. However, should the Project proceed, and if Taseko effectively implements its cumulative effects mitigation measures, both of these key indicators would benefit from the Project.

The expected change of the fish in Fish Lake (Teztan Biny) could reduce the capacity of the fisheries resource in the region. In turn, this would affect the people that rely on this resource. Further, the Panel accepts that Aboriginal peoples in the region would avoid fish in Fish Lake if the Project proceeds.

Similarly, the expected change of wetland and riparian ecosystems near Fish Lake (Teztan Biny) and Wasp Lake could reduce the capacity of this renewable resource in the region, especially through a loss of wetland functions. This would affect the people that rely on this resource.

The Panel concludes that fish in Fish Lake (Teztan Biny) and wetland and riparian ecosystems near Fish Lake and Wasp Lake might not meet the needs of future generations.

15.2 EFFECT OF THE ENVIRONMENT ON THE PROJECT

15.2.1 Proponent's Assessment

Taseko considered the following types of natural environmental issues or events that could have had an effect on the Project:

- extreme weather (severe rainstorms, snow storms, wind, drought), and the potential of climate change to increase rainfall);
- forest fires and the potential amplifying effect of the mountain pine beetle; and
- seismic activity.

Details of a number of planning, design, construction, and management strategies intended to minimize the potential environmental effects of the environment on the Project were described throughout the EIS.

Taseko reported that severe rainstorms and related surface runoff could trigger debris flows on steep slopes in the mine area and access corridor. Taseko provided mitigation measures including designing the tailings storage facility to contain the inflow design flood volume from a 72-hour storm event. Newly constructed water management structures (ditches, ponds, etc.) would be designed to manage a return-period event longer than the duration of the mine operation (>20 years). The Fish Lake (Teztan Biny) coffer/flood control dams were designed for a 1:1 000 year potential flood level in Fish Lake. Under extreme precipitation events that exceed the 1:1 000 year, 24-hour return period event, open pit operations would cease until excess water was managed appropriately.

Taseko submitted that high levels of snowfall could impede the movement of mobile equipment on the access road and at the mine site. Vehicles could experience reduced traction and reduced visibility during snowstorms. Taseko stated that the mine production fleet would include appropriate equipment to clear snow, and crushed aggregate would be produced to spread on the roads for improved traction.

Drought conditions would reduce the runoff entering the mine site area, and less water would be available for mine operations. Taseko indicated that the tailings storage facility operating pond would be designed to have a minimum pond volume with an operating buffer under average conditions.

Taseko stated that the primary effects of a fire in the mine site would be the loss of infrastructure (process plant, mill, accommodations buildings) and operating delays. Due to the potential damage or loss of bridges along the access corridor, access to the mine site could be restricted from half a day up to two weeks. Taseko reported that extensive dead timber due to the effect of the mountain pine beetle could increase the risk and intensity of fire.

Fire-fighting equipment would exist as part of the Health and Safety system for the mine, and water pumps would be strategically located around the mine site. Vegetation that could be fuel for fire would be removed from around mine infrastructure.

Taseko submitted that the Project site is situated in a region of moderate seismic activity and all Project components could potentially be affected by a seismic event. The tailings embankments are reported to have the potential for being the most affected and for having the greatest impact if they were to fail. Taseko stated that the tailings storage facility embankment dams would be designed to safely withstand seismic ground motions from the 1 in 5 000 year or maximum design earthquake.

15.2.2 Views of Participants

Environment Canada expressed concerns with Taseko's assessment of climate change beyond mine operations and Taseko's evaluation of the observed climate record. Environment Canada was of the opinion that the published literature indicated that significant changes in hydrology had occurred in the region and further changes were projected for the future. Environment Canada recommended that an ensemble of climate model projections be examined to assess the possible range of future climate change for the region.

The British Columbia Ministry of Forests, Lands and Natural Resource Operations submitted that the modelled decline of Bridge Glacier would result in a decline of summer stream flow in Taseko River (Dasixox) within the next 100 years. The Tsilhqot'in National Government noted that the future impacts of climate change would add risk to fish health in the Taseko River.

Natural Resources Canada submitted that it was satisfied in 2010 that the issues it had raised regarding earthquakes and seismic hazards had been adequately addressed by Taseko. Natural Resources Canada found the EIS to be adequate in terms of the information on regional seismic hazard and embankment dam design criteria, design basis earthquake and seismic hazard classification.

15.2.3 Panel's Conclusions and Recommendations

The Panel has considered that there are inherent uncertainties with regard to climate change. The Panel acknowledges that Taseko has committed to monitoring and adaptive monitoring that would likely be able to minimize the effects of the environment on the Project. With regards to potential embankment failure due to seismic activity, the Panel is of the opinion that Taseko has adequately addressed earthquakes and seismic hazards in its proposed embankment design.

The Panel concludes that the effect of the environment on the Project would not be significant.

15.3 ACCIDENTS AND MALFUNCTIONS

15.3.1 Proponent's Assessment

In its EIS, Taseko described a number of accidents and malfunctions that might occur during the life of the Project, determined the possible range of potential environmental effects, and identified procedures and measures to be implemented to avoid, minimize, and respond to these potential accidents and malfunctions. Taseko identified seven types of accidents,

malfunctions or unplanned events: fuel spill; failure or major leakage from tailings or reclaim pipeline; concentrate haul spill; road culvert failure; excessive water in tailings storage facility due to storm events; loss of power to tailings storage facility seepage recovery; and storm event in excess of design of Fish Lake flood control dams. Taseko determined the possible interactions between these potential events and the valued ecosystem components followed by an assessment of potential environmental effects.

Taseko indicated that a fuel spill could occur on land or in water as a result of a fuel truck overturning along the main access road. To minimize the potential of a fuel spill, Taseko would implement preventive measures, such as ensuring proper construction and maintenance of access roads, enforcing speed limits, ensuring appropriate driver training and haul monitoring and supervision. In the event of a fuel spill, Taseko would initiate an emergency response protocol which would involve notification of all agencies and responders, and implementation of spill handling procedures.

Taseko pointed out that the valued ecosystem components most likely affected by a fuel spill would be groundwater, soils, water quality and aquatic ecology, fish and fish habitat, wildlife, human and ecological health and traditional land use. With the implementation of mitigation and emergency response measures and monitoring, Taseko predicted that the residual effects of a spill on land would be localized, reversible and short term, and therefore not significant, because site conditions (soil and groundwater) could be restored within a short timeline.

In the event of a fuel spill in water, Taseko stated that there was a very low probability that a fuel truck could overturn and spill fuel into a watercourse or water body because of precautionary measures put in place and the low proportion of road located near or over water features. Taseko indicated that a worst case scenario would be a spill of a fully loaded fuel truck releasing its entire 50 000 L load into a tributary of the Taseko River (Dasiqox) or in the Chilcotin River (Tsilhqox). For water quality and aquatic ecology and for fish and fish habitats, Taseko determined that the geographic extent and magnitude of the environmental effects of a fuel spill to water could be significant. However, the temporal effects could be reduced and managed through the emergency response plan, complemented by additional mitigation and compensation measures. Taseko predicted that the residual effects would be temporary and reversible, and therefore considered non-significant. A similar conclusion was reached on the effects on wildlife where the effects were predicted to be temporary and reversible. As for residual effects on human health, ecological risk and traditional land use, Taseko concluded that with the proposed mitigation measures and emergency response plans, the effects would not be significant.

Taseko stated that there was a low probability that a failure or major leakage from the tailings or reclaim pipelines could occur during the life of the Project. If such an event were to occur, the Project was designed to contain all released tailings or process water within the mine site and no release would reach the area's watercourses. Taseko concluded that no valued ecosystem component would likely be detrimentally affected with such an event.

Taseko stated that there was a low probability that a concentrate truck could overturn and release its load on dry land or in water. To minimize this occurrence, Taseko stated it would take precautions and apply emergency response protocols similar to those proposed for a fuel spill. Taseko determined a concentrate spill on land would be a site-specific event, with a very small areal extent, and that clean-up procedures would be conducted in a short period of time.

In the event of a concentrate spill in water, Taseko stated that such a release could affect water quality and result in aquatic habitat degradation and mortality of sensitive species. The valued

ecosystem components most likely to be affected would be water quality and aquatic ecosystems, fish and fish habitat, wildlife, human and ecological health and traditional land use. Taseko noted that there were no mitigations specific to water quality and that effects downstream of a spill could lead to lower abundance of benthic organisms and loss of sensitive species. However, Taseko noted that productivity in the affected area could be reinstated in as little as one year or could take several years, depending on the success of clean-up and the water body in which the spill might occur. Taseko determined that the residual effects on fish and fish habitat could be significant on a temporal and spatial basis (0-4 years) and reversible with the appropriate mitigation plans during clean-up and from a follow-up and monitoring program. As for wildlife, Taseko stated that elevated copper levels in surface water were unlikely to be high enough to pose a potential acute risk to terrestrial wildlife consuming the water, or alter fish tissue copper levels over time. In terms of human health and ecological risk, Taseko indicated that monitoring would be undertaken in the event of a concentrate spill into a water body, and that a risk assessment would be undertaken if there were elevated levels of metal concentrations in water or fish.

Taseko indicated that there was a low probability that a road culvert could fail resulting in bank erosion and increased sedimentation that could affect downstream water quality and aquatic habitat. To minimize the potential for a road culvert failure, Taseko would implement a suite of preventive measures and would establish an emergency response protocol if the preventive measures did not prevent an accident. The valued ecosystem component most likely to be affected by the accident would be terrain stability and soil. Taseko indicated that the potential effects would be permanent; however that terrain stability could be re-established quickly.

Taseko noted that there was a low probability that storm events could result in excessive water in the tailings storage facility. To minimize the potential of such a situation, Taseko would implement a suite of measures to prevent accumulation of water in the tailings storage facility and would initiate emergency response protocol should the need arise. If discharge were to be necessary to maintain the integrity of the tailings storage facility, the tailings water would be either directed to Fish Creek (Teztan Yeqox) if the water quality were suitable or to the open pit if the water quality were not suitable. Taseko indicated that the latter scenario could require short-term rescheduling of mining sequences. Taseko indicated that none of the valued ecosystem components were expected to be detrimentally affected if this scenario were to arise.

Taseko stated that there was a low probability that a storm event could result in loss of power resulting in a temporary loss of the ability to reclaim seepage from the tailings storage facility seepage collection ponds and the potential to overflow into the inlets to Fish Lake (Teztan Biny). As with the other events, Taseko would implement a suite of preventing measures, such as providing access to backup power generation and pumping capacity, to minimize this risk, and would apply its emergency response plan if required. Taseko stated that loss of power would be temporary under most conditions and that existing containment in the seepage collection ponds would be sufficient to maintain containment. According to Taseko, a release of seepage of recovery water into the environment would be expected to be minimal, would have diluted concentrations of metals and nutrients, and would be of short duration. Taseko indicated that none of the valued ecosystem components were expected to be detrimentally affected if this scenario were to arise.

The Fish Lake (Teztan Biny) coffer/flood control dams have been designed to contain a 1:200 year 24 hour storm event. Therefore, Taseko estimated that there was a low probability that a storm event in excess of the design event could result in water being released from Fish Lake into the pit and affecting pit operations. Should such a situation arise, Taseko indicated that excess water would be pumped around the pit to Fish Creek (Teztan Yeqox). Taseko

predicted that none of the valued ecosystem components would be detrimentally affected if this situation were to occur.

Taseko pointed out that with the strong regulatory oversight required for designing the tailings storage facility, the likelihood of a structural failure of a tailings storage facility embankment under these conditions was extremely remote, and as a result excluded the structural failure of the tailings storage facility embankment dams as a potential accident and malfunction. For the same reasons, the structural stability of the non-potentially acid generating stockpile and the ore stockpile was not considered a potential accident and malfunction.

However, in response to the Panel's information requests, Taseko provided additional information and conducted additional assessment with regards to other failures identified in light of the changes made to the project design of the New Prosperity Project: seepage through foundations; embankment instability; insufficient potentially acid generating waste rock submergence; excessive sedimentation in the tailings storage facility during construction and operation; release of acid rock drainage from potentially acid generating outside the tailings storage facility; excessive sedimentation in waste rock storage areas (construction and operation); water pipeline rupture; water pump station failure; tailings pipeline rupture; tailings distribution failure; and excessive make-up water requirements, tailings embankment failure, abrupt escape of water into the open pit from Teztan Biny (Fish Lake), and failure of the water control dams. Taseko concluded that the risks associated with these failure modes were very low to moderate and no high risk scenarios were identified.

In response to a request to clarify its commitment and capability to deal with various failure modes, absent the financial security of the reclamation and closure bond, Taseko stated that it was the company's intention to meet its obligations under its permits and under the *Mines Act* by maintaining a sufficient cash flow and balance sheet through good business practices.

Overall, Taseko concluded that none of the potential failure modes presented risks that would be high or critical. They would all fall in the very low to moderate categories. Effects on valued ecosystem components were considered to be minor, not detrimental, or manageable with the application of emergency response and clean-up plans.

15.3.2 Views of Participants

During the EIS review, several participants voiced concerns related to potential embankment dam failure and the resulting potential environmental effects. For example, the British Columbia Environmental Assessment Office and the Tsilhqot'in National Government pointed out that even if the likelihood of a structural failure of the tailings storage facility embankments was remote, the consequence of such a failure would be very high and thus embankment failures needed to be fully considered and discussed.

The Ministry of Energy and Mines commented on Taseko's assessment of accidents and malfunctions in its EIS and on the additional information provided, and indicated that it agreed with Taseko's general conclusions of the risk assessment for the factors that were considered, but pointed out that the risks associated with accidents and malfunctions could change during Project development and after mine closure. The Ministry of Energy and Mines, as well as other participants, also noted that the risk assessment did not consider accidents and malfunctions related to mitigation measures for maintaining Fish Lake (Teztan Biny) (recirculation, aeration etc.) and accidents and malfunctions related to water treatment of tailings storage facility seepage. These measures were considered by the Ministry of Energy and Mines to be primary mitigations for the Project and any accidents or malfunctions related to those primary mitigations

could have direct effects on Fish Lake. Other participants suggested this was a critical error in the impact assessment of the risks to the Project and this deficiency would pose a significant risk to Fish Lake in the long-term.

The Ministry of Energy and Mines also indicated that through its permitting process it would require Taseko to develop a quality assurance and quality control program, continuous inspection, monitoring to reduce the risk of accidents and malfunctions, a detailed emergency preparedness and response plan of the tailings storage facility embankment dams and Fish Lake (Teztan Biny) water control dams.

15.3.3 Panel's Conclusions and Recommendations

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

- Taseko's implementation of preventive measures to minimize the likelihood of occurrence of accidents and malfunctions, and the application of emergency response protocol to control and manage the environmental effects should such an event occur;
- Taseko's conclusion that none of the potential failure modes would present high or critical risks;
- participants concerns regarding the consequences of a potential embankment dam failure;
- the consequences of accidents and malfunctions related to the proposed measures for maintaining Fish Lake (Teztan Biny) and related to water treatment of tailings storage facility seepage;
- the regulatory oversight provided by the Ministry of Energy and Mines under which these accidents and malfunctions would be controlled through quality assurance and quality control program, continuous inspection, monitoring, and emergency preparedness and response.

The Panel has reviewed the seven types of accidents and malfunctions identified by Taseko, and the additional information and risk assessment on possible failures in light of changes made to the Project design from the previous project proposal. The Panel notes that this Project would be subject to provincial regulatory oversight which would oversee the implementation of quality assurance and quality control program, continuous inspection, monitoring, and emergency preparedness and response.

The Panel concludes that with the implementation of the proposed preventive and mitigation measures, the emergency response plans, and the regulatory oversight, the risks of accidents and malfunctions are not likely to result in significant adverse effects.

It should be noted that issues regarding tailings storage facility seepage and measures for maintaining Fish Lake (Teztan Biny) are addressed in Chapter 5 and Chapter 6, respectively.

15.4 JUSTIFIABILITY OF SIGNIFICANT ADVERSE ENVIRONMENTAL EFFECTS

Under subsections 47(1) and 52(1) of the *Canadian Environmental Assessment Act, 2012*, the Minister of the Environment must decide if a project is likely to cause significant adverse environmental effects, after taking into account the review panel's report and the implementation

of any mitigation measures that the Minister considers appropriate. If the Minister decides that the project is likely to cause significant adverse environmental effects, the Minister must refer to the Governor in Council the matter of whether those effects are justified in the circumstances.

Pursuant to the Panel's Terms of Reference, if the Panel concludes that the Project is likely to cause significant adverse environmental effects, the Panel may include in its report a summary of any information that it has received that may be relevant to a determination by the Government of Canada on the justifiability of any significant adverse environmental effects. The Panel's Terms of Reference, however, stated that the Panel did not have a mandate to make any conclusions or recommendations on the justifiability of any significant adverse environmental effects.

The Panel concludes that the New Prosperity Project would result in significant adverse environmental effects on water quality in Fish Lake (Teztan Biny) and Wasp Lake, on fish and fish habitat in Fish Lake, on wetland and riparian ecosystems, on Aboriginal current use of lands and resources for traditional purposes, archaeological and historical resources, and cultural heritage. The Panel also concludes there would be a significant adverse cumulative effect on the South Chilcotin grizzly bear population and moose, unless necessary cumulative effects mitigation measures are effectively implemented.

During the course of the review, the Panel received numerous submissions that may be relevant to determining whether those effects are justified in the circumstances. These views are summarized as follows:

- Taseko was of the view that the New Prosperity mine proposal was modified in very substantial ways compared with the previous mine proposal to address the concerns identified by the previous panel, and concluded that the New Prosperity mine would not result in any significant adverse environmental effects. Taseko submitted that the proposed New Prosperity Mine was a significant project offering enormous financial benefits, not only for the company and its shareholders, but more generally for the people of the Cariboo-Chilcotin region, the province of British Columbia and Canada. The proposed mine would also offer many new opportunities for economic development and for employment, training and education for Aboriginal and non-Aboriginal people.
- Local and regional governments and business, as well as broader provincial and national business associations were of the view that the New Prosperity mine proposal could operate in an environmentally-safe way and they would support the Project if it met the environmental assessment requirements, and if there was adequate consultation with affected Aboriginal groups. They viewed this Project as an opportunity to provide new jobs, new training opportunities and enhanced economic activity for the entire region, and to maintain and improve municipal and regional infrastructure, education facilities, health care, social and other basic services. Some individuals also expressed similar views in favour of the Project proceeding. A number of participants pointed out that Taseko had a good track record operating the Gibraltar Mine located 60 km north of Williams Lake for the past 19 years and was considered a good corporate citizen.
- The Tsilhqot'in and the Secwepemc Nations both opposed the Project, and submitted that they would suffer enormous social, cultural and economic impacts. They are supported by Northern Shuswap Tribal Council, the Shuswap Nation Tribal Council, the BC First Nations Leadership Council and the Assembly of First Nations.
- In its closing submission, the Tsilhqot'in National Government provided a list of factors it considered relevant to justification. It stressed the cultural importance of the land to their communities and expressed their concern about the negative social, cultural and environmental effects that would result from the Project on the Tsilhqot'in people, and the

Xeni Gwet'in and Yunesit'in communities in particular. The Tsilhqot'in National Government also explained the impacts on their Aboriginal rights and title and the inequity of the Project impacts being borne largely by the Tsilhqot'in Nation and Xeni Gwet'in community. They questioned whether the Tsilhqot'in communities would benefit from the Project.

- The Tsilhqot'in National Government also noted the Tsilhqot'in communities and leaders overwhelming opposition to the Project is supported by resolutions of the Assembly of First Nations, the Union of British Columbia Indian Chiefs, and the First Nations Summit. The Tsilhqot'in National Government explained that the Tsilhqot'in were not opposed to development, but they had a different vision and different values for these lands that are incompatible with this mining development. The Tsilhqot'in National Government also raised the question of risk and uncertainties related to the economic viability of the proposed mine and related to long-term water treatment requirements.
- Similarly, the Stswecem'c Xgat'tem indicated that the possible economic and social benefits would be outweighed by the significant adverse environmental, social, and cultural effects from the transmission line that would cross their traditional lands, and from the mine in general, and the serious adverse impacts the Project would have on their Aboriginal title and rights.
- The Esk'etemc claimed that the transmission line would go through one of Esk'etemc's sacred areas, the foundation of Esk'etemc's society and living culture, and it would interfere with the spiritual nature of the area. The transmission line would cause irreversible loss to the Esk'etemc culture, Aboriginal rights and title, and to their ability to protect and make decisions about their lands.
- Both Taseko and the Aboriginal groups described communication and past experiences of collaboration attempts between Taseko and the Aboriginal groups in relation with the New Prosperity Project as having been difficult and not successful.
- MiningWatch Canada argued that Taseko did not provide an assessment of the net benefits and costs for the Project that one could weigh against any residual environmental or social concerns to determine whether the Project was justified in the circumstances, and Taseko had exaggerated the economic benefits of the Project. For example, MiningWatch Canada pointed out the net cost that would be incurred by BC Hydro for supplying power to the Project. In addition, the Friends of the Nemaiah Valley raised the issue of road improvement and maintenance costs that would be incurred as a result of this Project. MiningWatch Canada also argued that recent economic trends indicated that the local economy had improved since the previous panel review.
- Several participants suggested that the Project required a solid cost-benefit analysis and the Panel would benefit from such independent expertise. Some participants also questioned the economic viability of the Project given the low grade of the ore, the risks associated with a possible early closure, the cost to operate a water treatment plant that could be required in perpetuity, and the size of the required reclamation bond, for example.

The Panel believes that the Government of Canada and the Government of British Columbia have access to more complete expertise on economic matters than what was made available during this review. Accordingly, the Panel has decided not to report in more detail on this subject than what has been summarized above.

16 ENVIRONMENTAL MANAGEMENT

16.1 PROPONENT'S ASSESSMENT

Taseko outlined an environmental management system that would form the basis for more detailed procedures to be developed concurrent with Project permitting. The environmental management system would be utilized by Taseko to manage its regulatory and environmental commitments in a cost efficient manner.

Taseko stated that it would:

- prevent pollution, within the bounds of the operation;
- comply with relevant environmental legislation, regulations, and corporate requirements;
- integrate environmental policies, programs, and practices into all activities regarding the Project;
- ensure that all employees understand their environmental responsibilities and encourage dialogue on environmental issues;
- develop, maintain, and test emergency preparedness plans to ensure protection of the environment, workers and the public;
- work with Government and the public to develop effective and efficient measures to improve protection of the environment, based on sound science; and
- establish and maintain an environmental committee to review environmental performance and ensure continued recognition of environmental issues as a high priority.

Taseko submitted its priority objectives:

- with regards to surface water and groundwater: prevent offsite impacts on water quality due to mining activity;
- with regards to fisheries (loss of fish and fish habitat): preserve Fish Lake (Teztan Biny) and its fishery; implement a successful fish compensation plan;
- with regards to air emissions: achieve or beat target air emissions objectives; and
- with regards to wildlife and habitat: minimize land disturbance and practice progressive reclamation; implement a habitat compensation plan.

Taseko stated that it would implement measures to ensure compliance and review reporting performance with relevant environmental legislation and industry standards. Taseko noted that applicable legislation and regulations would include:

- Federal Legislation
- Canadian Environmental Protection Act
- Transportation of Dangerous Goods Act
- Species at Risk Act
- Fisheries Act
- Navigable Waters Protection Act
- British Columbia Legislation
- Environmental Management Act
- Water Act
- Forest and Range Practices Act

- Weed Control Act
- Mines Act
- Wildlife Act
- Fisheries Act, and
- Heritage Conservation Act

Taseko provided environmental management plans at a conceptual level that would convert the proposed environmental assessment mitigation measures into actions that were intended to minimize and, where possible, eliminate environmental impacts associated with the Project. Taseko proposed the following conceptual environmental management plans:

- Construction Management Plan
- Access Management Plan
- Tailings Impoundment Operations Plan
- Materials Handling (non-mined materials) and Waste Management Plan
- Emergency Response Plan
- Geotechnical Stability Monitoring
- Soil Handling Plan
- Erosion Control and Sediment Retention Plan
- Air and Noise Management Plan
- Surface and Groundwater Management Plan
- Materials Handling (non-mined materials) and Waste Management Plan
- Mine Materials Handling and ARD/ML Management
- Vegetation and Wildlife Management Plan
- Cultural and Heritage Protection Plan
- Occupational Health and Safety Plan

Taseko had identified conceptual adaptive management plans and submitted that their development would proceed with the permitting phase of the Project. A number of adaptive management plans would be developed for evaluating Project effects on the receiving environment. Taseko submitted the example of water quality predictions that were made for Fish Lake (Teztan Biny) and its tributaries. The predictions were compared with federal and provincial guidelines. Because exceedances for some metals and sulphate were predicted during certain phases of the mine life, monitoring programs would be in place to gauge the accuracy of the predictions and the process by which to determine if any action would be required.

Taseko envisioned that its adaptive management plan for fish and fish habitat, compensation plans, as well as water quality and lake productivity predictions would include specific monitoring provisions. Part of the monitoring provisions would include:

- measuring the condition of the system with selected indicators (numbers, size and health of fish populations, water quality in Fish Lake (Teztan Biny) and tributaries, etc.);
- identification of goals and setting performance criteria and standards (target numbers of fish in compensation habitat, water quality at or below predetermined thresholds, etc.);
- development of monitoring plans with adequate detection power (temporal and spatial coverage) to identify both deficiencies and shortcomings along with root causes; and

- evaluating root causes and the extent of deficiencies to make a decision on what actions to take: do nothing, implement corrective actions, or change the goal.

Taseko submitted that due to uncertainty, it would not be possible to predict the exact timing or concentration of variables and monitoring would be the tool to confirm predictions. With regards to water quality in Fish Lake (Teztan Biny) tributaries, Taseko stated that, should monitoring indicate levels of contaminants of potential concern were increasing, the adaptive management plan would include an alert. The alert could result in increased monitoring and an action level would be declared if the level were to approach X% of the guideline. The action level would initiate corrective actions.

Taseko stated that the concept of alert and action levels could be applied to:

- predicted water quality in Fish Lake (Teztan Biny) and tributaries;
- success of habitat compensation programs;
- survival, growth and health of fish in Fish Lake; and
- trophic status of Fish Lake and the capability of the lake to support and sustain the monoculture population of rainbow trout

Taseko stated that the overarching goal of the adaptive management program would be to provide a monitoring, early warning and action plan that would allow the operator to maintain a habitat capable of supporting a viable population of rainbow trout during the life of the mine.

Taseko submitted that the final adaptive management plan and its associated threshold levels would be determined at the time of permitting and adjusted through-out its implementation. Threshold levels would be based upon reaching a predetermined key indicator measurement as well as rate of change of the indicator. Taseko stated that this would facilitate the prediction of timing to install further mitigation before the onset of any significant adverse effects, and based upon the results of the monitoring and follow-up plans, further mitigation needs would be assessed and implemented as needed.

Taseko suggested it would apply appropriate technology to adjust the trophic state of Fish Lake (Teztan Biny) when monitoring results indicated that the threshold levels in the adaptive management plans were being approached.

Taseko cited case law and submitted that the Panel can and should consider the implications of post-environmental assessment permitting when assessing the likelihood for significant adverse environmental effects where some degree of uncertainty exists on an issue.

Taseko proposed the following commitments to reduce uncertainties at the environmental assessment stage:

1. Revise water balance modelling to demonstrate how post closure recirculation can be avoided or minimized, and provide results to the Ministry of Energy and Mines prior to receiving a *Mines Act* permit to operate the mine.
2. Develop a Water Monitoring and Adaptive Management Plan that addresses:
 - water quality monitoring parameters (e.g. locations, frequency, substances to be tested for);
 - water levels in Fish Lake (Teztan Biny), flows into and out of Fish Lake and flow rates within spawning channels;
 - fish health and productivity;

- submergence of potentially acid generating rock in the tailings storage facility;
 - groundwater, seepage and seepage interception;
 - spawning habitat mitigation flows;
 - determination of threshold levels of action for the parameters being monitored; and
 - recirculation system design, pump monitoring, backup/redundancy plans and emergency response measures.
3. Ensure Taseko's operations comply with *BC Water Quality Guidelines* unless the Ministry of the Environment has approved another limit for specified substances and water bodies pursuant to its April 2013 policy entitled "*Guidance for the Derivation and Application of Water Quality Objectives in British Columbia*" http://www.env.gov.bc.ca/wat/wq/pdf/wqo_2013.pdf.
4. Install a hypolimnetic aeration system (designed in consultation with and to the satisfaction of Fisheries and Oceans Canada) in Fish Lake before the start of construction to first reduce the current seasonal eutrophication and then to mitigate against further eutrophication once recirculation begins.
5. Prior to receiving a *Mines Act* permit and an *Environmental Management Act* permit to operate the mine:
- assess available water quality treatment systems (including but not limited to reverse osmosis systems) and identify a preferred system;
 - confirm/revise water quality modelling with specific reference to the proposed water treatment system; and
 - document how procurement, delivery, installation and operation of the system would be undertaken in accordance with the overall Water Monitoring and Adaptive Management Plan.
6. Prior to receiving a *Mines Act* permit to operate the mine, undertake additional geotechnical site investigations in consultation with the Ministry of Energy and Mines:
- to further define the location and extent of the faults north of Fish Lake and confirm/refine related assessment of hydraulic conductivity;
 - to obtain more detailed information regarding till thickness throughout the basin of the tailings storage facility; and
 - to perform additional pump tests between Fish Lake and the proposed pit and in the downstream areas of the tailings dams.

16.2 VIEWS OF PARTICIPANTS

Fisheries and Oceans Canada submitted that it was "unclear that the adaptive management plan offered by Taseko is of sufficient rapidity to account for a state-shift in eutrophication caused by a non-linear internal loading response." Fisheries and Oceans stated that successful adaptive management would be directly contingent upon monitoring efforts of sufficient duration, extent, and quality.

During the public hearing, Environment Canada submitted that "the level of uncertainty is such that our Department is still unable to draw any conclusions regarding the likelihood or magnitude of project effects on water quality."

Fisheries and Oceans, BC Ministry of Energy and Mines, BC Ministry of Environment, and the Tsilhqot'in National Government expressed concerns regarding the ability of Taseko to prevent adverse effects to the water quality of Fish Lake (Teztan Biny) and its tributaries.

The Tsilhqot'in National Government stated that adaptive management was not a substitute for mitigation measures nor would it be appropriate as a response to uncertainty about the significance of environmental effects.

The Tsilhqot'in National Government referred to the Operational Policy Statement: *Adaptive Management Measures under the Canadian Environmental Assessment Act*, which stated that "if, taking into account the implementation of mitigation measures, there is uncertainty about whether the project is likely to cause significant adverse environmental effects, a commitment to monitor project effects and to manage adaptively is not sufficient."

The operational policy also stated that:

a commitment to implementing adaptive management measures does not eliminate the need for sufficient information regarding the environmental effects of the project, the significance of those effects and the appropriate mitigation measures required to eliminate, reduce or control those effects. Where additional information collection or studies are needed over the life-cycle of the project, such studies in themselves should not be considered "mitigation measures".

The Tsilhqot'in National Government submitted that primary mitigation measures such as water treatment and the recirculation of lake flows have not been demonstrated to be technically and economically feasible.

The operational policy also noted that under the *Canadian Environmental Assessment Act, 2012*, requires every type of environmental assessment to:

Consider measures that are technically and economically feasible, and that would mitigate any significant adverse environmental effects. The implementation of these measures is then taken into consideration by the responsible authority when making its course of action decision. Therefore, it is insufficient to assert that implementation of an unidentified future measure, developed as a result of adaptive management, constitutes mitigation of a predicted adverse environmental effect.

Additionally, the operational policy stated that:

Commitment to adaptive management is not a substitute for committing to specific mitigation measures in the EA prior to the course of action decision. Adaptive management is an approach involving flexibility to modify mitigation measures or develop and implement additional measures in light of real-world experience.

The Tsilhqot'in National Government submitted that, as a matter of law, a significant adverse effect can only be rendered insignificant by technically and economically feasible measures. The Tsilhqot'in National Government stated that the courts have described feasible mitigation measures as "practical means", "known technologies", and as measures that are "known and proposed" and that "can and will" mitigate environmental effects.

The Tsilhqot'in National Government referred to the *Canadian Wildlife Federation Inc. v Canada (Minister of the Environment)* decision, which stated "...future prospects for the monitoring of water quality will do nothing in themselves to enhance water quality, or even to restore it.

Monitoring plans for the future are a far cry from known technology whereby the adverse water quality effects can be mitigated.”

16.3 PANEL’S CONCLUSIONS AND RECOMMENDATIONS

The Panel recognizes that adaptive management would be essential to manage changes to the ecosystem and agrees that the principles laid out by Taseko are sound. However, as noted elsewhere in this report, for such important effects as those on Fish Lake (Teztan Biny), more details are essential during the Project permitting phase. The Panel has dealt with effects on Fish Lake in the other chapters of this report.

RECOMMENDATION 28

The Panel recommends that, if the Project proceeds, Taseko be required to develop a detailed environmental management plan, and that this plan be approved by the appropriate regulators prior to mine permitting and updated regularly.

17 LIST OF PANEL'S CONCLUSIONS AND RECOMMENDATIONS

The Panel was mandated to conduct an assessment of the environmental effects of the Project in accordance with the requirements of CEAA 2012 and its Terms of Reference. The Panel was also mandated to identify those conclusions that relate to the environmental effects to be taken into account under section 5 of CEAA 2012 and to identify the recommended mitigation measures that relate to the environmental effects to be taken into account under section 5 of the CEAA 2012.

For Aboriginal rights and title, the Panel was also required to review information from Aboriginal groups and make recommendations on the potential impacts of the Project on potential or established Aboriginal rights or title. 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 and accommodate Aboriginal groups, 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 summary lists the Panel's conclusions on the significance of the environmental effects of the Project, and the impacts on potential and established Aboriginal rights or title in the area of the Project. Some of the conclusions appear twice because they relate to both CEAA 2012 and other issues. All of the conclusions are based on the assumption that Taseko will implement all the mitigation and environmental management measures outlined in its EIS. In addition, related recommendations are listed by number. The actual recommendations are not repeated here but may be found in the text of this report.

The Panel has reached the following conclusions:

Paragraph 5(1)(a) of CEAA 2012

Fish and Fish Habitat (Chapter 7)

- The Project would result in a significant adverse effect on fish and fish habitat. This effect cannot be mitigated.

SEE: RECOMMENDATION 6

- The Project would not result in a significant adverse effect on salmon habitat.

Migratory Birds (Chapter 9)

- The Project would not result in significant adverse Project and/or cumulative effects on migratory birds.

SEE: RECOMMENDATION 17

Paragraph 5(1)(c) of CEAA 2012

Aboriginal Peoples' Current Use of Lands and Resources for Traditional Purposes (Chapter 12)

- The Project would result in significant adverse effects on the Tsilhqot'in current use of lands and resources for traditional purposes. These effects cannot be mitigated.
- Two members of the Panel (Bill Ross and Ron Smyth) find the proposed transmission line would not result in significant adverse effects; and

- One member of the Panel (George Kupfer) finds that the proposed transmission line would result in significant adverse effects to the Secwepemc.

Moose as it relates to Aboriginal Peoples' Current Use of Lands and Resources for Traditional Purposes (Chapter 9)

- The Project alone would result in an adverse, but not significant effect on moose.
- The Project would result in a significant adverse cumulative effect on the regional moose population, unless necessary cumulative effect mitigation measures are effectively implemented.

SEE: RECOMMENDATION 15 AND 16

Mule Deer as it relates to Aboriginal Peoples' Current Use of Lands and Resources for Traditional Purposes (Chapter 9)

- The Project alone would result in an adverse, but not significant effect on mule deer.
- The Project would result in an adverse, but not significant cumulative effect on mule deer.

Archaeological and Historical Resources and Cultural Heritage of Aboriginal Peoples (Chapter 12)

- The Project would result in a significant adverse effect on the Tsilhqot'in cultural heritage. These effects cannot be mitigated.
- The Project would result in a significant adverse effect on Tsilhqot'in archaeological and historical resources.

SEE: RECOMMENDATION 21

- Two members of the Panel (Bill Ross and Ron Smyth) find the proposed transmission line would not result in significant adverse effects to the Secwepemc; and
- one member of the Panel, George Kupfer, finds that the proposed transmission line would result in significant adverse effects to the Secwepemc.

RECOMMENDATION 22, 23 AND 24

Grizzly Bear as it relates to Cultural Heritage of Aboriginal Peoples (Chapter 9)

- The Project alone would not result in a significant adverse effect on the South Chilcotin grizzly bear population.

SEE: RECOMMENDATION 12

- The Project would result in a significant adverse cumulative effect on the South Chilcotin grizzly bear population, unless necessary cumulative effects mitigation measures are effectively implemented.

SEE: RECOMMENDATION 13 AND 14

Socio-economic Conditions of Aboriginal Peoples (Chapter 14)

- The Project would not result in a significant adverse effect on the users of the meadows in the Fish Lake (Teztan Biny) area due to the loss of the grazing lands.

- The Project would result in an adverse, but not significant, effect on Aboriginal tourism opportunities.
- The Project would result in an adverse, but not significant, effect on trapper licensees in the region.

SEE: RECOMMENDATION 25

- The Project would result in an adverse, but not significant, effect on the Esk'etemc Community Forest.

SEE: RECOMMENDATION 26

- The Project would result in an adverse, but not significant, socio-economic effect on Aboriginal peoples regarding the harvesting of country food.

Navigation for Aboriginal Peoples (Chapter 14)

- The Project would not result in a significant adverse effect on navigation.

SEE: RECOMMENDATION 27

Aboriginal Peoples' Health

- The Project would not result in a significant adverse effect on human health.

SEE: RECOMMENDATION 19 AND 20

Subsection 5(2) of CEEA 2012

Surface Hydrology (Chapter 6)

- The Project would permanently alter the water flows in the Fish Creek (Teztan Yeqox) and Beece Creek (Bisqox) watersheds, but these effects would not be significant.

SEE: RECOMMENDATION 4

- The Project would result in a significant adverse effect on water quality in Fish Lake (Teztan Biny).
- Pore water seepage from the tailings pond would have a significant adverse effect on water quality in Wasp Lake.
- Pore water seepage from the tailings pond would not have a significant adverse effect on water quality in Big Onion Lake (Jidizay Biny) and Little Onion Lake, provided effective mitigation is proven and applied.
- The Project would not result in a significant adverse environmental effect on water quality in Beece Creek (Bisqox) and the Taseko River (Dasiqox).

SEE: RECOMMENDATION 5

Vegetation (Chapter 8)

- The Project would result in a significant adverse effect on wetland and riparian ecosystems.

SEE: RECOMMENDATION 7, 8, 9, 10 AND 11

Hydrogeology (Chapter 5)

- Metal leaching from potentially acid generating waste and tailings contained in the tailings storage facility would result in an adverse effect on water quality in the down gradient receiving environment.

SEE: RECOMMENDATION 1

Navigation (Chapter 14)

- The Project would not result in a significant adverse effect on navigation.

SEE: RECOMMENDATION 27

Terms of Reference

Aboriginal Rights and Title (Chapter 13)

- The Project would interfere with Tsilhqot'in proven and asserted Aboriginal rights.
- The Project would interfere with Esk'etemc and Stswecem'c Xgat'tem Aboriginal rights, asserted or otherwise.
- The Project would interfere with lands over which the Tsilhqot'in, the Esk'etemc, and the Stswecem'c Xgat'tem assert Aboriginal title.

Need For and Purpose of the Project (Chapter 4)

- Taseko has adequately demonstrated the purpose of the Project and the need for the Project to meet the requirements of this environmental assessment.

Alternatives to the Project (Chapter 4)

- An open pit mine would be the only economically viable way to meet the Project's need and achieve the Project's purpose.

Alternative Means of Carrying Out the Project (Chapter 4)

- Taseko's methodology for selecting its preferred alternative for the mine development plan and the transmission line corridor was reasonable for the purpose of this environmental assessment.

Capacity of Renewable Resources (Chapter 15)

- Fish in Fish Lake (Teztan Biny) and wetlands and riparian ecosystems near Fish Lake and Wasp Lake might not meet the needs of future generations.

Accidents and Malfunctions (Chapter 15)

- With the implementation of the proposed preventive and mitigation measures, the emergency response plans and the regulatory oversight, the risks of accidents and malfunctions are not likely to result in significant adverse effects.

Other Issues

Effect of the Environment on the Project (Chapter 15)

- The effect of the environment on the Project would not be significant.

Socio-economic Conditions (Chapter 14)

- The Project would result in an adverse, but not significant, effect on the recreational users of Fish Lake (Teztan Biny) during the time the mine is operating.
- The Project would result in an adverse, but not significant, effect on Taseko Lake Lodge.
- The Project would not result in a significant adverse effect on guides and outfitters for hunting.
- The Project would result in an adverse, but not significant, effect on trapper licensees in the region.

SEE: RECOMMENDATION 25

- The Project would not result in a significant adverse effect on the forest industry.

Human Health (Chapter 14)

- The Project would not result in a significant adverse effect on human health.

SEE: RECOMMENDATION 19 AND 20

Vegetation (Chapter 8)

- The Project would not result in a significant adverse effect on old forest.
- The Project would not result in a significant adverse effect on grassland ecosystems.
- The Project would result in a significant adverse effect on wetland and riparian ecosystems.

SEE: RECOMMENDATION 7, 8, 9, 10 AND 11

Hydrogeology (Chapter 5)

- Taseko's failure to provide any new hydrogeological data in support of the new mine plan and its refusal to provide additional geotechnical field data or modelling results as requested by the Panel have resulted in an incomplete understanding of the interaction between Fish Lake (Teztan Biny) and the open pit. This information deficiency impedes the Panel's ability to provide a reliable assessment of several critical issues, including the effect of pit dewatering on Fish Lake and the potential encroachment of the pit on the water control dams and possibly on Fish Lake.
- There would be no significant adverse effect of pit dewatering on Fish Lake water level, because of the predicted annual surface water inflow to Fish Lake (Teztan Biny) of 250 L/s (21 600 m³/d), and the ability to pump non-contact water from the groundwater depressurization wells back to Fish Lake. Based on the strong evidence, the risk of this outcome is high.

SEE: RECOMMENDATION 2

- There is strong evidence that the seepage from the tailings storage facility will be significantly higher than estimated by Taseko, resulting in potentially higher loading of contaminants in the receiving environment.

SEE: RECOMMENDATION 3

Atmospheric Environment (Chapter 10)

- Changes in air quality resulting from the Project would not result in a significant adverse effect on recreational users of the area or Taseko Lake Lodge.
- Project related noise would not result in a significant adverse effect on users of the area.
- Light pollution from the Project would not result in a significant adverse effect.

Species at Risk (Chapter 9)

- The Project would not result in significant adverse Project and/or cumulative effects on species at risk.

SEE: RECOMMENDATION 18

Environmental Management Plans (Chapter 16)

SEE: RECOMMENDATION 28

Report of the Federal Review Panel

New Prosperity Gold-Copper Mine Project

Dated: October 31, 2013

<original signed by>

Bill Ross
Panel Chair

<original signed by>

George Kupfer
Panel Member

<original signed by>

Ron Smyth
Panel Member

APPENDIX 1 PANEL TERMS OF REFERENCE

Amended Terms of reference for the Federal Panel Reviewing the New Prosperity Gold-Copper mine Project

[As amended by the Amendment to the Terms of References (August 3, 2012)]

INTRODUCTION

In November 2010, following the 2009/2010 environmental assessment of Taseko Mines Limited's Prosperity Gold-Copper Mine project under the Canadian Environmental Assessment Act by a federal review panel, the Government of Canada concluded that the project as then proposed was likely to cause significant adverse environmental effects that could not be justified in the circumstances.

On August 9, 2011, the Canadian Environmental Assessment Agency (the Agency) accepted a project description from Taseko Mines Limited (the proponent) for the development and operation of the New Prosperity Gold-Copper Mine project (the Project). The Project is a modification of the project proposal that was considered by the previous review panel.

On November 7, 2011, the Honourable Peter Kent, Minister of the Environment, announced that the Project will undergo a federal environmental assessment by way of a review panel (the Panel). In referring the Project to a review panel, the Minister directed the Agency to design an environmental assessment process that will:

- thoroughly assess whether the Project addresses the environmental effects identified in the 2009/2010 environmental assessment of the previous project proposal;
- make use of the information obtained during the 2009/2010 environmental assessment, to the extent possible, in order to ensure a timely decision; and
- allow the Agency to complete these activities and the Panel to conduct its review, including holding public hearings and preparing its report, within a timeframe of no more than 12 months.

These Terms of Reference have been developed in consultation with the responsible authorities (Fisheries and Oceans Canada, Transport Canada, and Natural Resources Canada) for the Project and were made available in draft form for review and comment by Aboriginal groups, the public, the proponent and other interested parties. The Minister of the Environment fixed and issued these Terms of Reference to the Panel after considering the comments received on the draft version.

Pursuant to section 126 of the *Canadian Environmental Assessment Act, 2012*, the assessment by the joint review panel is continued under the process established under the *Canadian Environmental Assessment Act, 2012* as if it had been referred to a review panel under section 38 of the *Canadian Environmental Assessment Act, 2012*.

DEFINITIONS

Definitions of terms used in these Terms of Reference are listed in Appendix 1.

PART 1 SCOPE OF THE PROJECT

1.1. The proponent proposes to develop and operate the Project located 125 kilometres (km) southwest of Williams Lake, British Columbia. The Project consists of an open pit mine and mill for the purpose of extracting and processing ore containing gold and copper over a 20-year mine life. The Project also includes support infrastructure and ancillary activities, including, but not limited to:

- the construction and/or use of equipment, buildings and structures;
- the establishment, construction and operation of a tailings storage facility, an explosives factory, a magazine facility, waste rock storage areas, water management facilities, and a 125-km transmission line;
- the decommissioning, closure and abandonment of the mine and mine-related infrastructure; and
- the establishment, construction and/or modification and use of transportation infrastructure including access roads, and highways to support the above-mentioned activities and the transport of mine concentrate(s) to the existing Gibraltar mine concentrate load-out facility near Macalister, 54 km north of Williams Lake.

PART 2 SCOPE OF ASSESSMENT

2.1. The Panel shall conduct an assessment of the environmental effects of the Project referred to in the Scope of the Project (Part 1) in a manner consistent with the requirements of the *Canadian Environmental Assessment Act, 2012* (the Act) and these Terms of Reference.

2.2. The assessment by the Panel shall include a consideration of the following factors:

- a. the environmental effects of the Project 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;
- b. the significance of the environmental effects referred to in the above paragraph;
- c. comments from the public and Aboriginal groups that are received during the review;
- d. measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;

- e. the need for the Project and alternatives to the Project; *
 - f. the purpose of the Project; *
 - g. alternative means of carrying out the Project that are technically and economically feasible, and the environmental effects of any such alternative means;
 - h. the need for, and the requirements of, any follow-up program in respect of the Project; and
 - i. 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.
- 2.3.** As per section 19(3) of the Act, community and Aboriginal traditional knowledge will be considered in conducting the environmental assessment.
- 2.4.** The scope of the factors to be considered in the environmental assessment of the Project shall be as outlined in the "Guidelines for the Preparation of the Environmental Impact Statement for the New Prosperity Gold-Copper Mine Project", issued by the Minister of the Environment on March 16, 2012, and in these Terms of Reference.

PART 3 MANDATE

- 3.1.** The Panel shall, in accordance with the Act and with these Terms of Reference:
- a. ensure that the information required for the environmental assessment is obtained and made available to the public;
 - b. hold hearings in a manner that offers the public and Aboriginal groups an opportunity to participate in the assessment;
 - c. prepare a report setting out:
 - i. its rationale, conclusions and recommendations relating to the environmental assessment of the project, including any mitigation measures and follow-up program; and
 - ii. a summary of any comments received from the public and from Aboriginal groups; and

* Consideration of these factors is to be from the proponent's perspective as set out in the Agency's Operational Policy Statement on Addressing "Need for", "Purpose of", "Alternatives to" and "Alternative Means" under the *Canadian Environmental Assessment Act*.

d. submit its report to the Minister of the Environment.

- 3.2.** The Panel shall use the information, submissions and testimony generated as part of the 2009/2010 review, including the 2009 Environmental Impact Statement for the previous project (2009 EIS) and the Report of the Federal Review Panel for the Prosperity Gold-Copper Mine Project dated July 2, 2010 (previous panel's report) to conduct its assessment. This information will be supplemented by a new Environmental Impact Statement (EIS) prepared by the proponent and, as required, by additional information generated through the panel process.
- 3.3.** For those components of the Project that have not changed from the previous project proposal and whose environmental effects are not anticipated to be affected by the new components of the Project, the Panel:
- shall use to the greatest extent possible the information, submissions and testimony generated as part of the 2009/2010 environmental assessment, including the 2009 EIS and the previous panel's report as its primary sources of information; and
 - may require additional information with respect to these components if it concludes that such additional information is required to fulfill its mandate.
- 3.4.** These project components referred to in article 3.3 that have not changed from the previous project proposal include the transmission line, the load out facility and the access road.
- 3.5.** To assess the environmental effects of those components of the Project that have changed or are new from the previous project proposal, the Panel shall use the information generated through the current environmental assessment, including the EIS to be submitted by the proponent.
- 3.6.** The Panel shall undertake its mandate in four stages:
- 1) Review the information, submissions and testimony generated as part of the 2009/2010 environmental assessment, including the 2009 EIS and the previous panel's report, particularly as they relate to the components of the Project outlined in article 3.4;
 - 2) Review the EIS as set out in articles 4.14 to 4.18 of these Terms of Reference;
 - 3) Conduct public hearings as set out in articles 4.19 to 4.23; and
 - 4) Prepare and submit a report to the Minister of the Environment.
- 3.7.** The first stage will occur during the period when the proponent is preparing its EIS. During that time, the proponent will be able to engage with the Agency and federal departments on guidance with respect to fulfilling the EIS Guidelines. The remaining stages will unfold once the proponent submits its EIS to the Panel.
- 3.8.** The Panel shall accept as part of its record and review information from Aboriginal groups related to the nature and scope of potential or established Aboriginal rights or title within

the Project area, as well as information on the potential adverse impacts or potential infringement that the Project may cause on potential or established Aboriginal rights or title.

3.9. The Panel shall also review the information, submissions and testimony generated as part of the 2009/2010 environmental assessment, including the 2009 EIS and the previous panel's report, with respect to the nature and scope of potential or established Aboriginal rights or title within the Project area, as well as information on the potential adverse impacts or potential infringement that the Project may cause on potential or established Aboriginal rights or title.

3.10. The Panel shall include in its report a summary of information referred to in article 3.8 and 3.9.

3.11. The Panel, based on its assessment of the environmental effects of the Project, may, subject to article 3.12, recommend measures to mitigate any adverse environmental effects of the Project that could adversely impact, or infringe on those potential or established Aboriginal rights or title that were identified in articles 3.8 and 3.9.

3.12. The Panel shall not have a mandate to make any determinations with respect to:

- the validity of Aboriginal rights or title claims asserted by Aboriginal groups or the strength of those claims;
- the scope of Canada's duty to consult and accommodate Aboriginal groups in respect of rights recognized and affirmed by section 35 of the *Constitution Act*, 1982; and/or
- whether Canada has met its duty to consult and accommodate in respect of rights recognized and affirmed by section 35 of the *Constitution Act*, 1982.

3.13. If the Panel concludes that taking into account the implementation of mitigation measures, the Project is likely to cause significant adverse environmental effects, it may include in its report a summary of any information it has received and that may be relevant to a determination by the Government of Canada with respect to the justifiability of any such significant adverse environmental effects. However, the Panel shall not have a mandate to make any conclusions or recommendations with respect to the justifiability of any significant adverse environmental effects.

PART 4 ENVIRONMENTAL ASSESSMENT PROCESS

The Panel

4.1. After consulting with the responsible authorities, the Minister of the Environment will appoint members of the Panel, including the chairperson. The Panel shall be composed of three members, 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.

- 4.2. The Panel may request clarification of its Terms of Reference by sending a letter signed by the chairperson to the President of the Agency setting out the request. Upon receiving such a request, the President, on behalf of the Minister of the Environment, is authorized to provide to the Panel such clarification. The President shall use best efforts to provide a response to the Panel within 14 calendar days. The Panel shall continue with the review to the extent possible while waiting for the response in order to adhere to the time periods of the original Terms of Reference. The Panel shall notify the public of any clarifications to its Terms of Reference.
- 4.3. Subject to article 4.12, the Panel may seek an amendment to its Terms of Reference by sending a letter signed by the chairperson to the Minister of the Environment setting out the request. As appropriate, the Minister may delegate to the President of the Agency the authority to consider and respond to any request from the Panel, to amend the Terms of Reference. The Minister or the President in case of delegation shall use best efforts to ensure a response is provided to the Panel's letter within 14 calendar days. The Panel shall continue with the review to the extent possible while waiting for the response in order to adhere to the timelines of these Terms of Reference. Any requests for amendments under this article, as well as any amendments to these Terms of Reference, shall be posted on the Public Registry.
- 4.4. The Panel shall have all the powers and duties of a panel described in section 45 of the Act and those set out in the Terms of Reference.

The Secretariat

- 4.5. Administrative, technical, and procedural support requested by the Panel shall be provided by a Secretariat. The Secretariat is comprised of staff from the Agency. The Secretariat will support the Panel and will be structured so as to allow the Panel to conduct its review in an efficient and cost-effective manner.

EIS Preparation and Submission

- 4.6. The proponent will prepare its EIS in accordance with the EIS Guidelines approved by the Minister of Environment.
- 4.7. The proponent will submit a draft of its EIS to the Agency. Within 30 days the Agency will review the EIS, compare it to the EIS Guidelines and provide the proponent with comments, on whether the draft EIS addresses the EIS Guidelines. As necessary, the Agency will identify aspects of the draft EIS that require further analysis or information.
- 4.8. Staff from the Agency who are assigned to the Secretariat referred to in article 4.5 shall not be involved in the Agency's review of the draft EIS.

- 4.9.** The Agency's review of the draft EIS does not affect or alter the Panel's assessment of the sufficiency of the EIS pursuant to articles 4.14 to 4.18.
- 4.10.** The proponent will revise its EIS in accordance with any comments from the Agency referred to in article 4.7 and will submit its EIS to the Panel.

Timelines

- 4.11.** The Panel shall complete its mandate and submit its final report to the Minister of the Environment within 235 days from the submission by the proponent of the EIS to the Panel in accordance with article 4.10
- 4.12.** The time period between the issuance by the Panel of any deficiency statement in accordance with article 4.16 and the submission of the requested information by the proponent is not included in the timeline referred to in article 4.11.
- 4.13.** As may be required in order to meet the timeline referred to in article 4.11, the Panel may, notwithstanding article 4.3, modify any timeline referred to in articles 4.14 to 6.8 of these Terms of Reference. The Panel shall notify the Minister of the Environment and the public of any such modification.

EIS Sufficiency

- 4.14.** Upon its submission to the Panel, the EIS will be made available on the Public Registry for public comment for 45 days. Aboriginal groups, the public, government authorities, and other interested parties may submit written comments to the Panel on the sufficiency of the EIS as measured against the EIS Guidelines and on the technical merit of the information within that period of time.
- 4.15.** Within 30 days of the conclusion of the public comment period on the EIS, the Panel, taking into consideration any comments received and its own review of the EIS, shall determine if the EIS contains sufficient information to proceed to public hearing. If the Panel determines that the EIS contains sufficient information to proceed to public hearing, it will schedule and announce the hearing in accordance with the procedures set out in these Terms of Reference.
- 4.16.** If the Panel determines that the EIS is not sufficient to proceed to public hearing, it shall issue a deficiency statement requesting additional information to be provided by the proponent. At the same time, the Panel shall place the deficiency statement on the Public Registry.
- 4.17.** Upon its submission to the Panel, the additional information provided by the proponent shall be placed on the Public Registry. The Panel shall commence, if it determines it is needed, a 15-day public comment period based on this additional information provided by the proponent.
- 4.18.** The Panel shall determine within 15 days of the submission of the additional information by the proponent, or of the end of the public comment period referred to in article 4.17, if

such consultation occurred, if the EIS, supplemented by the additional information, is sufficient to proceed to public hearing. The procedures described in articles 4.16 through 4.18 will apply, with the necessary adjustments, until such time as the Panel determines it has sufficient information to proceed to public hearing.

Public Hearing

- 4.19.** Upon determination that the EIS contains sufficient information to proceed to public hearing, the Panel will announce the public hearing. The Panel shall provide a 30-day notice of the start of the public hearing.
- 4.20.** The Panel shall issue procedures for the conduct of the public hearing. These procedures will allow for the public hearings to be conducted in a manner that provides for a full examination of matters determined by the Panel to be relevant, and encourage public input and participation in the environmental assessment process.
- 4.21.** The public hearing will provide Aboriginal groups, the public, government authorities, the proponent and other interested parties with an opportunity to participate in the assessment.
- 4.22.** The Panel shall, where practicable, hold the public hearing in the communities in closest proximity to the Project, including Aboriginal communities, to provide convenient public access for potentially affected Aboriginal groups and the public.
- 4.23.** The Panel shall, taking into account the timing of traditional activities in local Aboriginal communities when setting the time and location of the public hearing session, complete the public hearing within 30 days.

PART 5 SPECIALIST ADVISORS TO THE PANEL

- 5.1.** 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.
- 5.2.** The names of the experts retained by the Panel 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.
- 5.3.** The Panel may require any expert referred in articles 5.1 and 5.2 to appear before the Panel at the public hearing 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.

PART 6 REPORT

- 6.1.** Following the completion of the public hearing, the Panel shall prepare and submit to the Minister of the Environment a report including, but not limited to, a description of the panel process, and the rationale, conclusions and recommendations of the Panel relating to the environmental assessment of the Project, including any recommended mitigation measures and follow-up programs. The report will include an executive summary in both official languages of the finding and recommendations of the Panel. The report shall include:
- an identification of those conclusions that relate to the environmental effects to be taken into account under section 5 of the *Canadian Environmental Assessment Act, 2012*; and
 - an identification of recommended mitigation measures that relate to the environmental effects to be taken into account under section 5 of the *Canadian Environmental Assessment Act, 2012*.
- 6.2.** The Panel shall also include within its report a summary of any comments received, including those from the public and Aboriginal groups and the information as outlined in articles 3.8 to 3.11.
- 6.3.** The Panel shall identify in its report the mitigation measures it recommends, including as appropriate any commitments identified by the proponent in its EIS, as well as any other commitments identified by the proponent during the current panel review process and, as relevant, during the 2009/2010 review.
- 6.4.** If, taking into account the implementation of any mitigation measures, the Panel concludes that the Project is likely to cause significant adverse environmental effects, the Panel may, in a manner consistent with article 3.13, include in its report a summary of any information that it has received with respect to the justifiability of those significant adverse environmental effects.
- 6.5.** The report shall reflect the views of each member of the Panel.
- 6.6.** In order to meet the timeline referred to in article 4.11 the Panel will submit its report to the Minister of the Environment and the responsible authorities at the earliest possible date, and no later than 70 days following the date that the chairperson of the Panel formally closes the hearing process.
- 6.7.** Upon 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.
- 6.8.** The Minister of the Environment may require the panel to clarify any of the recommendations set out in its report.

Appendix 1: Definitions of Terms

“Agency” means the Canadian Environmental Assessment Agency;

“the Act” refers to the Canadian Environmental Assessment Act, 2012;

“environmental effect” means,

(a) any change that the Project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*,

(b) any effect of any change referred to in paragraph (a) on

- i. health and socio-economic conditions,
- ii. physical and cultural heritage,
- iii. the current use of lands and resources for traditional purposes by aboriginal persons, or
- iv. any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or

(c) any change to the Project that may be caused by the environment,

whether any such change or effect occurs within or outside Canada;

“EIS Guidelines” means the direction provided to the proponent by the Minister of the Environment 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 these Terms of Reference and the Act;

“Aboriginal” means those Aboriginal peoples of Canada as defined in the Constitution Act, 1982, Section 35 (2) including the Indian, Inuit and Métis peoples of Canada;

“Panel” means the review panel established by the Minister of the Environment pursuant to the Act and composed of the persons appointed by the Minister of the Environment pursuant to section 33(1) of the former Act and continued under section 126 of the *Canadian Environmental Assessment Act, 2012* to conduct an assessment of the New Prosperity Gold-Copper Mine project;

“Project” means the New Prosperity Gold-Copper Mine 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 section 78 of the Act.

APPENDIX 2 PANEL MEMBERS BIOGRAPHIES

Dr. Bill Ross (Panel Chair)

Dr. Bill Ross is a professor emeritus at the University of Calgary in the Faculty of Environmental Design. He has focused most of his research on the professional practice of environmental assessment and has extensive expertise on cumulative effects assessment. He has a Bachelor of Science from the University of Manitoba and a Ph.D. in Physics from Stanford University.

Dr. Ross has developed training, taught and advised on many aspects of environmental assessment in Canada and internationally. In addition to teaching postgraduate students, he has delivered training courses to further the practice of environmental assessment in many countries. In 1994, he headed the Canadian Mission to the Middle East to determine environmental assessment capabilities and needs as part of the Multilateral Peace Process. He is the founding president of the Western and Northern Canada Affiliate of the International Association for Impact Assessment. He has chaired the Independent Environmental Monitoring Agency for the Ekati Diamond Mine in the Northwest Territories for five years and has worked with the four Aboriginal groups involved for a decade. In 2009, Dr Ross was the winner of the Rose-Hulman award from the International Association for Impact assessment.

Dr. Ross has considerable experience as a member of environmental assessment review panels in Alberta and British Columbia. He chaired the federal review panel for the Oldman River Dam and he served on the joint review panels for the Suffield EnCana gas wells project and the Joslyn North oil sands mine project. He participated on the federal panels reviewing the twinning of the Trans Canada Highway in Banff National Park and the CP Rail Rogers Pass project and was a member of the joint federal-provincial review panel established for the Alberta-Pacific pulpmill. He was an advisor on cumulative environmental effects to the Cheviot coal mine review panel in Alberta.

Dr. George Kupfer (Panel Member)

Dr. George Kupfer is a consultant focusing on community consultation, conflict resolution and mediation related to social and environmental issues and industrial development. He has a B.A. from Seattle Pacific University, as well as a Masters and Ph.D. in Sociology from the University of Washington. He taught at the University of Alberta for 15 years, before establishing his own company, Fresh Start Limited. Dr. Kupfer primarily works in western Canada and lives in Sidney, BC.

Dr. Kupfer has facilitated many community consultation and stakeholder engagement initiatives related to industrial projects and their impacts. He has led multi-stakeholder consultations on drilling applications, gas pipeline developments, sour gas issues, transmission line route selection, on the relationship of the environment and the economy, and forest conservation strategies. He facilitated a multi-stakeholder review of the Alberta environmental impact assessment process and on developing agreements between First Nations, Metis and the government in the Wood Buffalo Region.

For a short time he was the public consultation advisor to the Alberta Energy Resources Conservation Board and afterwards assisted in a number of Board consultation and mediation projects. He has facilitated Crown consultation processes with First Nations for the federal and Alberta governments and advised the National Energy Board on the development of an internal Aboriginal consultation process and on dealing with pipeline emergencies. He has worked with First Nations and Metis, industry, individuals and communities and government departments in Alberta, British Columbia and the Northwest Territories.

Dr. Kupfer has served on numerous environmental assessment panels, specifically related to water management issues. He was recently a member of the joint federal-provincial panel reviewing a run-of-the-river hydroelectric project on the Peace River near Dunvegan, Alberta. He was also a member of panels reviewing water management projects for the Pine Coulee and Little Bow/Highwood projects in Alberta, and for reviews of the Jackpine and Horizon oil sand developments in northern Alberta. He managed the review panel of the Alberta-Pacific pulp mill and served as social impacts advisor to the Oldman River Dam Panel. Until recently he was a member of the Bute Inlet BC Run-of-the-River Review Panel until the project was withdrawn.

Dr. Ron Smyth (Panel Member)

Dr. Ron Smyth is a professional geologist and independent consultant. He holds a Ph.D. degree in geology from Memorial University of Newfoundland. He spent most of his career in government geological survey organizations; first with the Newfoundland Geological Survey where he held senior positions in geological mapping and mineral resource assessments from 1972 to 1982. He joined the British Columbia Geological Survey in 1982 as Mineral Land Use Specialist and prepared regional assessments of mineral and coal potential for land and resource management planning processes.

Dr. Smyth was Director and Chief Geologist of the BC Geological Survey from 1984-2002 and was the principal advisor to the BC Government on geological matters relating to minerals and coal. He has broad experience in the application of geology in the assessment of proposed new mines. He was a scientific advisor to the BC Mine Development Review Process in the 1980s and was responsible for a team of geological experts that provided scientific input to assessments of proposed new metal and coal mines. He also held the position of Chief Science Officer for the Offshore Oil and Gas Team, BC Ministry of Energy, Mines and Petroleum Resources from 2002 to 2008. In this position he was the government's expert on the geology and resource potential of the Pacific offshore basins and was the Ministry's chief advisor on science issues related to offshore energy development. He interacted with a range of stakeholders including First Nations, NGOs, industry, academia and the public.

Dr. Smyth was an Adjunct Professor, School of Earth and Ocean Sciences, University of Victoria and was co-chair of the University of Victoria-Ministry of Energy and Mines Research Partnership Committee from 2004 to 2008. He has been a member of numerous scientific advisory boards. He resides in Victoria.

APPENDIX 3 PANEL RULING ON INTERESTED PARTY STATUS

Letter sent to Registered Parties on September 14, 2012

Subject: Directions for applying for Interested Party status

This letter sets out the Panel's directions on how to apply for Interested Party status related to the public hearing for the New Prosperity Gold-Copper Mine project. While the Panel will allow opportunity for general public input within the review, only those persons with Interested Party status will be permitted to participate in all aspects of the review during the public hearing phase. The following discussion elaborates.

The relevant sections of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) are as follows:

- Subsection 2(2) defines an “interested party” as a person who, in the opinion of the Panel, is either “directly affected by the carrying out of the designated project” or “has relevant information or expertise.”
- Paragraph 19(1)(a) requires the Panel to take comments from the public into account as part of the environmental assessment.
- Paragraph 43(1)(c) of the CEAA 2012 requires the Panel to, in accordance with its terms of reference, “hold hearings in a manner that offers any interested party an opportunity to participate in the environmental assessment.”

The Panel's Terms of Reference and the direction from the Minister of August 3, 2012 require the Panel to submit its final report 235 days from the submission of the EIS. Accordingly, the Panel will seek to use the allotted review time efficiently and effectively and will require the same of those parties who participate in the review.

The Panel will be structuring the review to include General, Community, and Topic-Specific hearing sessions, as explained in the Hearing Procedures issued for this review. This structure will allow for public comment as follows:

- At the General and Community hearing sessions, the Panel will allow opportunity for comments from the public and Interested Parties. The format of those hearing sessions will be less formal.
- At the Topic-Specific hearing sessions, members of the public may attend as observers but the Panel will allow only those who are granted Interested Party status to participate in the proceedings. The format of those hearing sessions will be more formal.

The Panel will establish the schedule and location for the different hearing sessions at a later date. The Panel will also explain how to register for specific sessions at that time. To assist in the planning of the hearing, the Panel requires that the Interested Parties be identified in advance, along with their interests in the Project.

Since Taseko Mines Limited is the project proponent, it has full participation rights automatically and need not to apply for Interested Party status.

The Panel also grants Interested Party status to the following parties:

1. Aboriginal Groups

The following Aboriginal groups who have previously registered for this review:

- Tsilqot'in National Government;
- Xeni Gwet'in;
- Tsi Del Del – Alexis Creek Band;
- Yunesit'in – Stone Band;
- Tlesqox – Toosey Band;
- ?Esdilagh – Alexandria Band;
- Tl'etingox – Anaham Band;
- Esketemc;
- Stswecem'c Xgat'tem – Canoe Creek Band;
- T'eselc – Williams Lake Band;
- Xat'sull – Soda Creek Band;
- Llenlleny'ten – High Bar First Nation;
- Ulkatcho First Nation; and
- Métis Nation of British Columbia.

2. Federal and Provincial Government Agencies

Those federal and provincial agencies the Panel invites to offer their technical expertise or information relevant to the review.

If you wish to apply for Interested Party status, you must submit a brief application to the Panel by September 28, 2012 with the information listed in Appendix A to this letter. Forward your application by mail, e-mail or fax to the attention of:

Livain Michaud
Panel Manager
Canadian Environmental Assessment Agency
160 Elgin Street, Ottawa, ON K1A 0H3
Tel.: 613-948-1359 / 1-866-582-1884
Fax: 613-957-0941
Email: Newprosperityreview@ceaa-acee.gc.ca

The Panel will assess your application in the context of the Panel's mandate under the Act and the Terms of Reference and will respond in due course.

Sincerely,

<original signed by>

Bill Ross, Chair

Appendix “A”

New Prosperity Gold-Copper Mine Project – Federal Review Panel

Application for Interested Party Status

If you wish to apply for Interested Party status in the Review, then submit an application to the Panel with the following information by September 28, 2012:

- (a) Your name or organization name, address, phone number, and email address.
- (b) If you are applying on behalf of an organization, explain the organization and describe its membership.
- (c) A brief explanation of:
 - The relevance of the Project to you;
 - Your specific connection with the Project area or activities: and
 - How the Project may affect your interests.
- (d) A summary of the relevant information or expertise that you or your organization can provide to assist the Panel.
- (e) A brief statement describing:
 - how you or your group or a representative intend to participate in the environmental assessment process; and
 - the issues that you or your group intend to address and why those issues are relevant to your interests.
- (f) An explanation of how you or your group may collaborate with other persons or groups whose interests or perspectives may overlap with yours.

Applicants who have shared interests or a similar perspective in the Review should submit a single application for Interested Party status and list the members of the group who are collaborating in the participation.

The Panel may group parties with similar interest together and grant Interested Party status on the condition that the members of the group co-operate to participate as a single Interested Party.

NEW PROSPERITY GOLD-COPPER MINE PROJECT – FEDERAL REVIEW PANEL

RULING ON INTERESTED PARTY STATUS

OCTOBER 12, 2012

I. Introduction

On September 14, 2012, the New Prosperity Review Panel (the Panel) issued directions on how to apply for Interested Party status for the New Prosperity Gold-Copper Mine project review (the Review). In response, the Panel received 31 applications. This ruling explains the Panel's decision on those applications.

While the Panel will allow the opportunity for general public input within the Review, only those persons with Interested Party status will be permitted to participate in all aspects of the Review during the public hearing phase.

II. Legal Framework

The relevant sections of the *Canadian Environmental Assessment Act*, 2012 (the Act) are as follows:

- Subsection 2(2) defines an “interested party” as a person who, in the opinion of the Panel, is either “directly affected by the carrying out of the designated project” or “has relevant information or expertise.”
- Paragraph 19(1)(c) requires the Panel to take comments from the public into account as part of the environmental assessment.
- Paragraph 43(1)(c) of the Act requires the Panel to, in accordance with its terms of reference, “hold hearings in a manner that offers any interested party an opportunity to participate in the environmental assessment.”

The explicit definition of “interested party” and the requirement for the Panel to determine whether a person qualifies as an interested party are new under the Act. The Canadian Environmental Assessment Agency does not have policy guidance on this issue. Therefore, the Panel is guided by the general principles established by case law on interested party standing, the Panel's Terms of Reference, and the Act.

Subsection 2(2) states that it is a matter of opinion for the Panel to decide if a person is “directly affected by the carrying out of the designated project” or has “relevant information or expertise.” However, the exercise of that opinion must take into account and balance the important public interests reflected in the stated purposes set out in section 4 of the Act.

Generally, “directly affected” refers to a personal interest that is distinct from the general public interest in a matter. In the private law situation, a direct interest may arise from holding property or other legal right that may be affected by a decision. In the public law situation, an interest sufficient to support standing is interpreted more broadly but still must be “genuine interest”, a

“real stake” or “substantial connection”.³ The Supreme Court of Canada has emphasized the need to screen participation to allow only those with a genuine interest and exclude the mere “busybody”. In public law cases, the Court calls for a “liberal and generous” or “flexible” approach, guided by the purposes that underlie the traditional limitations on standing designed to protect the efficient use of the court’s resources.⁴

When assessing whether a person is “directly affected” by a designated project the Panel regards the situation to be closer to the public law situation because of the purposes of the Act. In addition, subsection 2(2) also contemplates granting interested party status if the Panel decides a person “has relevant information or expertise”. Therefore, the Panel has followed a liberal and generous approach to determine Interested Party status for this Review, weighing the requirements of 2(2) with the purposes listed in section 4.

I. Decision Criteria

The Panel instructed parties seeking Interested Party status to submit an application to the Panel by September 28, 2012, containing the information set out in Appendix A to the September 14, 2012 letter. (See Appendix A to this ruling)

When reviewing the applications, the Panel considered the effect the Project may have on the interests identified by the applicant and the contribution of information or expertise that the applicant may offer to the Review record. The specific types of factors the Panel considered included:

- Whether the applicant resides, works or spends substantial lengths of time in the Project area;
- Whether the applicant’s immediate interests may be affected by the Project, including the applicant’s social, safety, health, environmental, community, legal or economic interests;
- Whether the applicant can demonstrate a genuine interest in the Project or Project area that is distinct from the general public interest;
- Whether the applicant has relevant information or specific expertise that is relevant to the Project and would assist in informing the Panel;
- How the applicant intends to participate; and
- The extent to which the interests of applicants may overlap and those applicants may reasonably collaborate in their participation so the Review proceeds efficiently.

³ See *Canada (Attorney General) v. Downtown Eastside Sex Workers United Against Violence Society*, 2012 SCC 45; *Finlay v. Canada (Minister of Finance)*, [1986] 2 S.C.R. 607 [Finlay], *Thorson v. Attorney General of Canada*, [1975] 1 S.C.R. 138, *Nova Scotia (Board of Censors) v. McNeil*, [1976] 2 S.C.R. 265, 55 D.L.R. (3d) 632 and *Canada v. Borowski*, [1981] 2 S.C.R. 575.

⁴ See *Canada (Attorney General) v. Downtown Eastside Sex Workers United Against Violence Society*, *supra* note 2, at paras. 1 and 2.

IV. Analysis of the Application

The Panel has applied the factors set out above to the applications that it has received. A complete list of applicants is attached at Appendix B. The List of Interested Parties includes both the Interested Parties that the Panel identified in its September 14th letter, as well as the Interested Parties whose applications have been approved by this ruling.

Where an individual has submitted an application for Interested Party status and will be appearing on behalf of an organization, the Panel has granted Interested Party status to the organization only. The individual may participate as part of the organization's presentation.

Also, individual members of the Aboriginal communities that have been granted Interested Party Status may participate as part of their community's presentation during the Community Hearings. The scheduling of the Community Hearings will occur later and the Panel will issue further notices about how to register to make a presentation.

A. Applications for Interested Parties Status Granted

The Panel has determined that the following organizations and individuals demonstrated a sufficient connection to the Project, either on the basis of being "directly affected by the carrying out of the designated project" or having "relevant information or expertise."

1. Organizations

(a) Alkali Resource Management Ltd. (Alkali)

Alkali Resource Management Ltd. manages a Community Forest. The Project's proposed power line will cross the Community Forest, which Alkali says will affect its timber harvesting rights.

(b) Amnesty International Canada English Speaking (Amnesty International)

Amnesty International is a world-wide movement for the promotion of human rights. Amnesty International has expert knowledge of the international standards for the protection of the human rights of indigenous peoples and the relevance of these standards to the deliberation of review panels.

(c) Council of Canadians - Williams Lake Chapter

The Council of Canadians is a public interest advocacy organization that promotes environmental and social justice in Canada and abroad. The Council has over 25 years of experience working with communities to protect water resources. The Council of Canadians' Chapter in Williams Lake comprises members who live in the area and have been actively engaged in social and environmental issues in the community. In particular, the Council of Canadians raises issues around water justice, human right to water, environmental justice, and the impacts of climate change and regional water security.

(d) Fish Lake Alliance

Fish Lake Alliance is a group comprising local citizens with community concerns about the Project. Some of the interests of the group include industrial traffic, possible social impacts of the Project, environmental issues, and the social license area. Fish Lake Alliance has partnered with the Council of Canadians Williams Lake Branch and the Cariboo Chilcotin Conservation Society.

(e) Friends of Nemaiah Valley

The Friends of Nemaiah Valley provides public education outreach and additional public voice for the Nemaiah Valley and surrounding area. The organization researches environmental, economic, and socio-cultural impacts of the Project. The organization also researches wildlife (grizzlies and wild horses) and ecosystems, economic development, and Aboriginal rights and title. The organization will be assessing the quality of the proposed mitigation efforts, especially with respect to the endangered dry land interior grizzly population, and alternative economic development models.

(f) MiningWatch Canada

MiningWatch is a member-based organization comprising not-for-profit organizations working on environmental, social justice, international development, and Aboriginal issues. MiningWatch has expertise on issues which include, but are not limited to water quality, fisheries, long term risks, and risk management, consideration of alternative mine plans, and Aboriginal rights from the perspective of non-indigenous people concerned with social justice and equity.

(g) Share the Cariboo-Chilcotin Resources Society (and John Meech)

Share the Cariboo-Chilcotin Resources Society is a Cariboo-based land use advocacy group that is interested in long-term community stability through the wise use of land and resources. The Society has been in existence for over 20 years and has participated in many discussions on how to utilize resources that sustain communities and allow for the development of social programs that are funded by the results of wise resource utilization. John Meech may appear as part of the Share the Cariboo-Chilcotin Resources Society.

(h) St'át'imc Chiefs Council and St'át'imc Government Services (and Susan Senger)

The Panel expects that St'át'imc Chiefs Council and St'át'imc Government Services will co-ordinate their participation.

(i) St'át'imc Chiefs Council

The St'át'imc Chiefs Council is the council of all 11 St'át'imc chiefs elected from the 11 St'át'imc member communities. The St'át'imc have a membership of roughly 6,000 individuals, living both on and off-reserve. The Council asserts that the Project footprint is approximately 40 km northwest of the St'át'imc territory. The Council further asserts the mine footprint and cumulative impacts have may adversely affect St'át'imc interests in the area.

(ii) St'át'imc Government Services

The Environment Program within St'át'imc Government Services provides technical and advisory services on the sustainable management of natural resources within the St'át'imc territory. This includes, but is not limited to, high-valued resources like grizzly bear, mule deer, water, and culturally significant plants. The proposed mine footprint of the Project affects the wetland habitat currently used by South Chilcotin grizzly bears -- bears that are considered at risk by the St'át'imc Nation and are listed as "threatened" by the provincial government. Grizzly bears are an umbrella species for the landscape values associated with the St'át'imc culture. Susan Senger may appear as part of the St'át'imc Government Services.

(i) Taseko Lake Lodge

The Lodge is located within 5 km of the Project area. Taseko Lake Lodge asserts that the Project directly affects the Lodge's facilities, grazing, use areas, property value, and tourism business.

(j) Union of BC Indian Chiefs

The Union of BC Indian Chiefs represents 108 First Nations in British Columbia and is dedicated to promoting and supporting the efforts of First Nations to affirm and defend Aboriginal title and rights and treaty rights. The Union of BC Indian Chiefs has experience and expertise in developing options for addressing the social and economic conditions of First Nations peoples in British Columbia, the impacts of development on First Nations, the unique cultural considerations that must be factored into the development of rules, policies, and legislation, and broader issues of reconciliation and sustainable, culturally respectful development.

(k) Upper Fraser Fisheries Conservation Alliance

The Upper Fraser Fisheries Conservation Alliance is a non-profit society mandated to work towards the fisheries and aquatic-related interests of First Nations in the Upper Fraser watershed. Its membership consists of Aboriginal Governments and Tribal Councils in the Upper Fraser region. It has expertise in fisheries management and conservation, with specific regional expertise in the Upper Fraser.

(l) Wilderness Committee

The Committee is a non-profit conservation organization concerned with research and education regarding the importance of protecting Canada's remaining wilderness and wildlife. In the past, the Committee advocated for the designation of Ts'yl'os Provincial Park and protection of the South Chilcotins/Spruce Lake Provincial Park. The Committee will address the risks posed to fish and grizzly bear populations by the Project.

(m) Williams Lake Field Naturalists

The Williams Lake Field Naturalists is local group based in the Cariboo-Chilcotin region with an interest in good stewardship of natural resources including wildlife, fisheries, and water in the region. The group includes biologists, foresters, educators, research scientists, and naturalists who spend a great deal of time outdoors and have a very good knowledge of regional species

and ecosystems. This local knowledge is a valuable asset in assessing potential impacts and potential mitigation.

(n) Williams Lake & District Chamber of Commerce (and John Meech)

The Williams Lake & District Chamber of Commerce is a business organization with a membership of over 300 businesses in the Cariboo Chilcotin Coast region. The Chamber of Commerce will address the economic and employment opportunities that the Project will create for the members of the community. John Meech may appear as part of the Williams Lake & District Chamber of Commerce.

[NOTE: The Métis Nation British Columbia was not included in this list because it was granted Interested Party status on September 14, 2012.]

2. Individuals

(a) Michael Atwood

Mr. Atwood has been a resident of Williams Lake for sixty years. He is a director of the Cariboo-Chilcotin Conservation Society and a member of the Williams Lake Chapter of the Council of Canadians. Mr. Atwood has also been responsible for the Chimney and Felker Lake campgrounds for the last 11 years.

(b) Mike Bird

Mr. Bird is a resident of the Williams Lake.

(c) Stephanie Bird

Ms. Bird is a resident of the Williams Lake.

(d) Jonaki Bhattacharyya

Dr. Bhattacharyya has visited, lived, and conducted research in the Nemaiah Valley, Brittany Triangle, and surrounding areas of the Chilcotin – including Teztan Biny and the project area for the proposed New Prosperity mine – since 2006. Dr. Bhattacharyya has a PhD in Environmental Planning and seven years of direct research experience with the cultures and ecology of the Project area and surrounding region.

(e) Leonard Doucette

Mr. Doucette is a resident of 100 Mile House.

(f) James Hodgetts

Mr. Hodgetts owns property near Scum Lake, on the Haines Creek water system, within 1 km of the Taseko River. Mr. Hodgetts has been a resident in the area since 1983.

(g) Stuart Kohut

Mr. Kohut has been a resident of the Williams Lake area for 30 years. Mr. Kohut has also worked in the tourism field for the past 6 years, including in the Project area.

(h) Titi Kunkel

Ms. Kunkel is currently completing a PhD dissertation on Aboriginal values and resource development in the Cariboo Chilcotin region. Ms. Kunkel has worked with members of the First Nations communities in the region to understand Aboriginal values and assess the compatibility of these values with resource development in the region. Ms. Kunkel will present some of the outcomes of the study, including intergenerational connections of the Tsilhqot'in people to their land and the implications of resource development.

(i) Robert McCandless

Mr. McCandless has visited the area and has experience in the mining sector. Mr. McCandless has contributed to the environmental assessments of approximately 40 proposed mines in British Columbia from 1990 until his retirement from Environment Canada in 2009. Mr. McCandless has specialized knowledge of geochemistry, water quality, mine closures, and the Project's feasibility.

(j) Jack Monk

Mr. Monk fishes recreationally in the Taseko/Chilko watershed.

(k) Herb Nakada

Mr. Nakada has been a resident of Williams Lake for over 30 years.

(l) Marc Pinkoski

Dr. Pinkoski has taught more than two dozen courses at the University of Victoria on topics such as Contemporary Aboriginal Peoples of Canada, Ethnology of BC, Aboriginal Rights, Indigenous Politics in Canadian, Indigenous Studies, Political, and Economic Anthropology.

(m) Patricia Spencer

Ms. Spencer has travelled to Fish Lake and currently chairs the Lower Bridge Creek Watershed Stewardship Society and the South Cariboo Sustainability Society.

(n) George Wood

Mr. Wood fishes recreationally at Fish Lake. Mr. Wood has an M.A. degree in Geography and spent 15 years as a park planner with BC Parks. Mr. Wood has represented the Sierra Club on the development of the Tsitika Valley Provincial Park and Robson Bight Ecological Reserve in the past and is currently a member of the Friends of Nemaiah Valley.

(o) Gary Young

Mr. Young is a resident in the area south of Williams Lake.

B. Applications for Interested Parties Status Not Required

The Panel has determined that the following individuals may participate as part of the groups that have engaged them to present on their behalf. The sponsoring organizations have been granted Interested Party status. Separate Interested Party status is not necessary for the individuals.

(a) John Meech

Dr. Meech is a Professor of Mining Engineering at the University of British Columbia and the Director of the UBC Centre of Research in Minerals, Metals, and Materials. He has been associated with the mining industry since 1969.

He will be appearing separately on behalf of the Williams Lake and District Chamber of Commerce and the Share the Cariboo-Chilcotin Resources Society on different topics.

(b) Susan Senger

Dr. Senger has a PhD in biology from SFU, an MSc in Plant Science from UBC and is a double-registered professional (biology and agrology) in BC. She has been leading the work on grizzly bears within the St'át'imc territory since 2000. Dr. Senger will give a brief presentation at the topic-specific hearing on the grizzly bear values and the potential cumulative effects of further development on bears. She will be appearing on behalf of St'át'imc Government Services.

NEW PROSPERITY GOLD-COPPER MINE PROJECT – FEDERAL REVIEW PANEL**RULING ON ADDITIONAL INTERESTED PARTY STATUS APPLICATIONS****MARCH 8, 2013 UPDATE****I. Introduction**

On September 14, 2012, the New Prosperity Review Panel (the Panel) issued directions on how to apply for Interested Party status for the New Prosperity Gold-Copper Mine project review (the Review). In response, the Panel received 31 applications. Since the passing of the original September 28, 2012 deadline, the Panel received twenty additional applications, and has considered the applicants' reasons for submitting late applications. This ruling explains the Panel's decision on the applications.

A. Applications for Interested Parties Status Granted

The Panel has determined that the following organizations and individuals demonstrated a sufficient connection to the Project, either on the basis of being “directly affected by the carrying out of the designated project” or having “relevant information or expertise.”

1. Organizations**(o) Wayne McCrory on behalf of the Valhalla Wilderness Society and the Valhalla Foundation for Ecology**

The Valhalla Wilderness Society and the Valhalla Foundation for Ecology are both very active organizations in wildlife research and conservation in the Nemiah-Chilcotin area. The organizations have performed key wildlife and conservation research in the region for over 20 years, and they have an expertise based on participation in many environmental impact studies, land-use planning processes, including that involving two staff biologists and associates. Presentation will be made by Wayne McCrory on behalf of the two organizations. The organizations have proposed possible collaboration with Friends of Nemaiah Valley and the Xeni Gwet'in. Wayne McCrory explained that his application was late due to work commitments in remote areas of BC.

(p) South Cariboo Chamber of Commerce

The South Cariboo Chamber of Commerce represents the business community in the greater area of the South Cariboo Region of British Columbia. The organization believes that failure to provide resource based development in the area will aid in the continued decline in the communities, employment and way of life. The organization plans to make a presentation concerning the project and its economic advantages. The application was late due to management changes affecting the timing of the submission.

(q) Mayor Kerry Cook on behalf of the City of Williams Lake

Mayor Kerry Cook would like to make a presentation during the General Hearing in Williams Lake on behalf of the City of Williams Lake. It was explained that the application was late because the applicant was unaware that a formal application process was required to make a presentation at the public hearing.

(r) Mayor Mitch Campsall on behalf of the District of 100 Mile House

Mitch Campsall is a resident of the Cariboo region and the Mayor of the District of 100 Mile House. He intends to make a presentation to the Panel to express his views on the Project and its relationship to the community. The applicant was unaware of the deadline for the process.

(s) Mayor Mary Sjostrom on behalf of the City of Quesnel

Mayor Mary Sjostrom intends to present the City of Quesnel's formal position regarding the project and answer questions on behalf of the community. The application was late as the City only recently became aware of the opportunity to present at the public hearing.

(t) Cariboo Chilcotin Conservation Society

The Cariboo Chilcotin Conservation Society was involved with the Prosperity review and have partnered with the Fish Lake Alliance for the review of the New Prosperity Project. The Cariboo Chilcotin Conservation Society has applied late under the assumption that the Panel might accept such applications.

(u) Philip Hochstein on behalf of the Independent Contractors and Business Association of B.C.

The Independent Contractors and Business Association of B.C. would like to offer the perspective of construction companies in BC to the Panel. The applicant was unaware of the process or requirement to apply for Interested Party status.

(v) Karina Brino on behalf of the Mining Association of British Columbia

The Mining Association of BC represents mine developers and operators across B.C. and would like to offer its perspective to the Panel. The application was submitted late as the association was not aware of the application process.

(w) The Mining Association of Canada

The Mining Association of Canada is the national organization representing the Canadian mining industry, and it requests the opportunity to present *Towards Sustainable Mining* to the Panel. The application was late as the organization was not aware of the need to apply.

(x) Gavin C. Dirom on behalf of the Association for Mineral Exploration British Columbia

The Association for Mineral Exploration British Columbia is the lead association for the mine exploration and development industry based in B.C. and would like to share its perspectives on socio-economic benefits that the Project could provide.

(y) Quesnel Community and Economic Development Corporation

The Quesnel Community and Economic Development Corporation works to facilitate the economic, social and environmental wealth of all residents and would like to speak about the economic benefits of the Project at the public hearing. The application was submitted late because the applicant was not aware of the deadline in September.

2. Individuals**(p) Dennis Christianson**

Dennis Christianson is the manager of South Cariboo Regional Airport, and he operates Cariboo Air Service and Nick's Rag & Tube Aircraft Maintenance. He has spent most of his life in the area and would like to speak at the public hearing. Dennis Christianson was not aware of a deadline for submitting an application.

(q) Geoff Garland

Geoff Garland is a business person in Quesnel and serves on the Quesnel Community and Economic Development Corporation as a director and chair. He has lived most of his life in the Cariboo region and has raised his family in Quesnel for the past 14 years. Geoff wishes to participate in the dialogue at the public hearing in Williams Lake after recently being made aware of the submission process in Quesnel.

(r) Lorne Doerkson

Lorne Doerkson a business person and has lived in Williams Lake for almost a decade. Lorne wants to address the Panel at the public hearing and was recently made aware of the Project.

(s) Christine Gertzen

Christine Gertzen is a small business owner and resident of the Cariboo, and she would like to speak to the Panel about the positive impact of the Project. Her application was late after she recently became aware of the need to apply for Interested Party status.

(t) Frank Dobbs

Frank Dobbs is a business person in 100 Mile House, and he was not aware of the application process until after the deadline had passed.

(u) Randy Gertzen

Randy Gertzen is a small business owner in Williams Lake and a resident of over 50 years. He would like the opportunity to share a presentation about the effect of the mine on a small business owner with the Panel.

(v) Dean Fulton

Dean Fulton is a resident of Williams Lake. He may make a presentation to the Panel regarding the chance for economic growth from the Project. His application was submitted late because he was unaware of the application process.

(w) Daryl Anderson

Daryl Anderson works and lives in the Cariboo and would like to make an oral presentation to the Panel. He was not aware of the application process when the initial deadline passed.

(x) Allan Roberts

Allan Roberts has operated several businesses and raised his children in 100 Mile House, and he would like to speak about the present business and economic condition of 100 Mile House at the public hearing. He was recently compelled to get involved with the review process.

NEW PROSPERITY GOLD-COPPER MINE PROJECT – FEDERAL REVIEW PANEL**COMPLETE LIST OF INTERESTED PARTIES****MARCH 8, 2013****1. Proponent**

Taseko Mines Limited

2. First Nations

- (a) Tsilhqot'in National Government
- (b) Xeni Gwet'in
- (c) Tsi Del Del – Alexis Creek Band
- (d) Yunesit'in – Stone Band
- (e) Tl'esqox – Toosey Band
- (f) ?Esdilagh – Alexandria Band
- (g) Tl'etingox – Anaham Band
- (h) Esketemc
- (i) Stswecem'c Xgat'lem First Nation – Canoe Creek Band
- (j) T'exelc – Williams Lake Band
- (k) Xat'sull – Soda Creek Band
- (l) Llenlley'ten – High Bar First Nation
- (m) Ulkatcho First Nation
- (n) Métis Nation British Columbia

3. Federal and Provincial Government Agencies

Fisheries and Oceans Canada
Transport Canada
Natural Resources Canada
Environment Canada
Health Canada
Aboriginal Affairs and Northern Development Canada

British Columbia Environmental Assessment Office
Ministry of Energy and Mines
Ministry of the Environment
Ministry of Forests, Lands and Natural Resource Operations
Ministry of Aboriginal Relations and Reconciliation

4. Organizations

- (a) Alkali Resource Management Ltd.
- (b) Amnesty International Canada English Speaking
- (c) Council of Canadians (Williams Lake Chapter)
- (d) Fish Lake Alliance
- (e) Friends of Nemaiah Valley
- (f) MiningWatch Canada
- (g) Share the Cariboo-Chilcotin Resources Society (and John Meech)
- (h) St'át'imc Chiefs Council and St'át'imc Government Services (and Susan Senger)
- (i) Taseko Lake Lodge
- (j) Union of BC Indian Chiefs
- (k) Upper Fraser Fisheries Conservation Alliance
- (l) Wilderness Committee
- (m) Williams Lake Field Naturalists
- (n) Williams Lake & District Chamber of Commerce (and John Meech)
- (o)⁵ Valhalla Wilderness Society and the Valhalla Foundation for Ecology (and Wayne McCrory)
- (p)¹ South Cariboo Chamber of Commerce
- (q)¹ City of Williams Lake (and Kerry Cook)
- (r)¹ District of 100 Mile House (and Mitch Campsall)
- (s)¹ City of Quesnel (and Mary Sjostrom)
- (t)¹ Cariboo Chilcotin Conservation Society
- (u)¹ Independent Contractors and Businesses Association of British Columbia (and Philip Hochstein)
- (v)¹ Mining Association of British Columbia (and Karina Brino)
- (w)¹ The Mining Association of Canada (and Pierre Gratton)
- (x)¹ Association for Mineral Exploration British Columbia (and Gavin C. Dirom)
- (y)¹ Quesnel Community and Economic Development Corporation (and Amy Reid)

⁵ Updated March 8, 2013

5. Individuals

- (a) Michael Atwood
- (b) Mike Bird
- (c) Stephanie Bird
- (d) Jonaki Bhattacharyya
- (e) Leonard Doucette
- (f) James Hodgetts
- (g) Stuart Kohut
- (h) Titi Kunkel
- (i) Robert McCandless
- (j) Jack Monk
- (k) Herb Nakada
- (l) Marc Pinkoski
- (m) Patricia Spencer
- (n) George Wood
- (o) Gary Young
- (p)¹ Dennis Christianson
- (q)¹ Geoff Garland
- (r)⁶ Lorne Doerkson
- (s)¹ Christine Gertzen
- (t)¹ Frank Dobbs
- (u)¹ Randy Gertzen
- (v)¹ Dean Fulton
- (w)¹ Daryl Anderson
- (x)¹ Allan Roberts

⁶ Updated March 8, 2013

APPENDIX 4 HEARING SCHEDULE AND LIST OF PARTICIPANTS

Public Hearing Schedule (Revised)

August 15, 2013

<i>Date</i>	<i>Community</i>	<i>Hearing Location</i>	<i>Time</i>	<i>Registration / Submission Deadline</i>
General Hearing Sessions				
Monday – Tuesday July 22, 23	Williams Lake	Cariboo Memorial Recreation Complex Gibraltar Room, 525 Proctor Street	1 pm – 5 pm 7 pm – 9 pm	July 15, 16
Wednesday – Thursday July 24, 25	Williams Lake	Cariboo Memorial Recreation Complex Gibraltar Room, 525 Proctor Street	9 am – 5 pm	July 17, 18
Topic-Specific Hearing Sessions				
Thursday July 25 Geology and Hydrogeology	Williams Lake	Cariboo Memorial Recreation Complex Gibraltar Room, 525 Proctor Street	7 pm – 9 pm	July 18
Friday July 26 Geology and Hydrogeology	Williams Lake	Cariboo Memorial Recreation Complex Gibraltar Room, 525 Proctor Street	8 am – 5 pm	July 19
Saturday Geology and Hydrogeology July 27	Williams Lake	Cariboo Memorial Recreation Complex Gibraltar Room, 525 Proctor Street	9 am – 5 pm	July 20
Monday – Tuesday July 29, 30 Aquatic Environment	Williams Lake	Cariboo Memorial Recreation Complex Gibraltar Room, 525 Proctor Street	9 am – 5 pm	July 22, 23
Wednesday July 31 Terrestrial Environment	Williams Lake	Cariboo Memorial Recreation Complex Gibraltar Room, 525 Proctor Street	9 am – 5 pm	July 24
Thursday August 1 Human Environment	Williams Lake	Cariboo Memorial Recreation Complex Gibraltar Room, 525 Proctor Street	9 am – 5 pm	July 25

Community Hearing Sessions				
Tuesday – Thursday August 6 – 8	Xeni Gwet'in	Xeni Gwet'in Community Band Hall Nemiah Valley	9 am – 5 pm	July 30, 31, August 1
Friday August 9	Site Visit	Site Visit at Fish Lake	9 am – 3 pm	August 2
Monday August 12	Tsi Del Del (Alexis Creek Band)	School Gymnasium Alexis Creek Reserve, Chilanko Forks	10 am – 6 pm	August 5
Tuesday August 13	Yunesit'in (Stone Band)	Band Hall Stone Reserve	10 am – 6 pm	August 6
Wednesday August 14	?Esdilagh (Alexandria)	IR 12	10 am – 6 pm	August 7
Thursday August 15	Tl'esqox (Toosey Band)	Toosey Band Office Toosey Reserve	10 am – 6 pm	August 8
Friday – Saturday August 16, 17	Tl'etingox-t'in (Anaham Band)	Anaham School Gymnasium Anaham Reserve	10 am – 6 pm	August 9, 10
Monday August 19	Site Visit	Site visit at Little Dog Creek	10 am – 2 pm	August 18
Tuesday August 20	Alkali Lake (Esketemc)	Sxoxomic School Gymnasium Alkali Lake	10 am – 6 pm	August 13
Wednesday August 21	Dog Creek (Stswecem'c Xgat'tem)	Dog Creek Community Gymnasium Dog Creek Road, Dog Creek Reserve	10 am – 6 pm	August 14
Closing Remarks Session				
Friday August 23	Williams Lake	CJ's Southwestern Grill 1527 Hwy 97 S, Williams Lake	9 am – 5 pm	August 21

LIST OF APPEARANCES AT THE PUBLIC HEARING

A

Adams, Allan
Aitchinson, Gina
 Transport Canada
Alleyne, Dr. Carl
 Health Canada
Alphonse, Billy
Alphonse, Chiotine
Alphonse, Grant
 Councillor, Tl'etinqox First Nation
Alphonse, Jessica
Alphonse, Joe
 Chief, Tl'etinqox First Nation
 Chair, Tsilhqot'in National Government
Alphonse, Joe Marie
Alphonse, Pam
Alphonse, Wesley
Anderson, Daryl
Anthony, Art
Archie, David
 Chief, Stswecem'c Xgat'tem First Nation
Archie, David
Archie, Mike
 Chief, Canim Lake
Atamanenko, Peter
Archie, Sandra
Atamenko, George
Atwood, Michael

B

Battison, Brian
 Taseko Mines Limited
Baptiste, Dalton
Baptiste, Marilyn
 Secretary Treasurer, Union of BC
 Indian Chiefs
 Councillor, Xeni Gwet'in First Nation
 Tsilhqot'in National Government
Benjamin, Craig
 Amnesty International
Bhattacharyya, Dr. Jonaki
 Friends of the Nemaiah Valley
Billy, Teresa
Billyboy, Donna
Billyboy, Shawn
Billyboy, Thomas
Billyboy, William
Billyboy-Cuts, Carla Jean
Bittman, Kim
 Taseko Mines Limited
Birchwater, Sage

Bobby, Malanie
Bonamis, Alston
 Fisheries and Oceans Canada
Boyd, Dorothy
Bradford, Dr. Michael
 Fisheries and Oceans Canada
Brandt, Darren
 Tsilhqot'in National Government
Brody, Tom
 Taseko Mines Limited
Burk, Dru

C

Case, Joe
Carlson, Jim
Carlson, Sue
Chamberlin, Bob
 Vice-President, Union of BC Indian
 Chiefs
Charleyboy, Geraldine
Charleyboy, Irvin
Charleyboy, Pat Blane
Chelsea-Hutchinson, Beverly
Chelsea, Lynn
Chelsea, Morris
Chelsea, Patricia
 Councillor, Esk'etemc First Nation
Chelsea, William
Chipman, Gord
 Forester, Esk'etemc First Nation
Chretien, Leon
 South Cariboo Chamber of Commerce
Christianson, Dennis
Coleman, Ed
 City of Quesnel
Colgate, George
Cook, Kerry
 Mayor, Williams Lake
Cook, Shania
Corbett, Pat
Coulson, Jessica
 Natural Resources Canada

D

deShield, Coral
 Environment Canada
Desbarats, Dr. Alexander
 Natural Resources Canada
Dick, Arthur
Dick, Marie

Dick, Wanda
Diether, David
Dixon, Donna
 Xat'sull First Nation
Dobbs, Francis
Doerkson, Lorne
Dodd, Aliah
Dodd, McKenna
Doucette, Leonard
 South Cariboo Chamber of Commerce
Doxator, Luke
 Tsilhqot'in National Government
Doyle, Dr. James
 Taseko Mines Limited
Dunsworth, Ken
 Fish Lake Alliance

E

Eberhardt, Dr. Erik
 Expert for the Federal Review Panel
Elkins, Francis

F

Faubert, Edmond
Fanos, Bradley
 Fisheries and Oceans Canada
Frank, Annette
Freed, Dr. Rina
 Tsilhqot'in National Government

G

Gallagher, Greg
 Taseko Mines Limited
Garland, Geoff
Gilbert, Virginia
Gizikoff, Katherine
 Taseko Mines Limited
Grass, Annette
Grass, Starleigh
Gratton, Pierre
 Mining Association of Canada
Grinder, Blane
Grinder, Cecil
 Councillor, Tl'etinqox First Nation
Gottfriedson, Shane
 Chief, Kamloops Indian Band
Guichon, Otis
 Councillor, Tsi Del Del First Nation
Guichon, Percy
 Chief, Tsi Del Del First Nation
Guichon, Rocky
 Councillor, Tsi Del Del First Nation

Gunville, Peter
Gustafson, Karl
 Counsel for Taseko Mines Limited

H

Hagen, Michael
 Environment Canada
Hallbauer, Russell
 Taseko Mines Limited
Haller, Catherine
 ?Eniyud Enterprise
 Xeni Gwet'in First Nation
Haller, Roseanne
Hance, Orie
Hancock, Devon
Hanes, Charlotte
Hank, Dwayne
 Councillor, Yunesit'in
Harry, Alexis
Harry, Charlie
Harry, Harold
Harry, Joyce
Harry, Ken
Harry, Linda
Harry, Patrick
Hart Ramsay
 MiningWatch Canada
Heller, Agnes
Henderson, Spence
 District of 100 Mile House
Hochstein, Phillip
 Independent Contractors and Business
 Association of British Columbia
Holmes, Rick
Hooper, Barbara
Hooper, John
Hornby, Christine
Hurley, Dr. Karen
 Friends of the Nemaiah Valley

I

J

Jessiman, Barry
 Health Canada
Jones, Scott
 Taseko Mines Limited
John, Garry
 Chief, St'at'imc Chiefs Council
Johnny, Douglas
Johnny, Georgina

Councillor, Toosey Indian Band
Johnny, Howard
Johnny, Malanie
Johnny, Natika
Johnny, Nora
Johnny, Valerie
Johnson, Bert
Johnson, Charlie
Johnson, Deena
Johnson, Dorothy
Johnson, Dwayne
 Councillor, Esk'eternc First Nation
Johnson, Francis Jr.
Johnson, Francis Sr.
Johnson, Frederick
Johnson, Irene
Johnson, Irvine
Johnson, Lily
Johnson, Ronnie
Johnstone, Rob
 Natural Resources Canada

K

Kejick, Edward
Kendall, Sara
Kolausok, Edwin
Kuipers, James
 Tsilhqot'in National Government
Kunkel, Titi
Kuyek, Joan
 Tsilhqot'in National Government
Kwong, Dr. John
 Natural Resources Canada

L

Laceese, Francis
 Chief, Toosey Indian Band
Laceese, Peyel
 Toosey Indian Band
Lalonde, Manon
 Environment Canada
Laplante, J.P.
 Tsilhqot'in National Government
Larcombe, Patt
 Expert for the Tsilhqot'in National
 Government
Lerner, John
 Friends of the Nemaiah Valley
Leece, Brian
 Taseko Mines Limited
Lloyd, Bill
 Cariboo-Chilcotin Conservation Society

Louie, Ann
 Chief, Williams Lake Indian Band
Lulua, Alex
Lulua, Chantalle
Lulua, Dina
Lulua, Jimmy
Lulua, Sonny

M

MacDonald, Don
 Tsilhqot'in National Government
Mackenzie, Stewart
MacKenzie, Heather
MacKinnon, Don
 Friends of the Nemaiah Valley
Mack, Bernie
 Vice-Chair, Tsilhqot'in National
 Government
 Chief, ?Esdilagh First Nation
Mack, Jacinda
Mackie, John
 Transport Canada
McCrory, Dr. Wayne
 Friends of the Nemaiah Valley
McManus, John
 Taseko Mines Limited
Meech, Dr. John
 Cariboo-Chilcotin Resources Society
 Williams Lake and District Chamber of
 Commerce
Melli, Sonia
 Taseko Mines Limited
Merriam, Keith
 Taseko Mines Limited
Merritt, Jacqueline
Monk, Jack
Monk, Steve
Monroe, Keith
Montgomery, Rosalie
Morin, Dr. Kevin
 Tsilhqot'in National Government
Myers, Darnel
Myers, Douglas
Myers, Isaac
Myers, Ivor Dwayne
Myers, Michelle
Myers, William

N

Nakada, Herb
Narcisse, Stormy
Nelson, Jay

Counsel for Tsilhqot'in National
Government
Nicholson, Ann
Council of Canadians
Noble, Jenny

O

Oppermann, Nancy
Xeni Gwet'in First Nation
Orr, Dr. Craig
Watershed Watch Salmon Society
Tsilhqot'in National Government
Overton, Ashley
Taseko Mines Limited

P

Palmantier, Quinton
Palmer, Dr. Andie
Parr, Sadie
Valhalla Wilderness Society and
Valhalla Foundation
Paul, Jane
Councillor, Stswecem'c Xgat'tem
Pearse, Tony
Tsilhqot'in National Government
Pelletier, Luc
Health Canada
Phillip, Stewart
Grand Chief, Union of British Columbia
Indian Chiefs
Pinkoski, Dr. Marc
Praharaj, Tanmay
Environment Canada
Primeau, Sharon

Q

Quilt, Earl
Quilt, Jasmin
Quilt, Shaynne
Quilt, Yasmin

R

Reuter, Sigfried
Taseko Lake Lodge
Richardson, David
Fish Lake Alliance
Richmond, Al
Cariboo Regional District
Robbins, Frank
Councillor, Esk'etemic First Nation
Robbins, Fred
Chief, Esk'etemic First Nation

Robbins, Shirley
Robbins, Virginia
Roberts, Allan
Robinson, Andrew
Canadian Wildlife Service
Ross, Russell Myers
Chief, Yunesit'in Government
Rotinsky, Brenda
Fisheries and Oceans Canada
Rotzinger, Rob
Taseko Mines Limited
Rouleau, Dave
Taseko Mines Limited
Russell, Brittany
Counsel, Taseko Mines Limited
Ryll, Jason
Williams Lake District Chamber of
Commerce

S

Sam, Ann Marie
Nak'azdli Nation
Saugstad, Randy
Sellars, Bev
Chief, Xat'sull First Nation
Sellars, Tina
Sellars, Willie
Councillor, Williams Lake Band
Selbie, Dr. Daniel
Fisheries and Oceans Canada
Senger, Dr. Sue
St'at'mc Government Services
Setah, David
Setah, Naomi
Setah, Trina
Shaffer, Dr. Martin
MiningWatch Canada
Sherlock, Charles Loren
Shockey, Jaela
Counsel to Esk'etemic First Nation
Shoenberger, Wolfgang
Smith, Christy
Taseko Mines Limited
Smith, Dr. Leslie
Expert for the Federal Review Panel
Smith, Jeffan
Smith, Linda
Spencer, Patricia
Friends of Fish Lake
Sterritt, Gord
Upper Fraser Fisheries Conservation
Alliance

Stewart-Harawire, Dr. Makere
Stieman, David
 Councillor, Toosey Indian Band
Stockner, John
 UBC Fisheries Centre
 Tsilhqot'in National Government
Stump, Angelina
Stump, Clarence
Stump, Danny
Stump, Fanny
Stump, Ronald
Stump, Stanley
Stump, Trinity

T

Takagi, Rick
 South Cariboo Chamber of Commerce
Thomas, Hugh
Tipple, Violet
 Councillor, Toosey Indian Band
Toth, Brian
 Upper Fraser Fisheries Conservation
 Alliance
Tung, Michelle
 Upper Fraser Fisheries Conservation
 Alliance
Turner, Dr. Nancy
 Tsil'qot'in National Government

U

V

Verhaeghe, Crystal

W

Ward, Jack
Watson, Dr. Emma
 Environment Canada
Watterson, Dan
 Tsilhqot'in National Government
Wellburn, Jane
Wellburn, Jean
William, Alice

William, Chilcote
Williams, David
 Friends of the Nemaiah Valley
William, Delia
William, Gerald
 Councillor, Tsi Del Del First Nation
Williams, Lois
Williams, Loretta
 Xeni Gwet'in First Nation
William, Mary
William, Roger
 Chief, Xeni Gwet'in First Nation
Williston, Cheryl
 Taseko Mines Limited
Wonders, Glen
 Association for Mineral Exploration,
 British Columbia
Wong, Phil
 Environment Canada
Wright, Steven
 Environment Canada

Y

Yelland, Greg
 Taseko Mines Limited
Younger, Zoë
 Mining Association of British Columbia

Other

Xeni Gwet'in Youth
 Yunesit'in Youth

APPENDIX 5 PANEL'S DECISION REGARDING ITS MANDATE TO ASSESS IMPACTS ON ABORIGINAL RIGHTS

Letter sent to Registered Parties on September 13, 2012

Subject: Mandate of the Panel to Assess Impacts on Aboriginal Rights

On August 3, 2012, the New Prosperity Review Panel (the Panel) asked for comments on the interpretation of its mandate to review Aboriginal rights as set out in articles 3.8 to 3.11 of its Terms of Reference (TOR). The Panel has reviewed the comments it received from:

- Share the Cariboo-Chilcotin Resources Society, in a letter dated August 13, 2012;
- Williams Lake & District Chamber of Commerce, in a letter dated August 15, 2012;
- Mr. Keith Monroe, in an email dated August 15, 2012;
- Taseko Mines Ltd., in a letter dated August 16, 2012;
- Tsilhqot'in Nation, in a letter dated August 17, 2012;
- Esketemc Nation, in a letter dated August 17, 2012; and
- Canoe Creek Band (Stswecem'c Xgat'tem), in a letter dated August 17, 2012.

This letter sets out the Panel's decision.

1. Overview

The Panel asked for submissions in response to the following question:

To what extent do the Terms of Reference allow the Panel to consider, assess and make recommendations concerning the potential impacts of the Project on potential or established Aboriginal rights or title?

In essence, the answer to the question turns on whether the use of the word "review" in Articles 3.8 and 3.9 of this Panel's TOR should be interpreted narrowly or broadly. The question was raised because the wording for the current TOR differs from the TOR for the previous review. Some parties were concerned about the implications of the change and, specifically, whether the current mandate would be interpreted narrowly so the Panel would simply collect and report on the information presented on Aboriginal rights without assessing how the Project may affect those interests.

None of the parties who filed comments suggested that the current wording of the TOR should be interpreted narrowly. All thought that the Panel should, and in some cases must, consider and assess the information presented on Aboriginal rights to fulfil its mandate to assess the potential impacts of the Project. The comments differed only in how the Panel should consider and assess the information, and ultimately make recommendations.

The Panel's view is that the *Canadian Environmental Assessment Act 2012* (CEAA 2012) and its TOR allow it to consider, assess and make recommendations on the potential impacts of the Project on potential or established Aboriginal rights, provided it respects the limits established by Articles 3.12 and 3.13 of the TOR.

The Panel must therefore assess how the potential environmental effects of the Project may affect relevant Aboriginal interests, rather than attempting to determine the validity of the underlying Aboriginal rights claims or issues related to the scope or discharge of the Crown's duty to consult and accommodate in relation to those claims. Issues related to reconciling the interests of the potentially affected Aboriginal groups and the interests of the Crown are for the Crown, not the Panel. The Panel's assessment may inform the Crown in its subsequent efforts to reconcile interests, but the Panel's assessment must be limited to environmental effects of the Project as defined in section 5 of CEAA 2012.

2. Reasons for Decision

The generally accepted approach to interpretation of statutes and related documents is as follows:

Today there is only one principle or approach, namely, the words of an Act are to be read in their entire context and in their grammatical and ordinary sense harmoniously with the scheme of the Act, the object of the Act, and the intention of Parliament.⁷

The Panel has applied this approach to interpreting its TOR. Understanding the statutory framework is an important first step when reading the words in Articles 3.8 to 3.11.

CEAA 2012 and the TOR establish the basic framework for the Panel's mandate. CEAA 2012 is the overarching enabling statute, so it sets the legislative context and authority. The TOR set the detailed directions for the Panel, but they must always be read and understood within the context and authority of CEAA 2012. Article 2.1 of the TOR explicitly acknowledges this principle.

The following discussion explains the relevant aspects of CEAA 2012 and how the Panel interprets them to answer the interpretation of Articles 3.8 to 3.11.

(a) The context established by CEAA 2012

Pursuant to section 43(1) of CEAA 2012, the Panel must conduct an environmental assessment of the Project, in accordance with its TOR.

In a recent case, the Federal Court described the fundamental purposes of CEAA (the predecessor legislation), as follows:

The fundamental purpose of the CEAA is to ensure that projects requiring an EA 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" (paragraph 4(a) of the CEAA). Another underlying purpose is to ensure that there are opportunities for timely and meaningful public participation throughout the environmental assessment process (paragraph 4(d) of the CEAA) [emphasis added]. Therefore, operational

⁷ See Elmer Driedger, *The Construction of Statutes* (2nd ed., 1983), at page 87, as cited with approval in, *Bell ExpressVu Limited Partnership v. Rex*, [2002] 2 S.C.R. 559, 2002 SCC 42, at para. 26.

provisions found in the CEAA and its regulations must be interpreted and applied in a manner consistent with these purposes.⁸

Although this court decision dealt with the CEAA not CEAA 2012, the comments are still apt for this discussion. In particular, the current purposes listed in section 4 of CEAA 2012 include the following:

4. (1) The purposes of this Act are

(a) to protect the components of the environment that are within the legislative authority of Parliament from significant adverse environmental effects caused by a designated project;

...

(d) to promote communication and cooperation with aboriginal peoples with respect to environmental assessments;

(e) to ensure that opportunities are provided for meaningful public participation during an environmental assessment;...

Section 1 of CEAA 2012 contains the following definitions:

- “environmental assessment” as an “assessment of the environmental effects of a designated project...” and
- “environmental effects” means the environmental effects described in section 5.

Section 5 of CEAA 2012 describes “environmental effects” as including effects on Aboriginal interests, as follows:

5. (1) For the purposes of this Act, the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project are

...

(c) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on

- (i) health and socio-economic conditions,
- (ii) physical and cultural heritage,
- (iii) the current use of lands and resources for traditional purposes, or
- (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

The statute therefore contemplates the Panel would assess the impact of any potential changes to the “environment” on the defined categories of aboriginal interests. In fact, this assessment is a necessary part of the Panel’s mandate.

However, the assessment of environmental effects does not extend to a determination of rights or the validity of Aboriginal rights claims. Instead, the assessment entails information gathering

⁸ *Supra* note 32 at para 165.

and review that is more technical in nature focussed on the implications for Aboriginal interests related to potential environmental effects.

CEAA 2012 also requires the Panel to prepare and submit a report to the Minister, which sets out the Panel's "rationale, conclusions and recommendations, including any mitigation measures and follow-up program," and a summary of any comments received from the public, including interested parties (section 43(1)(d)). Given the explicit reference in section 5 to effects on the interests of Aboriginal peoples, the Panel's report should include "rationale, conclusions and recommendations" related to potential impacts on relevant Aboriginal interests.

These ideas are elaborated further in the Panel's TOR.

(b) The directions in TOR on the Panel's mandate.

When assessing the potential effects of the Project on Aboriginal interests, the TOR give the following directions:

3.8 The Panel shall accept as part of its record and review information from Aboriginal groups related to the nature and scope of potential or established Aboriginal rights or title within the Project area, as well as information on the potential adverse impacts or potential infringement that the Project may cause on potential or established Aboriginal rights or title.

3.9 The Panel shall also review the information, submissions and testimony generated as part of the 2009/10 environmental assessment, including the 2009 EIS and the previous panel's report, with respect to the nature and scope of potential or established Aboriginal rights or title within the Project area, as well as information on the potential adverse impacts or potential infringement that the Project may cause on potential or established Aboriginal rights or title.

3.10 The Panel shall include in its report a summary of information referred to in article 3.8 and 3.9.

3.11 The Panel, based on its assessment of the environmental effects of the Project, may subject to article 3.12, recommend measures to mitigate any adverse environmental effects of the Project that could adversely impact, or infringe on those potential or established Aboriginal rights or title that were identified in articles 3.8 and 3.9.

3.12 The Panel shall not have a mandate to make any determinations with respect to:

- the validity of Aboriginal rights or title claims asserted by Aboriginal groups or the strength of those claims;
- the scope of Canada's duty to consult and accommodate Aboriginal groups in respect of rights recognized and affirmed by section 35 of the *Constitution Act*, 1982; and/or
- whether Canada has met its duty to consult and accommodate in respect of rights recognized and affirmed by section 35 of the *Constitution Act*, 1982;

3.13. If the Panel concludes that taking into account the implementation of mitigation measures, the Project is likely to cause significant adverse environmental effects, it may include in its report a summary of any information it has received and that may be

relevant to a determination by the Government of Canada with respect to the justifiability of any such significant adverse environmental effects. However, the Panel shall not have a mandate to make any conclusions or recommendations with respect to the justifiability of any significant adverse environmental effects.

(underlining added)

The operative words (underlined) in 3.8, 3.9, 3.10 and 3.12 are mandatory. The operative words in 3.11 and 3.13 are discretionary. Reading Part 3 in its entirety, and in the context of CEEA 2012, the Panel is of the view that its mandate requires it to do more than simply receive the information on aboriginal interests. The mandate must include a consideration and assessment of the information within the limits prescribed by Articles 3.12 and 3.13.

The ordinary meaning of the word review also leads to this conclusion. The Oxford Dictionary defines “review” as follows:

examine or assess [something] formally with the possibility or intention of instituting change if necessary.⁹

The plain and ordinary meaning suggests a broader interpretation of “review”. That broader interpretation also aligns with context and purpose of CEEA 2012, which is to consider and assess the potential impacts of a project and its related activities.

(c) Review and use of the previous hearing record

The comments from the Esketemc Nation raised issues about how the Panel will reconcile the new information it receives with the previous evidentiary record and Panel findings and the extent to which the Panel is limited in its ability to make recommendations. The Panel believes it will assist parties to explain its approach in relation to the review of relevant Aboriginal interests.

The TOR direct the Panel to use and incorporate the previous record to the extent possible into the current review, but does not restrict the Panel in its ability to gather information:

- Article 3.2 directs the Panel to use the information, submissions and testimony generated as part of the 2009/10 environmental review of the proposed Prosperity Mine project (the “2009/10 Materials”), as well as new information submitted in this review.
- For the components of the Project that have not changed since the 2009/10 review, Article 3.3 directs the Panel to rely on the 2009/10 Materials as much as possible, as its primary source of information. Article 3.3 also directs that the Panel may require additional information.

The Panel wishes to follow an efficient and fair process. To that end, it will review and use the previous record to the extent it is relevant to do so. The Panel will also review and consider the findings of the previous Panel. Where there has been no change to the record, the previous findings will carry weight, but this Panel is not bound by the previous findings.

⁹ *The New Oxford Dictionary of English*, Oxford: Oxford University Press, 2001, “review”.

This Panel must consider and assess the consolidated record (previous information and current information) to reach its own findings and recommendations. The Panel cannot isolate any aspects in advance since the current revised Project must be considered as an integrated whole. So too, this Panel's findings and recommendations must stand as an integrated whole since they will interrelate.

In the interests of efficiency, the Panel will also allow Taseko and Interested Parties to rely on parts of the previous record where there is no change to evidence that is being presented. If parties wish to do so, they may identify the portions of the previous record that they wish to incorporate into the current record as part of their submission in this proceeding. The Panel will assess each request to determine if it is fair to incorporate the previous record as is or if there is a need to supplement that information or allow additional questioning.

In all cases, the Panel will be seeking trying to balance the interests and seek the cooperation of the participants to achieve a fair and efficient process.

Sincerely,

<original signed by>

Bill Ross
Chair

APPENDIX

Excerpt from the Terms of Reference

3.8. The Panel shall accept as part of its record and review information from Aboriginal groups related to the nature and scope of potential or established Aboriginal rights or title within the Project area, as well as information on the potential adverse impacts or potential infringement that the Project may cause on potential or established Aboriginal rights or title.

3.9. The Panel shall also review the information, submissions and testimony generated as part of the 2009/2010 environmental assessment, including the 2009 EIS and the previous panel's report, with respect to the nature and scope of potential or established Aboriginal rights or title within the Project area, as well as information on the potential adverse impacts or potential infringement that the Project may cause on potential or established Aboriginal rights or title.

3.10. The Panel shall include in its report a summary of information referred to in article 3.8 and 3.9.

3.11. The Panel, based on its assessment of the environmental effects of the Project, may, subject to article 3.12, recommend measures to mitigate any adverse environmental effects of the Project that could adversely impact, or infringe on those potential or established Aboriginal rights or title that were identified in articles 3.8 and 3.9.

3.12. The Panel shall not have a mandate to make any determinations with respect to:

- the validity of Aboriginal rights or title claims asserted by Aboriginal groups or the strength of those claims;
- the scope of Canada's duty to consult and accommodate Aboriginal groups in respect of rights recognized and affirmed by section 35 of the *Constitution Act*, 1982; and/or
- whether Canada has met its duty to consult and accommodate in respect of rights recognized and affirmed by section 35 of the *Constitution Act*, 1982.

3.13. If the Panel concludes that taking into account the implementation of mitigation measures, the Project is likely to cause significant adverse environmental effects, it may include in its report a summary of any information it has received and that may be relevant to a determination by the Government of Canada with respect to the justifiability of any such significant adverse environmental effects. However, the Panel shall not have a mandate to make any conclusions or recommendations with respect to the justifiability of any significant adverse environmental effects.

APPENDIX 6 CLARIFICATION FROM THE CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY REGARDING THE PANEL'S MANDATE TO CONSIDER ENVIRONMENTAL EFFECTS



Canadian Environmental
Assessment Agency

Agence canadienne
d'évaluation environnementale

President

Président

160 Elgin St., 22nd floor
Ottawa ON K1A 0H3

160, rue Elgin, 22^e étage
Ottawa ON K1A 0H3

MAR 06 2013

Mr. Bill Ross
Chair, Federal Review Panel
New Prosperity Gold-Copper Mine Project
c/o Mr. Livain Michaud
160 Elgin Street, 22nd Floor
Ottawa, Ontario
K1A 0H3

Dear Mr. Ross:

Thank you for your letter of March 4, 2013, wherein you have asked for clarification of the Terms of Reference for the Review Panel (the Panel) conducting the environmental assessment of the New Prosperity Gold-Copper Mine Project (the Project). More precisely, you are seeking a response to the following question:

Is the Panel's assessment of the "environmental effects" of the New Prosperity Gold-Copper Mine Project (Project) limited to the definition in section 5 of the Canadian Environmental Assessment Act, 2012, S.C. 2012, c. 19 (CEAA 2012), or must the Panel also consider the "environmental effects" of the Project as defined in Appendix 1 of its Amended TOR.

On August 3, 2012, the Minister of the Environment amended the Panel's Terms of Reference to reflect the fact that, with the coming into force of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) on July 6, 2012, the environmental assessment of the Project was to be continued and completed under CEAA 2012.

The definition of environmental effects that is found in Appendix 1 to the Panel's Terms of Reference has not been amended and remains as it was prior to the coming into force of CEAA 2012 and prior to the August 3, 2012, amendments to the Terms of Reference. This means that in conducting the assessment of the environmental effects of the Project in a manner consistent with CEAA 2012 and with the Panel's Terms of Reference (see section 2.1 of the amended Terms of Reference), the Panel must also consider the "environmental effects" of the Project as defined in Appendix 1 of the amended Terms of Reference.

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- 2 -

Through the August 3, 2012, amendments to the Terms of Reference, the Minister added a new requirement for the Panel, that applies at the reporting stage of its mandate, to identify which of its conclusions/recommendations relate to "environmental effects" as defined in section 5 of CEAA 2012. This new requirement can be found in section 6.1 of the amended Terms of Reference.

Following completion of the environmental assessment by the Panel and the submission of its report to the Minister of the Environment in accordance with Part 6 of the Amended Terms of Reference, the Minister, as required under section 47 of CEAA 2012, will then make the decisions referred to in subsection 52(1) of CEAA 2012.

I wish you well in the completion of your important work on this project review.

Yours sincerely,

<original signed by>

Elaine Feldman

APPENDIX 7 LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
2D	two dimensional
3D	three dimensional
µg/L	microgram per litre
µm	microns
Agency	Canadian Environmental Assessment Agency
AP	acidification potential
ATV	all-terrain vehicle
BC	British Columbia
BCWQG	<i>British Columbia Water Quality Guidelines</i>
CaCO ₃	Calcium carbonate
CEAA	former <i>Canadian Environmental Assessment Act</i>
CEAA 2012	Canadian Environmental Assessment Act, 2012
CEAR	Canadian Environmental Assessment Registry
cm	centimetre
COC	contaminants of concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CN	Canadian National (Railway)
CWQG	<i>Canadian Council of Ministers of the Environment Water Quality Guidelines</i>
dBA	decibel
dBA L _{eq}	A-weighted decibels equivalent sound level
dBA L _d	A-weighted daytime equivalent sound level
EA	environmental assessment
EIS	Environmental Impact Statement
GDP	gross domestic product
ha	hectares
HADD	harmful alteration, disruption and destruction
HRT	hydraulic (water) residence time
km	kilometres
km ²	square kilometres
kg/ha/y	kilograms per hectare per year
KV	kilovolts

L/s	litres per second
The Minister	Minister of the Environment
MMER	<i>Metal Mining Effluent Regulations</i>
m	metres
M	million
masl	metres above sea level
m/s	metres per second
MDP	mine development plan
MW	megawatts
m ²	square metres
m ³ /day	cubic metres per day
m ³ /s	cubic metres per second
mg/L	milligrams per litre
Mm ³	Million cubic metres
Mt	Million tonnes
NP	neutralization potential
NWPA	<i>Navigable Waters Protection Act</i>
The Panel	Federal Review Panel
PM _{2.5}	particulate matter less than 2.5 micrometres in diameter
PM ₁₀	particulate matter less than 10 micrometres in diameter
The Project	New Prosperity Gold-Copper Mine Project
SARA	<i>Species at Risk Act</i>
TLOC	Taseko Lake Off-Channel
TP	total phosphorus
Taseko	Taseko Mines Ltd.
TSP	total suspended particulate
US	United States