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Assessment Agency

Agence canadienne
d'évaluation environnementale

Kitsault Mine Project

Addendum Report



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1. Introduction

Avanti Kitsault Mine Ltd. (the proponent) is proposing to construct, operate and decommission an open pit molybdenum mine at a former mine site located in the northwest coast region of British Columbia. The proposed Kitsault Mine Project (the Project) is located approximately 140 km north of Prince Rupert, BC, within the Nass Area and the Nass Wildlife Area as defined by the *Nisga'a Final Agreement* (NFA), as shown in Figure 1-1.

The Project is subject to an environmental assessment (EA) under the *Canadian Environmental Assessment Act, 1992* (the former Act) because federal regulatory decisions may be made in relation to the Project. The Project was subject to a provincial EA under the *Environmental Assessment Act* (British Columbia). Both the federal and provincial EAs are subject to the requirements set out in Chapter 10 of the NFA.

As part of the EA process, the proponent submitted an Environmental Impact Statement in April 2012 that was reviewed by the Canadian Environmental Assessment Agency (the Agency) and federal departments, provincial ministries, the Nisga'a Nation, and Aboriginal groups. The Environmental Impact Statement described the proposed structural rehabilitation of the Nass River Bridge (the Bridge), located on the road used to access the mine site. The Agency prepared a Comprehensive Study Report (CSR) based on the Environmental Impact Statement and findings from the technical review, and posted it on the Canadian Environmental Assessment Registry website for a 30-day public comment period in August and September 2013.

The Agency received comments during the public comment period from the Nisga'a Nation on the nature and extent of the planned bridge works and the need for further assessment of these works. In response to these comments, the Agency received confirmation from the British Columbia Ministry of Forests, Lands, and Natural Resource Operations (BC FLNRO) that the Bridge would have to be replaced to support the anticipated loads associated with the development of the Project. Given that the replacement of the Bridge was not considered in the Environmental Impact Statement, the Agency made a request to the proponent in November 2013 for additional information on this component of the Project.

The Agency drafted this addendum, based on a review of the proponent's new information and in consultation with federal departments and the Nisga'a Nation, to present the Agency's assessment of the potential for the Bridge replacement to have significant adverse effects on the environment as defined in the former Act, as well as effects on the Nisga'a Nation as defined in Chapter 10, paragraphs 8(e) and 8(f) of the NFA.

The Minister of the Environment will consider the CSR and this addendum, as well as comments received from the Nisga'a Nation, Aboriginal groups and the public on the CSR and addendum when issuing her Environmental Assessment Decision Statement and NFA Project Recommendation. Any subsequent federal permitting or approval decisions by responsible authorities (RAs) must take the EA decision and NFA Project Recommendation into account.

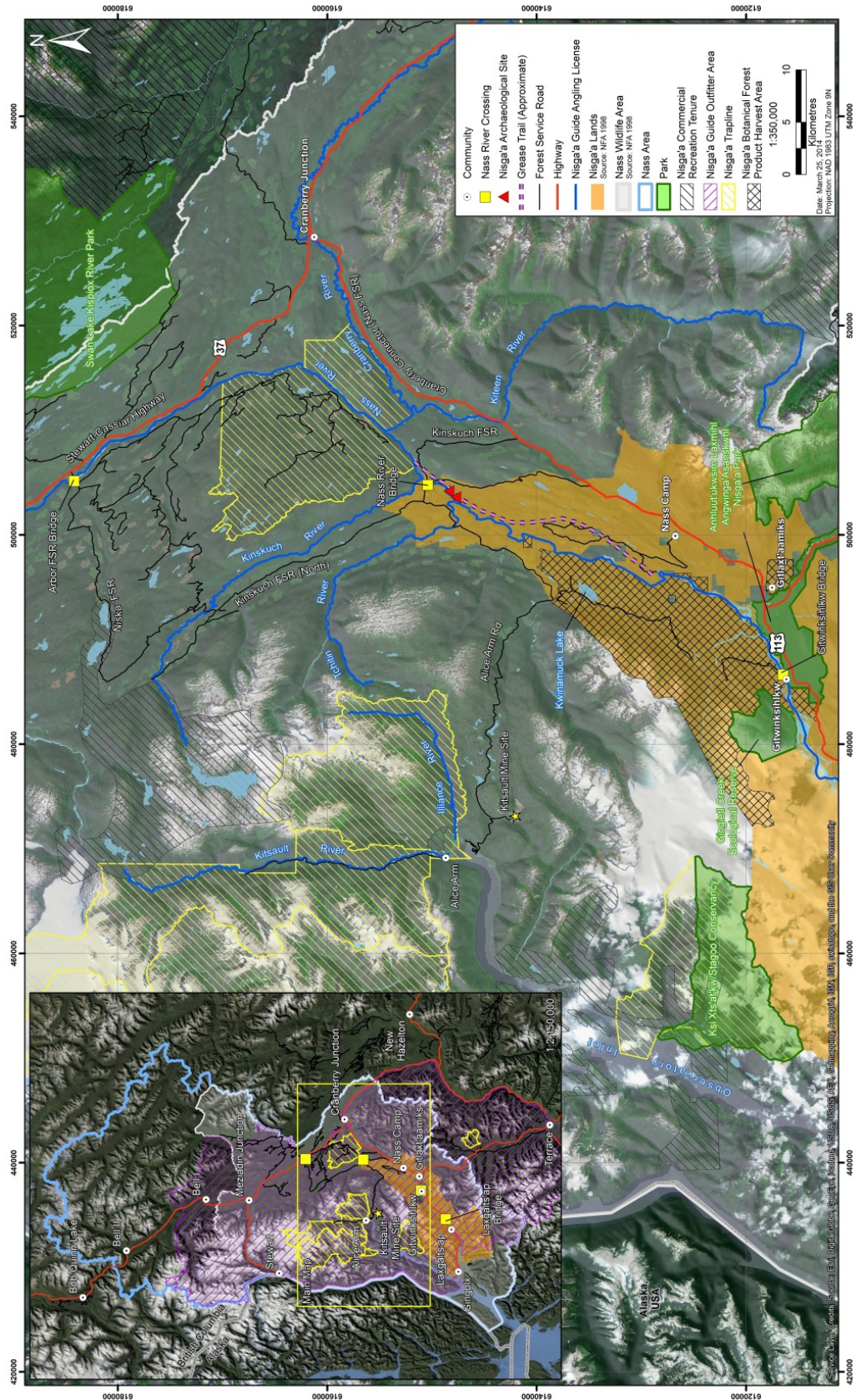


Figure 1-1 Nisga'a Lands and the location of the Nass River Bridge (figure: Avanti)

2. Description of Bridge Replacement and Assessment of Alternatives

2.1. Replacement of the Nass River Bridge

The Nass River Bridge is located on the Kinskuch Forest Service Road, 40 km upstream from the Nisga'a village of Gitwinksihlkw and 14.8 km northwest from where the Kinskuch Forest Service Road branches off of the Nass Forest Service Road (also known as the Cranberry Connector) (Figure 1-1). The Bridge is owned by the Government of British Columbia and falls along a secondary provincial road right of way on Nisga'a Lands, on Nisga'a Lands outside the right of way, and on British Columbia submerged land as defined in the NFA. The Bridge is just downstream of a sharp bend in the Nass River, and coincides with the narrowing of the river into a fast-flowing channel.

The one-lane Bridge was built in 1975 and is approximately 137 m long. It consists of a wooden deck and stringers over four piers, and a concrete abutment on each end (Figure 2-1). The concrete bases of the two center piers are approximately 1.5 m above the high water mark of the Nass River under average flows. The 200-year flood flow would reach just below the top of the concrete portion of the pier structure.

Recent close-proximity inspections of the existing Bridge by BC FLNRO identified areas of rot in the structure. This led BC FLNRO to downgrade the Bridge load capacity and determine that the Bridge must be replaced if it is to be used by the proponent to support the transport of industrial loads associated with all phases of the Kitsault Mine Project.



Figure 2-1 Photo of Nass River Bridge, facing east (inset: facing south) (photo: Avanti).

Key construction phases for the replacement of the Bridge are summarised in Table 2-1. The new Bridge would replace the wooden deck, superstructure, steel undertrusses and rods with a three span steel plate girder bridge with a composite precast concrete deck capable of accommodating a minimum load rating of 64 tonnes. Concrete abutments will be modified; additional new substructure may be required if the existing structures cannot be reused.

Table 2-1 Key construction phases for the replacement of the Nass River Bridge.

Phase	Description
Preliminary works (October to November 2014)	<ul style="list-style-type: none"> Tote roads will be cleared and existing bridge foundations exposed as required for inspection, confirmation of engineering and construction Temporary columns will be erected and braced on either side of the existing concrete piers
Superstructure replacement (mid-November 2014 to mid-February 2015)	<ul style="list-style-type: none"> The existing wood bridge deck will be removed New steel bridge girders will be assembled and launched on top of the existing wooden bridge girders Old wood bridge undertruss and girder sections will be removed by sliding (using Teflon pads) on the new steel girders The new pier steel will be installed, and the new bridge steel superstructure will be lowered into position Jump spans at each end of the Bridge will be installed on the abutments New concrete bridge deck and rails will be installed, and the temporary steel beams and columns removed Approach road work will be completed, and staging areas and tote roads will be dressed Final site cleanup will be carried out, including seeding to encourage establishment of vegetation on disturbed areas Creosoted timbers will be removed from Nisga'a Lands to be disposed of at an appropriate facility in accordance with applicable provincial regulations Organic, non-toxic materials, such as untreated bridge materials will be disposed of by excavating and burying within the Forest Service Road right of way, or hauled from the site for reuse or disposal
Substructure review and remedial works (concurrent with other phases)	<ul style="list-style-type: none"> The proponent will evaluate the substructure, including foundation concrete condition, foundation to rock connection, and the suitability of the rock supporting the foundation If the evaluation indicates that further works are required, the works will be engineered and constructed to accommodate the new superstructure design

Replacement of the Bridge is anticipated to take 4.5 months, with varying levels of bridge access during this time (Table 2-2). The proposed works are expected to impact approximately 2.0 ha of Nisga'a Lands, and require federal, provincial and Nisga'a Nation authorizations and approvals.

Table 2-2 Planned access restrictions during the replacement of the Nass River Bridge

Phase	Access restrictions	Timing and duration
Preliminary works	Bridge will be shut down for portions of the day, with a pre-published schedule of available travel times	October to November 2014 45 days (1.5 months)
Superstructure replacement	Traffic will be cut off to bridge. No plans for temporary river crossing during replacement of deck.	Mid-November 2014 to mid-February 2015 90 days (3 months)

Construction personnel will be housed off-site, either at the mine site or at local businesses that provide accommodation services.

2.2. Need for and Purpose of the Project, and Alternatives

2.2.1. Need for and Purpose of the Project

Under the former Act, the need for a project describes the problem or opportunity that a project is intended to solve or satisfy, while the purpose of a project describes what is to be achieved by carrying it out. The Kitsault CSR included a complete description of the need for and purpose of the Kitsault Mine Project, including the associated access routes. The Agency is of the view that the replacement rather than rehabilitation of the Nass River Bridge does not change the need for or purpose of the Project as described in the Kitsault CSR.

2.2.2. Alternatives

Under the former Act, the consideration of alternatives includes the assessment of alternatives to a given project (as a whole) as well as technically and economically feasible alternative means of carrying out components and activities associated with the project. The Kitsault CSR included a complete description of alternatives to the Kitsault Mine Project. The Agency is of the view that the replacement rather than rehabilitation of the Nass River Bridge does not change the consideration of alternatives to the Project as described in the Kitsault CSR.

Technically and economically feasible means of carrying out the Project could include alternative approaches to replacing the Nass River Bridge, such as alternative bridge designs and locations, and the construction of a temporary replacement bridge. In this case, BC FLNRO identified the need to replace its existing bridge with a new bridge at the same location, and will provide engineering approval of the bridge design. Given this arrangement, there are no other technically feasible alternative means of replacing the Nass River Bridge. Were it to be considered by BC FLNRO, the proponent has indicated that the construction of a temporary replacement bridge is not economically feasible.

3. Environmental Effects Assessment

3.1. Scope of Assessment

In the CSR, the Agency considered the scope of the Kitsault Mine Project as all physical works and activities associated with the construction, operation and decommissioning of the Project. Part of this scope of project comprised the use and maintenance of the network of existing access roads, including the Kinskuch Forest Service Road and Nass River Bridge. This addendum expands the assessment to include the replacement of the Bridge, and any changes in the use and maintenance of the Bridge following the replacement period, beyond those already considered in the Kitsault CSR.

This assessment focused on aspects of the environment with particular value or importance that are likely to be impacted by the replacement of the Bridge for the purposes of identifying the potential for significant adverse environmental effects. The valued components identified below

were selected based on information provided by the proponent, issues raised during consultation with the Nisga'a Nation and consideration of the anticipated environmental effects of the Bridge replacement.

- Surface water quality
- Fish and fish habitat
- Vegetation and plant communities
- Wildlife and wildlife habitat

This assessment considers possible effects during the expected 4.5 months of construction at the Bridge site and in the spatial area immediately adjacent to the Bridge where staging and construction is expected to take place, and downstream in the Nass River.

3.2. Methodology

Information provided by the proponent regarding the potential adverse environmental effects of the Bridge replacement was reviewed by the Agency in consultation with the Nisga'a Nation and expert federal authorities, including Environment Canada, Fisheries and Oceans Canada, and Transport Canada. This information included an Environmental Management Plan developed specifically for the replacement of the Nass River Bridge.

The Agency applied a set of criteria to evaluate the significance of residual adverse environmental effects. Table 3-1 describes the general definitions used to rate the overall significance of residual effects, both in the Kitsault Mine Project CSR and in this addendum.

Table 3-1 Definitions for significance rating for residual effects

Criteria	Definition
Not significant (negligible/minor)	Residual effects are generally of no or low magnitude, site-specific or local extent, short to medium-term, low frequency (once or intermittent), reversible and negligible or low ecological context; their effects are not distinguishable from those resulting from background physical, chemical and biological processes.
Not significant (moderate)	Residual effects are generally of medium magnitude, local to regional in extent, medium- to long-term in duration, at all frequencies of occurrence (once to continuous), and are reversible or irreversible and of medium ecological context; their effects and consequences are distinguishable at the level of populations, communities and ecosystems. Follow-up or monitoring of these effects may be required.
Significant	Residual effects are generally of high magnitude, regional in extent, long-term, and occur at all frequencies (once to continuous), are irreversible and of high ecological context; their effects are consequential in terms of structural and functional changes in populations, communities and ecosystems. If significant effects are justified, follow-up and monitoring would be required.

The following sections: assess the potential environmental effects of the replacement of the Bridge (including accidents and malfunctions); identify mitigation measures; summarise comments from government, Aboriginal groups and the public; and provide the Agency's conclusion in relation to any residual effects.

The proponent does not expect to change the use and maintenance of the Bridge (as described in the Kitsault CSR) following the replacement period, and therefore does not predict any new or different environmental effects. The proponent does not expect the replacement of the Bridge to result in any environmental effects to navigation.

3.3. Environmental Effects

3.3.1. Surface Water Quality

The Nass River runs from north to south under the Bridge. Water levels downstream of the Bridge vary between just over a metre during winter months to over six metres during the freshet, with periodic high water spikes during heavy rains in the fall months. The community of Gitwinksihlkw located 40 km downstream draws its water supply from the Nass River.

Potential Effects and Mitigation Measures

The work associated with the replacement of the Bridge will take place over top of the Nass River and adjacent to the river, outside of the wetted area. Sediment-laden water could be released from any loose or stockpiled materials and tote roads during heavy rain or snowmelt events. Given the timing of the work (see Table 2-1), the river is expected to be frozen or semi-frozen during the superstructure replacement. The proponent asserts that there are no routine emissions or effluents associated with the Bridge replacement that would have the potential to adversely affect water quality. Similarly, with winter construction (frozen or semi-frozen ground) and no excavation anticipated around the river, the generation of sediment-laden water is expected to be limited. Effects from accidents and malfunctions are considered separately in section 3.4.

Mitigation measures to minimize potential adverse environmental effects on surface water quality include:

- Work will be done outside of the wetted area of the Nass River.
- Machines working on the Bridge above the wetted area of the river will use biodegradable hydraulic fluids.
- Concrete wash water will be collected in large drums and removed from the site.
- Any stockpiled spoil or fill material will be located on flat ground with appropriate erosion control to prevent sediment being transported to the river.
- Sediment-laden water will be reduced during rain events by covering loose soil with plastic, using silt fences, and covering exposed soil on tote roads with mulch.
- Any sediment-laden water will be directed to vegetated, flatter areas where sediment can filter out prior to water re-entering the river.
- A stockpile of erosion and sediment control materials will be available at all times on both sides of the river, including but not limited to silt fencing, filter fabric, sand bags, heavy duty plastic or tarps, and hay or straw bales; and
- Portable sanitation facilities will be used at site during the construction period.

Government, Aboriginal and Public Comments

Reviewers provided comments on where the sediment filtering would occur and the effectiveness of the filtering process in reducing sediment in the water that eventually re-enters the Nass River.

Agency Conclusion

Following mitigation, the residual effects of the Bridge replacement on surface water quality are expected to be negligible based on the following criteria (from Table 3-1):

- Magnitude: none or low
- Extent: site-specific
- Duration: short-term
- Frequency: low frequency
- Reversibility: reversible
- Context: negligible or low effect on ecological context

The replacement of the Bridge is not likely to result in significant adverse environmental effects on water quality, based on the information in the CSR and this addendum, and with the implementation of the mitigation measures described above.

3.3.2. Fish and Fish Habitat

The proponent reports that over a dozen species of fish have been recorded in the Nass River. Based on provincial data within the Kalum Forest District where the Nass River is located, six of these fish species are listed as rare or endangered, with Bull Trout (a COSEWIC species of Special Concern) expected to be found in the vicinity of the Bridge.

Potential Effects and Mitigation Measures

Limited direct interaction with fish and fish habitat is anticipated since construction will take place during the winter and since the works associated with the replacement of the Bridge will take place outside of the wetted area of the Nass River. Potential effects on fish and fish habitat would arise from changes to surface water quality, or through accidents and malfunctions, which are considered in sections 3.3.1 and 3.4 respectively.

Mitigation measures to minimize potential adverse environmental effects on fish and fish habitat include the measures identified in relation to surface water quality, accidents and malfunctions, as well as the following:

- Riparian clearing will be minimized.
- The construction schedule will take place outside of the Kwinageese Sockeye closure window.

Government, Aboriginal and Public Comments

Government reviewers concluded that the replacement of the Bridge is not likely to result in a contravention of the habitat protection provisions of the *Fisheries Act*. Others suggested that

works near the water should not occur during the Kwinageese Sockeye closure window (mid-summer) as this species is of management concern.

Agency Conclusion

The proposed construction schedule will take place in the winter and outside of the Kwinageese Sockeye closure window. Any residual effects on fish and fish habitat are expected to be negligible based on the following criteria (from Table 3-1):

- Magnitude: none or low
- Extent: site-specific
- Duration: short-term
- Frequency: low frequency
- Reversibility: reversible
- Context: negligible or low effect on ecological context

The replacement of the Bridge is not likely to result in significant adverse environmental effects on fish and fish habitat, based on the information in the CSR and this addendum, and with the implementation of the mitigation measures described above.

3.3.3. Vegetation and Plant Communities

Deciduous forest, consisting mainly of aspen and birch, surrounds the area of the Bridge. The proponent reports that alder trees are growing in the old tote roads, which were used to access the four piers during construction of the original Nass River Bridge. The area beside the Bridge and along the right of way is considered second growth (no more than 40 years old) following the construction of the original bridge in 1975.

Potential Effects and Mitigation Measures

Vegetation will be cleared along the tote roads upstream of Bridge on both sides of the Nass River during the replacement of the Bridge. Existing shrubs and trees will be removed to ground level as required, to allow short-term access to the piers. Trees along the right of way and surrounding areas (up to 2.0 ha outside of the right of way) may be removed for safety, construction or access requirements. The effects are expected to be limited to the clearing of trees and shrubs as necessary for construction, and disturbance of soils along the right of way.

Mitigation measures to prevent adverse effects to vegetation and plant communities include:

- Amount of vegetation cleared will be minimized along tote roads.
- Shrubs that are cut to the ground will be left with root layers intact to allow regeneration and assist with soil stability.
- Tote roads will be revegetated after construction is complete.
- Any exposed soils, including along the tote roads, will be reseeded with a native seed mix (invasive plant free) and mulched with straw (when site is snow-free) to promote soil stability and vegetation regrowth; and
- Construction and staging areas will be flagged to limit area of impact.

Government, Aboriginal and Public Comments

No comments were received on the assessment of potential effects of the Bridge replacement on vegetation and plant communities.

Agency Conclusion

Any residual effects on vegetation and plant communities are expected to be negligible based on the following criteria (from Table 3-1):

- Magnitude: none or low
- Extent: site-specific
- Duration: short-term
- Frequency: low frequency
- Reversibility: reversible
- Context: negligible or low effect on ecological context

The replacement of the Bridge is not likely to result in significant adverse environmental effects on vegetation and plant communities, based on the information in the CSR and this addendum, and with the implementation of the mitigation measures described above.

3.3.4. Wildlife and wildlife habitat

No nesting birds or signs of bird use of the Bridge were noted by the proponent during a site visit in May 2013. However, the Bridge is located near habitat identified as potential critical nesting habitat for marbled murrelet, a species listed as threatened under the *Species at Risk Act* (SARA). Roosting bats may also use the Bridge as habitat, while bears and other wildlife are expected to migrate through the area. Western Toad, a species of Special Concern under SARA, is unlikely to be present on the Bridge site, but is known to occur within the area.

Potential Effects and Mitigation Measures

Construction of the new Bridge will take place outside the bird breeding window (March through August) and will take place during a time of the year (fall and winter) when bats are expected to use hibernacula areas away from the Bridge. The proponent has indicated that the Bridge does not provide suitable bat overwintering habitat and as a result, bats are not likely to be present during the construction phase. Given the timing of construction, the Bridge replacement is not expected to result in effects on migratory birds and bats. Western Toad in the area could be displaced. Minimal effects on bears and other wildlife in the area are anticipated.

Mitigation measures to minimize adverse environmental effects on wildlife and wildlife habitat include:

- Construction activities will be completed outside of the bird breeding window.
- Tree removal for safety, construction, or access requirements will not take place during the bird breeding window.

- Bridge inspection will be conducted by a qualified professional prior to the start of any work to ensure birds or bats are not using the structure for habitat. The results of this inspection will be considered as part of the follow-up program described in section 4.
- Vegetation clearing activities will be minimized, both on the tote roads and along the right of way.
- Domestic waste will be contained and properly disposed of to avoid attracting bears to the construction site.

Government, Aboriginal and Public Comments

Reviewers advised that any activities associated with the replacement of the Bridge (e.g. vegetation clearing) must occur outside of the bird breeding window. Comments indicated that the bird breeding window could actually begin earlier than the core nesting period of May 1 to July 31 that was identified by the proponent. In British Columbia, raptors, herons, cavity nesters and other resident species can begin nesting as early as March, and breeding season can extend to the end of August.

Considering that potential nesting habitat for marbled murrelet is located near the area of the Bridge replacement, the following measures were recommended by Environment Canada to mitigate the potential effects to this habitat:

- The creation of hard edges near to suitable nesting habitats should be avoided (e.g. avoid creating conditions attractive to edge predators, avoid windthrow effects).
- Nesting habitat should be maintained as a priority.
- Important habitat features (e.g. adequate large trees) should be maintained.
- Disturbance to nesting birds during breeding season should be minimized.
- Roads should not be constructed or widened unless there is no other practicable option.
- Trees should not be harvested except for salvage.
- Pesticides should not be used.
- Recreational structures, trails or facilities should not be developed.
- Due diligence should be exercised to limit the creation of ephemeral ponds by ensuring ditches have drainage or are in-filled.

Agency Conclusion

Any residual effects on wildlife and wildlife habitat are expected to be negligible based on the following criteria (Table 3-1):

- Magnitude: no or low
- Extent: site-specific
- Duration: short-term
- Frequency: low frequency
- Reversibility: reversible
- Context: negligible or low effect on ecological context

The replacement of the Bridge is not likely to result in significant adverse environmental effects on wildlife and wildlife habitat, based on the information in the CSR and this addendum, and with the implementation of the mitigation measures described above.

3.4. Accidents and Malfunctions

As part of the assessment, the Agency considered the following accidents and malfunctions that may occur in connection with the Bridge replacement:

- Debris from old bridge, including creosote-soaked wood, falling onto the ice or into the river (low risk)
- Fuel or oil spill (very low risk)
- Uncured concrete or grout falling or spilling into the river (very low risk)

Potential Effects and Mitigation Measures

With works proposed to occur during the winter, the proponent expects the river to be frozen or semi-frozen during the superstructure replacement. Adverse effects on surface water quality and fish could result from materials accidentally dropping, spilling or running off into the river during construction. The probability of a large concrete spill entering the river is extremely low as the overall quantity required for the replacement of the Bridge is small. Precast concrete panels will be used for the Bridge deck, requiring only small amounts of raw concrete.

Mitigation measures to minimize the environmental effects of accidents and malfunctions include the following:

General measures

- The Environmental Management Plan, including the Spill Response Plan, for the replacement of the Nass River Bridge will be implemented in full.
- A qualified Environmental Monitor will be on-site during higher-risk activities to monitor and adjust environmental protection measures as required.

Debris from old bridge, including creosote-soaked wood, falling onto the ice or into the river

- When removing large pieces during bridge deconstruction, especially creosote-soaked wood, large pieces will be secured first to ensure they do not fall into the water. Smaller pieces will be wrapped in a tarp, poly or filter fabric prior to removal.
- During frozen river conditions, dropped material will be picked up from the ice where it is safe to do so.
- Creosoted timbers will be removed from Nisga'a Lands to be disposed of at an appropriate facility in accordance with applicable provincial regulations.

Fuel or oil spill

- Large quantities of fuel (> 250 L) will not be stored on-site. If needed, a fuel truck will drive to the site to provide fuel for equipment. Any truck carrying fuel will be parked away from the roadway and construction area, a minimum of 30 m from the top of the river bank.
- Small amounts of fuels will be stored either in tanks \leq 250 L with auto shut-off valves, tidy tanks (tanks enclosed within secondary containment) in pickup trucks as per the Transportation of Dangerous Goods standards, or in smaller jerry cans in secondary containment such as spill trays adequate to contain maximum spill volumes.

- Pumps, generators or other small equipment will be placed on a spill tray during work near water.
- Equipment will be checked daily for leaks and will carry spill kits; equipment with leaks will not be permitted on-site until repaired.
- Any small drips will be collected, including the surrounding soil, and placed in buckets with lids, for disposal at an approved facility.
- Any spills that meet the reportable levels set out in the *Spill Reporting Regulation* under the *Environmental Management Act* (British Columbia) will be reported to the Nisga'a Nation and British Columbia for coordination of clean up, and will be considered as part of the follow-up program described in section 4.

Uncured concrete or grout falling or spilling into the river

- When working with concrete and grout, containment will be provided to prevent materials from entering the river (e.g. polysheeting or filter fabric placed under the Bridge).
- Inspections of all work will be carried out to check for voids where grout could escape.
- When precipitation is anticipated, uncured concrete will be covered up to prevent it from washing into the river.
- Adequate spill containment materials and spill kits will be available at all refueling areas and on heavy equipment.
- All on-site staff will be trained in refueling practices, handling requirements and spill kit location and deployment.
- The river gauge levels and weather forecast will be closely monitored by the environmental monitor to avoid high water events and schedule work during low river levels, particularly any concrete works. Contingency plans will include removing all unsecured equipment and material from the pier area in the event of water entering the work area.
- A carbon dioxide tank with regulator, hose and gas diffuser will be on-site during any concrete work, to be used to neutralize water in case of large spill.

Government, Aboriginal and Public Comments

Reviewers sought clarity on the timing of construction of the new Bridge to confirm the effectiveness of the proponent's mitigation measures for addressing the potential effects of spills and debris entering the Nass River. The proponent confirmed the construction schedule set out in Table 2-2 of this addendum.

Agency Conclusion

The replacement of the Bridge is not likely to result in significant adverse environmental effects as a result of accidents and malfunctions, based on the information in the CSR and this addendum, and with the implementation of the mitigation measures described above.

3.5. Effects of the Environment on the Project

Under the former Act, the evaluation of potential effects must include a consideration of the potential effects the environment may have on the given project. As part of the Kitsault CSR, the Agency concluded that significant adverse effects of the environment on the Project are not likely, based on the mitigation measures identified in the CSR. The Agency is of the view that the replacement rather than rehabilitation of the Nass River Bridge does not alter the conclusion described in the Kitsault CSR on the effects of the environment on the Project, including the Nass River Bridge component.

3.6. Capacity of Renewable Resources

Under subsection 16(2) of the former Act, a comprehensive study shall address the capacity of renewable resources that are likely to be significantly affected by a project to meet present and future needs. Renewable resources within the area of the replacement of the Bridge include wildlife, aquatic resources, and vegetation and plant communities. As part of the Kitsault CSR, the Agency concluded that significant adverse effects to these resources are not anticipated, based on the mitigation measures identified in the CSR. The Agency is of the view that the replacement rather than rehabilitation of the Nass River Bridge does not alter the conclusion described in the Kitsault CSR on the capacity of renewable resources.

3.7. Cumulative Environmental Effects

Cumulative environmental effects are defined as the effects that are likely to result when a residual effect of one project acts in combination with the effects of other projects or activities that have been or will be carried out. The Kitsault CSR included a complete assessment of the potential for the Project to result in cumulative environmental effects. Based on this assessment, the Agency concluded that the Project is not likely to result in significant adverse cumulative environmental effects, with the mitigation measures identified in the CSR. The Agency is of the view that the replacement rather than rehabilitation of the Nass River Bridge does not introduce new effects that would alter the conclusion described in the Kitsault CSR in relation to cumulative environmental effects.

4. Follow-up under the Canadian Environmental Assessment Act

The purpose of a follow-up program required under the former Act is to verify the accuracy of the EA and determine the effectiveness of measures taken to mitigate any adverse environmental effects.

In addition to the follow-up program established in the CSR, the proponent will implement the Environmental Management Plan for the Bridge replacement, including the Spill Response Plan. The proponent will ensure that an Environmental Monitor will be on-site during higher-risk activities and to complete the following inspections:

- Review fuel handling and storage practices and inspect equipment and vehicles for leaks or spills. As noted in Section 3.4, any spills that meet the reportable levels set out in the

Spill Reporting Regulation under the *Environmental Management Act* (British Columbia) will be reported to the Nisga'a Nation and British Columbia for coordination of clean up;

- Review bridge deconstruction methods and inspect pier stabilization work;
- Inspect grout and other concrete works on the new structure;
- Inspect erosion and sediment control measures, particularly during heavy or prolonged precipitation; and
- Inspect the existing bridge with a qualified professional prior to the start of any work to ensure birds or bats are not using the structure for habitat.

A part of the follow-up program for the Bridge replacement, the proponent will consider the results of these inspections and the need for adjustments to work procedures and mitigation measures. Upon completion, the results of the bridge inspection for nesting migratory birds and bats will be provided to Environment Canada for review and comment. Any resulting adjustments and/or adaptive management measures will be documented and communicated to the Nisga'a Nation.

The Environmental Monitor will attend the pre-work meeting to review the contents of the Environmental Management Plan with the construction supervisor and crew. The Environmental Monitor will keep a record of all activities, including any site-specific sediment and erosion control measures implemented throughout the Bridge replacement work and any changes made to the Environmental Management Plan.

Any changes made to the Environmental Management Plan will be communicated to the Nisga'a Nation and British Columbia.

5. Nisga'a Nation Effects Assessment

Chapter 10 of the NFA sets out specific provisions for environmental assessments that are required under federal, provincial, and Nisga'a law. As the replacement of the Nass River Bridge is a component of the Project, the effects of the Bridge replacement must be assessed as per Chapter 10 of the NFA.

In accordance with the NFA and under direction from the Agency, the proponent provided information that would allow the Agency to assess:

- whether the Bridge replacement could reasonably be expected to cause adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands or Nisga'a interests (8(e) of NFA); and
- potential effects of the Bridge replacement on the existing and future economic, social and cultural well-being of Nisga'a citizens who may be affected by the Project (8(f) of NFA).

5.1. Nisga'a Environmental Impact Assessment (8(e) of NFA)

The Nass River Bridge is located in the northeast section of Nisga'a Lands. Three Nisga'a villages are located near the Nass River, several kilometres downstream from the Bridge.

Gitwinksihlkw draws its drinking water from the Nass River about 40 km downstream from the Bridge. Laxgalts'ap and Gingolx are located about 70 km and 90 km downstream from the Bridge.

Earlier sections of this report assessed the potential environmental effects of the Bridge replacement on surface water quality, fish and fish habitat, vegetation and plant communities, and wildlife and wildlife habitat. This section considers how these effects could impact residents of Nisga'a Lands, Nisga'a Lands, and Nisga'a interests. The Nisga'a interests considered in the assessment include the following chapters of the NFA:

- lands (Chapter 3) and access (Chapter 6),
- water (Chapter 3) and fisheries (Chapter 8),
- wildlife and migratory birds (Chapter 9),
- forest resources (Chapter 5), and
- cultural artifacts and heritage (Chapter 17).

As in section 3.1, this assessment considered possible effects during the expected 4.5 months of construction in the area immediately adjacent to the Bridge where staging and construction is expected to take place, and downstream in the Nass River.

5.1.1. Potential 8(e) Effects and Mitigation Measures

The Bridge replacement could cause the following adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands or Nisga'a interests:

<u>Potential environmental effect</u>	<u>Potential 8(e) effect</u>
<ul style="list-style-type: none"> • Vegetation and plant communities (section 3.3.3) • Wildlife and wildlife habitat (section 3.3.4) • Accidents and malfunctions (section 3.4) 	<ul style="list-style-type: none"> ➤ Nisga'a Lands and Nisga'a interests related to forest resources ➤ Nisga'a Lands and Nisga'a interests related to wildlife and migratory birds ➤ Residents of Nisga'a Lands, Nisga'a Lands and Nisga'a interests related to water and fisheries

Vegetation and plant community effects on Nisga'a Lands and Nisga'a interests related to forest resources

The proponent has indicated that trees and vegetation on up to 2.0 ha of Nisga'a Lands may be removed for safety, construction or access requirements. Mitigation measures described in section 3.3.3 are designed to minimize the associated environmental effects; however the clearing of merchantable trees may still result in negative effects on Nisga'a Lands and Nisga'a interests related to forest resources.

Prior to undertaking any works in the field, the proponent will implement the following mitigation measures to address 8(e) effects:

- The proponent will flag the right of way and work areas on Nisga'a Lands and complete a timber cruise to assess the value of merchantable timber in the approved work area;

- Representatives from the Nisga'a Nation will be invited to be on site during flagging;
- Results of the timber cruise will be provided to the Nisga'a Nation;
- The proponent will fell the trees;
- The end use of felled trees, tree by-products and cleared vegetation will be determined in consultation with the Nisga'a Nation; and
- If requested by the Nisga'a Nation, the proponent will transport merchantable felled trees to any road-accessible location on Nisga'a Lands selected by the Nisga'a Nation.

Wildlife and wildlife habitat effects on Nisga'a Lands and Nisga'a interests related to wildlife and migratory birds

Section 3.3.4 describes mitigation measures to minimize potential adverse environmental effects on wildlife and wildlife habitat. These measures include the requirement that construction activities be completed outside of the bird breeding window, and for a bridge inspection to be conducted by a qualified professional prior to the start of any work to ensure birds are not using the structure for habitat.

Depending on the results of the inspection, it is possible that the effects of construction on wildlife and wildlife habitat could result in impacts to Nisga'a Lands and Nisga'a interests related to wildlife and migratory birds. To address this possibility, the proponent's

Environmental Management Plan will include following requirements:

- The results of the Bridge wildlife inspection will be shared with the Nisga'a Nation; and
- Any resulting adjustments to work procedures and mitigation measures as part of the follow-up program (see section 4) will be established in consultation with the Nisga'a Nation, communicated to the Environmental Monitor, and documented in an updated Environmental Management Plan to be provided to the Nisga'a Nation and British Columbia.

Accidents and malfunctions effects on residents of Nisga'a Lands, Nisga'a Lands and Nisga'a interests related to water and fisheries

Without mitigation, a major accident or spill during Bridge construction could cause materials to enter the Nass River, which could impact the water quality of community water supplies of Gitwinsiłkw. Such an accident or spill could also result in effects on fish health, which could in turn impact Nisga'a fish harvesting and commercial guiding interests.

Section 3.4 describes mitigation measures to minimize the potential adverse environmental effects of accidents and malfunctions. These include measures to mitigate the risk of debris from the old bridge, including creosote-soaked wood, falling into the river, the risk of a fuel or oil spill, and the risk of uncured concrete or grout falling or spilling into the river. The proposed construction schedule will take place outside of the Kwinageese Sockeye closure window, which is established mid-summer to protect a species of management concern that would be vulnerable to the effects of accidents and malfunctions.

As additional measures to mitigate potential 8(e) effects:

- The proponent will immediately notify the Nisga'a Nation of any spill that meets reportable levels set out in the *Spill Reporting Regulation* under the *Environmental Management Act* (British Columbia); and
- Any resulting adjustments to work procedures and mitigation measures as part of the follow-up program (see section 4) will be established in consultation with the Nisga'a Nation, communicated to the Environmental Monitor, and documented in an updated Environmental Management Plan to be provided to the Nisga'a Nation and British Columbia.

5.1.2. Nisga'a Nation Comments

The Nisga'a Nation raised a concern about the lack of clarity on the timing of construction. The Nisga'a noted that the mitigation measures put forward by the proponent are in part reliant on construction occurring at certain times of the year; however, there were inconsistencies in the proponent's original submission on when construction would start, which led the Nisga'a to question the viability of the proposed mitigation measures.

In the Nisga'a Nation's view, there would likely be fewer adverse environmental effects if construction were to occur in the winter. The proponent confirmed in a follow-up submission to the Agency its intention to begin Phase 1 of construction in October to mid-November, followed by Phase 2 for 3 months over the winter.

The Nisga'a also expressed concern that the proponent's original submission did not identify any environmental effects from the Project on wildlife and wildlife harvesting, the commercial harvest of salmon, and potential effects from spills of hazardous materials on Nisga'a Lands.

5.1.3. Agency Conclusions on 8(e) Assessment

Based on the information in this addendum, the Nass River Bridge replacement may reasonably be expected to result in temporary adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands, and Nisga'a interests related to forest resources, wildlife and migratory birds, and water and fisheries. These effects are not expected to be significant with the implementation of the mitigation measures described in sections 3.3, 3.4, and 5.1.1.

5.2. Nisga'a Economic, Social and Cultural Impact Assessment (8(f) of NFA)

The Nisga'a Nation uses the Nass River Bridge to access Nisga'a Lands (fee simple ownership) and other areas where Nisga'a citizens practice their rights as set out in the NFA, such as fishing and harvesting wildlife.

An extensive 8(f) economic, social and cultural impact assessment was completed as part of the Kitsault EA and was summarized in the Kitsault CSR. The proponent used the approach established during that assessment to identify a list of economic, social and cultural valued components that have the potential to be tangibly impacted by the Project as a whole. The

proponent then evaluated the potential effects of the Bridge replacement on these valued components and submitted its findings to the Agency.

5.2.1. Economic Well-being

The proponent identified potential effects of the Bridge replacement on the economic well-being of Nisga'a citizens in relation to access and employment.

Access

Replacement of the Bridge is anticipated to take 4.5 months, with varying levels of Bridge access during this time (Table 2-2). The construction of a temporary replacement bridge is not considered technically or economically feasible (see Section 2.2.2). Were it to be feasible, the installation of a temporary bridge at a suitable location upstream or downstream of the existing bridge would involve additional clearing and road construction activities that could reasonably be expected to have adverse environmental effects on Nisga'a Lands or Nisga'a interests.

The closest alternative route is to travel 50 km on the Cranberry Connector, 36 km on Highway 37, and about 66 km on the Arbor Forest Service Road. While the proponent will be upgrading and maintaining the segment along the Arbor Forest Service Road (including winter clearing), it will still take about four hours longer than crossing at the Nass River Bridge. As stated in Section 5.2.4 below, the Nisga'a Nation does not view the other existing bridges that cross the Nass River as practical alternative routes to access Nisga'a Lands. The temporary loss of access to the Bridge may result in the following negative effects on the existing economic well-being of Nisga'a citizens:

- Additional time and travel costs associated with the Arbor Forest Service Road route;
- Reduction or loss of income dependent on accessing Nisga'a Lands and resources northwest of the Nass River, including forest resources, commercial recreation tenures, and wildlife for guiding, fishing or hunting; and
- Costs to the Nisga'a Nation associated with notifying Nisga'a citizens of the temporary closure of the Bridge.

Many of the potential impacts will be reduced since the Bridge replacement will take place over the winter when the level of many activities is low. Based on the information available, Nisga'a winter traplines that are most readily accessed via the Nass River Bridge have not registered activity since 1992. The proponent has stated that if more detailed trapline data is available, it is willing to consider the effects of the Bridge replacement on revenues from these traplines. The proponent has also stated that it is willing to assist with communicating information about the Bridge closure to Nisga'a citizens.

The temporary loss of access to the Nass River Bridge is not expected to result in effects on the future economic well-being of Nisga'a citizens, because it does not affect the long-term ability of Nisga'a citizens to access Nisga'a Lands.

Employment

The replacement of the Bridge may result in limited, positive effects on the existing economic well-being of Nisga'a citizens if Nisga'a workers are hired onto the Bridge construction crew.

The proponent did not identify any effects on the future economic well-being of Nisga'a citizens related to employment, as the Bridge replacement is for a structure that is already in use, with the associated economic benefits.

5.2.2. Social Well-being

The proponent identified limited potential effects of the Bridge replacement on the existing social well-being of Nisga'a citizens. Bridge construction is not anticipated to result in an increased demand on social services, community infrastructure or housing. The work crew will be small, and will be housed off-site, either at the mine site or at local businesses that provide accommodation services. Interactions with Nisga'a citizens will be limited, except where Nisga'a citizens are hired onto the construction crew.

Vehicles carrying workers and supplies to the construction site from Terrace will cause a small increase in traffic along Highway 113 for the duration of the Bridge replacement period, which will elevate the risk of traffic accidents and could negatively affect the health of Nisga'a citizens.

The proponent did not identify any potential effects of the Bridge replacement on the future social well-being of Nisga'a citizens.

5.2.3. Cultural Well-being

The proponent identified potential effects of the Bridge replacement on the cultural well-being of Nisga'a citizens in relation to access. The existing cultural well-being of Nisga'a citizens may be temporarily affected during Bridge construction as it will take longer to access areas where cultural practices such as gathering plants, fishing and hunting occur.

The proponent did not identify any potential effects on the future cultural well-being of Nisga'a citizens, as it is anticipated that cultural practices that stop during construction will resume after a temporary period of time. Construction of the Bridge will not directly impact nearby archaeological and historical sites nor will it inhibit long-term access to these sites.

5.2.4. Nisga'a Nation Comments

The Nisga'a Nation commented on and questioned the viability of routes the proponent claimed could offer alternative access to Nisga'a Lands and areas used by Nisga'a citizens. The Nisga'a Nation does not view the other existing bridges that cross the Nass River as practical alternative routes to access Nisga'a Lands. The Nisga'a also noted that the consideration of access should encompass impacts to land use as well as property ownership (e.g. accessing Nisga'a Lands).

5.2.5. Agency Conclusions on 8(f) Assessment

Based on the information in this report and taking into consideration proponent plans to minimize adverse impacts, the Nass River Bridge replacement may result in both adverse and limited positive effects on the existing economic well-being of Nisga'a citizens, as well as limited adverse effects on the existing social and cultural well-being of Nisga'a citizens who may be affected by the Project.

6. Public Consultation

The Agency, federal departments and the Nisga'a Nation evaluated the proponent's assessment of potential adverse environmental effects of the replacement of the Bridge. Public comments on this addendum will be sought, in addition to those already received on the CSR, to inform the Minister's Environmental Assessment Decision Statement and NFA Project Recommendation on the Project.

7. Conclusions of the Agency

7.1. Canadian Environmental Assessment Act

The Agency has taken into account the following elements in reaching a conclusion on whether the replacement of the Bridge is likely to cause significant adverse environmental effects:

- Documentation submitted by the proponent
- Analysis and findings in this addendum
- Opinions and comments of federal government departments, provincial ministries and the Nisga'a Nation

The Agency concludes that with the implementation of mitigation measures, the replacement of the Bridge is not likely to cause significant adverse environmental effects.

Following public consultation on this addendum, the Minister will decide whether, taking into account the implementation of mitigation measures, the Project, including the replacement of the Nass River Bridge, is likely to cause significant adverse environmental effects. If the Environmental Assessment Decision enables the Project to proceed, the Project will then be referred back to the regulatory authorities for appropriate courses of action in accordance with Section 37 of the former Act.

7.2. Nisga'a Final Agreement

In addition to the requirements of the former Act, the Agency assessed the effects of the Bridge replacement on the Nisga'a Nation in accordance with Chapter 10, paragraphs 8(e) and 8(f) of the NFA. The Nisga'a Nation was provided with an opportunity to review a draft version of this document, including the 8(e) and 8(f) assessments, before it was provided to the public for comment.

In assessing the adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands, or Nisga'a interests as required under paragraph 8(e), the Agency also considered the analysis of environmental effects under the former Act where applicable. The Agency concludes that the Nass River Bridge replacement may reasonably be expected to result in temporary adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands, and Nisga'a interests related to forest resources, wildlife and migratory birds, and water and fisheries. The Agency considers the mitigation measures as described in this report appropriate to prevent or minimize the adverse environmental effects identified under paragraph 8(e).

The 8(f) assessment of economic, social and cultural effects was considered as a matter relevant to the assessment under section 16(1)(e) of the former Act. The Agency concludes that the replacement of the Bridge may have temporary adverse effects on the existing social and cultural well-being of Nisga'a citizens, and both adverse and limited positive effects on their existing economic well-being.

In accordance with Chapter 10, paragraph 8(h) of the NFA, the Minister will issue an NFA Project Recommendation in respect of whether the Project, including the Nass River Bridge replacement, should proceed. Any regulatory decisions that may be taken by the responsible authorities will take into account the NFA Project Recommendation issued by the Minister.