PROSPERITY GOLD-COPPER PROJECT
PROJECT REPORT SPECIFICATIONS

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LIST OF ABBREVIATIONS USED IN THIS DOCUMENT

AIA	Archaeological Impact Assessment
AP	Acid generating potential
ARD/ML	Acid rock drainage/metal leaching
CAEAL	Canadian Association for Environmental Analytical Laboratories
CaNP	Carbonate neutralization potential
CCG	Canadian Coast Guard
CCLUP	Cariboo-Chilcotin Land Use Plan
CCME	Canadian Council of Ministers of Environment
CDC	Conservation Data Centre
CEAA	*Canadian Environmental Assessment Act*
CEE	Cumulative environmental effects
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPUE	Catch per unit effort
DFO	Department of Fisheries and Oceans
DO	Dissolved oxygen
EA	Environmental Assessment
EA Act	British Columbia *Environmental Assessment Act*

EAO or EA Office	Environmental Assessment Office
EDQA	Environmental Data Quality Assurance
EIA	Environmental impact assessment
Executive Director	Executive Director of the Environmental Assessment Office
FMEA	Failure mode and effects analysis
FPC	Forest Practices Code
GPS	Global positioning system
IRM	Integrated Resource Management Zone
ISO	International Standards Organization
kV	Kilovolts
MAE	Multiple Accounts Evaluation
MDAP	Mine Development Assessment Process
MDL	Minimum detection limit
MDP	Mine development plan
MELP	Ministry of Environment, Lands and Parks
MEM	Ministry of Energy and Mines
$MJ/m^2/d$	Megajoules per square metre per day
ML	Metal leaching
mm/d	Millimetres per day
MOF	Ministry of Forests
MOH	Ministry of Health
MSDS	Material safety data sheet
MSBTC	Ministry of Small Business, Tourism and Culture
MW	Megawatts
NNP	Net neutralization potential
NP	Acid neutralizing potential
NPAG	Non-potentially acid generating
NPR	Neutralization potential ratio
NSR	Net smelter returns
PAG	Potentially acid generating
QA/QC	Quality assurance/quality control
RIC	Resource Inventory Committee
RoW	Right-of-way
SBFEP	Small Business Forest Enterprise Program
SEI	Sensitive Ecosystem Inventory
SLIM	Small Lakes Information Management
RA	(federal) Responsible Authority
TEM	Terrestrial Ecosystem Mapping
TSS	Total suspended solids

PART A: INTRODUCTION & BACKGROUND INFORMATION

INTRODUCTION

OVERVIEW OF THE PROSPERITY GOLD-COPPER PROJECT

Taseko Mines Limited of British Columbia (hereafter referred to as "Taseko Mines", "Taseko" or the "proponent") proposes to develop the Prosperity Gold-Copper Project (the "Prosperity Project" or the "project") located 125 km southwest of Williams Lake in South Central British Columbia. The general location of the proposed project is shown in Figure 1.

The project would involve a high volume open pit mine development. Conventional mining methods using large-scale electric shovels and haulage trucks would be used. Preliminary mine planning indicates that an ultimate open pit would be conical in shape, 1700 - 2140 m in diameter at the top, and 825 - 880 m deep. In addition to the mine and associated tailings and waste rock areas, the project includes development of an onsite mill, an approximately 125 km long power transmission line corridor, an access road and BC Rail concentrate transfer station facilities at Williams Lake.

The Prosperity deposit is a gold-copper porphyry ore deposit which lies within a sulphide-impregnated hydrothermal alteration zone, encompassing a diorite porphyry intrusive complex. Estimated mineable reserves are in the order of 675 million tonnes of ore at an average grade of 0.24% copper and 0.43 grams/tonne of gold. At an estimated throughput rate of 60,000 to 90,000 tonnes per day, Taseko forecasts that metal production would be 222,360 to 376,000 ounces of gold and 99 to 156 million pounds of copper per year, depending on the project design and operation selected.

Metallurgical and mill process testing conducted by Taseko indicate that conventional crushing, grinding and staged flotation would recover on average 73.2% of the gold and 87.3% of the copper. The standard flotation process would produce a concentrate averaging 24.2% copper, 37.4 grams per tonne of gold and 89 grams per tonne of silver. After processing at the mill, concentrates would be trucked to the BC Rail mainline at Williams Lake.

Construction of the project is estimated to take 26 months, with a construction labour force averaging 250 persons and peaking at 700 persons. Depending on the project design and operation selected, Taseko estimates that the average number of jobs at the mine site during operations would be 400-700 per year, and that there would be an additional 900-1,500 indirect and induced jobs each year over the 21-24 year life of the project. Taseko now states that the expected investment associated with the project would be $900 million ($600 million for start-up construction and $300 million for capital replacement costs). Annual operating costs estimated at $150 million would be over and above this.

PURPOSE OF THIS DOCUMENT

The Taseko Mines Prosperity Project is being reviewed under the harmonized British Columbia *Environmental Assessment Act* (EA Act) and *Canadian Environmental Assessment Act* (CEAA) review process. As part of this process, Taseko must file a joint Project Report/Comprehensive Study (the "Project Report").

The purpose of this document is to set out the Project Report Specifications, or terms of reference, for the Project Report to be prepared by Taseko Mines. The Project Report Specifications have been prepared by the Executive Director of the B.C. Environmental Assessment Office (the "EA Office") on the recommendation of the Prosperity Project Committee (the "Project Committee"), which includes representatives of federal and provincial agencies (assisted by technical staff within their agencies), local governments and First Nations. In developing its recommendations, the Project Committee considered input received from the public during a 28-day public comment period on draft Project Report Specifications, as well as input from Taseko Mines.

Part A of this document provides an overview of the project being proposed and the background to the current review. In accordance with section 24 of the EA Act, Part B of this document sets out the Project Report Specifications.

BACKGROUND ON THE PROJECT APPLICATION AND REVIEW PROCESS

PROSPECTUS SUBMITTED UNDER THE MINE DEVELOPMENT ASSESSMENT PROCESS

Prior to June 30, 1995 when the *Environmental Assessment Act* came into effect, proposed mine projects in British Columbia were reviewed under the Mine Development Assessment Process (MDAP) pursuant to the *Mine Development Assessment Act*. Following review under this process, recommendations were made with respect to the issuance of a Mine Development Certificate which would permit the project to proceed.

In accordance with the MDAP, in August, 1993 Taseko Mines filed a "Pre-Application For A Mine Development Certificate" for the project, which at that time was called the "Fish Lake Project"[1]. This document outlined the technical, environmental and socio-economic aspects of the proposed project, and provided the preliminary data required to determine the Terms of Reference for an Application for a Mine Development Certificate.

Provincial staff responsible for managing the MDAP initiated a review of the August 1993 Pre-Application. Provincial, federal and local government agencies, First Nations and the general public were given the opportunity to review the Pre-Application and provide comments on the project.

[1] Taseko Mines formally changed the name of the project from the Fish Lake Project to the Prosperity Gold-Copper Project in late 1995.

TRANSITION UNDER THE *ENVIRONMENTAL ASSESSMENT ACT*

On June 30, 1995, the British Columbia *Environmental Assessment Act* was proclaimed, thereby combining previous review processes for energy, major industrial, and mining projects into a single comprehensive review process. The purposes of the EA Act are: to promote sustainability by protecting the environment and fostering a sound economy and social well-being; to provide for the thorough, timely and integrated assessment of the effects of reviewable projects; to prevent or mitigate adverse effects; to provide an open, accountable and neutrally administered process; and to provide for participation by the public, proponents, First Nations, local, provincial and federal governments, and neighbouring jurisdictions.

The process supports sustainability by ensuring that major projects are constructed and operated in a manner that avoids or reduces environmental and other adverse effects, and provide economic and social benefits over the long term. The process:

- is neutrally administered through the EA Office;
- is comprehensive in scope, covering environmental, social, economic, cultural, heritage and health effects;
- is open and transparent, and requires project documentation to be placed on a Project Registry available to the public;
- has prescribed timelines for each step in the review process to ensure timely assessments;
- requires public comment periods with prescribed timelines;
- requires the creation of an inter-governmental Project Committee to be established for each proposed project accepted for review under the EA Act;
- provides for up to three stages of review to ensure that reviews are tailored to the complexity and significance of the project's effects; and
- requires joint decision-making by the Minister of Environment, Lands, and Parks and the "responsible" minister to ensure balanced decisions. The responsible minister for mining projects is the Minister of Energy and Mines.

By means of Transition Order No. M357 dated June 30, 1995, the Prosperity Project was transferred to the new Environmental Assessment Process at a step known as "delivery of draft report specifications to proponent". The period of time prescribed for the preparation of the draft Project Report Specifications was ordered to begin from the date that the Project Committee met for the first time. From that date, the time limits set out in the "Prescribed Time Limits Regulation" of the EA Act would apply. Accordingly, a Project Committee was established and met for the first time on September 7, 1995.

Prior to the September 7 meeting, preliminary draft Project Report Specifications were prepared by the EA Office, with the assistance of Hemmera Resource Consultants Ltd., based on the comments received in response to the 1993 Pre-Application document. Following this meeting, Project Committee members and their technical staff began a review of the draft specifications to ensure that their issues had been appropriately included, and to suggest any revisions. Following this review, the draft specifications were to have been provided to the public for review, then finalized and provided to the proponent.

A second Project Committee meeting was held on September 29, 1995 to review Taseko responses to the preliminary draft Project Report Specifications, and to determine the process and timelines to complete the Project Committee review of the draft specifications. At that meeting, it was confirmed that the project would be subject to the provisions of both the British Columbia *Environmental Assessment Act* and the *Canadian Environmental Assessment Act.*

During and subsequent to the review of Taseko's 1993 Pre-Application document, the federal Department of Fisheries and Oceans (DFO) and provincial Ministry of Environment, Lands and Parks (MELP) had raised concerns about the effects of the proposed mine development plan on the Fish Lake system. Both agencies requested that a revised mine development plan, or alternative mine development plans, be developed. Concerns about the effects on Fish Lake and its tributataries led DFO to withdraw from the review in October 1995. As a result the review was placed in abeyance.

In response to this development, Taseko Mines developed additional mine development plans having the potential to completely or partially preserve Fish Lake and associated fish habitat. In early 1997, the EA Office invited DFO to rejoin the review of the project to consider these alternatives. DFO indicated it would participate in a joint review process to review all mine development options.

DEVELOPMENT OF PROJECT REPORT SPECIFICATIONS

The EA Office re-established the Project Committee in early 1997, inviting federal and provincial government agencies, local governments and First Nations to participate. A list of the current Project Committee membership is contained in Appendix 2. The committee met on June 25, 1997, at which time Taseko Mines presented three mine development plan options:

- Option 1 would have the smallest pit development and less than full development of the ore body. At a production rate of 60,000 tonnes of ore mined per day, the mine life would be approximately 24 years and direct annual employment would be 400. Pit development would affect Fish Creek downstream of Fish Lake, while the tailings management would affect the Tete Angela watershed and creek system. Fish Lake would be retained with a 200m buffer between the northern most shore of the lake and the southern pit rim. (See Figure 2)

- Option 2 would have the largest development of the pit as safety factors would require a shallow gradient on the pit wall adjacent to the lake, and full development of the ore body. At a production rate of 90,000 tonnes of ore mined per day, the mine life would be approximately 21 years and direct annual employment would be 700. Pit development would affect Fish Creek downstream of Fish Lake and partially impact Fish Lake, while tailings management would impact a larger portion of the Tete Angela watershed than would be the case in Option 1. (See Figure 3)

- Option 3 would have a slightly smaller pit than Option 2 and full development of the ore body. At a production rate of 90,000 tonnes of ore mined per day, the mine life would be approximately 21 years and direct annual employment would be 650. Pit development would affect Fish Creek downstream of the lake while tailings and waste rock management facilities would affect Fish Lake and upper Fish Creek. The entire development would be confined to a single watershed. (See Figure 4)

During development of the draft Project Report Specifications, government review agencies searched for means to reduce and mitigate negative effects on productive fish habitats. This resulted in the suggestion of a fourth option which would eliminate possible effects on the Tete Angela watershed. Taseko Mines responded to this suggestion by conducting further assessment of Option 4:

- Option 4 would have the same pit development as Option 2 and the tailings impoundment would be located further up (to the southeast) the Fish Creek watershed (see Figure 5). Six variations of Option 4 were investigated: four (4A, 4B, 4C, and 4D) using areas progressively further up the Fish Creek watershed, one using a combination of Option 3 and 4D, and one using a combination of 4D and an area located on Cone Hill in the Tete Angela system.

After further assessment, review agencies suggested that Taseko concentrate on variants 4C and 4D as they were of the opinion that variants 4A and 4B may not allow for the preservation of the Fish Lake fish population. Taseko indicated it would continue to search for the best variant of Option 4, in consultation with the agencies, and report the results of its findings in the Project Report.

The Project Committee developed draft Project Report Specifications addressing all the alternatives and mine development plan options considered. This is in accordance with section 22(b) of the EA Act, which allows for a Project Report to include an assessment of alternative sites considered, and section 16(2) of CEAA which requires an assessment of alternative means of carrying out the project that are technically and economically feasible, and the environmental effects of any such alternatives. The original application was not amended as the original proposal was still under consideration.

Four technical subcommittees were established in June 1997 dealing with specific topic areas: water quality and acid rock drainage (ARD); geotechnical considerations; fish, fish habitat and fish compensation issues; and issues related to the transmission corridor and wildlife. The technical subcommittees were open to all members of the Project Committee and technical advisors within member agencies. From July 1997 to January 1998, the subcommittees worked in cooperation with Taseko Mines to ensure all issues were identified, discussed and clarified to the greatest extent possible prior to issuance of the draft specifications. The purpose was to develop a common understanding of the issues among review agencies and between review agencies and the proponent, and to minimize the risk that issues would be overlooked. The work of the Project Committee and technical subcommittees was supported by technical presentations and supplementary information provided by Taseko. A list of key project documents provided by Taseko to date is included in Appendix 3.

The Project Committee worked with Taseko to identify issues and develop draft Project Report Specifications in a timely manner. However, the process was proceeding under an expired time limit under the EA Act. Therefore, an Extension of Time Order was required pursuant to Section 90 of the EA Act. On January 7, 1998, the Minister of Environment, Lands and Parks signed an Extension of Time Order that set the deadline for preparation of draft Project Report Specifications and delivery of a copy of the draft Project Report Specifications to the proponent at February 6, 1998.

The draft Project Report Specifications were prepared and delivered to Taseko Mines under cover of a letter dated February 6, 1998. The draft Project Report Specifications were then made available to the public for comment pursuant to section 16 of the EA Act. The public comment period was set at 28 days, starting on February 20 and closing on March 20, 1998. During this period, the public was invited to submit comments on the draft specifications, which were then taken into consideration by the Project Committee in finalizing the specifications.

In addition to inviting written comments on the project, the EA Office held public forums to ensure that public issues and concerns were identified and addressed. Members of the Project Committee and technical subcommittees attended the public forums to discuss the issues, answer questions, and hear comments. Representatives of Taseko were also invited to attend. The public forums were held in Williams Lake on February 25, 1998 and in Alexis Creek on February 26, 1998.

Following the close of the public comment period, the Project Committee had 20 days (until April 9, 1998) to finalize the Project Report Specifications. These final specifications are being provided to Taseko Mines along with a request to prepare a Project Report and to submit that report to the Executive Director for review.

NEXT STEPS IN THE REVIEW

There is no time limit within which Taseko must submit its Project Report. However, once the Project Report is submitted, the EA Office will have 25 days to screen the report to determine if it meets the final form of the Project Report Specifications and can be accepted for review. If accepted, another public comment period will be established during which the public will be invited to review and provide comments on the Project Report. This comment period will be between 45 and 60 days. Additional public forums will be arranged to obtain public input on the Project Report.

Following this, the Project Committee will have 70 days to consider all the information submitted and comments received and make recommendations to the Executive Director. The Executive Director will then refer the Project Committee recommendations to the Minister of Environment, Lands and Parks and the Minister of Energy and Mines, who will then have 45 days to make a decision on whether to certify or reject the project, or require further review through a public hearing. Federal agencies will convey the findings of the assessment to the federal Minister of Environment for decision.

HARMONIZATION WITH THE *CANADIAN ENVIRONMENTAL ASSESSMENT ACT*

The *Canadian Environmental Assessment Act* (CEAA) was proclaimed in January 1995, establishing for the first time in a federal statute a process for conducting environmental assessments of projects involving the federal government. An environmental assessment is required if a federal authority[2] exercises one or more of the following duties, powers or functions in relation to a project:

- proposes the project;
- contributes any other form of financial assistance to the project;
- sells, leases or otherwise transfers control or administration of federal land to enable the project to be carried out; or
- exercises a regulatory duty in relation to the project, such as issuing a permit or licence or granting an approval, that is included in the Law List regulation.

In the case of the Prosperity Project, the responsible federal authority is the Department of Fisheries and Oceans (DFO).

To avoid duplication of review processes, the Canada-B.C. Agreement for Environmental Assessment Cooperation (the "harmonization agreement") has been negotiated between the federal and provincial governments. The goal of this agreement is to ensure projects subject to both pieces of legislation are reviewed under a single review process which meets both federal and provincial requirements. Under the harmonization agreement, the environmental assessment is conducted under the B.C. process; however, both governments retain their respective decision-making authority at the completion of the review. The Prosperity Project is subject to CEAA and triggers the Comprehensive Study requirements under that Act. In accordance with the provisions of the harmonization agreement, the Project Report will also serve as the CEAA Comprehensive Study.

With harmonization, both federal and provincial environmental assessment requirements are to be addressed and included in the Project Report. Where the cooperative environmental assessment fails to meet the requirements of CEAA, the federal government continues to participate in the review process being conducted under the EA Act. However, the federal government would meet the components of its requirements that are not being met by the B.C. process through additional studies or review procedures.

For the Prosperity Project, the Department of Fisheries and Oceans has advised that section 6.5.3 of these Project Report Specifications does not meet its requirements with respect to the

[2] A federal authority is defined as a federal Minister of the Crown, an agency or body of the federal government that is accountable to Parliament through a federal Minister to the Crown for the conduct of its affairs, or a federal department. A federal authority that has specified decision-making responsibility relating to a project is responsible for ensuring an assessment is carried out in compliance with CEAA, and is referred to as the Responsible Authority (RA).

contents of a Comprehensive Study Report. Accordingly, Canada and B.C. concur that, consistent with Section 18 of the harmonization agreement, Canada will continue to participate in the B.C. process, but will separately meet its additional comprehensive study report requirements with respect to section 6.5.3 through additional studies or review procedures.

RELATIONSHIP OF ENVIRONMENTAL ASSESSMENT PROCESS TO LAND USE PLANNING PROCESSES

The EA Act process and the CEAA process are project-specific review mechanisms. Neither is designed to be a land use planning mechanism. The harmonized environmental assessment process assesses projects within the context of the prevailing land use policy and planning framework of an area. Where a recognized land use plan exists, as is the case in the Prosperity Project area, the environmental assessment process evaluates the degree of compatibility of a development proposal with any specific land use planning objectives set in the vicinity of that development, whether set by the province or by local government.

The Prosperity Project is located in the Cariboo-Chilcotin District, an area that contains a mix of rural agricultural lands, small acreage holdings and Crown forest lands. The Cariboo-Chilcotin Land Use Plan (CCLUP) provides broad direction for sustainable use of Crown land and resources in this region. The plan divides the area into four zones:

- Enhanced Resource Development Zone
- Integrated Resource Management Zone
- Special Resource Development Zone
- Protected Areas.

The project development area is located within an Integrated Resource Management Zone (IRM), within which the following conditions apply:

- Some specific sites within this zone will be appropriate for enhanced resource use.
- Forestry, mineral/placer exploration and mining development, cattle grazing, tourism, recreation, wildcraft/agroforestry, fishing, trapping and hunting are appropriate activities.
- Management objectives for this zone will aim to integrate all values: social, environmental and economic.

More specific to mineral exploration and mine development, the CCLUP states:

> "The mineral and placer industries will have full access to all three zones [not Protected Areas] for exploration and mine development, subject to regulations of applicable statutes. Full access means that all (100%) of the land outside of protected areas is available to exploration and development, guided by the *Mineral Tenure Act* and the *Mines Act*. This respects the industries' requirement for as large a land base as possible to explore for "hidden" resources and recognises that the more intensive activities and impacts tend to be focused on the relatively small areas found to have potential for economically viable mineral occurrences."

The mine site and vicinity is currently zoned RR-1 (Rural 1) under the Cariboo Regional District's Bylaw 1000. Permitted uses in this zone related to mining activities include:

- extracting raw materials from the land, including crushing and screening, provided no further processing takes place on site; and
- temporary construction, exploration or work camps operated by or on behalf of a Government Agency, Government Department, or registered company for the temporary living accommodation of its employees, provided the method by which sewage is to be disposed of is satisfactory to the Medical Health Officer. On completion of the project concerned, the camp shall be removed and the site restored to a satisfactory condition.

Therefore, a zoning amendment would be required for the plant site to allow further processing of the ore and permanent accommodation for mine staff.

PART B: PROJECT REPORT SPECIFICATIONS

1 GENERAL INSTRUCTIONS FOR DEVELOPMENT OF THE PROJECT REPORT

1.1 SCOPE OF THE PROJECT AND REVIEW

1.1.1 SCOPE OF THE PROJECT

Under the EA Act, the "reviewable project" includes the facilities at the main site of the project, designated offsite facilities related to the project, and designated activities related to the project. Under CEAA, the project includes any proposed construction, operation, modification decommissioning, abandonment or other undertaking in relation to the physical work. The scope of the project under CEAA is determined by the responsible authority, DFO.

For the Prosperity Project, the scope of the project under review must therefore include all these considerations to meet the requirements of both acts and is determined by the Project Committee, which includes representation from DFO and the EA Office. In general, the scope of the project to be covered in the Project Report includes the construction, operation decommissioning and abandonment of:
the mine, mill, tailings, waste rock and other "onsite" facilities;
the access road, transmission line and other related offsite facilities; and
related activities.

More specifically, the following list identifies the facilities and activities that are considered reviewable components of the project.

Facilities

Facilities at the Main Site of the Project:

- open pit development
- tailings storage site(s)
- waste rock storage site(s)
- mill flotation plant and associated infrastructure, including tailings pipeline and make-up water pipeline(s)
- ore and low-grade ore stockpiles
- non-acid generating stockpiles
- temporary overburden stockpiles
- overburden borrow/pit areas
- site drainage works, clean water diversions and pollution control works
- other mine site infrastructure.

Designated Offsite Facilities Related to the Project

- transmission line
- access road
- BC Rail concentrate transfer station facilities in Williams Lake.

Activities

- mining, milling and storage of non acid generating (NPAG) waste rock
- acid rock drainage (ARD) management
- trucking of concentrate from the mine site to Williams Lake
- transfer of concentrate to BC Rail facilities in Williams Lake
- mitigation and compensation
- reclamation in accordance with the "Application Requirements" for a permit approving the Mine Plan and Reclamation Program pursuant to the *Mines Act* R.S.B.C. 1996, c.293.

1.1.2 SCOPE OF REVIEW

In the Project Report, Taseko is required to provide the following information related to these facilities and activities:

Alternatives Assessment

- identification of alternatives for facilities and activities included in the scope of the project
- process used to assess alternatives, select preferred alternatives, develop project development plan options, and select the proposed project development plan to be put forward in the Project Report
- comprehensive description of the proposed project development plan.

Report on the Proposed Project Development Plan

- identification and assessment of potential effects, including all potential adverse effects, during the construction, operational, closure and post-closure stages of the project
- plans and designs to avoid, mitigate or compensate for all adverse effects
- determination of residual effects, taking into account proposed mitigation and compensation
- assessment of residual effects based on a determination of their significance
- plans for residual effects monitoring and management
- conceptual plans for the reclamation of all disturbed areas, including a description of how these plans were developed
- identification and assessment of the potential effects of accidents and malfunctions that may occur in connection with the project, and contingency plans to deal with such accidents and malfunctions.

Cumulative Effects Assessment

- an assessment of the potential cumulative effects of the project.

Two key terms are used throughout this document related to the facilities and activities set out above:

"Proposed Project Development Plan" means the final project proposal being put forward by Taseko Mines for review, after the full assessment of alternatives, and includes all facilities and activities, both onsite and offsite, included in the scope of the project as defined above.

"Proposed Mine Development Plan" (MDP) means the onsite facilities as listed above that are included in the proposed project development plan, and all aspects of the activities in the proposed project development plan that occur onsite.

1.2 ORGANIZATION OF THE PROJECT REPORT SPECIFICATIONS

The Project Report Specifications are set out under the following main headings:

- purpose of the project
- assessment of alternatives and selection of proposed project development plan
- mine development plan and reclamation program
- environmental issues
- social and economic issues
- cultural and heritage issues
- First Nations issues
- public comments
- cumulative effects assessment.

Within each general heading, the Project Report Specifications have been subdivided into key topic areas. As appropriate, the specifications include three components:

1. at the introduction to the topic, a preamble to set the context for the specification and the rationale behind information requirements;
2. following the preamble, or immediately after the topic heading where there is no preamble, a box containing the primary requirements with respect to information, analyses, plans or other records related to that topic that the proponent must provide in the Project Report;
3. further direction and guidance on how to fulfil the requirements, for example by elaborating on the content of required studies, the methods to be used, or the manner in which the information is to be reported.

In developing the Project Report Specifications, the Project Committee has attempted to provide Taseko Mines with directions and guidance to ensure the Project Report adequately addresses the requirements set out in the boxes. However, it is recognized that during the time between issuance of the Project Report Specifications and submission by Taseko of its Project Report, it may be practical and beneficial to revise the direction and guidance provided. For example, such revision may be required where better methods are identified, where practical problems arise in implementing the existing directions, or where the results of ongoing studies identify a need for changes. To address this possibility, the Project Committee will determine any recommendations with respect to changes in consultation with Taseko Mines.

1.3 GENERAL INSTRUCTIONS FOR PRESENTATION OF INFORMATION

The following are general instructions regarding the presentation of information in the Project Report.

- Maps, figures, graphics and tables are to be properly labelled, include appropriate legends and scales, be legible, and be of an appropriate size to display the information being illustrated. Unbound versions of key maps should be provided for quick reference.
- Units of measurement used should be consistent throughout the report.
- Data tables are to be complete and are to include summary statistics. Where these data are referenced in the report, the location of raw data tables should be noted. When statistically derived data are used in the assessment of effects, or to characterize sample populations, tables showing these data must also be referenced. Where appropriate, maps should be used to provide spatial context for the data and effect interpretations. Rationales for data interpretations should be explicitly stated and comprehensive.
- Quality assurance/quality control (QA/QC) data generated, including laboratory data, must be interpreted and assessed.
- For data and information collected prior to the preparation of these Project Report Specifications and prior to the development of the Resource Inventory Committee (RIC) standards referred to within these specifications, Taseko is advised to consult with the appropriate agency or technical subcommittee to review the acceptability of the data/information. Agencies will provide Taseko with written reasons for accepting or refusing to accept the data/information through the appropriate technical subcommittee, or through the Chair of the Project Committee where no appropriate subcommittee has been established.

Since the Project Report will be a complex and lengthy document, it is suggested that special attention be paid to organizing and cross-referencing sections, and the use of appendices.

2 PURPOSE OF THE PROJECT

The *Canadian Environmental Assessment Act* requires that the purpose of the project be included in the Comprehensive Study Report.

- Taseko Mines is required to describe clearly the specific objectives that the proposed project intends to achieve. In addition to an overall project purpose, discuss the purpose of each of the project facilities and activities and their relevance to the overall project development plan.

3 ASSESSMENT OF ALTERNATIVES AND SELECTION OF THE PROPOSED PROJECT DEVELOPMENT PLAN

To minimize adverse effects and maximize beneficial effects, in consideration of the technical, environmental, economic, social, spatial and temporal parameters of the project, Taseko must ensure careful selection of the proposed project development plan from among the alternative means of carrying out the project. Optional project development plans will be determined by combining complementary, technically and economically achievable alternatives for the various facilities and activities included in the scope of the project, as set out in 1.1.

Taseko Mines put forward three mine development plan options for development of the Prosperity Project. The three mine development plans were presented to the Project Committee for the first time at a meeting held in June, 1997. During the process of developing the draft Project Report Specifications, a fourth option was also advanced by the Fisheries Technical Subcommittee. In developing its proposal, Taseko has also considered alternatives for other facilities comprising the project, including the transmission corridor and access road, and alternative means of carrying out project activities.

Taseko Mines is required to provide the following information in sequence:

- Identify all reasonable alternatives for the facilities and activities included in the scope of the project, as set out in section 1.1. Provide the rationale applied to identify alternatives. Where only one alternative was considered, such that an assessment of alternatives may not be appropriate, provide a full explanation of why only that alternative was considered.

- Document and provide the rationale for the criteria, factors, information, methods and processes used to assess the alternatives, select preferred alternatives, and combine them to form the project development plan options.

- Document and provide the rationale for the criteria, factors, information, methods and processes used to select the proposed project development plan from the project development plan options.

- Provide a comprehensive description of the facilities and activities that constitute the proposed project development plan.

The identification and assessment of alternatives, selection of preferred alternatives, development of project development plan options, and selection of the proposed project development plan should be conducted within a defined and transparent process, based on the steps set out below. Taseko is not expected to conduct the same detailed level of analysis that will be required for the proposed project development plan, once selected. However, Taseko should refer to the specifications set out in the balance of the document as they provide guidance on the project-related issues that are of concern to review agencies. For example, in assessing alternatives for pit development, reference to sections 6.5.2.1, 6.5.2.2 and 6.5.3

clarifies requirements for the preferred option and provides guidance as to the issues of concern with respect to the protection of fish and fish habitat during assessment of the project alternatives.

Taseko Mines has been working with review agencies in an iterative process to develop these steps. It is expected that this iterative process will continue through completion of the alternatives assessment requirements as outlined below.

1. Identification of a candidate list of alternatives for assessment

The candidate list of alternatives will include alternatives for the construction, management and control technologies for the various components being considered. This step will also include the rationale used to identify alternatives. While not an exclusive list, Taseko should ensure the following points are covered in this step with respect to particular project components:

Pit Development Alternatives

Explanation of the following factors is required in identifying potential pit development alternatives:

- open pit versus underground mining or a combination of underground/open pit mining, including consideration of mounting an underground operation from within an Option 1 pit to avoid pit intrusion into Fish Lake rather than expanding to an Option 2 pit
- pit development that preserves Fish Creek in its present configuration
- pit development that delays moving Fish Creek as long as technically feasible
- pit development that avoids pit intrusion into Fish Lake, including consideration of an intermediate between pit options 1 and 2 that would preserve the integrity of the deep water habitat in Fish Lake
- pit development that avoids or minimizes post-closure maintenance of all structures required to maintain diversions, water control structures or fish habitat.
- criteria used in identifying alternatives, including a summary, at a conceptual level, of the resources potentially at risk with the various pit alternatives and associated closure measures.

Tailings/PAG Waste Rock Impoundment Alternatives

Explanation of the following factors is required in identifying tailings/PAG waste rock impoundment alternatives:

- alternative milling processes as they may relate to ultimate tailings management practices and selection of suitable disposal methods and locations that may minimize impacts to fish and wildlife habitat as well as other environmental resources
- alternative tailings and waste rock management regarding the location and configuration of the tailings facilities
- alternative tailings impoundment design, management and closure options to minimize environmental resource impacts associated with each alternative site
- alternative tailings management practices, storage efficiencies and use of local construction materials

- assessment of spatial/distal boundaries used in identifying tailings/PAG waste rock impoundments, including technical, economic and environmental factors
- site-specific conditions as they may relate to surface water management, maintaining water quality and habitat values from an operational and closure perspective
- multiple tailings sites
- minimizing footprints of the impoundments within fish-bearing watercourses
- criteria used in identifying alternatives, including a summary, at a conceptual level, of the resources potentially at risk with the various tailings disposal alternatives and associated closure measures.

Mill Makeup Water Pipeline Alternatives

A number of issues should be addressed in developing alternatives for makeup water sources and pipeline alternatives. Makeup water also includes any water usage that may be required for tailings pond and pit flooding. These issues relate to siting concerns and if there are adequate sources of water available. An explanation of the following factors is required in identifying potential mill makeup water supply alternatives:

- criteria used in identifying potential makeup water sources, including environmental resources and potential risk to them
- criteria used in identifying potential pipeline routes.

Waste Rock Storage Alternatives

This heading deals with waste rock storage sites constructed separately from the tailings/PAG waste rock facilities discussed above. Many of the siting considerations for tailings/PAG waste rock sites also apply to waste rock storage sites. The latter sites can also impact upon fish and wildlife and other environmental resources through direct physical disruption, ongoing operations and post-closure performance.

Explanation of the following factors is required in identifying waste rock storage site alternatives:

- alternative tailings and waste rock management plans regarding the location and configuration of the waste rock storage site facilities, such as alternatives that would crush and convey waste rock so that dump sites may be located in non fish-bearing waters
- criteria used to select the waste rock storage site design, management and closure options to minimize environmental resource impacts associated with each alternative site
- criteria used in identifying alternatives, including a summary, at a conceptual level, of the resources potentially at risk with the various waste rock storage site alternatives and associated closure measures
- assessment of spatial/distal boundaries used in identifying alternative waste rock storage sites, including technical, economic and environmental factors
- site-specific conditions as they may relate to surface water management, maintaining water quality and fish habitat values.

Water Treatment and Treated Water Discharge Alternatives

If so required, identify alternatives for water treatment and treated water discharge that would be necessary to meet CCME or other current guidelines. Explain what criteria were used in identifying potential water treatment and treated water discharge alternatives, including a

summary, at a conceptual level, of resources potentially at risk associated with waste water treatment/discharge alternatives during operation, closure and post-closure phases.

Transmission Line Alternatives

Explanation of the following factors is required in identifying potential transmission line alternatives:

- criteria used in identifying and selecting power source (hydro-electric versus generation) alternatives.
- criteria used in identifying potential transmission line corridors, including: project cost estimates; technical and engineering considerations (e.g. suitability of terrain and surficial ground features to provide foundations for supporting powerline structures); and environmental resources and land uses (e.g. agriculture, recreation, forests, cultural and heritage resources, private land, and mineral resources), navigation, and Aboriginal interests potentially at risk with the various power transmission alternatives.

2. Analysis of candidate alternatives

While requirements for a full assessment of the proposed project development plan are outlined elsewhere in the specifications, a conceptual level analysis is required of potential alternatives identified in Step 1 above. The objectives of this step are to determine specific indicators to be used to rank alternatives, with associated units of measurement, exclusion criteria, and impacts upon these criteria. The components of this analysis will be based on consideration of specifications for the various topics (e.g. sections 6.1, 6.3.6, 6.4.4, 6.5.3, 7, 8, 9 etc.), with a level of detail commensurate with achieving the above objectives. Details of these components of analysis will be developed by the proponent in consultation with agencies, and in general terms would include technical and engineering considerations, environmental effects, navigation, social and economic effects, effects on cultural and heritage resources, health and safety effects, effects on Aboriginal interests, and project cost estimates.

Alternatives are to be analyzed in terms of, where relevant, maximum anticipated impact to resources identified as potentially at risk in Step 1 during development, operation, closure and post-closure phases.

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3. Elimination of unachievable alternatives

Based on the analysis in Step 2, identify alternatives which may be eliminated from the list as they are not achievable. Provide the rationale used to determine which alternatives are not achievable, including identification and explanation of exclusion criteria.

4. Identification of potentially achievable alternatives

Based on the analysis in Step 2, identify alternatives which are potentially achievable and ranked high relative to others to combine into potential project development options. If elements that rank lower on this scale are retained, appropriate justification is required.

5. Identification of project components with one preferred alternative

For some project components, there may be one preferred alternative that will be the same whichever alternatives are selected for other project components. This is expected to be the

case for project components that do not form part of the mine development plan, including the access road and transmission line corridor, since the criteria, methods and processes used to select preferred alternatives for these components will be largely independent of the selection of the preferred mine development plan components. The rationale for selection of each of these preferred alternatives must be provided.

6. Identification of mine development plan options

For some project components, the selection of the preferred alternative will be highly dependent upon the selection of other project components. This is expected to be the case for components of the mine development plan, including the pit, tailings impoundment and waste rock storage areas. Project components that have ranked highly in Step 4 will be combined into several potentially achievable mine development plan options, considering physical or engineering constraints in their combination.

The rationale for selecting the particular combinations of alternatives that comprise the mine development plan options must be provided, with detailed explanation provided should alternatives ranked lower in Step 4 be included. This step should include consideration of how the selection of technologies to be used will affect the management plans. For example, the use of tailings "paste" technology would affect the tailings disposal methods and tailings management strategy.

7. Assessment and comparison of mine development plan options

An assessment and comparison of the potentially achievable mine development plan options will be conducted through the application of Multiple Accounts Evaluation (MAE). The objective of the MAE is to provide a clear basis for recording and comparing accounts to derive a preferred mine development plan. The MAE will be used as a tool to assist in the identification of the preferred mine development plan option that will form part of the proposed project development plan. The methodology and rationale (including potential weighting, ranking and scaling factors) used to select the preferred option must be provided.

8. Description of the proposed project development plan

The preferred mine development plan identified in Step 7, plus the preferred alternatives for other project components identified in Step 5, together will form the proposed project development plan to be assessed in detail in the Project Report. A comprehensive description of the proposed project development must include all these components.

4 METHODOLOGY FOR ENVIRONMENTAL IMPACT ASSESSMENT OF THE PROPOSED PROJECT DEVELOPMENT PLAN

To meet the requirements of both the EA Act and CEAA, potential effects to be considered in the environmental assessment (EA) of a proposed project should include direct and indirect effects on: environmental factors, including air and water quality, fish and other aquatic resources, wildlife, terrain and soils, and vegetation; other resource uses; economic and social factors; archaeological and other heritage and cultural resources; and health. In addition, any potential effects on the exercise of First Nations' traditional uses and activities must be identified and assessed.

Taseko must identify and describe, at a preliminary level, the potential effects associated with the proposed project before mitigation and compensation is implemented, then describe the mitigation and compensation proposed. However, the detailed environmental assessment of the proposed project development plan, and development of environmental management programs, is to be based upon the significance of any potential effects *residual* to the project planning effort, that is, taking into account the mitigation and compensation measures proposed. Residual effects should be defined by comparing projected conditions with and without the project, assuming that planned mitigation and compensation measures will be implemented and effective. The mitigation and compensation plans must identify, evaluate and account for the risks and potential consequences associated with failure of the planned measures.

The EA should be based on a comprehensive description of the proposed project development plan, as required in section 3, including designs and measures to avoid, mitigate or compensate for anticipated adverse effects. The EA methods should be clearly described to ensure that reviewers readily understand how environmental effects were analyzed, how residual effects were determined, how the significance of residual effects was determined, and how environmental management plans were arrived at. The criteria and methodology used in arriving at significance determinations must be clearly specified.

The study area for the EA should be based on the areal extent of project facilities and activities and their likely effects. It should encompass:

- the immediate mine area plus the corridors for the transmission line and access road
- those specific areas in which the direct and indirect effects of the project may be felt
- a wider area for comparison purposes when assessing the significance of those effects.

The effects analysis should consider the magnitude, areal extent, duration, frequency and reversibility of residual effects. The analysis should consider both the cumulative effects and assimilative capacity of the receiving environment. The likelihood of the occurrence of effects should be assessed separately. Taseko Mines is expected to continue working with review agencies during development of the Project Report to discuss and further clarify the methodology to be used.

5 MINE DEVELOPMENT PLAN AND RECLAMATION PROGRAM

Taseko Mines is required to provide sufficient information to clarify the proposed configuration of the pit, tailings and waste rock storage areas, water diversion(s), plant site and associated infrastructure, definition of the ore body, acid rock drainage/metal leaching (ARD/ML) management, mine closure and reclamation. The information provided in this section may become a portion of a future application for a mine permit under the *Mines Act*.

5.1 MINE DEVELOPMENT PLAN INFORMATION

The following Project Report specifications are prepared in accordance with requirements under the *Mines Act* and 'Health, Safety and Reclamation Code for Mines in British Columbia". It must be noted that some information requirements relate specifically to mine development plan Options 1 and/or 2. Therefore, Taseko Mines is required to fulfil these information requirements only if Option 1 or Option 2 is the proposed mine development plan (MDP) put forward in the Project Report. For all other specifications, the information requirements apply regardless of the preferred MDP option.

5.1.1 CONCEPTUAL MINE PLAN

Taseko Mines is required to:

- Provide a conceptual mine plan for the preferred MDP covering:
  - proposed pit
  - definition of reserves with cut-off grades
  - assumed metal prices
  - processing and plant site infrastructure, including tailings pipeline, make-up water pipeline and reclaim water pipeline
  - low-grade ore storage
  - ore storage
  - non-potentially acid generating (NPAG) waste rock storage
  - temporary overburden storage
  - temporary potentially acid generating (PAG) waste rock storage
  - overburden borrow/pit areas
  - tailings/waste rock impoundment
  - stream diversions, if applicable
  - Fish Lake dam, if applicable.

- Provide plan views of the site, relating the drill hole locations, geology and cross-section locations. Include plans and sections of the pit at variable time intervals throughout the life of the mine and at closure. Ensure plans show the proposed open pit excavation with the ultimate pit outline, as well as the location , size, and volume of the overburden/surficial materials stockpiles, waste rock dumps, low-grade ore and ore stockpiles, tailings/waste rock impoundments and plant site. Document the expected lithologies/alteration/mineralization to be exposed during mining which may influence discharge quality during operations and post-closure.

- Provide the rationale for the location of all temporary and permanent mine components including: size and volume of the waste rock and low-grade ore stockpiles, overburden/surficial material stockpiles, tailings/waste rock impoundment, plant site, transportation routes, and any other proposed temporary or permanent mine site component.

- Prepare a risk assessment based on "failure mode and effects analysis" (FMEA) of the open pit, tailings storage facility, tailings and reclaim water pipelines, waste rock storage areas, fisheries compensation structures and mill site.

Conceptual plans must be in sufficient detail to provide assurance that the project can proceed in a safe and environmentally sound manner, and that all potential adverse effects are identified and can be prevented or adequately mitigated and/or compensated for. As a guideline for conceptual information the company should refer to Appendix 1 of the "Application Requirements for a Permit Approving the Mine Plan and Reclamation Program Pursuant to the *Mines Act* R.S.B.C. 1996, c.293". It is recommended that this information include at least three NSR values to account for variations in waste rock quantities that might affect the handling of potential ARD/ML materials for the pit configurations of the proposed project development plan..

5.1.2 OPEN PIT

Taseko Mines is required to:

- Provide a conceptual design for the open pit that addresses the following:
  - the potential for pit wall instability of all pit slopes in the upper soil zones and adjacent to Fish Lake, and any diversion structures.
  - potential for drainage from Fish Lake or seepage from the Fish Lake watershed into the pit.

- Provide estimates and proposed management of pit inflows and outflows.

- Provide the results of rock slope stability studies in conjunction with the pit wall design.

- If Option 1, 2 or 4 is the proposed mine development plan, provide an assessment of the potential for piping of lake water between the lake bottom and the pit. Provide a contingency plan in the event that excessive seepage into the open pit is observed.

Standard practice for pit design is to design for 10-15% of pit walls to suffer distress. If Fish Lake is to be preserved the pit wall adjacent to Fish Lake should be designed for 0-5% of that wall to suffer distress. There may a similar requirement for pit design below permanent stream diversions near the pit crest.

5.1.3 GEOTECHNICAL WORK

Geotechnical data must provide assurance that all mine components will function as proposed. This is particularly important for the tailings impoundment.

Taseko Mines is required to:

- Provide the results of geological, geotechnical and geohydrological site investigations that must specifically include the location of the waste rock dumps, tailings/waste rock impoundments, temporary stockpiles, process facilities, open pit and, if applicable, Fish Lake dam.

- Complete geotechnical drilling to determine structural and rock mass properties that will influence behaviour and design of the open pit walls.

- Provide a conceptual slope monitoring program to assess pit stability.

The geotechnical drilling to determine structural and rock mass properties that will influence behaviour and thus design of the pit walls should include boreholes oriented in accordance with geological structure, that will allow confident interpretation of the rock structures and rock mass strength characteristics of the proposed pit walls in various sectors. The number of sectors must not be less than the cardinal quadrants.

5.1.4 TAILINGS IMPOUNDMENTS AND STORAGE PLANS

The dam design height must accommodate the tailings and permanent saturation of PAG waste rock, as these materials accumulate in the impoundment. In the event of an unscheduled mine closure, PAG material must be kept fully saturated to limit oxidation.

Taseko Mines is required to:

- Provide conceptual plans for the tailings dam. Dam plans must ensure adequate stability for site conditions, contaminated seepage control, QA/QC construction control, construction material properties and loading conditions. Conceptual design details for the tailings impoundment must cover the range of possible production rates and consider the ability to segregate PAG and NPAG waste rock.

- Provide information on the filling technique and schedule for the tailings/waste rock impoundment.

- If Option 2 is the preferred pit configuration, provide conceptual designs for the Fish Lake dam. Dam designs must ensure adequate stability for site conditions, construction material properties and loading conditions.

- Provide conceptual information for design of the tailings pipeline and reclaim water pipelines.

5.1.5 WASTE ROCK STORAGE PLANS

Taseko Mines is required to:

- Provide profiles for each of the proposed NPAG waste rock storage area showing current topography, material composition, operational dumps and final dump height and configuration. Include conceptual design specifications (volume, thickness, frequency, source, etc.) for the final soil and/or till cap.

- Provide a contingency plan for handling of low grade ore and ore stockpiles in the event that mining ceases early.

- Conduct a risk assessment of the contamination of NPAG waste rock with PAG waste rock, using a combination of ARD/ML prediction data and the proposed waste management units.

- Provide geotechnical assurance of foundation stability.

5.1.6 MILL PLANS

Taseko Mines is required to:

- Develop conceptual mill plans that outline milling processes, waste management, chemicals and dangerous materials, water management, atmospheric emissions, storage tank management and spill management. The mill plans shall be consistent with standard engineering practices for mine development.

- Provide a single line mill process flowsheet showing solid and liquid balances, and supernatent recycle rates.

- Characterize tailings discharge parameters (chemistry, discharge rates, percent solids, acute toxicity, etc.). This characterization is to include discharges to the tailings impoundment, seepage and surface discharge from the tailings impoundment that may occur during operation and closure phases.

5.1.7 MINE SEQUENCING

Tailings and waste rock storage plans must be sequenced with open pit development to ensure that PAG material storage requirements are satisfied.

- Taseko Mines is required to provide a description and schedule of mine sequencing and materials handling throughout the mine life, with emphasis on tailings, NPAG and PAG waste rock. Ensure tailings and PAG waste rock are handled and stored in a timely manner that prevents short-term oxidation and metal release and the buildup of soluble weathering products. This description and scheduling is to include:
  - cover removal and storage (glacial till, Chilcotin Basalts, colluvium, and glacial lacustrine sediments)
  - construction material acquisition and usage and sequencing
  - PAG and NPAG waste rock, ore extraction and pit development (vertically and horizontally, sources, volumes, segregation and stockpiling)
  - relating of construction capabilities to the rate, sequencing and production of NPAG versus the generation of PAG waste rock and tailings material.

5.1.8 GEOLOGICAL INFORMATION

Taseko Mines is required to:

- Provide a discussion of the soils, surficial and bedrock geology of the deposit that includes geological maps and cross-sections. Maps should include the surficial geology and surface/subsurface bedrock geology of the area to be disturbed by the project, and of any surrounding area that may be subject to environmental effects. Where appropriate, the following geologic parameters should be included:
  - lithologic descriptions including age, colour, grain size, mineralogy, physical strength, hardness, weathering characteristics, depositional setting, and correlations
  - spatial distribution and thickness of lithologic units
  - alteration styles, mineralogy, occurrence and intensity
  - structural fabric (i.e. fractures, faults, foliation, lineations, etc.) and structural relationships
  - ore mineralogy, including sulphide types, abundance, mode of occurrence, extent of previous oxidation and an estimate of relative sulphide reactivity
  - type and grade of metamorphism
  - regional geologic framework including tectonic belt, terrane, regional metamorphism and structure.

- Delineate the regional and local geological structures in the project area that may affect the proposed infrastructure, and show their potential effect on the proposed infrastructure and ARD/ML mitigation. This includes major structural features as well as lesser local structures.

For further detailed requirements regarding soils refer to section 6.6.

5.1.9 CONDEMNATION WORK

Due to the large area proposed for the facilities, there is a need to evaluate the potential for discovery of significant mineral deposits in areas which will be permanently covered by tailings or waste rock, or alienated by fisheries mitigation/compensation works.

Taseko Mines is required to:

- Prepare a compilation of all available geological, geophysical, geochemical, drilling, trenching and other relevant exploration information for areas which may be affected.
- Evaluate the potential for the discovery of additional porphyry copper-gold deposits or other deposit types.

The compilation of geological, geophysical, geochemical, drilling, trenching and other relevant exploration information should include a summary of past exploration work, and a review of available exploration information, regardless of ownership of subsurface rights. Descriptions of all known mineral occurrences, and results of all drill holes and trenches should be included.

Condemnation work may consist of surface surveys, trenching and drilling. In addition to drill-testing of any new anomalies and exploration targets, drilling results from widely spaced condemnation holes should be provided. A density of one hole per one to five km^2 is reasonable, depending on the complexity of the geology. Geotechnical holes may partially cover this requirement, provided they extend far enough into bedrock.

5.1.10 SPILL PREVENTION

Taseko Mines is required to:

- Discuss operational plans for the transportation, storage, containment and spill response for all the various reagents, fuels, road de-icing and dust suppression chemicals, and other potentially harmful commodities which will be transported to and from the mine site and utilized at the site. Include material safety data sheets (MSDS), where available, for all reagents and any other chemicals used in the milling process.
- Provide conceptual plans for dealing with spills, in particular from the tailings pipeline, and warning equipment to detect and prevent spills. The plans shall encompass all activities within the proposed project development area, including activities related to the transportation of material to or from the mine site along transportation routes between Williams Lake and the mine site, and including loading facilities in Williams Lake.
- Provide conceptual plans for dealing with concentrate spills arising from transport accidents and for dealing with incidents of heavy rainfall and/or run-off events at loading facilities associated with the project.

- Provide a conceptual assessment of the effectiveness of the designs for the various mine development plan components identified in section 5.1.1 in dealing with common failures that may result in spills of polluting substances to the environment.

For the conceptual plans for dealing with spills refer to "Summary of Environmental Standards and Guidelines for Fuel Handling, Transporting, and Storage, 2nd Ed." (MELP, December 1995) and "Guidelines for Industry Emergency Response Contingency Plans" (MELP, March 1992).

5.1.11 SEWAGE AND SOLID WASTE

Taseko Mines is required to:

- Provide a conceptual solid waste management plan which addresses the disposal options for all of the potential wastes generated on site during construction and operation (e.g. recycling, alternative uses, backhauling etc.). Plans for storage and recycling of Special Waste (used oil, solvents, antifreeze, etc.) must be included. Any impacts expected on the nearby Cariboo Regional District refuse site must be reported.

- Provide conceptual plans for disposal of sewage generated at the site during construction and operation, including estimated volumes and treatment options.

5.1.12 SEDIMENT CONTROL

Taseko Mines is required to:

- Provide conceptual plans for run-off discharge works and sediment control and collection works/measures for the roads, transmission line corridor, stockpiles, mill area, load-out facility, and waste rock and tailings areas during construction, operation and closure.

- Assess potential sedimentation impacts to aquatic habitats originating from site run-off, including roads, creek crossings, diversion ditches, overburden stockpiles, soil stripping, and construction activity. Identify locations of erosion-prone materials and areas requiring channel stabilization.

- Recommend mitigation measures for sedimentation impacts and develop plans for sediment control where required.

Sediment control measures should meet the Canadian Council of Ministers of Environment (CCME) 1993 "Water Quality Guidelines for Canada" criterion of 10 mg/l TSS above background for backgrounds less than 100 mg/l. (Note that these criteria are the same as the "Approved and Working Criteria for Water Quality, 1997 Edition" (In Press) produced by the Water Quality Section, Water Management Branch, MELP.)

5.2 RECLAMATION PROGRAM

A conceptual reclamation plan must be provided in sufficient detail to ensure that it meets the requirements of Part 10 of the "Health, Safety and Reclamation Code for Mines in British Columbia". As with the mine development plan information, Taseko should refer for guidance to Appendix 1 of the "Application Requirements for a Permit Approving the Mine Plan and Reclamation Program Pursuant to the *Mines Act* R.S.B.C. 1996, c.293".

5.2.1 RECLAMATION PLANNING INFORMATION

- Taseko Mines is required to provide a conceptual reclamation plan that includes the following:
  - reclamation planning information (maps and descriptions) corresponding to the stages of mine construction, 5-year mark, and mine closure, which must include interim reclamation objectives, proposed end land uses and the means by which reclamation work will achieve objectives. The above parameters must be supported by information on soil conditions, the natural plant succession and plant communities to be established through reclamation.
  - soil salvage and replacement, including soil requirements pertaining to ARD/ML prevention
  - as much detail as possible on the requirements for soil handling, salvage and stockpiling, including a soil handling plan, salvage requirements and stockpile requirements
  - water quality assessments, predictions, management, treatment and sludge disposal
  - a conceptual program for care and maintenance procedures in the event of a temporary shutdown.

Information on salvage requirements should cover:

- descriptions of the soils (or suitable overburden) to be salvaged
- what materials or layers to strip separately and how to operationally distinguish them
- total depth to be salvaged
- erosion control and sediment retention measures required for exposed surfaces
- anticipated volumes of each soil type.

Information on stockpile requirements should cover:

- description of conceptual soil stockpile locations and volume
- what layers or materials are to be stored separately, and why
- storage requirements, including erosion control and sediment retention
- descriptions of stockpile treatments during the storage period
- opportunities for direct hauling.

The conceptual reclamation plan should be prepared to minimize impacts to natural grassland communities through use of native seed sources and to minimize the risk that deleterious substances may be deposited into watercourses after closure.

5.2.2 FINAL RECLAMATION PLAN

- Taseko Mines is required to provide a conceptual final reclamation plan for the closure or abandonment of the project, in reference to parts 10.5 and 10.6 of the "Health, Safety and Reclamation Code for Mines in British Columbia". This plan must include specific reclamation objectives and methodologies for all site facilities, including building removal, upon completion of the mine. The conceptual final reclamation plan must address the information requirements set out below. Should departure be made from these information requirements, such departure must be discussed with and agreed to by Taseko and the Chair of the Project Committee, in consultation with the Regional Reclamation Inspector.

End land use objectives
Clearly identify end land use objectives for the mine site at a suitable map scale (1:10,000). Map(s) should overlay the closure configurations of the pit, tailings, waste rock dumps, and any other facilities to remain following closure. The text must describe the means by which the proposed reclamation program will achieve the end land use objectives. Achievement of these objectives should also be clearly reflected throughout the reclamation and mine plans, and should be an integral part of operations throughout the mine life.

Productivity or capability objectives
Identify the general means by which productivity or capability objectives will be achieved, and the specific yardsticks by which reclamation success will be measured or determined, for each of the specified end land use objectives.

Long-term stability
Address the long-term stability, both physical and chemical, for all structures and discharges from the mine site. This includes a description of the major design assumptions to be used for major facilities and proposed post-closure monitoring and maintenance. Structures or design features required for long-term ARD prevention require special attention in this description.

Treatment of structures and equipment
Specify what structures and/or equipment would remain in place following mine decommissioning, and what, if any, reclamation treatments are proposed.

Waste dump and stockpile reclamation
Describe waste rock dump reclamation, including anticipated final configurations, proposed re-sloping, post-closure water management surface treatment to alleviate compaction, details of soil replacement, a description of proposed revegetation methods, and long term monitoring and maintenance requirements. Conceptual post-mine cross-sections must be provided along with a map illustrating section locations. In general, short dump lifts (50 m or less) are encouraged. Dumps must be designed to accommodate the proposed end land use(s), and to allow for proper placement and retention (through hydraulic and geotechnical management) of salvaged growth media.

Tailings reclamation
Describe proposed tailings reclamation in detail, including the anticipated final impoundment configuration, any proposed resloping, post-closure water management, details of soil replacement on tailings dam faces (if not constructed with suitable growth media at surface) and the impoundment surface (if it is not to remain flooded following closure), a description of proposed revegetation methods, final tailings surface and seepage water quality predictions, and long term monitoring and maintenance requirements.

Pit reclamation
Describe whether or not the pit (or portions) will be flooded at closure and if so, details of water quality, and any discharges to the receiving environment. Proposed reclamation/revegetation measures to be undertaken within the pit area must be described. Develop conceptual plans to reclaim pit walls above the diversion stream to stabilize erosion and reduce ARD. Assess whether water quality treatment would be needed to meet regulatory requirements at the pit outlet once the pit is full and describe any long term maintenance requirements.

Watercourse reclamation
Provide details of the re-establishment of post-mine watercourses and mine site water management.

Road reclamation
Make provision to reclaim roads where applicable (this will apply to most locations unless there is a specific elevation, terrain or other exemption agreed to by the Chief Inspector of Mines, MEM) and decommission to ensure geotechnical and hydraulic stability. There may be reasons for some site roads to be retained post-closure. Preliminary identification of roads to be exempted from reclamation requirements is expected to be made during the course of the project review.

Operational and post-closure monitoring
Provide conceptual long term monitoring plans for flooded structures, such as the tailings impoundment and PAG waste rock storage. Note that long-term monitoring may be required for geotechnical, ARD, trace elements, revegetation, sedimentation or other requirements depending upon the site and closure plan.

First Nations Interests
Consult with First Nations regarding reclamation planning and consider First Nations' values in developing a reclamation plan.

Reclamation planning requires an understanding of soil conditions in order to develop efficient soil handling plans which will result in suitably reclaimed soil conditions to meet end land use and capability/productivity objectives in a cost efficient manner. Details of the specific requirements related to terrain and soils are located in section 6.6 and details related to vegetation are in section 6.7. Additional components that may be required in the reclamation plan to address fish and fish habitat issues are set out in section 6.5.

6 ENVIRONMENTAL ISSUES

6.1 CLIMATE AND AIR QUALITY

The climate and air quality studies are required to assess potential effects of the project on air quality, including any potential effects on human health. Climate data collection is also in support of section 6.2 Hydrology and Water Management.

6.1.1 METEOROLOGY

- Taseko Mines is required to provide a description of the climate in the vicinity of the mine site in accordance with the directions set out below.

Meteorology stations are to be located in Fish Creek Valley and in the vicinity of the tailings impoundment for mine development plan Options 1 and 2. The sites to be used are shown as sites M4 and M5 of Figure 6. These sites should be in a location that will not be disturbed by future mining activity so as to allow for continued operation of the sites should the project proceed. If the monitoring location is disturbed, it should be relocated a short distance away to remain within the same topographic regime.

Data to be provided from the Fish Creek Valley site (M5) shall include temperature (daily maximum, minimum and mean), precipitation (non-freezing periods only; mm/d), wind speed and wind direction, barometric pressure, and total solar radiation ($MJ/m^2/d$). Data to be collected at site M4 are temperature (daily maximum, minimum and mean), precipitation (non-freezing periods only; mm/d), wind speed and wind direction. Establishment and maintenance of the stations shall include checks on towers for vertical alignment and orientation of wind vanes for true north.

Taseko is referred to the following documents for guidance in establishing and operating the meteorological stations: "M.I.S. Station Installation Procedures", MELP, June 5, 1987; "B.C. Ministry of Environment and Parks Erection and Maintenance Procedures for Guyed Wind Tower," MELP, August 26, 1987; and "On-site Meteorological Program Guidance for Regulatory Modelling Applications," U.S. EPA, June 1987.

6.1.2 FINE PARTICULATES

- Taseko Mines is required to provide baseline inhalable particulate data (PM_{10}) collected at a suitable location in the vicinity of the mine site in accordance with the directions set out below.

The site shall be located off any road with traffic such that it is not excessively influenced by road dust. One year of data collected on a rotational six-day schedule is required.

6.1.3 DUSTFALL

- Taseko Mines is required to provide baseline dustfall data collected from sites within the ultimate perimeter of the tailings impoundment and sites around the mill site to establish existing dustfall characterization. This requirement shall be fulfilled in accordance with the directions set out below.

Data for mass of dustfall per area per time and metal concentration in the dustfall must be collected at the dustfall sites indicated in Figure 6. The sites shall be located so as to minimize disturbance and relocation should the project proceed. A baseline database of one sample per site per month for one year is required. Each site must have at least one duplicate for metals concentration for QA/QC. Minimum Detection Limits (MDLs) for metals in dustfall should be as shown in Table 1.

Table 1: Minimum Detection Limits for Metals in Dustfall

Elements	Detection Limits (mg/dm2/day)
Aluminum	0.005
Antimony	0.005
Arsenic	0.005
Barium	0.0002
Beryllium	0.0001
Bismuth	0.002
Cadmium	0.0002
Calcium	0.001
Chromium	0.0004
Cobalt	0.0004
Copper	0.0002
Iron	0.03
Lead	0.001
Lithium	0.0004
Magnesium	0.0002
Manganese	0.0001
Molybdenum	0.0007
Nickel	0.0005
Phosphorus	0.007
Potassium	0.048
Selenium	0.005
Silver	0.0004
Sodium	0.048
Strontium	0.00002
Thallium	0.002
Tin	0.007
Titanium	0.0002
Tungsen	0.002
Vanadium	0.0007
Zinc	0.0001

6.1.4 ASSESSMENT OF CLIMATE DATA

- Taseko Mines is required to assess climate data to establish baseline climate conditions, to assist in the air quality predictive work and to assist in the hydrology and water management work. This requirement shall be fulfilled in accordance with the directions set out below.

The assessment of climate data must include the following:

- Comparison of the data collected with data from existing and past Atmospheric Environmental Service stations in the area (Tatlayoko, Big Creek, Alexis Creek, Puntzi Mountain).
- An assessment of climate data collected that includes:
  - site maps showing locations of meteorological stations, and reporting of latitude and longitude to 0.0001 degrees
  - comparisons to minimum and maximum expected bounds and rates of change
  - table and chart outputs of wind roses, frequency distributions, hourly values, daily averages or totals
  - summary of completeness, accuracy, precision of the data
  - statistical summary of the data for each month
  - documentation of servicing and calibration and of data gaps
  - precipitation intensity-duration-frequency curves for the mine site.

6.1.5 EMISSIONS SOURCES AND AIR QUALITY ASSESSMENT

Taseko Mines is required to:

- Provide a listing of point source emissions from the mill complex. In addition, list and prioritize significant sources of fugitive dustfall from mining and milling activities and from transportation of concentrate, including loading facilities in Williams Lake, if any. Provide an assessment of the potential contribution of dustfall to soil and water contamination.

- Assess the potential for effects on human health from fine particulates in the nearby community of Nemiah Valley.

- Provide an assessment of air quality data collected in accordance with the directions set out below.

The assessment of air quality data must include the following:

- site maps showing locations of air quality stations, and reporting of latitude and longitude to 0.0001 degrees
- comparisons to minimum and maximum expected bounds and rates of change
- summary of completeness, accuracy, precision of the data
- statistical summary of the data for each month
- documentation of servicing and calibration and of data gaps.

Predict and describe nuisance dusting impacts in terms of potential frequency and severity.

Provide an assessment of impacts resulting from degradation of air quality on human health, visibility and metal contamination from dustfall on soil, vegetation, and surface water bodies.

Assess impacts resulting from degradation of air quality on human health, visibility, and metal contamination from dustfall on soil, vegetation, and surface water bodies.

Provide a conceptual mitigation plan to minimize impacts from dustfall and fine particulates, in particular, incidents of wind blown tailings beach materials. Outline dust control measures to be used.

Relate air quality observations to MELP air quality objectives.

6.2 HYDROLOGY AND WATER MANAGEMENT

6.2.1 SURFACE WATER HYDROLOGY

- Taseko Mines is required to report on surface water hydrology studies that can be used to:
  - assess the availability of dilution in the receiving environment
  - assist in the development of the site water balance as required in section 6.2.3
  - determine the sizing of run-off and sediment control works
  - determine water supply requirements
  - assess impacts on fisheries habitat and water licensees due to modification of stream flows
  - assist in the ARD prediction work.

  This requirement shall be fulfilled in accordance with the directions set out below.

Regional hydrology studies should be guided by the procedures set out in the MELP publication "A Procedure for Regionalization of Peak Flows in B.C." (February, 1997). The collection of hydrology data should meet the standards set in the Environment Canada, Water Resources Branch publications "Hydrometric Field Manual - Measurement of Streamflow" (1981) and "Hydrometric Field Manual - Measurement of Stage" (1983).

Maps should be included that show surface water hydrology monitoring sites. Include latitude and longitude of the sites. Maps shall be correct and consistent in showing the direction of drainages impacted by the project.

Report data for snow depth and water equivalent collected from a snow course located in the vicinity of the mine site (to be operated in accordance with "Snow Survey Sampling Guide", Water Management Branch, MELP, 1981), and correlation of site data with regional snow monitoring stations.

Include estimates of mean monthly and annual run-off, with confidence limits, for each catchment basin that may be impacted by any of the mining options. A unit run-off-basin elevation curve shall be established and correlated to data from neighbouring hydrometric stations with a longer record.

Provide seven-day low flow estimates for mean annual conditions and for a ten-year recurrence interval for each catchment basin at the site. Provide estimates of peak instantaneous flow and seven day low flows for 200, 100, 50 and 10 year return periods. Include staff gauge readings, stage discharge curves, and metering notes.

Provide an assessment of completeness of data and documentation of changes. Hydrometric stations must be regularly checked for QA/QC, and details for all gauging sites are to be documented. These checks must include levelling of staff gauges against known bench marks and calibration of stations to account for stage shifts. Readings of staff gauges must be frequent enough to provide adequate resolution of peak and low flows. The stage discharge curves must be developed by metering over the entire range of flow conditions.

The impact of logging activities on the hydrological estimates used in water quality predictions in designing culverts, ditches and sediment control structures and on water balance estimates for the pit and tailings impoundment, shall be considered and accommodated where necessary during project design.

To assist with the ARD/ML prediction work, the hydrologic considerations shall include the following:

- Clearly demonstrate how current baseline and ongoing surface and groundwater quality and flow rates are anticipated to be altered by individual mine components, in particular the pit, ore and low-grade ore stock piles, waste rock pile, tailings/waste rock impoundment.
- Provide a detailed assessment and prediction for all site water discharges. This assessment must include volumes, water quality, discharge structures and location, potential impacts on the receiving environment and the description of any treatment processes. Describe contingency plans for excessive run-off events and drought conditions.
- Predict the surface run-off rate, water quality and control and mitigation strategies for surface run-off from the various mine components.
- Provide mitigation strategies to separate non-contaminated from potentially contaminated drainage, and to prevent erosion and sediment discharge during the construction, operational and closure phases.
- Provide details on the additional water requirements necessary to maintain the PAG material fully saturated. If exposure is expected, kinetic test work is required to determine an acceptable exposure period. (Further details on kinetic testing are contained in section 6.4.3.3.)

6.2.2 GROUNDWATER HYDROLOGY

- Taseko Mines is required to provide a comprehensive ground water assessment that determines if project related facilities and activities will impact groundwater flows and quantity, outlines the need for mitigative and/or monitoring measures, and assists with ARD/ML prediction work. The requirement shall be fulfilled in accordance with the directions set out below.

Provide results of a hydrogeological study which determines seepage rates and direction into or from the pit, waste rock dump and tailings impoundment areas, and any impacts on surface stream flows and surface water quality. Groundwater data is required to assess the extent and likelihood that the pit will flood at abandonment, and that groundwater will contribute to the tailings impoundment and waste rock dump water balance.

Determine the expected location and rates of seepage from the tailings impoundment, characterize the seepage quality, and define the proposed mitigation strategies. In particular, potential seepage to Vick and Slim Lakes in the case of Options 1 and 2, potential seepage to

6.3 WATER QUALITY AND AQUATIC ECOLOGY

6.3.1 WATER QUALITY MONITORING PROGRAM

- Taseko Mines is required to provide details of a water quality monitoring program conducted in accordance with the directions set out below.

6.3.1.1 Objectives

The objective of the water quality monitoring program is to provide a baseline data base that can be used to:

- characterize the range and measure of water and sediment quality and aquatic ecology characteristics
- predict, model and assess potential effects prior to development
- monitor and assess change during construction, operation, closure and post-closure
- formulate site-specific water quality objectives for the aquatic environment
- determine allowable maximum waste water discharge and seepage rates based on specific water quality objectives
- support the biological monitoring programs.

6.3.1.2 Monitoring Site Selection

Control and/or impact test sites are required on all potentially affected waters with aquatic resources or potential water uses requiring protection. Preliminary sampling data should be used to locate control and impact sites that have similar variability to maximize the detection of an impact or difference of a desired size between them. Wherever possible, sites should be located so that they will not have to be relocated significantly as development proceeds. The latitude and longitude for each monitoring site must be determined and reported to the nearest 0.0001 degrees.

Streams and Lakes
Sites must include those listed in Table 2 and shown approximately in Figure 7.

Table 2: Water Quality Sampling Sites

Water Body	Station No.	Option No.			
		1	2	3	4
Fish Creek upstream from Fish Lake	W1	C[1]	C	B	I
Fish Creek downstream from Fish Lake	W2	C	B	B	B
Fish Creek near mouth	W3	I	I	I	I
Taseko River upstream from mine (note that site W4 is downstream from the south channel of Beece Creek and thus may not be totally upstream from mine options 3 and 4. It is therefore desirable that more than one year of baseline data be collected at this station to ensure adequate characterization of baseline conditions).	W4	C	C	C	C
Taseko River upstream from Fish Creek	W5	C	C	C	C
Taseko River downstream from Fish Creek	W6	I	I	I	I
Fish Creek downstream from pit	W8	I	I	I	I
Taseko River downstream from outflow from Big Onion Lake	W9	N/A	N/A	I	I
Big Onion Lake outlet flow (sampling required only during periods of outlet flow)	W10	N/A	N/A	I	I
Beece Creek near mouth	W11	N/A	N/A	I	I
Beece Creek upstream from mine	W12	N/A	N/A	C	C
Vick Creek downstream from Vick Lake	W13	I	I	N/A	N/A
Taseko River downstream from Beece Creek	W14	N/A	N/A	I	I
Groundhog Creek (North Arm)[2]	W16	N/A	N/A	N/A	B
Tete Angela Creek E.	W17	C	C	N/A	N/A
Tete Angela Creek W.	W18	I	I	N/A	N/A
Taseko River downstream from mine (Options 3 & 4)	W19	N/A	N/A	I	I
Taseko River downstream from mine (Options 1 & 2)	W20	I	I	N/A	N/A
Spring North of Big Onion Lake (Southern Site)	W21	N/A	N/A	I	I
Spring North of Big Onion Lake (Northern Site)	W22	N/A	N/A	I	I
Vick Creek upstream of Lake	W23	I	I	N/A	N/A
Groundhog Creek[2]	W24	N/A	N/A	N/A	I
Big Onion Lake		N/A	N/A	I	I
Wasp Lake		N/A	N/A	I	I
Little Onion Lake		N/A	N/A	I	I
Rat Cabin Lakes (North & South)		I	I	N/A	N/A
Tete Angela Headwater Lake		I	I	N/A	N/A
Little Fish Lake		C	C	B	B
Big Lake		C	C	C	C
Slim Lake		I	I	F	N/A
Vick Lake		I	I	F	N/A
Fish Lake		I	I	B	I
Wolftrap Lake		N/A	N/A	F	I

[1] I=impact, C=control, B=baseline characterization, F=fisheries compensation, N/A = not applicable

[2] These sites would only be required for Option 4d, or other variants of Option 4 should surface water from the tailings impoundment catchment be diverted to Groundhog Creek.

Groundwater
Existing monitoring wells as shown in Figure 8 must be sampled. While not required for the Project Report, Taseko should note that prior to site development, groundwater wells should be established to sample aquifers in both surficial deposits and bedrock below at the following locations:

- downgradient from the pit
- downgradient from the waste rock piles
- downgradient from the tailings impoundment
- upgradient from the pit (for Options 1 and 2)
- in Groundhog Creek, downgradient from the tailings impoundment (for Option 4 depending on the variation selected).

The locations of these monitoring wells must be selected so that they are not disturbed by future development. One year of sampling must be completed prior to site disturbance.

6.3.1.3 Frequency and Duration of Monitoring

The following are minimum requirements for frequency and duration of monitoring.

Streams
Minimum of monthly for one full year, plus:

- weekly for five consecutive weeks starting with early spring freshet on the rising limb of the hydrograph for each stream as indicated by stream hydrology monitoring
- weekly for five consecutive weeks during low flows identified from stream hydrology monitoring. The lowest flows accessible for each stream should be monitored to represent base flow conditions most closely.

The timing of the weekly monitoring will be different for each stream, depending on elevation, aspect, snowpack, freezing conditions, etc., and the timing selected should be documented with respect to the stream hydrographs. If flow is non-existent due to freeze-up or dry conditions, then a monthly sample is not required, provided that flow conditions are documented for the sample period. Five-week intensive sampling should be timed to be completed prior to the stream in question drying or freezing up. For creeks whose duration of flow is less than five weeks (e.g. Big Onion Lake outlet), as many weeks of data as can possibly be collected must be obtained. At least once seasonally, including during the five consecutive weekly sampling, replicates (at least triplicates) shall be collected at each sampling site to evaluate instantaneous variability. This will enable statistical determination of the variability at each site to assess whether future changes in water quality are due to mine impacts or natural site variability.

Lakes

- Once at spring overturn at 5 m depth intervals for the variables in Table 3, plus dissolved oxygen and temperature profiles at 1 m depth intervals. An additional two years of data collected at spring overturn must be collected prior to site disturbance. Provide proposed plans for collection of additional lake data, possibly in a reduced number of lakes, as appropriate depending on the mine plan option selected.
- Dissolved oxygen and temperature profiles at 1 m depth intervals during late summer and late winter through the ice for one year. An additional two years of data to be collected prior to disturbance.

Groundwater

- All wells must be sampled quarterly for one year as a minimum.

6.3.1.4 Required Water Quality Variables and Minimum Detection Limits

Table 3 sets out the required water quality variables and minimum detection limits to be used.

Table 3: Surface and Groundwater Water Quality Variables

Variables	B.C. Water Quality Criteria[1]	Minimum Detection Limits[2]
Temperature, water (field)	1 ° C change (A)[3]	0.5 ° C
Oxygen, dissolved (surface water only)	5-11 mg/L (A)	0.1 mg/L
pH (field and lab)	6.5-9.0 (A) pH units	0.05 pH units (0.1 pH units for field measurement)
Specific Conductivity (field and lab)	not applicable	2 µS/cm
Filterable Residue	not applicable	1 mg/L
Total suspended solids	10 mg/L increase (A)[4]	1 mg/L
Turbidity (field and lab)	1-5 NTU increase (A, D)	0.1 NTU
Alkalinity, total	not applicable	1 mg/L
Sodium (groundwater only)	not applicable	0.5 mg/L
Sulphate	100 mg/L (A)[4]	1 mg/L
Fluoride	0.2-0.3 mg/L (A)	0.02 mg/L
Carbon, dissolved organic	not applicable	0.5 mg/L
Nitrogen, ammonia	0.1+ mg/L (A)	0.01 mg/L
Nitrogen, nitrite	0.02-0.2 mg/L (A)	0.002 mg/L
Nitrogen, nitrate	10 mg/L (AL, D)	0.005 mg/L
Nitrogen, Total (lakes only)	none	0.02 mg/L
Phosphorus, ortho dissolved	0.01 mg/L (A, D, R)	0.001 mg/L
Phosphorus, total dissolved	0.01 mg/L (A, D, R)	0.001 mg/L
Phosphorus, total	0.01 mg/L (A, D, R)	0.001 mg/L
Chloride	not applicable (re: nitrite toxicity)	0.5 mg/L
Hardness	not applicable (re: metal toxicity)	0.5 mg/L
Aluminum, dissolved	20 µg/L (A at pH 6) 50 µg/L (A at pH≥ 6.5)	2 µg/L 5 µg/L
Antimony, total & dissolved	20 µg/L (A), 6 ug/L (D)	0.6 µg/L
Arsenic, total & dissolved	5 µg/L (A), 25 µg/L (D)	0.5 µg/L

Table 3 continues next page.

Table 3 continued from previous page.

Variables	B.C. Water Quality Criteria[1]	Minimum Detection Limits[2]
Barium, total & dissolved	1000 µg/L (A, D)[4]	100 µg/L
Beryllium, total & dissolved	5 µg/L (A), 4 µg/L (D)	0.5 µg/L[5] (5 µg/L for groundwater)
Boron, total & dissolved	500 µg/L (I), 5000 µg/L (D, S)[4]	50 µg/L
Cadmium, total & dissolved	0.01 µg/L (A, 30 mg/L hardness) 0.06 µg/L (A, 210 mg/L hardness)	0.05 µg/L[5] (0.2 µg/L for groundwater)
Chromium, total & dissolved	2 µg/L (A)[4]	0.5 µg/L[5] (1.0 µg/L for groundwater)
Cobalt, total & dissolved	0.9 µg/L (A)	0.1 µg/L (1.0 µg/L for groundwater)
Copper, total & dissolved	2 µg/L (A)	0.2 µg/L (1.0 µg/L for groundwater)
Iron, total & dissolved	300 µg/L (A, D)[4]	30 µg/L
Lead, total & dissolved	3 µg/L (A)	0.3 µg/L (1.0 µg/L for groundwater)
Manganese, total & dissolved	50 µg/L (D), 100 µg/L (A)[4]	5 µg/L
Molybdenum, total & dissolved	10 µg/L (I), 50 µg/L (S, W)	1 µg/L
Nickel, total & dissolved	25 µg/L (A, hardness≤60 mg/L)	2 µg/L
Selenium, total & dissolved	1 µg/L (A)[4]	0.5 µg/L[5] (0.5 µg/L for groundwater)
Silver, total & dissolved	0.05 µg/L (A, hardness≤100 mg/L)	0.01 µg/L[5] (0.1 µg/L for groundwater)
Titanium, total & dissolved	100 µg/L (A, D)	10 µg/L
Uranium, total & dissolved	10 µg/L (I), 100 µg/L (D)	1 µg/L
Vanadium, total & dissolved	100 µg/L (D, I, S)	10 µg/L (30 µg/L for groundwater)
Zinc, total & dissolved	14-30 µg/L (A)[4]	1 µg/L (5 µg/L for groundwater)

1 "Approved and Working Criteria For Water Quality" (1997 draft), (Water Quality Section, Water Management Branch, MELP).

2 As defined in "B.C. Environmental Laboratory Manual", 1994. MDLs should be at least ten times below criteria to ensure accurate quantification at criteria levels. Higher detection limits will be accepted if lower ones are not commercially available or if environmental levels are ten times above the detection limits used.

3 A=aquatic life, D=drinking water, I=irrigation, S=livestock, W=wildlife, R=recreation.

4 Criteria are currently under review.

5 These MDLs do not meet the protocol of having MDLs that are one order of magnitude lower than set out in the "Approved and Working Criteria for Water Quality", (1997 draft). However, they are reported as being the lowest commercially available. The proponent is encouraged to seek lower detection limits for cadmium, chromium and selenium in particular since these MDLs are only ≤1x, 4x, and 2x, respectively, lower than set out in the "Approved and Working Criteria for Water Quality" (1997 draft), and the data may not be adequate for water quality objectives, impact prediction or baseline.

As outlined in the Quality Assurance section below, field blanks that have been processed in the same manner as water samples from the environment are required to document that the MDLs were actually attained without contamination.

Mercury monitoring in ambient waters is not recommended since levels are typically very low (e.g., 1 - 2 ng/L), and require ultra-clean measurement techniques and ultra-low detection limits (e.g., 0.1 ng/L) for accurate quantification. Instead, it is recommended that mercury be monitored in fish tissue, bottom sediments, and humidity cell leachate, column test cell leachate, and/or bench or pilot scale milling effluents.

6.3.1.5 Quality Assurance

- Taseko Mines is required to provide a quality assurance program for the water quality monitoring to document the quality and acceptability of the data produced in terms of detectability (contamination), precision and bias. This requirement shall be fulfilled in accordance with the directions set out below.

Document the quality assurance and quality control measures used in obtaining the data, as well as the data quality objectives used for data assessment. Include procedures for maximum sample hold times and sample bottle cleaning and storage prior to sampling. An evaluation of the quality of the baseline monitoring data must be presented to demonstrate its acceptability for use. The analytical laboratories used must be certified by the Canadian Association for Environmental Analytical Laboratories (CAEAL) or registered under the Environmental Data Quality Assurance (EDQA) Regulation pursuant to the *Waste Management Act*. The data acceptance criteria used by the laboratories must be presented.

The quality assurance program must include field blanks that are processed in the same manner as environmental samples and field replicates. In-house reference samples (in a concentration range of the same order of magnitude as that of the environmental samples, preferably submitted blind to the laboratory) are optional for the Project Report, but may be required for future monitoring of the project. The results from these samples determine the overall detectability (contamination), precision and bias, and hence, acceptability, of the results from the environmental samples. These results must be presented along with the results for the environmental samples. Other quality assurance samples that are useful in determining the acceptability of individual steps in the measurement process and locating the source of errors are laboratory blanks, sample bottle blanks, travel blanks, laboratory duplicates, and laboratory reference and spiked samples. The results from these samples need not be presented, but must be recorded and available on request.

The frequency of quality assurance samples shall be at least:

- Field blanks: one for each field sampling trip for each applicable variable.
- Field replicates: one duplicate for each sampling trip for each variable.
- Optional in-house reference samples: one for each field sampling trip for each applicable variable (maximum of once per month).

Detection Limits
Detection limits used shall be as specified in Tables 3, 5, and 6. Not more than 5% of the values for field blanks for a variable should have detectable values, nor should any blank value exceed five times the detection limits specified or the lowest associated result reported. Detectable blank values shall be flagged and taken into account in the interpretation of the associated results.

Precision
Field duplicates should have a difference of no more than 25% of their mean, and three or more field replicates should have a percent relative standard deviation = (SD/mean) x 100 of no more than 20%, when the replicate values collected at the same time and location are all ≥ five times the detection limit. Replicates exceeding these objectives shall be flagged, and the cause of the imprecision shall be investigated. The results for blank and reference samples may provide some insight. Interpretations using data exceeding these objectives shall take the imprecision into account.

Bias
The values for reference samples should be within the 95% confidence limits for the reference material if available, or within ± 20% of the known value for the reference sample. Values outside these objectives shall be flagged, and the bias taken into account in the interpretation of the results for the variable.

Sample hold times
The time-sensitive analyses in Table 3 and their Analytical Starting Times (if they have not been stabilized in an approved manner with chemicals or by freezing) from the 1994 B.C. Environmental Laboratory Manual are:

- 48 hours: nitrite, ortho phosphorus, and total dissolved phosphorus.
- 72 hours: pH, specific conductivity, turbidity, alkalinity, organic carbon, ammonia, and nitrate.

Sample travel and hold times shall be recorded and be available on request. Values for these analyses that were analyzed outside of the time limits should be flagged, and caution used in the interpretation of these values.

Additional QA/QC requirements for groundwater monitoring include the use of dedicated samplers for each well. Inline filters should be used for collection of dissolved metal samples to prevent precipitation of metals by exposure to air. Well casings and sampling equipment must not be constructed of materials that will leach metals into the groundwater to be sampled. Wells must be adequately purged to ensure representative groundwater samples. Generally this will require removing at least three well volumes prior to sampling; however, purging requirements must be determined for each well individually. To ensure that wells are adequately purged prior to sampling, field measurements of pH and conductivity must be collected during purging to determine that constant pH and conductivity are arrived at prior to sampling. In low yield wells, purging may be necessary a number of days in advance of sample collection. Well purging requirements must be established for each well in advance of the sample collection program. These requirements must be documented and repeated for each sample event.

Sampling procedures must be documented for all surface and ground water sampling. A reference to be used for sampling procedures is the "British Columbia Field Sampling Manual for Continuous Monitoring Plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples," 1996 Edition (Permittee), November 1996. A reference to be used for analytical procedures is the "British Columbia Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials," 1994 Edition (Permittee), March 1994.

6.3.2 SEDIMENT QUALITY MONITORING

- Taseko Mines is required to provide details of a sediment quality monitoring program conducted in accordance with the directions set out below.

6.3.2.1 Objectives

The objective of the sediment quality monitoring is to provide a baseline data base that can be used to:

- Assess change or impacts during construction, operation, closure and post-closure that may have relevance to toxicity and physical habitat requirements (e.g., particle size) for benthos fish eggs and alevin.
- Formulate site-specific objectives for the aquatic environment.
- Support the biological monitoring programs.

6.3.2.2 Sampling Sites

Identify sediment accumulation sites through reconnaissance and by using stream reach mapping. Depositional zones in the vicinity of the stream and lake water quality stations shown approximately in Figure 7 and specified in Table 4 shall be sampled, and additional samples should be taken wherever benthic invertebrate samples are collected.

Table 4: Sediment, Benthic Invertebrate, and Periphyton Sample Sites

Water Body	Station No.	Habitat Stratification	Site Type
Fish Creek	W2, W8, W3	pool/rifle	I[1]
Fish Creek	W1	pool/rifle	C/I
Beece Creek	W12	pool/rifle	C
Beece Creek	W11	pool/rifle	I
Tete Angela Creek W.	W18	pool/rifle	I/C
Tete Angela Creek E.	W17	pool/rifle	C
Taseko River	W4, W5, W6, W19, W20	pool/rifle	C/I
Groundhog Creek[2]	W16, W24	pool/riffle	C/I
Big Onion Lake		profundal	I
Wasp Lake		profundal	I
Wolftrap Lake[2]		profundal	I
Lower Taseko Lake		profundal	C
Little Fish Lake		profundal	I/C
Big Lake		profundal	C
Slim Lake		profundal	C
Vick Lake		profundal	I/C
Fish Lake		profundal	I

[1] I=impact; C=control
[2] Required only for Options 4c and 4d.

6.3.2.3 Required Sediment Quality Variables and Minimum Detection Limits

Table 5 sets out the required sediment quality variables and minimum detection limits.

Table 5: Sediment Variables

Variables	B.C. Sediment Quality Criteria for Aquatic Life[1]	Minimum Detection Limits[2]
Grain size distribution	not applicable	not applicable
% Moisture	not applicable	not applicable
Total Organic Carbon	not applicable	1 mg/g
Metal Analysis on <63 μm particle sizes (silt and clay)	All concentrations expressed on a dry weight basis in μg/g	
Antimony, total	0.43 - Ontario interim guideline	0.05
Arsenic, total	6	0.6
Cadmium, total	0.6	0.06
Chromium, total	26	2.6
Copper, total	16	1.6
Lead, total	31	3
Manganese. total	460	46
Mercury, total	0.17	0.02
Nickel, total	16	1.6
Selenium, total	5	0.5
Silver, total	0.5	0.1
Zinc, total	120	12

1 "Approved and Working Criteria For Water Quality"(1997 draft).

2 As defined in "B.C. Environmental Laboratory Manual", 1994. MDLs should be at least ten times below criteria to ensure accurate quantification at criteria levels. Higher detection limits will accepted if lower ones are not commercially available or if environmental levels are ten times above the detection limits used. The data for the former may not be adequate for establishing objectives and baseline.

6.3.2.4 Sampling Methods and Quality Assurance

The sampling methods used should be compatible with those in the "British Columbia Field Sampling Manual for Lake and Stream Sediment Sampling", 1996 Edition. It is recommended that sediment samples be collected to a depth of 5-10 cm to sample the recent sediments and to aid in interpretation of the benthic invertebrate data. Depth of sampling shall be consistent between replicates and sites for temporal and spatial comparability. At least five replicate samples shall be collected per site.

The degree of sensitivity for detecting spatial/temporal differences for the most variable substance of concern with varying sample sizes shall be reported for each site. The number of samples collected at a given site should strive to meet the target of detecting a 20% difference in the mean for the most variable substance of concern for that site. Care must be taken to ensure that there is minimal disturbance of the surface layers of the sediment samples and that the fine particulate fraction is retained for whatever sampling methods are used. Samples should be collected in wide-mouth, airtight, plastic or glass jars and stored in a dark location at 4°C (not frozen), unless freezing is a part of an acceptable protocol. Quality assurance measures as outlined in the above section on water quality shall be followed.

6.3.3 BENTHIC INVERTEBRATE MONITORING

- Taseko Mines is required to provide details of a benthic invertebrate monitoring program conducted in accordance with the directions set out below.

6.3.3.1 Objectives

The objectives of the benthic invertebrate monitoring program are to:

- Characterize the community diversity and abundance prior to project development so that changes due to project development, operation and closure can be evaluated.
- Support the fisheries studies.

6.3.3.2 Sampling Sites

Sites in the vicinity of the stream and lake water quality stations specified in Table 4 shall be sampled. Stratify sampling sites by riffles or pools (riffles for the more sensitive benthic invertebrates and pools where the highest concentration of fine particle sizes, most likely to have adsorbed contaminants, reside). In lakes, sample at least one site in a profundal depositional area. Provide a description, as indicated below, and rationale for selection of the sites sampled.

6.3.3.3 Sampling Methods

The sampling methods used should be compatible with those in the "Guidelines for Monitoring Benthos in Freshwater Environments" (Environment Canada, 1993). Natural substrates should be sampled wherever possible. Artificial substrates may be substituted at the Taseko River sites if sampling logistics using natural substrates are confounded by excessive depth or velocity. Regardless, the same sampling method should be used at a site over the life of the mine monitoring program for temporal compatibility of results. A maximum of 500 μm mesh size may be used for collecting samples for use in the Project Report.

While not required for the Project Report, Taseko should note that additional benthic invertebrate data using a mesh size for collection of ≤250 μm, with separate analysis of the collected samples sorted by >250 μm and <500 μm, is expected to be collected prior to site disturbance. The sorting of collected samples prior to analysis will allow some comparison with previously collected benthic invertebrate data.

Samples are required from late summer or fall during stable flows, from riffles for flowing waters and from pools or depositional areas for standing waters. In every case, control and impact sites for each watercourse or section of watercourse to be characterized should be as

similar in physical and biological habitat as possible. This requires documentation of stream velocity, depth, substrate size and type, gradient, and vegetative cover for each site and replicate.

For the baseline data requirements at the Taseko River site below Taseko Lake, it is recommended that repeated weekly sampling for three to five consecutive weeks be done to establish the nature of within-season variability, since this may not be a true control site for Option 3 (i.e., it may become an impacted site, depending on the discharge point of Beece Creek). Baseline information on intra-seasonal variability may assist in distinguishing between future changes due to seasonal variability and changes due to the mine. At other impacted sites, control stations will serve to evaluate within-season and year-to-year natural fluctuations in population numbers and community diversity.

Taseko is referred to the "Guidelines for Monitoring Benthos in Freshwater Environments" (Environment Canada, 1993) as a guide to sample handling. All samples shall be clearly identified and properly preserved for archiving. All samples must be retained and arrangements for archiving must follow protocols in "Protocols for Reference and Voucher Collections of Aquatic Invertebrates Stored at the Royal B.C. Museum" by Gordon Green and Philip Lambert, RBCM, dated December 1994, DOE FRAP 1994-15. There is no provincial archiving system and thus the proponent must make its own arrangements for safe storage of samples for at least seven years from the commencement of mining operations.

At least five replicate samples are required per site. The degree of sensitivity for detecting spatial/temporal differences in benthic invertebrate abundance and diversity with varying sample sizes shall be reported for each site. The number of samples collected at a given site should strive to meet the target of detecting a 20% difference in the mean number of individuals and species for that site.

6.3.3.4 Quality Assurance

- Taseko Mines is required to document the quality assurance procedures used in the benthic invertebrate monitoring program, develop a reference or voucher collection, and document references used for identification.

The quality assurance procedures outlined in the "Guidelines for Monitoring Benthos in Freshwater Environments" (Environment Canada, 1993) are recommended.

6.3.4 MONITORING OF METAL LEVELS IN FISH

- Taseko Mines is required to provide details of a program to establish baseline levels of metals in fish conducted in accordance with the directions set out below.

6.3.4.1 Objectives

The objective of the program to monitor metal levels in fish is to characterize metal levels in fish muscle and liver in areas that may be impacted by effluent or seepage from the mine, so that changes due to project development can be evaluated.

6.3.4.2 Sampling Sites

Sampling sites shall include the Taseko River near Fish Creek, Fish Creek below the falls, Fish Lake, Little Fish Lake, Tete Angela Creek East and West, and Groundhog Creek.

6.3.4.3 Sample Size

Sample size shall be a minimum of ten specimens for each resident species per site, preferably of uniform age, sex, and weight for comparability of results. Duplicate muscle samples from a number of specimens for each species is recommended to determine intra-organism variability.

6.3.4.4 Required Variables and Minimum Detection Limits

Table 6 sets out the required variables and minimum detection limits to be used.

Table 6: Fish and Fish Tissue Variables

Variables	B.C. Criterion[1]	Minimum Detection Limits[2]
% Moisture	none	not applicable
Metal Analysis on Liver and Muscle		
Antimony, total	none	0.05 µg/g dry weight
Arsenic, total	3.5 µg/g wet weight	0.35 µg/g wet weight or
		1.75 µg/g dry weight[3]
Cadmium, total	none	0.03 µg/g dry weight
Chromium, total	none	0.5 µg/g dry weight
Lead, total	0.8 µg/g wet weight	0.08 µg/g wet weight or
		0.4 µg/g dry weight[3]
Mercury, total	0.1-0.5 µg/g wet weight	0.01 µg/g wet weight
Nickel, total	none	2 µg/g dry weight
Selenium, total	3 µg/g wet weight	0.3 µg/g wet weight or
		1.5 µg/g dry weight[3]
Individual Specimen Data		
Length	none	1 mm
Weight	none	0.5 g
Age	none	1 year
Sex	none	Male or Female
Gonadal Maturity	none	Immature, Maturing, Mature, Gravid or Spent

1 "Approved and Working Criteria For Water Quality" (1997 draft).

2 As defined in "B.C. Environmental Laboratory Manual", 1994. MDLs should be at least ten times below criteria to ensure accurate quantification at criteria levels. Higher detection limits will be accepted if lower ones are not commercially available or if environmental levels are ten times above the detection limits used. The data for the former may not be adequate for establishing objectives and baseline.

3 Assuming 80% moisture content in the fish tissue.

6.3.4.5 Quality Assurance

- Taseko Mines is required to document the quality assurance procedures used in the program to monitor metal levels in fish. The methods and quality assurance measures used must be compatible with those in the "British Columbia Field Sampling Manual for Biological Sample Collection: Freshwaters" (1996 Edition). All quality assurance data for replicates and reference materials must be reported along with the regular data.

So as not to introduce contamination, the following precautions should be taken: use stainless steel cutting blades and plastic cutting boards, clean dissection equipment with de-ionized water between dissections, use acid-washed sample containers or do dissections in a dust-free environment. Muscle tissue should be free of skin and bones. Care should be taken not to puncture the digestive tract or other internal organs during dissection.

6.3.5 PERIPHYTON MONITORING

- Taseko Mines is required to provide details of a baseline periphyton monitoring program conducted in accordance with the directions set out below.

6.3.5.1 Objectives

The objectives of the periphyton monitoring program are to:

- Determine the baseline level of attached primary productivity in streams in terms of chlorophyll a standing crop to compare to future levels in potentially impacted streams.
- Determine the baseline periphyton community diversity qualitatively to compare to future communities in potentially impacted streams.

6.3.5.2 Number of Samples

At least five replicate samples are required per site. The degree of sensitivity for detecting spatial/temporal differences in chlorophyll a standing crop with varying sample sizes shall be reported for each site. The number of samples collected at a given site should strive to meet the target of detecting a 20% difference in the mean level of chlorophyll a standing crop, and to detect the dominant species for that site.

6.3.5.3 Timing of Sampling

Sampling are required from the period of mid-summer maximum growth and after peak scouring flows have subsided.

6.3.5.4 Methods and Quality Assurance

The methods and quality assurance measures used must be compatible with those in the "British Columbia Field Sampling Manual for Biological Sample Collection: Freshwaters" (1996 Edition). Natural substrates are recommended to determine natural community diversity and production. Consideration may be given to artificial substrates, such as Styrofoam, for chlorophyll a measurements. References used for identification must be documented.

6.3.5.5 Sampling Sites

Samples are required from the vicinity of all the stream sites listed in Table 2 and the control/impact sites should have similar flow, depth, solar arc, and substrate size/type.

6.3.6 WATER QUALITY ASSESSMENT

6.3.6.1 Data Presentation and Assessment

- Taseko Mines is required to provide a water quality assessment in accordance with the directions set out below. Graphical presentation of key variables and stream flows over time for key sites is required to illustrate patterns and variability. Power and confidence calculations are to be done for key variables at key sites once the impacts have been predicted to guide future monitoring. Key variables are those variables that the impact assessment indicate may contribute to degraded water quality, and key sites are those sites where the discharge of key variables might take place.

For the water quality assessment discussed in the following section, the entire range of data must be considered, not just mean values, because extreme events that have serious environmental consequences can be lost when using only mean values. For example, high levels of metals or acidity may occur briefly during the first flush of spring freshet, but could wipe out large numbers of sensitive aquatic organisms present in the receiving waters at that time of the year.

All of the data must be provided in an appendix, as well as summaries of the maximum, minimum, mean or median, standard deviation and coefficient of variation for each site.

6.3.6.2 Water Quality Predictions and Impact Assessment

- Taseko Mines is required to predict the waste loads from the proposed mine, predict the resulting receiving water quality under worst case conditions, and assess the environmental impact of the resulting water quality using the water quality objectives developed in section 6.3.6.3. The assessment shall include recommendations for characteristics that may be useful for future impact assessment and seepage detection. This requirement shall be fulfilled in accordance with the directions set out below.

Waste discharge and seepage flows, concentrations, and loadings must be predicted using data from various sources, including:

- quantity and quality of groundwater and surface drainage from the area to be mined
- quantity and quality of tailings liquid from milling process tests
- quantity and quality of leachates from samples of tailings, waste rock, and ore
- quantity and quality of humidity cell or column test liquid from acid rock testing
- waste discharge models (e.g., nitrogen loss from explosives as outlined in Environment Canada's "The Export of Nutrients from Surface Coal Mines. Regional Program Report 87-12." (K.D. Ferguson and S.M. Leask, 1988).

All assumptions used in predicting waste discharges shall be stated.

Present groundwater chemistry for each well graphically (e.g. piper plots) to facilitate data interpretation and comparison of sample sites.

Use the predicted waste loads in a mass balance model of the mine area to predict the resulting receiving water quality under worst case conditions (e.g., 1-in-10 year flood and low flows). The report must include predictions of waste loads and water quality on a month by month basis for the critical years of mine site development (critical years are those years when worst-case contaminant loads are expected such as during construction, years when significant construction events or water use change occur, milestone years of operation, and at closure). Mass balance modelling requires detailed hydrologic data, existing receiving water quality data, and predicted waste loads. Taseko is referred to MELP's draft "Mass Balance Guidelines for Mining Proposals" (unpublished) which is available from MELP staff.

Assess the environmental impact of the predicted waste loads and receiving water quality using the water quality objectives developed in section 6.3.6.3. If the impact assessment indicates that the proposed water quality objectives would not be attained and the receiving waters may not be adequately protected, then further reductions in waste loads would be required or the proponent must prove that the predicted water quality would not have a deleterious impact on the receiving environment. Failing this, the waste discharge would not be allowed.

If the impact assessment predicts that the water quality objectives would not be attained and the waste loads cannot be reduced, additional studies may be required to determine the capacity of the receiving waters to accept the additional contaminants without adversely impacting receiving water uses such as aquatic life. These studies could include:

- determining the complexing capacity of the receiving waters for key contaminants (the complexing capacity and complex stability should be determined separately for each contaminant for each season with quality assurance considerations as outlined in section 6.3.1.5.)
- determining the actual existing levels of key contaminants in the receiving waters using low-level methods
- determining the speciation of key contaminants by measurements and/or modelling
- conducting bioassays using sensitive local species and the local receiving waters (e.g., the water effect ratio approach).

Taseko must consult with the Water Quality/ARD Technical Subcommittee for guidance if additional studies are needed.

6.3.6.3 Water Quality Objectives

- Taseko Mines is required to propose watershed-specific water quality objectives for key variables on all watercourses with the potential to be impacted by effluent discharge or seepage, after due consideration of B.C. criteria for water, sediment and biota, existing water, sediment and biota quality, and the existing and potential water uses that should be designated for protection.

The process for approval and adoption of the proposed water quality objectives is as follows:

1. Taseko will undertake the analysis following MELP guidelines for establishing specific water quality objectives and these will be submitted to MELP for approval.
2. MELP has the authority for setting or approving site specific water quality objectives.
3. The process of approval will not bring into question the validity of the data if the QA/QC procedures and data quality objectives laid out in these specifications are adhered to.

Water quality objectives are established using either the provincial water quality criteria (as summarized in the 1997 edition of "Approved and Working Criteria For Water Quality") for the relevant water uses, or are based on background values (e.g., upper 95% confidence limits of background values or a 20% increase over background), when background exceeds the criteria. The proponent will be expected to prove to MELP that any significant change in background levels that exceed criteria will not be harmful to the designated water uses. Guidance on setting water quality objectives can be obtained from the following documents:

- "Developing Water Quality Objectives in British Columbia - A User's Guide", 1996.
- "Water Quality Assessment and Objectives for Tsolum River Basin, Vancouver Island", 1995.
- "Water Quality Assessment and Objectives for Yakoun River and Tributaries, Queen Charlotte Islands", 1993.

These documents and advice on setting water quality objectives can be obtained from the Water Quality Section, Water Management Branch, MELP.

6.3.6.4 Aquatic Environmental Monitoring Proposal

- Taseko Mines is required to document the proposed aquatic environmental monitoring program that will be followed until project certification.

It is expected that this proposal will include additional work to complete baseline information needs for downgradient groundwater data, lake overturn, late summer and winter data, and benthic invertebrate data as outlined in the above sections. Monitoring programs for the construction, operation, closure and post-closure phases of the project will be identified through the permitting process, as outlined in section 6.9.

6.4.3.3 Kinetic Testing

Taseko Mines is required to:

- Based on ABA test results and geology, provide results of kinetic test programs conducted of sufficient quantity, duration and detail to identify reasonable worst case and median case drainage chemistry for mine components. ARD/ML onset times, NP and AP reaction rates and duration must be determined.

- Assess the potential for differences in weathering of each lithological/alteration/waste management unit and determine the potential for ARD/ML. Select and design appropriate kinetic tests and relate this information to the potential for water quality impacts.

- Provide kinetic characterization of the critical lithological/alteration/waste management units associated with the tailings material, ore, low grade ore stockpiles, construction materials, pit walls and any other material which will be disturbed or exposed during the mining operation.

- Include kinetic test work which determines the impact of gypsum/anhydrite on ARD reactions and predictions, and how this may differ from weathering on-site. If possible collect gypsum rich and gypsum barren samples from the same lithological/alteration/waste management unit for two comparative kinetic test cells.

6.4.4 OVERBURDEN AND CONSTRUCTION MATERIALS

Taseko Mines is required to:

- Confirm that the cover materials to be used for construction purposes (glacial till, Chilcotin Basalts, colluvium, and glacial lacustrine sediments) do not pose any substantive ARD/ML concern.

- Identify and describe the types of overburden and construction materials, source location, volumes to be disturbed, temporary stockpile and end locations, ARD/ML potential (including quantification of available NP sources if materials are to be used as a source of neutralization), physical properties, potential suitability for infrastructure use, including roads, tailings/waste rock impoundment and berms, during mine construction, operation and reclamation activities. Include materials handling and scheduling plans. Assess drainage characteristics, cover performance and dump stability where overburden may be covered by mine waste or used as cover material.

- Identify the sources of any off-site neutralizing materials if required, and discuss the practicability of using such sources.

6.4.5 WASTE ROCK AND TAILINGS

Taseko Mines is required to:

- Characterize the types of NPAG waste rock, including: its location from within the pit, volumes to be excavated, temporary stockpiles and post-operational locations and size (volumes and surface area) with profiles showing topography, height and configuration, construction method and sequencing schedule, ARD/ML potential, suitability for use during mine construction, operation and reclamation activities, ARD/ML prevention/mitigation plans and operational monitoring program, and conceptual post-closure monitoring program.

- Where waste rock is planned to be used for construction purposes, the prediction data must demonstrate geochemical suitability; the level of regulatory criteria will be based on this information.

- Characterize the types of PAG materials, including: its location from within the pit, volumes to be excavated, temporary stockpile locations and size (volumes and surface area), ARD/ML potential, mineralogy, prediction of drainage chemistry and potential effects on surface and ground waters, ARD/ML prevention and mitigation plans, and an operational monitoring program.

- Characterize the tailings, including mill discharge rate for critical stages during start-up and operation of the mill, ARD/ML potential, mineralogy, particle size, tailings segregation (i.e. coarse and fine fraction), prediction of drainage chemistry and potential effects on surface and ground waters, ARD/ML prevention and mitigation plans and operational monitoring program.

- Accurately define the various waste management units in terms of day-to-day practical management (e.g. bench heights may be the limiting factor on materials segregation). The intent is to quantify practical material segregation and handling programs. The focus is to be on management scenarios which are achievable over both the short and long term.

- Determine the requirements to maintain PAG materials fully saturated in the tailings/waste rock impoundment.

- Describe the waste rock and tailings QA/QC management systems to be utilized for materials handling at the mine site. Include tools which will be part of the system (e.g. global positioning system (GPS), International Standards Organization (ISO), etc.)

Incorporate information from other reports and studies that is relevant to the ARD/ML characterization and evaluation of the tailings to be generated for this project.

6.4.6 ORE

- Taseko Mines is required to characterize the ore, including its location from within the pit, volumes to be excavated, temporary stockpile locations and size (volumes and surface area), ARD/ML potential, prediction of drainage chemistry and potential effects on surface and ground waters, ARD/ML prevention and mitigation plans, and an operational monitoring program. The assessment of ore stockpiles must include:
  - sufficient static and kinetic tests to determine the time to ARD/ML onset and severity of oxidation
  - ability to mill the ore after oxidation processes have occurred
  - impact on the closure plan in the event that milling is not an option
  - operational plans for the collection and containment of the run-off
  - contingency plans for the permanent disposal of unmilled ore.

6.4.7 OPEN PIT

Taseko Mines is required to:

- Characterize the ARD/ML potential of the pit wall rocks. This assessment must include prediction of short- and long-term pit water chemistry, taking into consideration pit seepages (input and output) and hydrological processes, the development of long-term ARD/ML mitigative plans, and whether collection and treatment is required. If flooding is proposed, information requirements include: exposure time of the ultimate pit wall prior to flooding, time and rate of flooding, and final height of water table for each flooding option being considered.

- Provide contingency planning for the treatment of pit water during and after operations if there are significant uncertainties regarding the potential for ARD/ML contaminant release to the receiving environment.

6.4.8 MITIGATION AND CONTINGENCY PLANNING

Taseko Mines is required to:

- Develop a comprehensive mitigation plan for all mine components with the potential for ARD/ML. Where significant prediction or mitigation uncertainties exist, contingency measures are required. Non-preventable impacts and risks resulting from ARD/ML must be clearly identified and addressed. The mitigation plan must include the following information for each mine component:
  - location, volume, and surface area of each mine component with an identified significant impact or risk from ARD/ML
  - proposed receiving water quality objectives and the amount by which potential ARD/ML contaminant release must be reduced to ensure receiving water quality objectives are met
  - baseline surface and ground water quality and flow rate data
  - climate constraints (e.g. ability to flood pit)
  - material constraints (e.g. cover material availability and suitability)
  - demonstration of how mitigation and contingency plans are compatible with the overall mine development plan
  - potential failure mechanisms, including their likelihood and consequences, and strategies for avoidance
  - maintenance and monitoring requirements.

- Demonstrate that the mitigation and contingency plans: are technically capable of:
  - achieving discharge standards
  - attaining receiving environment objectives
  - minimizing long-term alienation of land, surface waters and ground waters
  - reducing reclamation liability.

- Describe a conceptual iterative ARD/ML prediction and assessment program that includes characterization of pre- and post-weathering material.

6.4.9 MONITORING PROGRAM

- Taseko Mines is required to develop a comprehensive ARD/ML monitoring program that includes:
  - operational monitoring of ARD/ML characteristics of mine materials including PAG waste rock, NPAG waste rock, ore, low grade ore, tailings and construction materials
  - operational and conceptual post-closure monitoring of surface and groundwater quality and flows that includes the tailings/waste rock impoundment, NPAG waste rock dump, stockpiles and the pit
  - operational monitoring to ensure that adequate material segregation is being achieved
  - baseline and operational monitoring of surface and groundwater quality and flows to detect the onset, degree, and contaminant release from mining operations.

Additional testwork may be requested by the Water Quality/ARD Technical Subcommittee to resolve prediction uncertainties that will aid the proponent in the development of mitigative plans and contingency measures.

6.4.10 COLLECTION AND TREATMENT

Where collection and treatment is required, Taseko Mines is required to:

- Demonstrate that the following conditions have been met:
  - all preventative methods have been examined and either create more risk of environmental contamination or are determined to be inadequate or ineffective
  - the collection system will be constructed and operated in a manner that ensures minimal risk to the environment, and there will be no significant environmental impacts from the exfiltration from ditches and ponds
  - the treatment system will allow the mine to meet discharge limits and receiving environment objectives
  - the deposition site for treatment sludge will be both physically and geochemically secure.
  - the presence of contaminated drainage, operation of the treatment plant and sludge disposal will be acceptable and viable long term land uses for the site.

  Collection and treatment will only be an acceptable mitigation method where these conditions have been met.

- Demonstrate that the system can be maintained for as long as is necessary.

- Use mitigation measures and divert uncontaminated water to reduce the alienation of land, the volume of drainage and treatment requirements.

Supportive evidence for the above items includes detailed engineering and economic analysis, relevant ecological factors, and a comprehensive risk management plan to demonstrate that environmental values will not be jeopardized.

Taseko would be required to post sufficient financial security to cover all costs associated with outstanding capital costs and the long-term operation, maintenance, and monitoring of the treatment facility.

6.5 FISH AND FISH HABITAT

Taseko Mines is required to demonstrate how the following two goals will be achieved during the construction, operational, closure and post-closure phases of the project:

- the conservation goal, as set out in DFO's "Policy for the Management of Fish Habitat", to maintain the current productive capacity of fish habitats of systems affected by the proposed project development plan, through the application of the No Net Loss principle; and

- the goal to conserve the wild fish populations of systems affected by the proposed project development plan.

This requirement shall be fulfilled in accordance with the directions set out below.

In developing the proposed project development plan and conducting the environmental assessment, Taseko must consider pertinent acts, policies, guidelines and directives relating to fish protection and management. These documents include, but are not necessarily limited to, the following:

- Federal *Fisheries Act*
- *Canadian Environmental Assessment Act*
- B.C. *Fish Protection Act* (unproclaimed)
- DFO "Policy for the Management of Fish Habitat"
- DFO "Habitat Conservation and Protection Guidelines"
- B.C. Fisheries Program Strategic Plan "Conserving our Fisheries Resources"
- B.C. Fisheries Program "Policy for Wild Indigenous Fish"
- B.C. Fisheries Program "Policy for Lake Stocking of Cultured Fish"
- B.C. Fisheries Program "Policy for Fish and Aquatic Invertebrate Transplant and Introduction"
- Cariboo-Chilcotin Land Use Plan
- June 6, 1997 letter from Fred Mifflin, federal Minister of Fisheries and Oceans to Cathy McGregor, provincial Minister of Environment, Lands and Parks, re. Taseko Mines Limited proposed Prosperity Gold-Copper mine.

Taseko should consult with the Fisheries Technical Subcommittee regarding any changes or additions to this list that may arise during preparation of the Project Report.

6.5.1 BASELINE DATA REQUIREMENTS

Fisheries baseline studies are required to characterize and quantify the fish habitat and fish populations within rivers, streams and lakes that could be affected by the proposed project development plan. Fish Creek, Beece Creek, Vick Creek, Taseko River and Tete Angela Creek are the watersheds that could be affected by the mine development plan options; the transmission corridor crosses a much wider area and therefore has the potential to affect other watersheds.

Taseko is required to provide a reconnaissance fish and fish habitat inventory (using RIC standards where appropriate), describing and documenting fish habitat and populations in all watersheds that may be affected by the project. In general the studies must:

- At a conceptual level, describe and quantify fish populations and fish habitat within the streams, rivers and lakes that may be affected by all alternative project components to support the assessment of alternatives, identification of project development plan options, and selection of the proposed project development plan, as required in section 3.
- At a detailed level, describe and quantify fish populations and fish habitat components that may be affected by the proposed project development plan.
- Contribute to the development of mitigation measures and compensation plans for the proposed project development plan that support the goal of conservation of fish and fish habitat.
- Contribute to the development of a conceptual reclamation plan for the proposed project development plan that is compatible with the principle of No Net Loss.
- Provide the necessary baseline data in support of on-going monitoring programs to assess the effectiveness of mitigation measures and the compensation plans.
- Provide the necessary baseline data in support of the assessment of effects on the recreational and native fisheries of the affected area, as required in sections 7.6 and 9.

Detailed studies for the proposed project development plan must include:

- quantification of habitat by reach and type within affected watersheds, including measures such as length of stream, square meters, depths, velocities
- distribution and abundance of fish by species and life stage
- assessment of the existing productive capacity of stream and lake habitat.

For affected lakes, limnological surveys (according to RIC standards where appropriate) are required that provide details on total area, shoal area, maximum and mean depths and water quality parameters as identified in section 6.3. Productive capacity of stream and lake habitat can be expressed in numbers of fish per unit length or area, kilograms per unit measure, or in the case of lakes kilograms per hectare per year.

6.5.2 MITIGATION AND COMPENSATION PLANNING

Taseko is required to outline a Fish and Fish Habitat Mitigation and Compensation Plan. This plan must include the following:

- Appropriate mitigation measures that will reduce or eliminate potential adverse effects of the project on fish and fish habitat during the construction, operational, closure and post-closure phases of the project. Sufficient data must be provided to assess whether the mitigation measures will be practicable and effective. In addition, an assessment must be made of the risks and the potential consequences associated with failure of the mitigation measures. Agencies will make a determination on the appropriateness of the proposed mitigation in accordance with established policies and procedures.

- Appropriate compensation measures to offset the magnitude and risk of any losses where it is anticipated that mitigation measures will likely not meet the goal of maintaining the productive capacity of fish habitat. These measures must be developed in accordance with DFO's No Net Loss principle, "Conservation and Protection Guidelines" and ministerial direction. Sufficient detail must be provided to demonstrate that the principle of No Net Loss of productive habitat will be met.

The objective is to achieve No Net Loss of productive capacity of habitat supporting Canada's fisheries resources, taking into account the implementation of any appropriate mitigation and/or compensation measures. Important factors to be considered are:

1. The level of productive capacity.
2. The actual or potential contribution to the nation's fisheries resources.
3. The extent to which: a) compensation methods are demonstrated to be biologically sound, reasonable, and based upon practical and proven techniques; and b) implementation of the compensation measures is in accordance with the "Policy for the Management of Fish Habitat", including the hierarchy of preferences, such that all reasonable efforts to achieve the conservation goal under the current stage of the hierarchy have been demonstrated to be inadequate prior to the transition to the next stage.
4. The extent to which the goal of conserving wild fish populations through natural means has been demonstrated to be met.

Final details would be required prior to issuance of an authorization under the federal *Fisheries Act*.

6.5.2.1 Mitigation

The mitigation elements that should be included in the Fish and Fish Habitat Mitigation and Compensation Plan include, but are not necessarily limited to, the following:

Pit Development

- Assess the potential of conserving fish, fish habitat and productive capacity in lower Fish Creek during operation of the mine, and returning lower Fish Creek to a stable natural state following closure of the mine.
- Assess whether developing a stable, productive diversion channel with a single diversion from the existing stream would be practicable.
- Assess whether it would be practicable to develop the final diversion stream quickly in order to minimize the number of diversions.
- Assess whether it would be practicable to allow flows into the new diversion channel(s) to establish stream flora and fauna prior to destruction of existing diversion channel(s).
- Assess whether it would be practicable to divert or treat pit wall ARD, if generated, above diversion streams, in order to preserve the water quality in lower Fish Creek.
- Assess whether it would be practicable to create a temporary tunnel to channel diversion flows around the pit for the life of the mine and post-closure. Consider:
  - illumination needs
  - maintenance costs
  - contingency fish capture/transportation costs and associated risks.
- Assess whether it would be practicable to use diversion stream protection measures, such as half-pipes, full pipes and coverings to protect from ARD, debris from headwalls and dust. Consider:
  - scheduling and relocating protection measures
  - contingency fish capture/transportation costs and associated risks.
- Assess whether it would be practicable to develop water storage structures and pipelines/pumps from other watersheds to augment the flows downstream of pit during critical periods of fish life history. Consider:
  - anticipated temperature and clarity of water stored or pumped for this purpose, temperatures of water in the receiving environment during summer low flows, and the impacts of any differences in water temperatures or water quality
  - potential schedules of release and rates of flow change.
- Develop terms of reference for conceptual design/contingency plans for restoring flows to lower Fish Creek if the diversion stream is blocked or the bench fails, with time estimates for various scenarios during operational, closure and post-closure phases.
- Should the pit option in the proposed project development plan intrude into Fish Lake, assess methods for ensuring no net loss of productive capacity. Consider the creation of new shoal areas within the Fish Lake dam design.
- Should the pit option in the proposed project development plan intrude into Fish Lake, assess alternative methods for rapid riparian and aquatic vegetation recolonization on the Fish Lake dam and its shoal areas.
- Should the pit option in the proposed project development plan intrude into Fish Lake, develop plans for a lake level control structure with a fish-way on Fish Lake outlet, and a proposed operation schedule.
- If appropriate, assess whether if would be practicable to aerate Fish Lake in perpetuity to mitigate loss of overwintering habitat.
- Provide conceptual descriptions and commitments to conduct fish salvage operations.

Tailings Impoundment(s)

- Demonstrate that the size of the proposed tailings impoundment dam is minimized with respect to downstream extent, amount of rock, and height of dam, so as to reduce the footprint and construction impacts.
- Develop conceptual plans for water storage for summer flow augmentation:
  - assess the anticipated temperature and related water quality parameters of water stored for this purpose, and the temperature of water in the receiving environment during summer low flows
  - provide conceptual descriptions and commitment to mitigate effects through the application of construction scheduling windows.
- Develop conceptual fish salvage plans for all fish-bearing water bodies being isolated.
- Develop conceptual plans for water diversion around the tailings impoundment to sustain flows downstream of the tailings pond to the extent possible.
- Assess whether it would be practicable to augment reduced downstream flows in the watersheds affected by pumping and piping water from other sources to diversion stream(s) upslope of the tailings impoundment, and assess the potential effects.
- Assess whether augmenting reduced downstream flows by creating water storage and release facilities immediately downstream of the impoundment dam, and on its upslope diversion ditches, would be practicable, and assess the potential effects.
- If applicable, assess whether minor tailings dam alignments to avoid fish-bearing tributaries in the Upper Fish Creek watershed would be practicable.
- Develop mitigation measures to minimize impacts to aquatic resources during the condemnation program.

Tailings and Make-Up Water Pipelines

- For any stream crossings along the pipeline routes, propose mitigation measures that conserve fish and fish habitat.

Waste Rock Dump(s) and Low Grade Ore Storage Site(s)

- Assess whether it would be practicable to locate the NPAG waste rock/low grade storage site such that it avoids all fish-bearing tributaries of Fish Creek on the north side of the site.
- Assess whether diverting water around the site to maintain flows in fish-bearing watercourses would be practicable.
- Assess water storage for summer flow augmentation.

Roads and Camps

- Include mitigation measures to offset any effects on fish and fish habitat. Watercourse crossing techniques must follow Forest Practices Code guidelines.

Mill

- If mill make-up water is required, propose a conceptual schedule for extraction of make-up water that would mitigate effects to fish and fish habitat.
- If required, assess whether it would be practicable to develop water storage capabilities for mill make-up water that would allow for water extraction to occur when the risk to fish and fish habitat would be minimal.

Transmission Line

- Describe conceptual level measures that would mitigate potential effects of the transmission line on fish and fish habitat.

General

- Identify and develop timing windows for construction activities to avoid sensitive periods for fish and mitigate effects on fish and fish habitat.
- Specify how operations will comply with DFO's "Guidelines for the Use of Explosives".
- Outline dust control measures related to protecting water quality.
- At a conceptual level, report on the costs and technical feasibility of all mitigation measures proposed in the proposed project development plan.
- Develop conceptual fish salvage plans for all fish-bearing water bodies being isolated.

6.5.2.2 Compensation

The compensation plan shall be based upon the following principles:

- Use appropriate compensation measures to meet the principle of No Net Loss of productive capacity following the Hierarchy of Preferences set out in "Policy for the Management of Fish Habitat" and "Habitat Conservation and Protection Guidelines" as follows:
  1. create similar habitat to that lost within the same system
  2. create similar habitat to that lost within a nearby system
  3. increase the productive capacity for stocks affected within the same system
  4. increase the productive capacity for stocks within a nearby system.
- Use compensation ratios that account for site specific conditions and risks. Compensation ratios of greater than 1:1 may be appropriate to account for ongoing losses and/or deficiencies in anticipated productivity of the compensation features. Alternatives may also include use of a conservative adaptive management approach.
- Compensation features must be in place prior to habitat damage
- To the extent practicable, maintain the ecosystem functionality within the Fish Creek system for all lake and stream ecological components, including inlet and outlet spawning and rearing, lake shoal feeding, and deepwater overwintering habitat.

The compensation elements that should be included in the Fish and Fish Habitat Mitigation and Compensation Plan include, but are not necessarily limited to, the following:

General

- Toward meeting the above principles, use best available stream restoration guidelines, for example "Fish Habitat Enhancement: A Manual for Freshwater, Estuarine and Marine Habitats" (Envirowest Consultants for DFO, 1990)" and "Stream Analysis and Fish Habitat Design: A Field Manual" (Robert Newbury and Marc Gaboury, 1993).
- Quantify the productive capacity of compensation habitat proposed to ensure the principle of No Net Loss is met.

- Identify where proposed habitat compensation sits within DFO's Hierarchy of Preferences outlined in DFO's "Policy for the Management of Fish Habitat":
  - provide rationale and justification for dropping each level within this hierarchy of preferences
  - provide conceptual level cost estimates for the various habitat compensation considerations for each level down DFO's Hierarchy of Preferences.
- Identify monitoring and maintenance requirements of compensation measures for the life of the project, or longer, to ensure No Net Loss is achieved.
- At a conceptual level, report on the technical feasibility of the compensation measures proposed.

Pit Development

- Assess the potential for developing functional fish habitat within diversion stream(s). Consider:
  - the risk of failure of recreating a series of diversion streams with high productive potential throughout operations, considering use of explosives, dust, ARD, wall failures, debris, bridges, spills, etc.
  - riparian development alongside diversion stream(s).
- Assess whether using artificial fish transportation upstream and downstream around the pit would be practicable.
- Should the pit option in the proposed project development plan intrude into Fish Lake, develop plans to create new habitat for that displaced by the dam and pit.
- If required, assess alternatives and develop plans to create deepwater habitat in Fish Lake required for fish overwintering.
- If required, develop plans to recreate permanent Fish Lake stream outlet habitat to match productive capacity of existing lower Fish Creek.

Tailings Impoundment(s)

- Assess the potential for providing functional fish habitat in diversion channels, with water storage in their headwaters.
- Develop conceptual plans for enhancing tributaries or mainstem habitat in affected watersheds if required to meet the principle of No Net Loss.

Waste Rock

Assess the potential for providing functional fish habitat in diversion ditches around the site.

- If stream and/or lake habitat is covered by waste rock piles, assess the potential of creating new functional habitat with sufficient productive capacity to ensure No Net Loss.

6.5.3 ENVIRONMENTAL ASSESSMENT

Taseko is required to provide an assessment of the effects of, and risks from, the proposed project development plan throughout the construction, operational, closure and post-closure phases, in relation to the conservation goals for fish and fish habitat. Taseko must identify and describe, at a preliminary level, the potential effects associated with the proposed project before mitigation and/or compensation is implemented, then describe the mitigation and/or compensation proposed. A detailed environmental assessment is then required of any

potential effects residual to the project planning effort, taking into account appropriate mitigation and/or compensation measures proposed. Taseko Mines is expected to work with review agencies who will provide advice and guidance on a methodology that is in accordance with agency acts, policies, guidelines and directives (as listed above in this section), except DFO which will be dealing separately with the proponent.

The elements that should be included in the environmental impact assessment include, but are not necessarily limited to, the following:

Pit Development

- Quantify and characterize potential changes in the affected reaches of Fish Creek resulting from the proposed project development plan, before and after proposed mitigation and compensation have been accounted for, for the following parameters:
  - spawning, rearing and migration habitat (linear and square meters, depths, velocities, stability, other physical and biological attributes)
  - the productive capacity of these reaches
  - anticipated seasonal fish usage and biological function (total, distribution and size distribution of population production)
  - the proportion of fish spawning and production in outlet versus inlet streams
  - seasonal flows, channel shaping flows, extreme flows (high and low) and other geomorphological processes.
- Should the pit option in the proposed project development plan intrude into Fish lake, quantify and characterize potential changes in Fish Lake that would result from those intrusions for the following parameters:
  - the productive capacity of Fish Lake and component parts of the lake at risk
  - fish seasonal distribution and biology
  - fish overwintering requirements (depth and area) and habitat availability to meet these needs
  - limnological processes associated with the development of the above parameters.
- Quantify and characterize the risks of failure of the proposed pit-related mitigation and compensation measures, including but not limited to, the following factors:
  - the risk of debris generated from the pit headwall blocking diversion stream flows
  - the time requirements for restoration of flows from a blocked or buried diversion stream during operation, closure and post-closure phases of the project
  - the risk of a diversion stream bench failing into the pit
  - the risk of impairing natural productive capacity in lower Fish Creek
  - the time requirements for restoration of flows from a failed diversion stream bench during operation, closure and post-closure phases of the project
  - the risk of any effects of altered water quality post-closure once the pit is full on fisheries resources in Lower Fish Creek and Taseko River.
- Should the project development plan result in intrusions into Fish Lake, assess the effects on fish and fish habitat of sediment production and berm heave and failure (i.e. localized slumping of lakebed and/or bottom of berm into deepwater habitat).

Tailings Impoundment and Waste Rock Management

- Quantify and characterize potential changes in streams and lakes affected by the tailings and waste rock storage and associated management facilities, distinguishing stream reaches and lake habitat upstream of the proposed tailings and waste rock storage area boundaries from those downstream of storage area boundaries (including streams tributary to downstream lakes), for the following parameters:
  - the area for rearing in streams and lakes by type (cover types, linear and square metres, depths, velocities, other physical and biological attributes)
  - the area for spawning in streams and lakes (linear and square metres, depths, velocities, other physical and biological attributes)
  - the productive capacity of these stream reaches and lake habitat
  - anticipated seasonal fish usage and total production, distribution and size distribution of population production.
- Quantify anticipated changes in the above resulting from project development, including effects at low flows, spawning flows and channel-shaping flows, and provide the context of these effects on a local and regional scale.
- As required, extend the assessment to include portions of other watersheds influenced by the tailings and waste rock storage within a watershed context.
- Assess the potential consequences of seepage from all tailings and waste rock storage areas on fish habitat downstream.
- Assess surface water quality of tailings impoundments and the potential effects of flood events spilling this water into fish habitat downstream during operational, closure and post-closure stages of the project.
- Assess the potential for, and consequences of, pipeline ruptures.

Roads and Camp

- Conduct an environmental impact assessment commensurate with risks to the environment.

Mill

- Assess anticipated mill make-up water requirements and the impacts of extraction on the fish and fish habitat of the selected water body.
- Quantify the schedule and range of flows anticipated to be extracted.
- Conduct an appropriate instream flow needs assessment, to be determined in consultation with the Fisheries Technical Subcommittee.

The Department of Fisheries and Oceans has advised that this section (6.5.3) does not meet its requirements with respect to the contents of a Comprehensive Study Report. Accordingly, Canada and B.C. concur that, consistent with Section 18 of the harmonization agreement, Canada will continue to participate in the B.C. process, but will separately meet its additional comprehensive study report requirements with respect to section 6.5.3 through additional studies or review procedures.

6.5.4 RECLAMATION PLANNING

In consideration of the objective of Net Gain of Habitat and to meet the principle of No Net Loss, as set out in DFO's "Policy for the Management of Fish Habitat", Taseko should consider the following in developing its reclamation planning. This will be in addition to the requirements for reclamation planning set out in section 5.2.

- If required, and if not already developed at an earlier phase in the proposed project development plan, develop conceptual level plans to return lower Fish Creek to a stable and ecologically functioning natural state. Assess the practicability of doing so, considering pit wall stability above and below the bench the stream would rest on, beaver activity, debris falls, snow avalanches.
- Should the proposed project development plan include flooding the pit on closure, and its water quality is anticipated to meet appropriate criteria, assess whether developing the pit outlet as a tributary to lower Fish Creek would be practicable, and develop conceptual plans to provide functional fish habitat (fish passage, rearing, and spawning habitat) in this outlet stream.
- Assess whether it would be practicable to develop vegetated shoals around the pit that would provide fish rearing and feeding habitat. If practicable, develop conceptual plans.
- Assess whether it would be practicable to develop a final configuration for tailings impoundment that could provide functional long term fish habitat, including passage, overwintering, and tributary spawning and rearing habitat.

6.6 TERRAIN AND SOILS

Taseko Mines is required to:

- Provide a terrain and soils survey that:
  - characterizes and maps the soils that occur within the proposed project development area
  - summarizes baseline data on the concentration of trace elements in site soils prior to project development
  - includes a bioterrain database to be used in the Terrestrial Ecosystem Mapping (TEM) program.
- Provide a commitment to preserve, store and reuse soil.
- Outline a conceptual baseline and monitoring program to assess trace element uptake in soils at mine closure, and where possible, during the mine life.

The terrain and soil survey should be carried out following standard provincial and federal systems. Taseko Mines is referred to the following documents to provide guidance:

- "The Canadian System of Soil Classification". 2nd Ed. Agriculture Canada Publication 1646. (Agriculture Canada Expert Committee on Soil Survey, 1987)
- "Field Manual for Describing Terrestrial Ecosystems", Update to MELP Manual 2 (MELP, 1996).
- "The Terrain Classification System for British Columbia (Revised Edition)" (MELP, 1988). MELP Manual 10 following the "Guidelines and Standards to Terrain Mapping in B.C.", 1996, compiled for the Resources Inventory Committee (RIC).
- "Soil Inventory Methods for British Columbia" (Resources Inventory Committee, 1995).

The soil survey should be at two levels of intensity; detailed in the pit area and semi-detailed in the proposed tailings storage facility areas, mill site, and waste rock storage piles. The areas outside of the mine facilities should be mapped at a reconnaissance level.

Soil samples should be analyzed by a certified laboratory that adheres in general to the standards of the "Manual on Soil Sampling and Methods of Analysis" (McKeague 1978). Additionally, a rigorous quality assurance/quality control program must be reported. Soil analyses should include:

- coarse fragment content
- particle size analysis
- pH
- electrical conductivity
- CEC and exchangeable cations-Mg, Ca, K, Na
- available macronutrients-P, K, Mg, Ca
- total nitrogen
- total carbon

- total sulphur
- lime requirement.

Mapping scales should correspond to the mapping scales used in the Terrestrial Ecosystem Mapping (TEM) program outlined in section 6.8 and should use standard Terrain Unit Symbols when identifying landforms. In order to facilitate determination of soil salvage requirements, the rooting depth, soil horizon, and depth to growth impediments should be compiled in a tabular form for each profile in each soil management unit. Typical or representative soil profile descriptions should be appended to the soil survey report.

The information collected from the terrain/soil survey and mapping may be used in the soil salvage and soil erosion control assessments, preparation of the reclamation plan, and provision of the bioterrain component of TEM.

At the permitting stage, Taseko will be required to complete a terrain stability assessment in support of any timber harvesting or construction/maintenance activities associated with roads and the transmission line. The proponent should contact the MOF for further advice on this item.

At the permitting stage, prior to site disturbance, 1:5,000 TEM mapping for the pit area, mill site, waste rock storage areas and tailings facility will be required. Field samples using survey intensity level three (26-49% of polygons) is required for the mine site and tailing facility option areas**.** The allocation of sampling will be 15% full field plots and 85% visual checks.

6.7 VEGETATION

Taseko Mines is required to:

- Characterize vegetation communities within the area potentially affected by the proposed project development plan.
- Assess the potential effects of the proposed project development plan on vegetation.
- Document ambient concentrations of trace elements in wetland and upland vegetation to determine the potential for contamination of vegetation which may be consumed by wildlife or people.
- Develop conceptual plans for mitigation for vegetation affected by development.
- In addition to the requirements in section 5.2, provide a conceptual reclamation plan that minimizes impacts to natural grassland communities through use of native plant species. Identify indigenous vegetation to be planted for each specific biogeoclimatic zone through which the transmission line corridor passes.
- Develop a conceptual monitoring program for trace elements in vegetation during mine life and at closure. Recommendations for longer term monitoring should be based on the analysis of baseline conditions and degree of use by humans and wildlife.

Sample vegetation to determine concentrations of trace elements of concern, to be determined in consultation with MELP. Trace elements present in the ore and waste rock should be included in the analyses. Sample design should be developed in consultation with local residents, including First Nations where possible, who harvest native plant species, and consider areas used by wildlife for forage.

The B.C. Conservation Data Centre should be consulted with regard to possible red- and blue-listed plant species and communities within the proposed project development area.

6.8 WILDLIFE

The Project Report must address wildlife issues for the area potentially affected by the proposed project development plan, including the mine site, transmission line corridor and access road. The specifications below set out the requirements for each of these affected areas. The specifications apply to all species identified as occurring or potentially occurring in the area affected by the proposed project development plan, and that may be affected by the project.

6.8.1 MINE SITE

6.8.1.1 Ecosystem and Habitat Inventory

- Taseko Mines is required to provide Terrestrial Ecosystem Maps (TEM) and evaluate development impacts on ecosystems within the TEM mapping area. This TEM mapping shall also identify rare ecosystems, allow for red- and blue-listed species inventories to be focused in suitable habitats, enable an evaluation of development impacts on wildlife habitat and provide information important in developing mitigation strategies for wildlife. This requirement shall be fulfilled in accordance with the directions set out below.

For the proposed mine development plan, calculate the total area of each ecosystem (site series), structural stage and combination thereof potentially affected by facility development.

Produce 1:20,000 TEM maps at survey intensity level four for the proposed mine development area and adjacent areas (with sampling concentrated in sensitive and high value wildlife areas). Particular emphasis is to be placed on the identification and mapping of sensitive ecosystems and vulnerable and threatened plant communities. Capability and suitability interpretations should be done for red- and blue-listed species and COSEWIC (Committee on the Status of Endangered Wildlife in Canada) listed species identified and for waterfowl. The boundaries of the area to be covered shall be determined by Taseko and MELP regional staff. In the event agreement cannot be reached on the appropriate boundaries to use, the matter is to be referred back to the Transmission Corridor/Wildlife Technical Subcommittee.

Provide maps showing capability and/or suitability interpretations where appropriate, to be determined in consultation with the Regional Wildlife Section Head, MELP, for ungulates, black bear, grizzly bear, waterfowl, red and blue-listed species and COSEWIC species known to occur in the study area. MELP has developed TEM mapping at 1:50,000 scale for a portion of this and adjacent areas. This smaller scale mapping (1:50,000) should be used in conjunction with the 1:20,000 maps to be developed in order to predict impacts on species, such as grizzly bears, that move and utilize habitats over larger geographic areas.

Follow all published or approved drafts of Resource Inventory Committee (RIC) manuals and standards for terrestrial ecosystem mapping in effect at the inception of the work. Any deviation from these standards should be discussed with the Regional Wildlife Section Head, MELP.

Provide digitized products in addition to hard copies of maps that are produced. Standards for digital products for all TEM requests are shown in Section 10 of the "Addenda for Terrestrial Ecosystem Mapping Standards" (April 1996).

6.8.1.2 Wildlife Habitat and Wildlife Inventory

- Taseko Mines is required to identify and assess the potential effects of the proposed mine development plan on red- and blue-listed wildlife species, COSEWIC species, ungulates, large carnivores, furbearers, small mammals, raptors, waterfowl and other birds, and amphibians that use the areas affected by the mine development plan. This requirement shall be fulfilled in accordance with the directions set out below.

The wildlife sampling referred to below must be during the seasons and at times of day which facilitate detection of the target species or species groups (either direct sightings, auditory detection or capture, or indirect evidence of use), following standard sampling approaches and timing.

Red- and Blue-listed Wildlife
Identify any rare, endangered and vulnerable species (red- and blue-listed and COSEWIC species) that may occur at some point throughout the year in the proposed mine development area. Data on relative abundance, distribution and habitat use of these species will need to be collected. RIC standards, published or draft, shall be applied wherever appropriate. Any deviation from these standards should be discussed with and agreed to by the Regional Wildlife Section Head, MELP. Occurrence records for rare plants, invertebrates, fish and wildlife should be registered with the provincial Conservation Data Centre, located in Victoria, and the regional Rare and Endangered Species Biologist (MELP, Williams Lake).

Ungulates
Identify the ungulate species occurring in the proposed project development area. Conduct aerial surveys to collect data on the relative abundance (high, moderate, low density) and distribution of these species by season (winter, summer) that will verify the capability/suitability mapping and provide a baseline (one year) to predict and mitigate impacts. RIC standards, published or draft, shall be applied wherever appropriate. Any deviation from these standards should be discussed with the Regional Wildlife Section Head, MELP.

Large Carnivores
Report on the use of the proposed mine development area by black bears and grizzly bears. Identify a management strategy for dealing with potential human-bear conflicts. Identify the potential effects of the project on grizzly bear habitat based on mapping and classification of grizzly bear habitat for the proposed mine development area and adjacent areas. Determine the significance of any adverse effects and propose means of preventing or mitigating any adverse effects. Develop a mitigation/management strategy to reduce impacts on important habitats.

Furbearers and Small Mammals
Identify the furbearer and small mammal species known and potentially occurring in the proposed mine development area. Determine the relative abundance of furbearer species in the area in order to predict impacts and develop a mitigation plan. RIC standards, published or draft, shall be applied wherever appropriate. Any deviation from these standards should be discussed with the Regional Wildlife Section Head, MELP.

Raptors
For the proposed mine development, provide an inventory of raptorial birds and identify nesting and foraging areas. Identify raptor species using the study area for nesting and/or foraging, estimate relative abundance, and identify potential impacts. RIC standards, published or draft, shall be applied wherever appropriate. Any deviation from these standards should be discussed with the Regional Wildlife Section Head, MELP.

Waterfowl and Other Birds
For the proposed mine development area, provide an inventory of waterfowl and other bird species, identifying important nesting and foraging areas. Conduct breeding bird surveys and identify the species and their relative abundance and distribution and how they will be impacted by disturbance and reduction of nesting and foraging habitat. RIC standards, published or draft, shall be applied wherever appropriate. Any deviation from these standards should be discussed with the Transmission Corridor/Wildlife Technical Subcommittee.

Amphibians
Provide the results of amphibian surveys in proposed fisheries compensation areas and assess the potential impact of fisheries enhancement activities on amphibian populations. RIC standards, published or draft, shall be applied wherever appropriate. Any deviation from these standards should be discussed with the Regional Wildlife Section Head, MELP.

Conduct reconnaissance amphibian and amphibian habitat inventory (using RIC standards where appropriate) and produce presence/not detected data for amphibian species within the proposed mine development area. Based on this inventory information, predict the impacts of mine development on amphibian abundance and distribution, particularly with respect to potential ARD impacts, and develop a mitigation strategy to reduce impacts on important habitats.

6.8.1.3 Wildlife Habitat Mitigation

- Taseko Mines is required to prepare a summary of the amount and type of wildlife habitat potentially impacted by the proposed mine development area and a mitigation strategy to reduce negative effects on wildlife habitat.

Appropriate mitigation may include:
- the choice of options that least impact the most valued wildlife habitat
- securing and/or enhancement of important wildlife habitats in adjacent areas or watersheds.

6.8.2 TRANSMISSION CORRIDOR

6.8.2.1 Ecosystem and Habitat Inventory

- Taseko Mines is required to provide Sensitive Ecosystem Inventory (SEI) mapping, a modification of Terrestrial Ecosystem Mapping (TEM) that focuses on sensitive habitats, and evaluate the potential effects of project development on ecosystems within a three kilometre wide transmission line corridor. This requirement shall be fulfilled in accordance with the directions set out below.

SEI mapping must follow a TEM approach (for mapped habitats) to be developed and agreed to by Taseko and MELP. The list of sensitive habitats to be mapped must be submitted for review and agreed to by the Regional Wildlife Section Head, MELP, prior to the inventory.

Complete 1:20,000 SEI mapping for the transmission corridor. Particular emphasis is to be placed on the identification and mapping of sensitive ecosystems, vulnerable and threatened plant communities, and ecosystems/site series important for wildlife species at risk and regionally important wildlife.

Produce 1:20,000 SEI maps at a sampling intensity level of 15-20% of identified polygons (with sampling concentrated in important areas, to be determined in advance through discussions with MELP regional staff). These maps should include wildlife species capability and suitability interpretations for ungulate species (mule deer, moose, bighorn sheep), black bear, grizzly bear, and all red-listed species. Additional species for capability and suitability interpretations from blue- and COSEWIC species lists and waterfowl will be determined by the Regional Wildlife Section Head, MELP and CWS in consultation with Taseko.

6.8.2.2 Wildlife Habitat and Wildlife Inventory

- Taseko Mines is required to identify and assess the potential impact of the transmission corridor on red- and blue-listed wildlife species, COSEWIC species, ungulates, raptors, waterfowl and other birds that use areas within and adjacent to the transmission corridor, with particular attention to grassland, riparian, cliff and forest/grassland ecotone habitats. This requirement shall be fulfilled in accordance with the directions set out below.

The wildlife sampling referred to below must be, or have been, conducted during the seasons and at times of day which facilitate detection of the target species or species groups, following standard sampling approaches and timing.

Red- and Blue-listed Wildlife
Identify any rare, endangered or vulnerable wildlife species (red- and blue- listed and COSEWIC species) that occur at some time during the year in the transmission line corridor, and their relative abundance, distribution and habitat use. Data on relative abundance and distribution of these species will need to be collected or collated from existing sources (MELP files, CDC and provincial or regional status reports) in order to provide a baseline to predict and mitigate impacts. Occurrence records for rare plants, invertebrates, fish and wildlife should be registered with the provincial CDC, located in Victoria, and the regional Rare and Endangered Species Biologist (MELP, Williams Lake).

Ungulates
Data on the relative abundance and distribution of mule deer, moose and bighorn sheep within the transmission line corridor should use information collected and collated from existing sources (including MELP inventory data). Of particular concern are bighorn sheep habitats in grassland habitats along the Fraser River, mule deer winter range on both sides of the Fraser River and Word Creek and moose winter habitat at Big Creek, Willan Creek, Tete Angela Creek and in wetland habitats. New access for construction of the powerline could expose ungulates on their winter ranges to increased poaching. Using the ungulate inventory information, assess the potential effects of transmission line development to ungulates and develop a mitigation strategy to minimize the negative effects.

Birds and Waterfowl
Within the transmission line corridor, provide the results of surveys of breeding birds in sensitive habitats. Identify nesting areas for raptorial birds and important waterfowl use areas. Data on the relative abundance and distribution of waterfowl species is required to be collected and/or collated from existing sources and used to predict areas of importance to waterfowl. Predict and assess the potential impacts of the transmission line on breeding and migratory birds and develop a mitigation strategy to minimize any potential adverse effects of right-of-way development.

Identify the potential effects of transmission line development on bird mortality due to collisions and electrocutions where it crosses the Fraser River and adjacent grasslands. Either: a) provide the results of migratory bird surveys in the vicinity of the transmission line crossing of the Fraser River and adjacent grasslands to identify species numbers and altitude of flight under various weather conditions, including low cloud and fog; or b) accept that species susceptible to interactions with transmission lines (such as pelicans, trumpeter swans and raptors) occur in this area, and commit to developing appropriate mitigation, in consultation with MELP and CWS, that recognizes the conditions and times of greatest risk and exposure.

6.8.2.3 Wildlife Habitat Mitigation

Taseko is required to:

- Prepare a summary of the amount and type of wildlife habitat potentially affected by the transmission line corridor based on the SEI mapping and species inventories.
- Prepare a mitigation strategy to reduce negative effects on wildlife habitat.
- Develop a mitigation plan to reduce potential bird loss collisions with the transmission line, particularly in the vicinity of wetland, lake and riparian habitats and on migratory corridors such as the Fraser River. Demonstrate how powerlines that cross migratory corridors or are near lakes will be designed, constructed and/or located to minimize collision of large birds with the lines.

6.8.3 ROAD ACCESS

Taseko is required to:

- For new road corridors, identify the potential effects on red- and blue-listed species.
- Identify ungulate and bear species migratory corridors that may cross any proposed new road based on frequency of use.
- Where significant animal movement corridors exist, develop a mitigation plan to reduce negative effects on potentially affected wildlife species. Significance will be assessed by the professional judgement of Taseko's project wildlife biologist in consultation with the Regional Wildlife Section Head, MELP.
- Classify all streams and wetlands that may potentially be affected by access road construction according to the guidelines in the Forest Practices Code Riparian Management Area Guidebook.

6.9 ENVIRONMENTAL SUPERVISION AND FOLLOW-UP PROGRAM

- Taseko Mines is required to outline a conceptual program for environmental supervision, mitigation, environmental effects monitoring, and follow-up that is designed to manage the potential adverse effects of the project through construction, operational, closure and post-closure phases of the project. The program shall be developed to verify the accuracy of the environmental impact assessment and determine the effectiveness of all mitigation and compensation measures that were incorporated into the proposed project development plan. The objectives that the program is intended to achieve must be defined.

While it is recognized that a detailed program would only be determined during the permitting stage, the following sets out the general directions and requirements to be included in developing the environmental supervision and follow-up program.

Environmental Supervision

The program for environmental supervision for all proposed construction, operation and decommissioning activities should include the following components:

- Environmental quality assurance by environmental supervisors/monitors for all activities having potential for significant environmental risk.
- Environmental supervisors/monitors having qualifications and abilities to the satisfaction of review agencies.
- Environmental supervisors/monitors independent of contractors, having the authority to suspend work until the problem is rectified where unacceptable situations with serious environmental implications arise.
- Prepare an initial non-comprehensive list of examples of unacceptable situations where work suspensions could occur.
- Onsite training by environmental supervisors of all construction staff/contractors prior to work on site.
- Regular reporting to company and agencies.
- Assisting project manager in complying with environmental legislation and regulations applying to the project.
- Identifying all environmental requirements, including water quality standards and mitigation to agency satisfaction, in the terms-of-reference provided for contractors.
- Environmental monitoring team supervisor reporting to agencies.
- Monitoring staff not to be terminated without agreement of agencies.
- Provision of adequate office space, communications, vehicles, telephone to environmental team.
- Schedule of regular reports and emergency reports.
- Terms of reference and final selection of environmental monitoring staff to the satisfaction of agencies.
- 24-hour availability on site.

Mitigation

Mitigation plans for construction, operational, closure and post-closure phases of the project should include the following components:

- All mitigation measures and environmental protection standards identified in the project review process.
- An evolving environmental mitigation plan (to be updated regularly by environmental supervisors) specific to the project that guides the company in its activities to avoid environmental impacts, prescribes mitigation, and indicates specific design details for each mitigation feature.
- A contingency plan to the satisfaction of review agencies prior to commencement of construction including but not limited to:
  - tailing pipeline ruptures, culvert plugging, dam rupture, beaver activity etc.
  - identification of risk to the environment
  - assessment of risk
  - back-up plans or redesign of project specifications to address the risk of anticipated as well as unusual circumstances, accidents, or malfunctions
  - company policy to meet or exceed the various codes and guidelines
  - listing of legislative requirements such as to immediately report all spills to Environment Canada Emergencies, or the Provincial Emergency Program
  - discussion of environmental effects of potential malfunctions, including dam or dike ruptures, tailing pipeline malfunctions, diversion channel malfunctions, etc.
- A commitment to provide bonding to a level to be defined at the permitting stage to fund the operation of the environmental supervision/monitoring/mitigation program as proposed.

Environmental Effects Monitoring

Environmental effects monitoring of ecosystem components over the life of the project and post-closure should include the following components:

- Monitor as per the mitigation/monitoring plans.
- Monitor status of resource.
- Monitor the soundness and accuracy of predictions made by the environmental impact assessment.
- Monitor the effectiveness of mitigation and compensation plans.

Follow-Up Program

Terms of reference for a Follow-Up Program should include the following:

- An objective to verify accuracy of the environmental assessment predictions.
- An objective to verify accuracy of the cumulative environmental effects assessment predictions.
- An objective to verify that the principle of No Net Loss of productive capacity of fish habitat, as set out in DFO' "Policy for the Management of Fish Habitat", has been achieved.
- A report on effectiveness of the compensation program and reclamation program.
- Recommendations on the effectiveness of both initial and subsequent mitigation and compensation measures.

6.10 CAPACITY OF RENEWABLE RESOURCES

It is a requirement of CEAA that Taseko assess the capacity of renewable resources that are likely to be significantly affected by the proposed project to meet the needs of the present and those of the future, in consideration of the direct and cumulative environmental effects of the project. This capacity is based on a range of ecological considerations, such as:

- integrity of the ecosystem
- productive capacity of the resource
- carrying capacity of the ecosystem
- assimilative capacity of the ecosystem
- cumulative environmental effects with other projects.

This requirement is to be addressed in sections of the Project Report that specifically address impacts on renewable resources. Relevant sections of the report will include those dealing with the following topics:

- Climate and Air Quality
- Hydrology and Water Management
- Water Quality and Aquatic Ecology
- Fish and Fish Habitat
- Terrain and Soil
- Vegetation
- Wildlife
- First Nations Issues
- Cumulative Effects Assessment

7 SOCIAL AND ECONOMIC ISSUES

7.1 INTRODUCTION

Social and economic impact assessments measure the effects of a project on individuals, organizations, communities and governments. Economic effects generally include impacts on employment and labour markets, income, infrastructure capacity, government finances, and on economic and regional development. Social effects generally include impacts on population growth, social characteristics, housing and accommodation, social services, traffic and transportation and community infrastructure

The purpose of the assessments required below is to allow an informed evaluation of whether the social and economic benefits associated with development of the project will outweigh the costs. The Project Committee must be able to document the potential socio-economic benefits of the project, as well as potential costs, as part of its final referral to Ministers at the end of the Project Report review stage. Proponents are expected to provide the analyses necessary to support any claims that their projects will provide regional or local economic benefits of a particular type and size. For the Project Report, supporting analysis, statistics, rationale or examples are needed, and assumptions and information sources should be clearly documented.

Where appropriate, the assessment of the various socio-economic effects should consider the context in which those effects occur. For example, estimated project social effects (e.g. on housing, police, health, education, etc.) are likely to be significantly different if a large portion of the workforce is resident in the region and currently unemployed or under-employed, than if regional employment is strong and most of the workforce is expected to be from outside. Taseko should clearly distinguish the between effects on the immediate local area (local communities such as Alexis Creek and adjacent rural areas) and effects on regional centres such as Williams Lake. Where appropriate, Taseko should clearly explain how local residency is determined and applied for the purpose of its analyses.

Taseko is not limited to addressing only the issues identified in these specifications. Taseko is encouraged to include views, analysis or specific proposed measures on any other issues raised by community interests to-date.

7.2 STUDY AREA PROFILE

- Taseko Mines is required to provide a profile of the study area that includes the following information:
  - a clear definition, including map representation, of the geographic area considered in assessing local/community impacts and regional impacts
  - a general demographic profile of the region, including age groups, gender, family status and social assistance levels
  - a profile of the local labour force and labour market conditions, including a description of the existing labour pool and unemployment rates, particularly as they relate to the types of jobs which will be created by the project, both during construction and at the operations stage
  - existing economic conditions in the study area
  - a profile of existing community services.

7.3 ECONOMIC ISSUES

Economic impacts include the various taxes payable to the different levels of government, public and private expenditures related to the project, and employment effects. Estimates used in the economic analysis should be based on reasonable assumptions regarding the successful development and operation of the project. The estimates should reflect reputable, recent research, techniques, or approaches used by other similar studies. A rigorous cost-benefit analysis is not required.

7.3.1 INCOME

- Taseko Mines is required to estimate the direct, indirect and induced income for all phases of the project.

7.3.2 TAXES

While not a requirement of the Project Report, it is suggested that Taseko Mines may provide separate estimates of the major taxes that would be payable, including federal and provincial corporate income, federal and provincial capital and fuel, provincial mining, sales, property, water rentals, regional and municipal levies. Estimates of employment-related federal and provincial taxes may also be provided.

If the report provides estimates of personal tax payments (e.g. provincial income tax, sales tax, property tax, fuel tax, etc.), they should be on an incremental basis where appropriate. For example, in the absence of supporting research, it would seem reasonable that if those people were living in the province, they were paying some or all of the various taxes prior to benefiting from the project.

7.3.3 REGIONAL AND PROVINCIAL ECONOMIC DEVELOPMENT

- Taseko Mines is required to assess the impacts of the project on regional and provincial economic development in terms of the industrial benefits and the potential for other new investments.

It is suggested that the proponent include a table, or other representation, which shows the salient economic parameters by category and time period. An example of the type of table that may be used is given below.

	To Date	**Development**	**Operations 1-5 year**	**Operations 5-10 year**	**Operations 10-15 year**
Project Expenditures:					
Capital-Mine:					
- Offsite - Sustaining					
Totals					
Operating:					
- Wages					
- Services					
- Materials					
Totals					
Employment:					
Direct:					
- in region					
- in B.C.					
- in Canada					
Totals					
Indirect	May do by region or province etc.				
Induced	" "				
Totals					
Taxes:					
Fed CIT[1]					
BC CIT					
BC MT[2]					
Fed Fuel					
Other					
Gov't Expenditures:					
- provincial					
- local					
- federal					
Totals					

[1] CIT=corporate income tax
[2] MT=mining tax

7.3.4 GOVERNMENT EXPENDITURES

- Taseko Mines is required to estimate government expenditures that may be required as a result of development of the project and describe any proposed measures to offset these expenditures.

Potential government expenditures to consider will include:

- costs for new or upgraded infrastructure (e.g. road and bridge upgrades, incremental maintenance)
- new or incremental costs for social services.

7.3.5 LABOUR MARKET ANALYSIS

Employment impacts include direct, indirect, and induced employment estimated on a consistent basis (e.g. if multiplier analysis is used, direct project employment should take care not to include those transportation employees that are likely to be among the multiplier's indirect employees).

- Taseko Mines is required to provide a labour market analysis profiling the project labour requirements and labour supply in the project area, throughout B.C. and outside the province.

The labour market analysis should include the following:

- Identify the direct workforce requirements at the regional and provincial levels for each phase (construction, operational and closure) of the mine.
- Develop a labour supply profile for the project describing employment, unemployment and occupational characteristics, education levels, and experience in the project area. Project the labour supply required over the life of the project, and assess local hire potential, identifying those currently able to accept employment and those who have an opportunity to be trained prior to project construction and/or operation. Once the local hire potential is established, estimate the number of workers coming in to the study area.

7.4 SOCIAL ISSUES

7.4.1 POPULATION

- Taseko Mines is required to estimate the effects of the project on the population of the project area, as well as those communities specifically identified, for each major phase (construction, operational, and closure) of the project. Consider marital status, family size and local constraints in developing refined population increments resulting from the project.

7.4.2 WORKFORCE SETTLEMENT AND HOUSING

- Taseko Mines is required to estimate the housing requirements and evaluate the settlement options for the construction, operation and closure of the project.

This assessment should include the following:

- determine the labour camp and infrastructure requirements for the different components of the project
- assess the need for off-site housing and identify the type of housing that may be required
- review residential development plans in local communities to estimate the future housing supply.

7.4.3 TRANSPORTATION AND TRAFFIC

- Taseko Mines is required to provide an assessment of transportation and traffic issues that considers social, economic, health and safety perspectives.

The assessment of traffic and transportation should:

- identify project related traffic volumes
- identify the effect that project related traffic will have on local communities
- identify and assess safety issues including accident rates and conflicts with existing traffic on access roads
- identify commuting options which manage the effect on the communities and workers
- evaluate any new road developments in relation to the Cariboo-Chilcotin Land Use Plan and other land uses currently undertaken in the area
- assess the effect of the access road on other sectors such as the economy and recreation
- assess the demand that will be placed on the rail and port facilities
- assess the demand for air service
- identify required infrastructure improvements
- identify the noise and air emissions issues related to transportation in the context of current noise and emission discharges in the region.

7.4.4 NAVIGABLE WATERS

The *Navigable Waters Protection Act* is designed to protect the public right of navigation by prohibiting the building or placement of any work in navigable waters without the approval of the Minister of Fisheries and Oceans. The Act is administered by the Canadian Coast Guard (CCG) of the Department of Fisheries and Oceans. Final determination of navigability rests solely with the Minister or his representative, which in this case is CCG. Navigable Waters is defined in CCG "Navigable Waters Protection Application Guide" as any body of water capable, in its natural state, of being navigated by floating vessels of any description for the purpose of transportation, recreation or commerce. It also includes a canal and any other body of water created or altered for public use, as a result of the construction of any work, as well as any waterway where the public right of navigation exists by dedication of the waterway for public purposes, or by the public having acquired the right to navigate through long use.

Taseko Mines is required to:

- Identify all waterways and waterbodies that will be directly affected by components of the proposed project development plan. Provide representative width, depth, gradient and photographs of all potentially affected waterways.
- Identify the project components that will affect waterways and waterbodies and the anticipated effects on the waterways and waterbodies.
- Provide information on current and/or historic usage of all waterways and waterbodies that will be directly affected by the proposed project development plan.

Upon receipt of the above information, CCG Navigable Waters Protection Division will make a determination of the navigability of any waterways or waterbodies and appropriate measures or authorizations that would be required.

7.4.5 COMMUNITY SERVICES

- Taseko Mines is required to assess the demands that the project will place on services in the project area and the effect of that demand. Describe the increase in demand quantitatively, where possible and reasonable. Otherwise, describe this increase qualitatively.

For all services, use base case and base case projections to describe existing services and capacity, and to forecast the demand for services over the life of the project. Clearly state base case projections without the project. Specific services to be addressed include, but are not necessarily limited to: police, health care, fire, ambulance, education, social services, recreation, basic infrastructure (water, sewer, transportation), justice, commercial, retail and industrial services.

In assessing the effect on these services:

- assess the demand for services generated by the project
- identify specific types of services that are likely to be in greatest demand
- identify services that will be available on site
- compare demand to existing capacity
- discuss both service ability to deal with general increased demand as well as with emergency situations
- identify areas where significant impacts may occur.

7.5 HEALTH AND SAFETY

- Taseko Mines is required to provide an assessment of the health impacts resulting from the project and describe any proposed mitigation.

The assessment should consider the following:

- facilities and services, including the supply of and demand for community based health services, provision of services at the mine site and the interaction between those services and local community services
- water supply and watersheds, including the effect on water supply and quality for local residents, communities and the mine site, as well as potential site and potential health risks from discharges
- the effect of the project on air quality around the mine site and in the broader study area, and potential health risks from proposed discharges
- public health risks including water and air quality issues, community health and stability indicators, transportation of dangerous goods, noise.

7.6 IMPACTS ON OTHER RESOURCE USES

The Project Report should assess the potential effects of the project on other regional economic activities identified, such as forestry, recreation and tourism, agriculture, and ranching. The review and analysis should generally reflect the relative significance of the effects involved (if any). For example, if the project will or could have significant positive or negative effects on forestry activity in the region or mine area, then a clear presentation of those effects is desirable. Conversely, if the impacts of infrastructure developed to service the project on ranchers or other residents are identified as being of minor significance then fewer resources can be used on those effects.

7.6.1 LAND TENURE

Land tenure includes, but is not restricted to, surface, sub-surface and placer tenures in good standing. Surface tenures may include easements, leased lands, fee simple lands, flooding reserves, Indian Reserves and other government reserves.

Taseko Mines is required to:

- Determine current and forecasted land tenure and land uses within the proposed mine development area.
- Provide relevant data to identify impacts of project development, operation and closure on current and forecasted land tenure and land uses in the region for monitoring, mitigation and compensation measures.
- Determine ancillary land uses/site developments that will be placed on Crown land and that are not covered by the permits, licenses or approvals issued by MEM. Examples include permanent staff housing and the transmission line corridor, both of which require authorization under the *Land Act*. It could also include developments that would normally be authorized by MEM within the boundaries of a mineral claim, but which may, in certain instances, be located partly or entirely outside these boundaries.

To present this information, it is recommended that Taseko construct large-scale maps and spatially referenced databases detailing current and forecasted land tenure and use within the mine development area. Surrounding areas may be mapped at a smaller scale.

Create both overlays for the land tenure and land-use maps and spatially referenced databases of proposed mine facilities (e.g. pits, waste dumps, plant site, tailings pond). These should identify all land tenures and land uses potentially affected by project development, operation and closure. Overlays should accurately delineate the boundaries of the mineral claims so that it is apparent where mine facilities are located relative to the claim boundaries. This information is useful in establishing permitting/approval jurisdiction of the various Crown agencies.

7.6.2 FISHING

- Taseko Mines is required to provide a comprehensive assessment of the impacts of project development on the recreational lake and stream fisheries affected by the proposed project development plan, and present mitigation/compensation plans.

This assessment should provide results of visitor and creel surveys conducted to examine lake use, catch success, and the importance of the lake in a regional and provincial context. Taseko should provide visitor and creel data on Fish Lake collected for the period of one year. The data collection should occur over a variety of day types including week days, weekend days and holidays, and seasons. Data collection should be primarily through on-site observations and questioning of visitors to the lake. The data collected should provide information on the value of the sport fishery, origin of the users at Fish Lake, characteristics of the anglers, the total amount of fishing effort expended on the lake over the year, the catch success, the total number of fish caught, and characteristics of the fish caught by anglers.

Present in a clear and concise manner, both yearly data and, where available, an examination of variation between years of visitor, creel, and SLIM survey data. Examine and present the Fish Lake fishing experience in a regional context through comparison of SLIM and CPUE data available from provincial files on other lakes. Identify the estimated sustainable angling effort (angler days/ha/year) for Fish Lake based on catch success and the estimated fish population.

Estimate the extent to which development of other fishery resources in the region could compensate for adverse effects on existing fisheries.

Estimate the economic value of the fish resource in Fish Lake. The valuation should reflect current usage with reasonable allowance for potential changes (e.g. angler preferences, recreational demand, etc.). Taseko Mines should also estimate the costs of achieving those economic values, on an incremental basis, via compensation programs at other lakes in the region or the province.

7.6.3 OUTDOOR RECREATION AND TOURISM

- Taseko Mines is required to estimate the value of recreation and tourism in both the proposed project development area and in the broader area, and assess the effect of the project on park and recreation features and on tourism and recreation opportunities. Identify any MOF recreation conflicts which may exist. Describe plans for mitigation and/or compensation.

Taseko should consider a wide range of tourism activities, such as canoeing/kayaking and backcountry tourism opportunities.

7.6.4 HUNTING/TRAPPING/GUIDING/OUTFITTING

Taseko Mines is required to:

- Identify the number of trapping and guiding territories affected by the project and describe the nature of the effect in terms of the specific trapline and guiding area affected.
- Assess the importance of the areas affected relative to overall area traplines and guiding territories and, to the extent possible, quantify the effect on guide outfitters and trappers.
- Propose mitigation measures for diminished wildlife and wilderness values of the guide outfitter territories and registered traplines affected, where appropriate.
- Identify potential impacts to recreational hunting opportunities in the immediate and adjacent areas.
- Identify potential impacts to sustenance use (e.g. wildlife, fish, berries, wood, etc.) in the immediate and adjacent areas and estimate the values that will be affected.

Taseko is encouraged to enter into discussions with affected guides and trappers regarding possible compensation.

7.6.5 FORESTRY

7.6.5.1 Introduction

Although the mine site is entirely located within the Chilcotin Forest District, the proposed location of the transmission corridor falls within the jurisdictional boundary of three forest districts located in the Cariboo Forest Region: 100 Mile House, Williams Lake and Chilcotin. The MOF will coordinate the development between the three districts; however, the proponent is required to contact each individual forest district to determine the operational planning and tenure administration stipulations of each district. Timber and road tenures required for this project will be issued and administered by each district. The proponent should also contact each district to determine existing tenures that may be impacted by the proposed project.

- Taseko Mines is required to contact the MOF district office to determine any potential conflicts with current Forest Development Plans and the impacted licensees. Prior to project development, Taseko must discuss the potential conflicts with the licensees, including the Small Business Forest Enterprise Program (SBFEP). While Taseko is not required to have completed these discussions prior to submission of the Project Report, the company must indicate in the Project Report its commitment to undertake these discussions.

7.6.5.2 General Requirements

Forestry assessment is needed to identify how project development, operation and closure will affect both current and future forest resources and uses. This data will be used to ensure that impacts of the proposed project on forest resources are minimized, and that access for forest uses (e.g., harvesting, silviculture, protection, grazing and recreation) is not denied.

Taseko Mines is required to:

- Determine current and future forest resources and activities in the proposed project development area. These operations should be quantified to provide a measure of the scale of activities.
- Assess and quantify the effect of project development, operation and closure on current and planned or potential forest uses and describe mitigation plans and compensation measures.
- A portion of the proposed transmission corridor route is located with the Taseko Lakes Special Resource Development Zone of the Cariboo-Chilcotin Land Use Plan (CCLUP). Taseko is required to assess the impact of the corridor on the resource values and targets identified for the Taseko Lakes CCLUP sub-unit.
- Develop a program to monitor changes in forest resources and uses during project development, operation and closure and to ensure mitigation, compensation and reclamation plans meet the Forest Practices Code specifications.

This assessment should adhere to the guidelines established by "Forest Practices Code Guidebooks, Resource Inventory Committee Manuals" and other standard reference materials.

7.6.5.3 Timber Harvesting

- Taseko Mines is required to identify an estimated annual harvest level and the number of years which are required to complete the harvesting. Harvesting methods should also be included in the assessment.

The area identified for harvesting must be timber cruised to MOF standards. Timber cruising details can be obtained from the MOF. This may occur after submission of the Project Report.

Taseko is advised that the MOF may seek compensation for the destruction of immature timber and to contact the MOF for clarification.

7.6.5.4 Range Tenures

Range tenures administered by the MOF may be impacted by the proposed project, particularly those located within the transmission corridor. Section 69 of *the Forest Practices Code of British Columbia Act* requires a person to mitigate the effect of removing or rendering ineffective a natural range barrier.

Taseko Mines is required to:

- Identify where natural range barriers could be impacted by the proposed transmission corridor and set out measures to mitigate the impacts.
- Identify whether the proposed corridor will be seeded, and the potential impacts on range movement.
- Identity the proposed method of controlling undesired vegetation within the corridor and the potential impacts of the control on the range resources.

7.6.5.5 Access for Timber Harvesting

Taseko Mines is required to:

- Identify access requirements specific to timber harvesting activities within the transmission corridor and mine site area. Identify whether existing access routes will be utilized or whether additional access routes will be required. Include access requirements and impacts during the project's construction and operation.
- Complete a terrain stability assessment in support of any timber harvesting or road construction/maintenance activities.

7.6.6 AGRICULTURE/RANCHING

An agricultural/ranching assessment is needed to identify how project development, operation and closure will affect both current and future agricultural/ranching resources and activities, and to ensure that impacts to these resources and activities are managed appropriately.

Taseko Mines is required to:

- Determine current and future agricultural/ranching resources and activities in the proposed project development area.
- Assess and quantify the effects of the proposed project on current and planned or potential agricultural/ranching activities. Areas of concern include the availability of forage for livestock, the effects on cattle movement, and the spread of noxious weeds. Describe mitigation plans and compensation measures.
- Develop a program to monitor changes in agricultural/ranching resources and activities during development, operation and closure and to ensure mitigation, compensation and reclamation plans meet the regulatory specifications.

Agriculture/ranching assessment should adhere to the guidelines established by "Forest Practices Code Guidebooks" (e.g., the 'Range Management Guidebook"), "Resource Inventory Committee Manuals" and other standard reference materials.

8 CULTURAL AND HERITAGE EFFECTS

8.1 IMPACTS ON ARCHAEOLOGICAL RESOURCES

An archaeological impact assessment (AIA) of the proposed project development area, including the mine site, transmission line corridor, access road corridor and all ancillary developments, must be completed prior to issuance of a Project Approval Certificate. Acceptance of the AIA results is required in order to identify all potential impacts from the project and provide management direction.

An AIA was conducted for the mine development area as proposed in 1993, in conjunction with an archaeological overview of the proposed transmission line corridor. Eighteen archaeological sites were located within the mine site area and an additional nine sites were identified within or near the proposed transmission line corridor. The overview identified additional areas of archaeological potential within the study corridor and recommended an AIA of those areas once route selection had been made.

Other possible developments that may warrant archaeological investigation, and were not previously considered, include fisheries enhancement/compensation programs proposed for Rat Cabin, Fish, Big Onion and Wasp Lakes.

- Taseko Mines is required to complete the AIA initiated in 1993 for the mine development area, transmission line corridor and ancillary developments which require land altering activities. Ancillary developments include, but are not limited to, waste rock and tailings sites, secondary access roads, borrow pits and possible damming and excavation of waterways for purposes of fish habitat compensation. The AIA shall be in accordance with Section 3.5 of the "British Columbia Archaeological Impact Assessment Guidelines" (Archaeology Branch, 1996) and must be undertaken in advance of ground disturbing activities. The AIA is also to address potential adverse impacts on historic trails. As well, the AIA is to consider ancillary facilities and developments which may have indirect effects on sites, such as improved access and increased traffic in the vicinity of sites sensitive to vandalism, potential adverse impacts of project abandonment and restoration.

9 FIRST NATIONS ISSUES

The EA Act contains requirements for consultation (statutory) with First Nations to identify all project impacts. The EA Act (s.22) further identifies the potential impacts of the project on the exercise of Aboriginal rights as a matter that may be included in a Project Report. The information gathered on potential impacts on traditional uses and activities is intended to contribute to an assessment made by the government on potential unjustifiable infringements to Aboriginal rights in order for the ministers to fulfil legal obligations. The identification of potential unjustifiable infringements requires both the involvement of First Nations in identifying their Aboriginal rights and consultations with First Nations to determine the potential adverse impacts of projects upon the exercise of those rights.

There is an understanding among provincial agencies that the government's legal obligation to avoid unjustifiable infringements of Aboriginal rights will be fulfilled as part of the environmental assessment process and will not have to be repeated by agencies in post-certification approvals (unless there are significant design changes, or the certification level assessment has not been done at a sufficiently detailed on-the-ground level). However, agencies will continue to notify and inform First Nations and seek their comments on post-certification permits and approvals. The *Guide to the British Columbia Environmental Assessment Process* (Appendix III, First Nations Issues) outlines obligations, roles and responsibilities.

The *Canadian Environmental Assessment Act* does not contain any requirements specific to the need to consult with First Nation people. It does, however, direct federal responsible authorities (in the case of the Prosperity Project, the Department of Fisheries and Oceans) to consider any comments received from potentially affected parties, including First Nations. CEAA also states that any assessment carried out shall include a consideration of the environmental effects of the project, with "environmental effects" being defined as "any change that the project may cause in the environment, including any effect of such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons or on any structure, site or thing that is of historic, archaeological, paleontological or architectural significance". Potential impacts on First Nation people or First Nation interests and the need to consult with First Nation people are, therefore, of critical importance to meeting the obligations established under CEAA.

Taseko Mines is required to:

- Make best efforts to identify the impacts of the project on Aboriginal interests, including the exercise of traditional uses and activities. It is recognized that such identification usually results from a First Nation identifying its traditional uses and activities (either as a response to a request from the EA Office and the proponent, or through consultative processes), or as a result of specific studies undertaken with the cooperation of First Nations who have indicated that there are potential adverse impacts to the exercise of traditional uses and activities. The Terms of Reference for any such studies must be approved by the EA Office in consultation with the First Nations and Taseko.

- Detail measures to prevent or mitigate any significant adverse effects on Aboriginal interests, including those on the exercise of traditional uses and activities.

- Provide a summary of consultations undertaken, and planned, with each of the First Nations identified as being affected by the project (those invited to participate on the Project Committee).

- Report on the results of consultations and give details (unless specifically prevented from doing so as a result of bilateral agreements between Taseko and a First Nation, in which case, it should be so noted) of the identification of impacts on the exercise of traditional uses and activities.

- In cases where Taseko is required by these specifications, or is reliant upon working jointly or cooperatively with an agency or First Nation to collect information or undertake studies, and, where the Executive Director is satisfied that Taseko, despite efforts made in good faith, has been unable to do so, provide the information, and make its assessment, independently.

10 PUBLIC COMMENTS

Public consultation is a key aspect of the environmental assessment process. The *Canadian Environmental Assessment Act* requires that every Comprehensive Study includes consideration of comments from the public. The B.C. *Environmental Assessment Act* states that the Project Report may require a proponent to provide information on its plans for public consultation about the project.

Taseko Mines is required to:

- Describe the ongoing public consultation activities and any plans for further public consultation about the project.
- Summarize the comments made by the public to-date with respect to the project.
- Identify the key issues of concern raised by the public and how Taseko has, or intends to, address them.

11 CUMULATIVE EFFECTS ASSESSMENT

A cumulative environmental effects (CEE) assessment is a requirement under *Canadian Environmental Assessment Act*. The B.C. *Environmental Assessment Act* states that a proponent may be required to provide data necessary or useful to enable the assessment of the probable cumulative effects of a project.

- Taseko Mines is required to provide a cumulative effects assessment which identifies and describes 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, how such effects can be mitigated, and the significance of the effects following mitigation.

The objectives of the CEE assessment are to include a consideration of 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. These assessments are bounded by the following definitions.

"Cumulative environmental effects" are defined as:

The effect on the environment which results from effects of a project when combined with those of other past, existing and imminent projects and activities. These may occur over a certain period of time and distance.

Further, "environmental effect" is defined as:

> *a) any change that the project may cause in the environment, including any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, whether any such change occurs within or outside Canada and*
>
> *b) any change to the project that may be caused by the environment, whether any such change occurs within or outside Canada.*

The intent of the CEE assessment is to provide quantitative evaluations where existing data are available. However, where information on future or historic effects are insufficient, qualitative best professional judgements should be used to provide a level of detail that is feasible and reasonable under the circumstances.

DFO has provided the following guideline for conducting the CEE assessment based on the "Reference Guide for the *Canadian Environmental Assessment Act* - Addressing Cumulative Environmental Effects" (Federal Environmental Assessment Agency, 1994). The following is intended as a guideline only to assist Taseko in preparing the CEE assessment.

The reference guide suggests an 8-Step procedure for conducting the CEE assessment. The first four steps define the scope of the assessment by listing:

- residual environmental effects relevant to the assessment
- other projects producing environmental effects to which the effects of the proposed project would contribute incrementally
- the geographic scope of the CEE assessment
- the temporal scope of the CEE assessment.

The next four steps involve

- analyzing the scale of the CEE to determine need of mitigation measures
- listing mitigation measures that offset CEEs
- determining the significance of the CEEs taking into account mitigation measures
- defining a conceptual post-construction monitoring program to assess the accuracy of the CEE assessment.

The assessment of cumulative environmental effects largely depends on effective scoping, that is, setting the boundaries of the assessment and the focus of the analysis. A scoping exercise for cumulative environmental effects should include identification of the environmental effects to be considered, identification of the likely cumulative environmental effects within those limits, and the setting of spatial and temporal boundaries for the assessment.

Step 1: Scope of Direct Environmental Effects
A list of direct environmental effects anticipated with the proposed project is required to set the scope of CEE examined in Step 2. As assessments of these direct environmental effects are being conducted in the project review, it is adequate to formulate a list with reference to the studies in which they were described. A cumulative effects assessment is required for those environmental effects that will not be fully mitigated and/or compensated and which are likely to accumulate with environmental effects of other projects and activities.

Step 2: Scope of Other Projects
The CEE assessment must identify all likely effects of the proposed project on the environment when taking into consideration environmental effects of other past, existing and imminent projects. Use of a matrix is recommended to clarify the relationships between the various projects, their environmental effects, and the likely CEEs.

This step should involve the following:

- Assess incremental environmental effects anticipated by the proposed project in combination with environmental effects of existing facilities and activities.
- Assess incremental environmental effects anticipated with the proposed project in combination with environmental effects of other projects and activities that will be carried out.

Step 3: Geographic Scope
The geographic scope required for this CEE study will vary with the type of CEE being assessed. Specific geographic scopes need to be identified pertaining to the environmental effects of the proposed project.

Step 4: Temporal Scope
The temporal scope of CEE assessment is largely determined by the result of Step 2, and as such will vary with the type of CEE. CEEs from present and probable projects need to be included. The temporal scope of the CEE must include historic conditions and trends at least to an order-of-magnitude scale in order to emphasize the historic significance of anticipated impacts and need for protection of the resources. Similarly, for probable future projects the assessment must forecast CEEs anticipated for the life of the project at an order-of-magnitude scale.

Step 5: Analysis of Mitigation Requirements
The significance of any CEEs must be assessed to determine the need and scale of additional mitigation measures to offset effects. This section may be best presented in tabular format as an extension of the matrix suggested in Step 2 above. For each type of CEE, discuss the significance of the CEE relative to the following aspects and identify any uncertainty in the nature or magnitude of these effects:

- the status of the receiving environment (how past, current, and future projects affect or stressed the environment)
- interactions among environmental effects (such as the combined effect of reduced flows and elevated water temperature on fish)
- interactions among any environmental effects on:
  - health and socio-economic conditions
  - physical and cultural heritage
  - use of lands and resources for traditional purposes by aboriginal persons
  - any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.
- possible environmental effects on the project
- combination of all environmental effects of the project.

Step 6: Mitigation Measures
Prior to determining the significance of any CEEs, technically and economically feasible mitigation measures that could reduce or eliminate the direct and cumulative effects must be documented. To facilitate the analysis, reference these in the analysis matrix.

Step 7: Determining the Significance of the Effects
In determining the significance of the CEEs, the CEE assessment must facilitate three general steps: i) determining whether the residual environmental effects are adverse; ii) determining whether the adverse residual environmental effects are significant; and iii) determining whether the significant adverse residual environmental effects are likely. The following steps are suggested by the CEAA reference guide to assist in making these determinations:

- Compare the quality of the existing environment with the predicted quality of the environment once the project is in place. To make this comparison, itemize the various attributes together with their environmental effects.

- Provide quantitative measures of the adverse residual environmental effects, after taking into account the mitigation and compensation measures, including the following criteria:
  - indicate the magnitude of adverse residual environmental effects
  - quantify the geographic extent of adverse residual environmental effects
  - identify the duration and frequency of adverse residual environmental effects
  - indicate the degree to which adverse residual environmental effects are reversible or irreversible
  - provide an ecological context to adverse residual environmental effects, using environmental standards, guidelines and objectives, or quantitative risk assessment or other methods to quantify or rank effects as appropriate. Cost-benefit analysis is not appropriate.
- Indicate the likelihood of occurrence of significant adverse residual environmental effects by either calculating the probability of occurrence, confidence limits, or quantitative risk assessment of the effects, as appropriate.

Step 8: Follow-Up

A conceptual monitoring program is required to confirm the accuracy of the environmental assessment and the effectiveness of the mitigation program. Monitoring components may be required to assess the cumulative environmental effects of the project into the future.

12 PERMITS, LICENSES AND APPROVALS

The following list sets out the permits, licenses and approvals that may be required for the Prosperity Project under enactments other than the B.C. *Environmental Assessment Act* and *Canadian Environmental Assessment Act*:

Cariboo Regional District Bylaw 1000
Zoning amendment for plant site.

Forest Act/*Forest Practices Code of British Columbia Act*, MOF
License to Cut
Special Use Permit
Free Use Permit
Road Use Permit

Fisheries Act, DFO
Section 32 authorization for killing fish by means other than fishing.
Section 35(2) authorization for harmful alternation, disruption or destruction of fish habitat.

Health Act, MOH
Permits will be required for drinking water, food handling and food service facilities, and sewage disposal systems under the capacity of 5,000 imperial gallons (22,700 litres) per day, pursuant to the following regulations:

- Industrial Camps Health Regulation
- Safe Drinking Water Regulation
- Sanitation and Operation of Food Premises Regulation
- Sewage Disposal Regulation
- Sanitary Regulations.

Heritage Conservation Act, MSBTC, Archaeology Branch
A Heritage Inspection Permit pursuant to Section 14 of the *Heritage Conservation Act* is required to conduct the AIA. The implementation of impact management measures may require Heritage Investigation Permits. Heritage Investigation Permits will, in most cases, be required prior to specific developments taking place, although in some cases they may run concurrently with development.

Heritage Inspection and Heritage Investigation Permits issued under Section 14 of the *Heritage Conservation Act* provide the authority to collect data from archaeological sites for impact assessment and data recovery purposes. Alteration Permits issued under Section 12 of the *Heritage Conservation Act* follow from Inspection and Investigation Permits and allow alteration of archaeological sites during development activities. Alteration Permits are issued subsequent to completion and acceptance of the impact assessment and management studies required by the Archaeology Branch.

Land Act, MELP
Authorization may be required under the *Land Act* for ancillary land uses/site developments that will be placed on Crown land and that are not covered by permits, licenses and approvals issued by MEM.

Mines Act, MEM, Mines Branch
Permit approving the Mine Plan and Reclamation Program pursuant to section 10

Mineral Tenure Act, MEM, Mineral Titles Branch
The proponent currently holds mineral claims which allow for exploration and development on mineral resources. A mining lease will be required prior to commencing any production on the property.

Navigable Waters Protection Act, CCG
If the navigability of any waterbody is substantially interfered with or rendered more difficult, authorization by the Minister of Fisheries and Oceans under Section 5(1) will be required.

Waste Management Act, MELP, Williams Lake
Waste Management Effluent Permit
Waste Management Air Permit
Waste Management Refuse Permit
In addition, a Special Waste Generator Number will be required.

Water Act, MELP, Williams Lake
Water licences or approvals that may be required under the *Water Act* include:

- make-up mill process water under mining purpose
- camp supply and cooling water under industrial purpose
- mine site drainage
- for tailings impoundments under storage and mining purposes
- stream crossing.

In addition, a license may be required for storage for any freshwater ponds.