38 SUMMARY OF POTENTIAL RESIDUAL EFFECTS OF THE PROJECT 38-1

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38 SUMMARY OF POTENTIAL RESIDUAL EFFECTS OF THE PROJECT

This section summarizes the potential adverse residual effects of the Project. Residual adverse effects are the effects of the Project that may remain after taking into account the implementation of mitigation measures.

Table 38.1 below identifies anticipated residual effects based on the assessment of potential environmental effects (Volume 2 Sections 12 to 15), economic and land and resource use effects (Volume 3 Sections 16 through 27), and social, heritage and human health effects (Volume 4 Sections 28 through 33).

Table 38.1 identifies the Project phase(s) in which the effect is expected to occur, the contributing Project activities or physical works, the proposed mitigation measures that are to be used to avoid or reduce the potential effect, the residual effects and its determination of significance.

Table 38.1 has been amended in accordance with the amendments to section 39 of the EIS. Section 39 has been amended in accordance with the directions to amend dated July 18, 2013 issued by the EAO and the Agency.

As per the EIS Guidelines Section 8.5.2 Analysis of Effects and Section 23 Requirements for the Federal Environmental Assessment, Table 38.2 describes how the following federal considerations are addressed in the EIS:

- Changes to the environment
- Changes to components of the environment within federal jurisdiction
- Changes to the environment that would occur on federal or transboundary lands
- Changes to the environment that are directly linked or necessarily incidental to federal decisions
- Effects of changes to the environment on Aboriginal peoples
- Effects of changes to the environment that are directly linked or necessarily incidental to federal decisions

Table 38.1 Summary of Potential Residual Effects of the Project

Note: The purpose of this table is to track RESIDUAL EFFECTS rather than all potential effects. Therefore, table entries are restricted to those potential effects that cannot be mitigated, in whole or in part, resulting in a potential adverse residual effect.

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Section 12 – Fish and Fish Habitat				
Loss of fish habitat	Construction	Construction of the dam and generating station, Highway 29, and Hudson's Hope shoreline	Implement the Fish and Aquatic Habitat Management Plan (see Volume 5 Section 35 Summary of Environmental Management Plan) A 15 m riparian buffer will remain adjacent to watercourses during reservoir clearing Place material relocation sites (R5a, R5b, and R6) 15 m back from the high water level to avoid affecting Peace River fish habitat. Incorporate fish habitat features into the final capping of material relocation sites upstream of the dam. Contour and cap with gravels and cobble substrate the spoil area between elevations 455 m and 461 m to provide a productive fish habitat that will be available to fish during the operation phase. Include fish habitat features (e.g., shears, large riprap point bars, etc.) in the final design of the north bank haul road bed material that would be placed in the Peace River. Compensate for fish habitats affected by Highway 29 realignment 'like for like' in the vicinity of the habitat loss. Fish habitat features will be incorporated into the final designs of the watercourse crossings. Replant disturbed riparian areas with local vegetation. Incorporate fish habitat	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			features into the final design of the Highway 29 roadway that would border the reservoir, east of Lynx Creek. Construct the Hudson's Hope shoreline protection with large material that will provide replacement fish habitat. Incorporate additional fish habitat features (e.g., shear zones and point bars) into the final design of the Hudson's Hope shoreline protection Merchantable trees, and vegetation that could interfere with navigation, will be removed using clearing practices to maintain a 15 m machine-free zone Manage construction footprints to reduce the impact on fish and fish habitat. Remove temporary structures as soon as they are no longer required.	
Loss of fish habitat	Construction	Construction headpond and reservoir filling	Contour Highway 29 borrow sites prior to decommissioning to provide littoral fish habitat in the reservoir. Cap material repositioning areas with gravel and cobble, and contour to enhance fish habitat conditions. Where appropriate, plant a 15 m wide riparian area along the reservoir shoreline adjacent to BC Hydro-owned farmland to provide riparian habitat and bank stabilization.	Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Altered fish habitat due to transformation of reservoir habitat	Operations	Operation of the reservoir	Manage reservoir fluctuation within a 1.8 m maximum normal operating range to reduce effects to the shoreline fish habitat. Future mitigation and compensation options will be evaluated after reservoir development and follow-up monitoring. Compensation options that are technically and economically feasible will be implemented.	Not significant
Altered fish habitat downstream of Site C Dam	Operations	Operation of the reservoir	Enhance side channel complexes between the dam site and the confluence of the Peace and Pine rivers to increase wetted habitat during low flows. Create new wetted channels and restore back channels on the south bank island downstream of the dam to create off channel and back channel habitat.	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Reduced fish health and survival due to sediment inputs	Construction	Construction of the dam and generating station	Implement the following Environment Management Plans: • Air Quality Management Plan • Erosion Prevention and Sediment Control Plan • Surface Water Quality Management Plan Adjust the timing of construction activities to coincide with periods of high background sediment levels where feasible. Use clean rock materials for riprap construction to reduce the amount of sediment that is introduced into the aquatic environment. Reduce equipment production rates to reduce the amount of sediments generated by equipment when needed.	Not significant
Reduced fish health and survival due to sediment inputs	Construction	Construction headpond and reservoir filling	Berm or cap areas with high potential to produce sediments. Leave stumps in the headpond area in place during reservoir clearing to reduce soil disturbance and potential sedimentation issues, where feasible. Clear in winter, where feasible, to reduce soil disturbance	Significant
Reduced fish health and survival due to fish entrainment	Construction	Construction headpond and reservoir filling	Utilize large diameter diversion tunnels and associated hydraulics that provide low risk of fish mortality. Incorporate smooth and gradual transitions from the round tunnels to the square exits. Complete tunnel linings with a smooth concrete surface	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			finish. Reduce any obstructions (e.g., boulders) in the tunnel tailrace area. Operate the modified diversion tunnel for a short duration, as described in Volume 1 Appendix B Reservoir Filling Plan. Approaches to mitigate the potential effects of fish entrainment on health and survival of fish during construction are considered in more detail in Volume 2 Appendix Q Fish Passage Management Plan.	
Reduced fish health and survival due to increased total dissolved gas	Construction	Construction headpond and reservoir filling	Modify spillway design to reduce the magnitude of total dissolved gas generated. Develop and implement an operational procedure to reduce the number of hold points and duration of the reservoir filling and turbine commissioning to reduce total dissolved gas concentration in tailwater.	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Reduced fish health and survival due to fish entrainment	Operations	Operation of the dam and generating station	Use large, slow rotating Francis turbines to increase entrainment survival. Design smooth and gradual transitions at the approach channel and penstock entrances and tailrace exit structures into the final design. Design the orientation and size of openings and exits to reduce hydraulic turbulence to reduce fish injury. Ensure smooth surface finishing on linings of spillways. Reduce obstructions (e.g., boulders) from the turbulent zone in the spillway and tailrace areas. Approaches to mitigate the potential effects of fish entrainment on health and survival of fish during operation are considered in more detail in Volume 2 Appendix Q Fish Passage Management Plan.	Not significant
Reduced fish health and survival due to increased total dissolved gas supersaturation	Operations	Operation of the dam and generating station	The spillway design has been modified to reduce total dissolved gas generation. Develop and implement an operational procedure to manage the rate of discharge at each gate to reduce dissolved gas generation – initiate spillway discharge operations through multiple gates to reduce the rate of discharge at each gate. Develop and implement an operational procedure to reduce operation of turbines in water discharge ranges that produce 'rough load operation' to reduce total dissolved gas concentration in tailwater.	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Hindered fish movement due to obstruction to fish passage	Construction	Construction of the dam and generating station	Provide upstream fish passage during construction by a trap and haul facility. Implement a periodic capture and translocation program for small-fish species, contingent on the results of investigative studies into the genetic exchange requirements of upstream and downstream populations. Approaches to mitigate the potential effects of obstructed fish movement during the construction of the Project are considered in more detail in Volume 2 Appendix Q Fish Passage Management Plan.	Significant
Hindered fish movement due to obstruction to fish passage	Operations	Operation of the dam and generating station	Provide upstream fish passage during operations by a trap and haul facility Implement a periodic capture and translocation program for small-fish species, contingent on the results of investigative studies into the genetic exchange requirements of upstream and downstream populations. Approaches to mitigate the potential effects of obstructed fish movement during the operations of the Project are considered in more detail in Volume 2 Appendix Q Fish Passage Management Plan.	Significant
Section 13 – Vegetation and Ecological Communities				
Habitat Alteration and Fragmentation Old growth, grasslands and wetlands	Construction	Clearing, grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries	Project design to date has located new proposed roads and other linear disturbances along existing disturbed areas as much as possible to minimize the effects of habitat loss. Place transmission towers and temporary roads away from wetlands and known rare plant occurrences where feasible.	Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
		Diversion and reservoir filling	All known occurrences will be provided as inputs during the final design phase for consideration. If there is limited or no existing data to help facilitate avoidance measures, then supplemental pre-construction surveys will be conducted. These pre-construction surveys will target rare plants as defined in Section 13.2.2—including vascular plants, mosses, and lichens. If avoidance is not feasible, other mitigation measures will be considered, including effect reduction and compensation.	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Habitat alteration and fragmentation Tufa seeps, wetlands and rare plants	Construction	Clearing, grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Diversion and reservoir filling	An Environmental Protection zone will be established to protect occurrences located adjacent to construction areas. Signage will be added where necessary to indicate the boundaries of the exclusion area. Construction personnel will be required to attend a field-based orientation session where the exclusion areas will be explained, and the importance of avoiding disturbance within them will be stressed. This will form part of the Environmental Training Management Plan (Section 35.2.2.8 in Volume 5 Section 35 Summary of Environmental Management Plans). A Wetland Mitigation and Compensation Plan will be developed, incorporating information on location, size and type of wetlands affected by the Project. The plan will include applying a mitigation hierarchy that prioritizes mitigation actions to be undertaken: 1. Avoid direct effects where feasible; 2. Minimize direct effects where avoidance is not feasible; 3. Maintain or improve hydrology where avoidance is not feasible; 4. Replace like for like where feasible; 5. Improve the function of existing wetland habitats; and 6. Create new wetland habitat	Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Habitat alteration and fragmentation: Grasslands, wetlands, and rare plants	Construction	Clearing, grubbing, site preparation, diversion and reservoir filling	The Soil Management, Site Restoration and Revegetation Plan will take into account the location of known occurrences, and suggest the seed mixes and methods to avoid indirect loss or alteration to nearby occurrences.	Not significant
Habitat alteration and fragmentation: Old growth, wetlands and rare plants	Construction	Clearing, grubbing, site preparation, diversion and reservoir filling	Temporary construction access roads will be closed and reclaimed following construction. During construction, access roads will be controlled to limit use.	Not significant
Habitat alteration and fragmentation: Wetlands and rare plants	Operation	Operation of the dam and generating station	A spatial database of known rare plant occurrences in the vicinity of Project components will be maintained and searched to avoid effects during operations and maintenance activities. The database will be actively updated as new information becomes available.	Not significant
Habitat alteration and fragmentation: Old growth, grasslands, wetlands, and rare plants	Construction	Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Diversion and reservoir filling	Efforts have been made during Project design to use existing access corridors, plan for deactivation of temporary access roads, and minimize disturbance to help limit additional fragmentation. Project components where this has occurred are listed below. • **Substation and Transmission Lines to Peace Canyon Dam:** Constructing the new transmission lines adjacent to the existing line, and using the existing corridor and maintenance access roads. • **Highway 29 Realignment:** Using	Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			portions of existing roads and selecting borrow sites that already exist or that would be eventually covered by the reservoir. • **Quarried and Excavated Construction Materials:** Further developing existing quarry sites (e.g., Wuthrich, Del Rio, and West Pine) and using a site that has already been affected by development (85th Avenue Industrial Lands). • **Construction Access Roads:** Use of existing infrastructure for moving material, upgrading existing access roads, and deactivation of temporary roads used for reservoir clearing, and placing the south bank access to the Dam Site along the existing transmission line corridor.	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Habitat alteration and fragmentation: Wetlands and rare plants	Construction	Clearing, grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Diversion and reservoir filling	The construction methods used will take into account the location of known occurrences and high-suitability habitat. Where complete avoidance is not feasible, effect reduction will be considered. This can include timing construction activities to winter months, and surface protection measures such as placing ramps to reduce vehicle compaction within occurrences, or using rubber-tired versus tracked equipment to minimize ground disturbance.	Significant
Habitat alteration and fragmentation: Grasslands, wetlands, and rare plants	Construction	Clearing, grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries	The indirect effects associated with increased dust deposition are expected to be diffuse, and are not considered to threaten the continued viability of any known rare plant occurrences. Fugitive dust from construction activities will be minimized through the application of an Air Quality Monitoring and Dust Control Plan (Section 35.2.2.7 in Volume 5 Section 35 Summary of Environmental Management Plans).	Not significant
Habitat alteration and fragmentation: Wetlands	Construction and operations	Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Operation of the dam and generating station	Construction and maintenance activities in and around watercourses and wetlands will conform to BC Hydro's regulator-accepted practices including Approved Work Practices for Managing Riparian Vegetation (BC Hydro et al. 2003). An Agreement between BC Hydro, the B.C. Ministry of Environment, and Fisheries and Oceans Canada (BC Hydro et al. 2009) identifies other accepted work practices that	Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			are to be developed and available for use in the near future. Additional guidance will be used from Standards and Best Practices for Instream Works (B.C. Ministry of Water, Land and Air Protection 2004) and the Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al. 1992), which are designed to reduce sedimentation and avoid introduction of deleterious substances to aquatic environments. Maintaining surface flow patterns is important in the retention of functioning wetlands. Construction activities will be designed and carried out in a manner that seeks to maintain the hydrology of adjacent wetlands, particularly where known rare plant occurrences are present. Measures will be implemented to maintain existing hydrological patterns as much as possible, if roads cannot avoid wetlands. Culverts will be installed under access roads to maintain hydrological balance, and sedimentation barriers will be installed as needed. A hydrologist will be employed to assist with developing site-specific measures to reduce changes to existing hydrologic balance and wetland function during construction of the Jackfish Lake Road and Project access roads and the transmission line.	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Habitat alteration and fragmentation: Wetlands	Construction	Clearing, grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries	Stormwater management will be designed to control runoff and direct it away from work areas where excavation, spoil placement, and staging activities occur. Consideration for maintaining recharge levels to wetlands will be given when diverting water around work sites, providing there is not expected to be a measurable increase in sediment transport to these sensitive areas. Surface water quality management will be addressed in the Erosion Prevention and Sediment Control Management Plan (Section 35.2.2.9), Fisheries and Aquatic Habitat Management Plan (Section 35.2.2.10) and Emergency Response Plan (Section 35.2.1.1), all in Volume 5 Section 35 Summary of Environmental Management Plans.	Significant
Habitat alteration and fragmentation: Old growth, rare plants	Construction	Clearing, grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries	A hierarchal decision matrix has been developed for reservoir clearing to reduce erosion potential along steep, unstable slopes and along riparian zones for all defined watercourses. Specifically the decision matrix includes: • Retention of all trees in on steep, unstable slopes that would be highly susceptible to landslides if the vegetation was removed • Retention of non-merchantable trees and vegetation in riparian areas within a 15 m buffer from the high water mark. Merchantable trees may still be removed using clearing practices to	Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			maintain a 15 m machine-free zone. These same standards will be employed in other work areas, and will follow BC Hydro's approved work practices.	
Habitat alteration and fragmentation: rare plants	Construction	Clearing, grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries	An experimental rare plant translocation program will be considered for suitable rare plant species found within the reservoir and other areas where Project components are certain to remove the populations. The translocation program will follow the B.C. Ministry of Environment's Guidelines for Translocation of Plant Species at Risk in British Columbia (Maslovat 2009). Translocation of endangered plants is generally thought to have a low likelihood of success and should be considered a follow-up monitoring opportunity, rather than a means to relocate occurrences to prevent their loss.	Significant
Habitat alteration and fragmentation: Tufa seeps, grasslands, wetlands, and rare plants	Construction and operations	Clearing, grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Operation of the dam and generating station	A Vegetation and Invasive Plant Management Plan (Section 35.2.2.22 in Volume 5 Section 35 Summary of Proposed Environmental Management Plans) will be developed and implemented during the entire construction phase (including restoration) and integrated during operations. The plan will be designed using the locations of known rare plant or sensitive site occurrences and locations of high-suitability habitats as inputs. Weed control efforts will be coordinated with the rare plant botanists to ensure that effects to occurrences	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			are avoided or reduced.	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Habitat alteration and fragmentation: Grasslands, wetlands, and rare plants	Construction and operations	Clearing, grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Operation of the dam and generating station	Disturbed sites will be replanted quickly with ground cover, shrubs, or trees that are regionally appropriate once erosion concerns have been addressed. This will be part of BC Hydro's Soil Management, Site Restoration and Revegetation Plan (Section 35.2.2.19 in Volume 5 Section 35 Summary of Environmental Management Plans). Additional mitigation measures to reduce the spread of invasive species are described below. Prior to work commencing, surveys will be conducted to identify invasive species populations. Treatment will be initiated as required. All vehicles entering and leaving work sites will be washed thoroughly, with special attention to wheel wells, tire treads, and tracks where mud and seeds of noxious weeds may be lodged. Wash areas will be located away from any water body and riparian areas. Used wash water will be treated to prevent seed dispersal.	Significant
Habitat alteration and fragmentation: Old growth, wetlands and rare plants	Operations	Operation of transmission line	BC Hydro has considerable experience managing and maintaining an extensive transmission line network within the province, including the existing transmission corridor along which the new lines will be constructed. The Integrated Vegetation Pest Management Plan for Transmission Line Rights-of-Way (BC Hydro 2010) will be	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			followed in order to reduce or avoid the spread of invasive species during the operations phase of the transmission line and the Pest Management Plan For Management of Vegetation at BC Hydro Facilities (BC Hydro 2012b) will be used to manage invasive species at other Project facilities.	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Habitat alteration and fragmentation: Wetlands and rare plants	Construction	Construction of the Project	With the creation of the Project, BC Hydro will fund a compensation program. This program would include: • A survey of habitat enhancement projects in the RAA will be conducted to identify projects that might provide compensation for rare and sensitive habitats and protect occurrences of rare plants (e.g., wetlands). If suitable habitat enhancement projects can be found, BC Hydro will provide assistance (financial or in-kind) to the managing organization. The inventories will also identify areas that are under threat from development or in need of habitat enhancement. Where opportunities exist, BC Hydro will consider direct purchase – if offered for sale – and management of these lands to enhance or retain rare plant values. BC Hydro will also consider contributing to other protection options where direct purchase is not feasible. BC Hydro will fund or undertake targeted surveys in the RAA to locate additional occurrences of the 18 directly affected rare plant species that the Conservation Framework identifies as requiring additional inventories (Table 13.14). Full element occurrence data will be collected and transmitted to the B.C. Conservation Data Centre for each additional	Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			occurrence found.	
Habitat alteration and fragmentation: Rare plants	Construction	Construction of the Project	BC Hydro will fund or undertake a study in an attempt to clarify the taxonomy of Ochroleucus bladderwort. This is the only species of the 34 directly affected taxa for which the Conservation Framework identifies further taxonomic research as being required for its conservation. The study plan will be developed in consultation with the B.C. Conservation Data Centre and may include field, herbaria, and genetic work.	Significant
Section 14 – Wildlife Resources				
Habitat Alteration and Fragmentation Wetlands and wetland-associated key indicators: amphibians and reptiles, butterflies and dragonflies, migratory birds, raptors, bat	Construction and operations	Construction of the dam and generating station, Highway 29, access roads, transmission line Reservoir filling Quarrying and excavation of construction materials Operation of the dam and generating station	Efforts on this Project have been made to use existing corridors, deactivate temporary access roads, and minimize disturbance where possible, to help minimize fragmentation. Project components where this has occurred include: • **Substation and Transmission Lines to Peace Canyon Dam:** building the transmission lines adjacent to the existing line, therefore using the existing corridor and maintenance access roads • **Highway 29 Realignment:** use portions of existing roads and select borrow sites that already exist or would be covered by the reservoir • **Quarried and Excavated Construction Materials:** further develop existing quarry	Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			sites such as Wuthrich, Del Rio, and West Pine, and use a site that has already seen development – the 85th Avenue Industrial Lands. **Road and Rail Access:** use existing infrastructure for moving material, upgrade existing access roads, and deactivate temporary roads used for reservoir clearing, and place the Project access road to the dam site area along the existing transmission line corridor. All known wetland locations (e.g., breeding habitat for butterflies and dragonflies, amphibians, migratory birds), snake hibernacula, bat hibernacula, Sharp-tailed Grouse lek sites, beaver lodges, and large raptor stick-nest locations would be provided as inputs during the final design phase so further reductions and avoidances can be considered. If work is required immediately adjacent to any wetlands, then appropriate barriers and no- or restricted-activity buffer zones would be established to avoid direct disturbance to these sites. Habitat would be cleared in the approved areas only and construction would be monitored to prevent any unnecessary clearing. Construction and maintenance activities in and around watercourses and wetlands would conform to BC Hydro's regulator-accepted practices including Approved Work Practices for Managing Riparian Vegetation	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			(BC Hydro et al. 2009). New wetland habitat areas would be created as partial compensation for wetland loss due to the reservoir. Consideration for creating areas that are fish-free would be included to minimize the effects of fish predation on invertebrate and amphibian eggs and larvae and young birds. Measures would be implemented to maintain existing hydraulic patterns as much as possible if roads cannot avoid wetlands. Ditches, culverts, and other structures would be placed to maintain the natural drainage patterns and allow the movement of flows. Construction and maintenance activities in and around watercourses and aquatic habitats would conform to BC Hydro's accepted work practices with additional input from Standards and Best Practices for Instream Works (B.C. Ministry of Water, Land and Air Protection 2004b) and the Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al. 1992), which are designed to reduce sedimentation and avoid introduction of deleterious substances to aquatic environments. BC Hydro would have an Erosion Prevention and Sediment Control Plan (Section 35.2.2.9 in Volume 5 Section 35 Summary of Proposed Environmental Management Plans) as part of their	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			Construction Management Framework. Stripping vegetation and soils would be minimized as much as possible, taking into consideration proximity to sensitive habitats, e.g., wetlands, and slope stability. Within the reservoir, a hierarchal decision matrix has been developed for clearing to reduce erosion potential along steep, unstable slopes and along riparian zones for all defined watercourses. Specifically, the decision matrix includes: ▪ Retention of all trees in areas with steep, unstable slopes that would be highly susceptible to landslides if the vegetation was removed ▪ Retention of non-merchantable trees and vegetation within riparian areas around existing water bodies within a 15 m buffer from the high water mark. Merchantable trees may still be removed using clearing practices, in order to maintain a 15 m machine-free zone. These same standards would be employed in other work areas and would follow BC Hydro's approved work practices. Stormwater management would aim to control runoff and direct it away from work areas where excavation, spoil placement, and staging activities occur. Consideration for maintaining recharge levels to wetlands would be considered when	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			diverting water around work sites, providing there is not expected to be a measurable increase in sediment transport to these sensitive areas. A Surface Water Quality Management Plan (Section 35.2.2.21 in Volume 5 Section 35 Summary of Proposed Environmental Management Plans) would be developed as part of BC Hydro's Construction Environmental Management Framework. Cleared areas that will not have permanent features would be replanted with appropriate vegetation in order to promote soil stability. Regionally appropriate vegetation would be included in the reclamation activities. BC Hydro would develop a Soil Management, Site Restoration and Revegetation Plan (Section 35.2.2.19 in Volume 5 Section 35 Summary of Proposed Environmental Management Plans). All activities that involve potentially harmful or toxic substances, such as oil, fuel, antifreeze, and concrete, would follow approved work practices and consider the provincial BMP guidebook Develop with Care (B.C. Ministry of Environment 2012). BC Hydro would have a Fuel Handling and Storage Management Plan (Section 35.2.2.11 in Volume 5 Section 35 Summary of Proposed Environmental Management Plans). This plan would include the need for all construction machinery and	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			vehicles to be properly maintained to ensure that harmful fluids do not leak into aquatic environments or other sensitive areas. Prior to initiating construction activities in proximity to any water body, the hydraulic, fuel, and lubrication systems of all equipment would be checked to ensure that systems are in good condition and free of leaks. All machines would have a spill kit and operators would be educated on how to use the kit. Minimum distances between maintenance and refuelling sites and water bodies would be specific in the plan. BC Hydro's Construction Environmental Management Framework would include an Emergency Response Plan (Section 35.2.1.1 in Volume 5 Section 35 Summary of Proposed Environmental Management Plans) as well as a Hazardous Waste Management Plan (Section 35.2.2.13 in Volume 5 Section 35 Summary of Proposed Environmental Management Plans). Herbicide application would be used to control invasive plants and for the maintenance of some vegetation along the transmission line and at project facilities. The use of herbicides is described in BC Hydro's Pest Management Plan for Management of Vegetation at BC Hydro Facilities (BC Hydro 2012) and Integrated Vegetation Management Plan for Transmission Rights-of-way	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			(BC Hydro 2010). Disturbed sites would be replanted quickly with ground cover, shrubs, or trees that are regionally appropriate, once erosion concerns have been addressed per BC Hydro's Soil Management Site Restoration and Revegetation Plan. A Wildlife Management Plan (Section 35.2.2.24 in Volume 5 Section 35 Summary of Proposed Environmental Management Plans) and Vegetation and Invasive Plant Management plan (Section 35.2.2.22 in Volume 5 Section 35 Summary of Proposed Environmental Management Plans) would also be included, defining objectives for limiting invasive species by monitoring the presence and possible spread of invasive plants in temporarily disturbed areas, as well as the success of revegetation programs. Mitigation measures to reduce the spread of invasive species include: ▪ Prior to work commencing, surveys would be conducted to identify invasive species populations. Treatment would be initiated as required ▪ All vehicles entering and leaving work sites would be washed thoroughly, with special attention to wheel wells, tire treads, and tracks where mud and seeds of noxious weeds may be lodged ▪ Locating wash areas away from any water	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			body and riparian areas ▪ Treating used wash water to prevent seed dispersal The Pest Management Plan for Management of Vegetation at BC Hydro Facilities (BC Hydro 2012) and the Integrated Vegetation Management Plan for Transmission Rights-of-Way (BC Hydro 2010) would be followed in order to reduce or avoid the spread of invasive species during the operations phase of the Project.	
Habitat alteration and fragmentation Loss of nesting habitat: migratory birds	Construction	Construction of the Project	Nest boxes for cavity-nesting waterfowl would be incorporated into wetland mitigation plans. Additional boxes would be established within riparian vegetation zones established along the reservoir on BC Hydro-owned properties, where feasible. The feasibility of placing small floating islands along some areas within the reservoir would be examined. Based on present land ownership, it is estimated there would be over 300 ha of BC Hydro-owned Cultivated Field remaining after the reservoir is filled. A portion of these fields would be managed to provide some breeding habitat for Northern Harrier and Short-eared Owl. Wetland compensation would also address some habitat losses for these two species.	Significant
Habitat alteration and fragmentation Bats	Construction	Construction of Highway 29 Realignment, Quarries	Bat roosting habitat features would be considered for incorporation into new bridge designs. This can be achieved following published	Not Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			guidelines (Keely and Tuttle 1999; Johnston et al. 2004; Gore and Studenroth 2005) without compromising bridge safety or structural integrity. Bridge night roosts are currently the only public sites within the Peace River valley where relatively large numbers of bats can be captured in a night. Bat boxes may be installed on free-standing poles or on facility walls where their presence would not interfere with facility operations and maintenance. The feasibility of incorporating bat boxes onto mounting poles being used for artificial eagle nest sites would be examined. Bat boxes should be situated where they will get at least 10 hours of sun to provide warm conditions for maternity roosts. Additional information on design, construction, and installation of bat boxes is available from Bat Conservation International (2012). Balsam poplar and aspen would be considered in plantings when reclaiming disturbed habitats and when enhancing habitat for wildlife compensation. Deciduous trees would provide future roosting habitat for bats. Once rock extraction is complete at Portage Mountain, opportunities for creating hibernating and roosting sites would be explored. This can include leaving deep drill holes at least 3 m deep in remaining rock faces, and creating roost microsites on warm aspects that are inaccessible to predators.	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Habitat alteration and fragmentation Fishers	Construction and Operations	Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Operation of the dam and generating station	The fisher population, particularly south of the Peace River, is lower than initial estimates, based on habitat availability and provincial density. Throughout its range, fur harvest, timber harvest, predator control, and urbanization have been the greatest contributors to fisher population declines (Lofroth et al. 2010). Mitigation measures that limit these factors may increase the population. Create natural or artificial piles of coarse woody debris dispersed throughout the disturbed landscape to maintain foraging areas and cold-weather rest sites. Focus on younger plateau forest where coarse woody debris is limited. Create arboreal resting sites. Spruce rust broom was found to be rare in the Peace River valley, primarily due to the lack of coniferous forests. Creating rust broom-like structure in deciduous stands may provide additional resting opportunities for fisher. Provide artificial den boxes within forested stands that have limited den trees.	Not Significant
Habitat alteration and fragmentation Ungulates	Construction and Operations	Construction of the dam and generating station, Highway 29, access roads Operation of the dam and generating station	BC Hydro would continue to manage lands it owns to the east of the Halfway River and west of Wilder Creek to maintain values of these areas as winter range and their accessibility.	Not significant
Disturbance and	Construction	Clearing,	The clearing of vegetation for	Not

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
displacement: ▪ Migratory birds, non-migratory birds, raptors ▪ Timing of works ▪ Lighting ▪ Roads		grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries	all work would consider both the Migratory Bird Convention Act and the B.C. Wildlife Act, where active nests are protected from disturbance and removal. The provincial government has developed least-risk windows for terrestrial wildlife that are of management concern within the Peace Region of the B.C. Ministry of Forests, Lands and Natural Resource Operations. Suggested critical time periods when construction should be avoided are: ▪ Songbirds: May 1 through July 31, when nesting could occur (B.C. Ministry of Forests, Lands and Natural Resource Operations 2011) ▪ Trumpeter Swan, raptors and owls: April 1 through July 31 Goddard (2010) observed lek attendance by Sharp-tailed Grouse between mid-April and mid-May in the Peace River region, and a nesting initiation to hatching date range from early May to mid-July. There is no specific mention for grouse within the least-risk windows, but nesting overlaps the critical time frame suggested for raptors. Clearing activities for much of the area are presently scheduled to occur during the winter months, thereby avoiding conflicts with nesting birds (see Volume 1 Appendix A Vegetation, Clearing, and Debris Management Plan). Scheduling constraints may require clearing activities to occur outside the winter	significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			months. If clearing work during the critical bird breeding season outlined above cannot be avoided, a nest and lek search protocol would be developed and implemented prior to clearing, to avoid disturbance to active nests. The protocol would be developed in consultation with Environment Canada, Canadian Wildlife Service, and the Ministry of Environment. The protocol would outline buffers required around active nest sites. As feasible, lighting would be focused on work sites, minimizing light pollution in surrounding areas. During construction, access would be restricted on roads used by work crews. Temporary roads would be closed and reclaimed when no longer needed.	
Disturbance and displacement: Butterflies and dragonflies, amphibians and reptiles, migratory birds, non-migratory birds, raptors, bats, fur-bearers, ungulates, and large carnivores	Construction and operations	Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Operation of the dam and generating station	BC Hydro uses a GIS-based mapping system for recording, storing, and analyzing information for managing resources along all of its rights-of-way. The information is reviewed when developing vegetation management prescriptions during operations. If occurrences for rare species (e.g., Yellow Rail) are known along the transmission line right-of-way or are adjacent to generation facilities, the location of these sites would be incorporated into the database for future planning and consideration, so as to minimize or avoid unnecessary disturbance.	Not Significant
Displacement	Construction	Construction of	All known lek locations would	Not

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
and disturbance Sharp-tailed Grouse		the Project	be provided as inputs during the final design phase so further reductions and avoidances are considered. If new construction sites are added or the area where disturbance is to occur is poorly understood, the new areas would be checked to confirm if leks are present and possible ways to minimize disturbance. If work is required immediately adjacent to any leks, then appropriate barriers would be added so as to instruct construction personnel to avoid these sites. Habitat would be cleared in the approved Project activity zone only, and construction would be monitored to prevent any unnecessary clearing	Significant
Disturbance and displacement: Bald Eagle nests	Construction	Clearing, grubbing, site preparation Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Diversion and reservoir filling	The baseline data on Bald Eagle nest sites from 2011 would be updated prior to commencement of construction to ensure an accurate understanding of the number of nests that would be affected by the Project. To mitigate the loss of Bald Eagle nests within the proposed reservoir, new nesting platforms would be erected along the expected reservoir shoreline. Platforms would be designed to be attractive to nesting Bald Eagles – i.e., platform suitable for supporting a large stick-nest, with structures extending above the platform to provide perch sites for adults and juveniles prior to fledging – and would be placed in areas removed from potential human disturbance. The Best Management Practices for	Not Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			Raptor Conservation during Urban and Rural Land Development in British Columbia (Demarchi et al. 2005) provides further guidance. For each active nest lost due to the Project, two nesting structures would be provided; the two-to-one ratio is proposed by BC Hydro. Bald Eagle nests are typically located adjacent to water. With construction lasting up to eight years, it is possible Bald Eagles would not use the newly erected platforms until the reservoir is filled. Bald Eagle nests confirmed active the year clearing is started within the reservoir, and outside the dam construction area would be retained through the entire construction phase until reservoir filling is initiated. Nests that could be lost during seasonal flooding associated with Stage 2 dam construction would be removed to limit displacement or possible mortality. Appropriate government approvals and permits would be obtained prior to removing any nest. For active nests retained through construction, a no-clearing buffer centred on each active nest would be employed	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Disturbance and displacement: ▪ Large carnivores	Construction and Operations	Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Operation of the dam and generating station	Preventative measures would be used to avoid creating human-bear conflicts. Before commencement of work, all crews should participate in a Bear Aware™ or similar training program. Feeding of wildlife (including birds) would be prohibited at work sites. Construction areas and worker housing sites would be fenced and kept clean and free of waste, with garbage securely stored in bear-proof containers or removed from site. Trucks and work vehicles are not secure storage areas for garbage, because bears have been known to break into vehicles for food (Davis et al. 2002). Work crews would be prohibited from hunting and cleaning game around construction sites. If precautions to remove bear attractants such as food and garbage are not effective in deterring aggressive bears from construction areas, the Environmental Monitor would notify a Conservation Service Officer that a potential "problem bear" is in the area. A bear would only be classified as a "problem bear" if: ▪ It shows repeated interest in people and their facilities ▪ It is heavily habituated to people and has repeatedly obtained unnatural foods ▪ It displays aggressive behaviour (unprovoked charges or predatory behaviour) and is an imminent threat to human safety	Not Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			The Conservation Service Officer would determine whether further actions, such as more aggressive aversive conditioning (e.g., use of rubber bullets, hard capture and release, etc.), translocation, or destruction of the bear are necessary, and would advise about how to ensure worker safety. A detailed Human-Bear Conflict Management Plan would be developed for the Project.	
Mortality: ▪ Migratory birds, non-migratory birds, raptors ▪ Timing of works Collision and electrocution mortality	Construction and Operations	Clearing, grubbing, site preparation Construction and operation of transmission lines	The clearing of vegetation for all work would consider both the *Migratory Bird Convention Act* and the B.C. *Wildlife Act,* where active nests are protected. The provincial government has developed least-risk windows for terrestrial wildlife that are of management concern within the Peace Region of the B.C. Ministry of Forests, Lands and Natural Resource Operations (see above in Disturbance and Displacement mitigation). Clearing activities for much of the area are presently scheduled to occur during the winter months, thereby avoiding conflicts with nesting birds (see Volume 1 Appendix A Vegetation, Clearing, and Debris Management Plan). Scheduling constraints may require clearing activities to occur outside winter months. If clearing work during the critical bird breeding season outlined above cannot be avoided, a nest and lek search protocol would be developed and implemented prior to clearing to avoid disturbance and possible mortality to nesting birds.	Not Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			The protocol would be developed in consultation with Environment Canada, Canadian Wildlife Service, and the Ministry of Environment. The protocol would outline buffers required around active nest sites. The design of the transmission towers reduces the risk of collision and electrocution by: 1. BC Hydro's standard design has all of the conductors in the same horizontal plane. This configuration will be used unless there is a requirement to reduce the right-of-way. 2. The standard phase-to-phase spacing (distance between the lines) for 500 kV transmission lines is approximately 10 meters and phase-to-ground (conductors to the tower body) is over 3 meters so the risk of electrocution by contacting two phases or one phase and the tower is virtually non-existent.	
Mortality: ▪ Butterflies and dragonflies, amphibians and reptiles, migratory birds, non-migratory birds, raptors, bats, fur-bearers, ungulates	Construction	Clearing, grubbing, site preparation Construction of the dam and generating station,	The project would avoid the release of deleterious hydrocarbons and other hazardous materials by conforming to BC Hydro's accepted work practices with additional input from Standards and Best Practices for Instream Works	Not Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
and large carnivores		Highway 29, access roads, transmission line, quarries	(B.C. Ministry of Water, Land and Air Protection 2004b) and the Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al. 1992), which are designed to reduce sedimentation and avoid introduction of deleterious substances to aquatic environments. Mortality due to sedimentation would be reduced or avoided following similar plans, e.g., BC Hydro would have an Erosion Prevention and Sediment Control Plan (Section 35.2.2.9 in Volume 5 Section 35 Summary of Proposed Environmental Management Plans) as part of their Construction Management Framework. Surface water quality would be monitored to ensure it does not exceed established guidelines for aquatic life (see Volume 2 Appendix E Water Quality Baseline Conditions in the Peace River). BC Hydro would follow their Pest Management Plan for Management of Vegetation at BC Hydro Facilities (BC Hydro 2012) and Integrated Vegetation Management Plan for Transmission Rights-of-Way (BC Hydro 2010) for the use of herbicides. This includes consideration for use around wetlands and species at risk.	
Mortality: ▪ Butterfly and dragonfly, amphibians and reptiles Predation	Construction and Operations	Construction and operation of the Project	A portion of the wetlands created to compensate for habitat loss would be designed to remain fish-free to eliminate predation to invertebrates (dragonfly larva) and amphibians and reptiles.	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Mortality: ▪ Amphibians and reptiles, mammals Roads	Construction	Construction of the Project	Road mortality for both amphibians and snakes was documented during baseline studies and is expected to occur during Project construction, as many roads have multiple users. During detailed road design, efforts would be made to minimize or avoid additional losses. Where roads are adjacent to wetlands or amphibian migrations across roads are anticipated, fencing would be placed along the length of the road to guide amphibians through structures designed for wildlife passage under the road. The size and number of the structures needed and the length of fencing would be determined in consultation with regulators. Road mortality of mammals is expected to occur during Project construction. Measures to minimize road mortality include: ▪ Reducing vehicle traffic by using buses and car-pooling for workers ▪ Requiring workers to adhere to strict speed limits ▪ Instructing workers that wildlife has right-of-way unless there are safety concerns ▪ Maintaining a logbook of wildlife sightings, including roadkills, and posting warning signs at locations with frequent wildlife crossings ▪ Promptly moving roadkill well off the road to avoid secondary mortality of	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			scavengers ▪ Including wildlife-vehicle collisions as safety issues for discussion on worker tailboard meetings Temporary workers involved in on-site Project construction would be encouraged not to hunt in the LAA.	
Mortality: Large carnivores	Construction and Operations	Construction of the dam and generating station, Highway 29, access roads, transmission line, quarries Operation of the dam and generating station	Preventative measures would be used to avoid creating human-bear conflicts. Before commencement of work, all crews should participate in a Bear Aware™ or similar training program. Feeding of wildlife (including birds) would be prohibited at work sites. Construction areas and worker housing sites would be fenced and kept clean and free of waste, with garbage securely stored in bear-proof containers or removed from site. Trucks and work vehicles are not secure storage areas for garbage, because bears have been known to break into vehicles for food (Davis et al. 2002). Work crews would be prohibited from hunting and cleaning game around construction sites. If precautions to remove bear attractants such as food and garbage are not effective in deterring aggressive bears from construction areas, the Environmental Monitor would notify a Conservation Service Officer that a potential "problem bear" is in the area. A bear would only be classified as a "problem bear" if: ▪ It shows repeated	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			interest in people and their facilities ▪ It is heavily habituated to people and has repeatedly obtained unnatural foods ▪ It displays aggressive behaviour (unprovoked charges or predatory behaviour) and is an imminent threat to human safety The Conservation Service Officer would determine whether further actions, such as more aggressive aversive conditioning (e.g., use of rubber bullets, hard capture and release, etc.), translocation, or destruction of the bear are necessary, and would advise about how to ensure worker safety. A detailed Human-Bear Conflict Management Plan would be developed for the Project. Mitigation for wolves will include previously-described measures for minimizing road traffic, deactivation and reclamation of temporary construction roads, maintaining clean worksites and camps, and encouraging temporary workers to not hunt in the LAA. Filling the reservoir during the fall will prevent potential drowning of young pups. It should be noted that mitigation is not designed to promote increases in the wolf population as that would conflict with the current regional goal of reducing wolf predation on livestock and ungulates.	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Section 15 – Greenhouse Gases				
Emission of Greenhouse Gases	Construction	The burning of diesel and gasoline in vehicles and heavy equipment Emissions associated with construction materials	Implement fleet management measures to reduce fuel consumption and increase fuel efficiency. (see Volume 2 Section 35 Summary of Environmental Management Plans) Initiatives to mitigate the GHG emissions have been incorporated into the design of the Project.	Not significant
Release of Greenhouse Gases	Operations	Clearing, filling and operation of the reservoir	Reduce the long-term conversion of land while still achieving the purpose of the Project. This was taken into consideration in the design of the project.	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Section 18 – Regional Economic Development				

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Due to Project expenditures: Change in business opportunities during construction Change in business and contracting profile, capabilities and capacity during construction	Construction	Construction of the Project	General Population: • Implement Business Participation Strategy to increase awareness in the business community about Project procurement opportunities (refer to Volume 1 Appendix F Project Benefits Supporting Documentation) • Partner with local business organizations and with economic development offices and programs to deliver business information sessions and to communicate contracting opportunities • Mitigation in the Labour Market assessment will also contribute to expansion and diversification of the contractor profile, capabilities, and capacity. Aboriginal Peoples: • Continue outreach initiatives to make Aboriginal businesses aware of Project contracting opportunities • Where identified by Aboriginal groups as an interest, BC Hydro will consider commitments respecting capacity building, education, and training associated with Aboriginal participation in labour market opportunities • Implement a Business Participation Strategy: continue to notify Aboriginal groups of business information sessions, and about opportunities to register with BC Hydro's Aboriginal Business Director (refer to Volume 1 Appendix F Project Benefits Supporting Documentation)	Project benefits on Regional Economic Development

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Section 19 – Current Use of Land and Resources for Traditional Purposes				
Changes in fishing opportunities and practices	Construction and operations	Construction and operation of the Project	Consider developing fish habitat compensation projects that align with BC Hydro compensation programs. Develop a communications program to inform harvesters of planned or unplanned events related to construction activities that may affect fishing opportunities or access. Develop a communications program to inform harvesters of longer-term changes in fish community composition. Implement mitigation measures set out in Volume 2 Section 12 Fish and Fish Habitat. Implement measures supporting the development of 3 boat launches along the Site C reservoir accessible via Highway 29 to support navigability and navigable use, and the re-establishment of recreational sites on the Site C reservoir and downstream, and to re-establish and create new use patterns and access, as set out in Volume 3 Section 26 Navigation.	Not significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
Changes in hunting and trapping opportunities and practices	Construction and operations	Construction and operation of the Project	Consider developing wildlife habitat compensation projects that align with BC Hydro compensation programs. Develop mitigation measures intended to decrease impacts on First Nation trap lines in the Project activity zone. Develop a communications program to inform harvesters of planned or unplanned events related to construction activities that may affect hunting and trapping opportunities or access. Implement mitigation measures set out in Volume 2 Section 14 Wildlife Resources. Implement all mitigation measures set out in Volume 3 Section 24 Harvest of Fish and Wildlife Resources pertaining to trapping.	Not significant
Changes to other cultural and traditional uses of land	Construction and operations	Construction and operation of the Project	Work with Aboriginal groups to ground truth traditional land use information for specific areas within the Project activity zone prior to commencing construction, e.g., when determining the exact location of an access road. Develop a communications program to inform harvesters of planned or unplanned events that may affect opportunities to harvest plants, berries, and other resources. Consider developing habitat compensation projects that align with BC Hydro compensation programs . Work with Aboriginal groups to identify permanent habitation structures used in	Significant

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			the current use of lands and resources for traditional purposes that may be lost to inundation. Effects on cabins associated with tenured trap lines will be addressed as set out in Volume 3 Section 24 Harvest of Fish and Wildlife Resources. Where untenured cabins may be impacted by the Project, BC Hydro will work with Aboriginal individuals to determine appropriate measures that could be implemented. Work with Aboriginal groups to identify potential sites for relocation of medicinal and food plants to compensate for areas that will be inundated. Use only indigenous and/or non-invasive plants and grasses in re-vegetation programs associated with the Project. Engage with Aboriginal groups around any reclamation phase that may present opportunities to restore ecological communities that support species of high traditional use value. Be prepared to provide support for the indigenous plant nursery owned by West Moberly and Saulteau First Nations located at Moberly Lake. The First Nations have a business plan to support propagation of a wide range of indigenous plant species for use in reclamation work. Establish a Culture and Heritage Resources Committee to provide advice and guidance on the mitigation of specific effects of the Project on culture and heritage resources. The	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			Committee would consist of BC Hydro officials and Aboriginal members whose communities are in the immediate vicinity of the Project. Consider implementing, in consultation with Aboriginal groups and British Columbia where appropriate, the following potential initiatives: • identification and naming of key cultural sites and the potential to integrate Aboriginal names into Project operations and sites; • recording of stories and history associated with key cultural sites that may be affected by the Project; • protecting and documenting, including mapping, of important Aboriginal trails and sites; • contribute funding to sponsor a youth culture camp that includes transfer of knowledge around medicinal and food plants; • engage with Aboriginal groups to commemorate lost and/or inundated places; • engage with Aboriginal groups around potential plans to undertake ceremonies prior to the commencement of construction on key elements of the Project; and • develop and implement an education program respecting Aboriginal culture, history and use of lands and resources in the Project Area to be offered to all workers on the	

Potential Residual Effect	Project Phase	Contributing Project Activity or Physical Works	Proposed Mitigation	Significance
			Project Implement mitigation measures set out in Volume 2 Section 13 Vegetation and Ecological Communities, Volume 4 Section 32 Heritage Resources, and those measures supporting the development of new shoreline recreation sites in Volume 3 Section 25 Outdoor Recreation and Tourism. Implement measures supporting the development of 3 boat launches along the Site C reservoir accessible via Highway 29 to support navigability and navigable use, and the re-establishment of recreational sites on the Site C reservoir and downstream, and to re-establish and create new use patterns and access, as set out in Volume 3 Section 26 Navigation.	

Section 20 – Agriculture				
Permanent loss of agricultural land	Construction and operations	Filling and operation of the reservoir	Implement mitigation measures including: ▪ Agricultural compensation fund to support projects, such as irrigation and drainage improvements ▪ Relocation of suitable quality soil in selected locations ▪ Inclusion of land in the Agricultural Land Reserve, based on discussions with the ALC, Crown and private landowners	Not significant
Section 24 – Harvest of Fish and Wildlife Resources				
Changes in fishing opportunities	Construction	Clearing and filling of the reservoir	Implement Outdoor Recreation and Tourism mitigation measures that support recreational shoreline use, boating access, and water-based navigation (Volume 3 Section 25 Outdoor Recreation and Tourism; Volume 3 Section 26 Navigation) to mitigate construction effects on fishing opportunities. Implement Fish and Fish Habitat mitigation measures that support fish populations (Volume 2 Section 12 Fish and Fish Habitat) to mitigate construction effects on fishing opportunities	Not significant
Changes in fishing opportunities	Operations	Operation of the reservoir	A residual positive effect on fishing opportunities is expected during the operations phase. No mitigation required.	Positive effect on fishing opportunities
Changes in hunting opportunities	Construction	Construction of the dam and generating station, Highway 29 and access roads Quarrying and excavation of construction materials Clearing	Implement Outdoor Recreation and Tourism mitigation measures that support recreational shoreline use, boating access, and water-based navigation (Volume 3 Section 25 Outdoor Recreation and Tourism; Volume 3 Section 26 Navigation) to mitigate construction effects on hunting opportunities. Implement Wildlife Resources mitigation measures that support harvestable game populations (Volume 2 Section 14 Wildlife Resources) to mitigate construction effects on hunting opportunities.	Not significant

Changes in use of harvesting areas	Construction	Construction of the Project	A residual positive effect on the use of harvesting areas is expected during construction. No mitigation required.	Positive effect on use of harvesting areas

Section 25 – Outdoor Recreation and Tourism				
Changes in outdoor recreation and tourism infrastructure	Construction and operations	Clearing and filling of the reservoir	• Develop an Outdoor Recreation Mitigation Plan (Volume 3 Appendix E). The plan specifies opportunities for recreation infrastructure on the Site C reservoir, and provides technical support to recreation providers in the region to assist with their development along, or adaptation to, new shoreline conditions. • Develop a Public Safety Management Plan that will identify public communications procedures for public safety hazards, and access restrictions and closures during construction and operation of the Site C reservoir (Volume 5 Section 35 Summary of Environmental Management Plans). • Establish and operate three new permanent Site C reservoir launches and day use sites (Cache Creek and Lynx Creek trailer launches and Hudson's Hope Shoreline Protection small craft launch) to replace flooded boat launch areas. • Provide funds to the District of Hudson's Hope for the enhancement of Alwin Holland Park or other community shoreline recreation areas • Provide a Community Recreation Site Fund to support development of new shoreline recreation sites within the Peace River and tributaries through to the Alberta border, as well as the Site C reservoir. • Provide technical support to outdoor recreation providers that require access to the Site C reservoir to assist with their development along, or	Not significant

			adaptation to, new shoreline conditions. • Fund the development of a B.C. Peace River / Site C Reservoir Navigation and Recreation Opportunities Plan • Enter into agreements with the owners of the campground at Cache Creek and the hunting camp near the Site C dam site. Where it is both physically and economically feasible, the costs to relocate facilities will be included in the agreements. • Establish a permanent north bank Site C dam site public viewpoint.	
Change in outdoor recreation and tourism use levels during	Construction and operations		Project effects on outdoor recreation levels are expected to be beneficial and not require mitigation. However, mitigation proposed for changes in recreation and tourism infrastructure will enhance outdoor recreation benefits by replacing and improving outdoor recreation infrastructure that is lost due to the Project. BC Hydro will also work with the private sector and local governments to develop new RV sites (per mitigation described in Volume 4 Section 29 Housing). Mitigation proposed in Volume 4 Section 29 Housing (e.g., implementing on-site workforce housing) will enhance tourism benefits by avoiding shortages in hotel, motel, and campground availability that might inconvenience leisure travellers.	Beneficial effects expected

Section 26 – Navigation

Changes to navigability, navigational use and access	Construction and operations	Construction of the dam, generating station and Highway 29	Implement Public Safety Management Plans and supporting boater communication tools to communicate with the boating public about changes to navigability and navigation use, and about hazards and navigation restrictions, such as restricted navigation zones at the dam site, interferences, public safety issues, and any temporary navigation or boat launch access closures associated with active work areas for reservoir clearing, Highway 29 relocation, and Hudson's Hope shoreline protection construction. • The Public Safety Management Plans and supporting boating protocols will be based on established marine communication plans developed for other major infrastructure projects throughout BC, which included input from the Navigable Waters Protection Program, Transport Canada, local user groups and Aboriginal groups. Communications will help boaters plan their trips and provide information about alternative boating areas or launches, when restrictions are in place. • Develop signage for public safety around dams in accordance with the Guidelines for Public Safety Around Dams adopted by BC Hydro. Develop three boat launches along the Site C reservoir to replace Halfway River and Lynx Creek boat launches and the Hudson's Hope ferry landing boat launch. The new boat launches, complete with upgraded amenities, will be located at Hudson's Hope, Lynx Creek and Bear Flat, and will be accessible via Highway 29. Provide a Community Recreation Site Fund to support development of new shoreline recreation within the Peace River and tributaries through to the Alberta border as well as the Site C reservoir. This will support re-establishment of recreational sites on the Site C reservoir and downstream, and	Not significant

Section 27 – Visual Resources				
Changes to visual resources	Construction	Clearing Construction of the dam and generating station, Hudson's Hope shoreline protection, transmission line, Highway 29 and access roads Quarrying and excavation of construction materials Reservoir filling	Restore and re-vegetate disturbed surfaces in construction areas after disturbance activities cease in accordance with the Project Soil Management, Site Restoration, and Re-vegetation Plan. Naturally landscape the shoreline protection in Hudson's Hope Paint permanent Site C dam site buildings and other aboveground structures to blend in with the character of the surrounding environment where possible. Select previously disturbed areas or areas generally hidden from view for the potential off-site workforce accommodation camps, where feasible.	Not significant
Changes to visual resources	Operations	Operation of the dam and generating station and reservoir	No mitigation proposed.	Not significant
Section 28 – Population and Demographics				
Changes to PRRD population, with specific reference to City of Fort St. John	Construction	Construction of the Project	Implement mitigation measures proposed for the Labour Market and Housing VCs (Volume 3 Section 17 and Volume 4 Section 29), including measures to increase the local labour supply (thus reducing the need to hire persons living outside the LAA) and the provision of camp accommodation, to moderate growth of the local population. Implement mitigation measures proposed for the Community Infrastructure and Services VC (Volume 4 Section 30) to mitigate the effects of an increased local population.	Not significant
Changes to Aboriginal community populations	Construction	Construction of the Project	Implement mitigation measures as proposed for the Labour Market, Housing and Community Infrastructure and Services VCs (Volume 3 Section 17, Volume 4 Section 29, and Volume 4 Section 30). If implemented with Aboriginal organizations and First Nations communities, these measures will eliminate the adverse effect of certain population and demographic	Not significant

			changes from the Project. Support Aboriginal persons in maintaining permanent residence in home communities by providing camp housing and commuter support where demand warrants. Implement workforce management policies to require contractors to offer cross-cultural awareness training to their workers and to adopt and monitor codes of conduct. BC Hydro will work with local area First Nations to develop and deliver the cross-cultural awareness training. Procurement of local Aboriginal businesses for Project construction contracts where feasible.	
Section 29 – Housing				
Change in the demand for housing, with specific reference to the City of Fort St. John	Construction	Construction of the Project	Scale camp capacity up or down as required to accommodate direct workers. Two smaller camps may be used in off-site locations depending on short-term housing market conditions in the local area at the time of construction, while the south bank camp would be designed to be easily expanded to accommodate potentially higher annual direct workforce during construction. Provide logistical assistance to the Project workforce seeking local accommodation, through a community camp co-ordinator. Expand the supply of rental housing by building at least 40 rental units in partnership with BC Housing for use by Project workforce during construction. Transition the units to permanent affordable housing use after construction (in partnership with BC Housing). Build up to 10 new affordable housing units to be used by the community in the Fort St. John area, in partnership with BC Housing, to expand the supply of affordable housing. Expand the supply of temporary	Not significant

			accommodation by expanding the supply of long-stay RV sites in partnership with the private sector or local governments. Pre-book hotel and motel space when substantial temporary hotel accommodations are required when feasible. Provide financial support to emergency or transitional housing providers in the City of Fort St. John (e.g., Salvation Army), to support for people who require transitional or emergency housing, or who need help to become job-ready and able to participate in market housing Mitigation measures listed above will address adverse effects on Aboriginal renters in the City of Fort St. John as well as on its non-Aboriginal renters. It is proposed that BC Hydro work with First Nation communities in the LAA to track net migration to on-reserve housing and, using the results of the monitoring of rental market conditions in the City of Fort St. John, identify if additional housing related mitigation may be needed.	

Section 30 – Community Infrastructure and Services				
Change in demand for, or provision of, services – health and social services during construction	Construction	Construction of the Project	Work with Northern Health to plan for appropriate health care services for Project workforce, including camp residents; on-site health care for all workers residing in camps would include a combination of: • Physician care • On-site nurse or nurse practitioner care • Coordination on program delivery (i.e., Employee Assistance Program, men's health programs) Provide Northern Health with actual workforce and camp population statistics to help plan for service levels Support Northern Health and partner agencies in planning for anticipated changes in resident population by communicating workforce schedules, in-community population forecasts, housing plans, and on-site medical and social services Support Northern Health initiatives as they develop approaches for delivery of health services for camp workers Provide new families with local information package about health, education, and social services.	Not significant

Section 31 – Transportation				
During construction: ▪ Minor traffic delays ▪ Decline in level of Service on some roads and at some intersections ▪ Potential for impeded access to and egress from properties on some roads ▪ Small increase in collision frequency due to increased traffic on some routes ▪ Lower collision frequency due to permanent road upgrades on some routes	Construction	Construction traffic associated with construction of the Project. Commuter traffic associated with construction of the Project.	**Highway 29 North** Implement Traffic Management Plan to include Traffic Control Plans, Public Information Plans, Incident Plans, and Implementation Plans. Realign sections of Highway 29 that would be inundated by the reservoir between Hudson's Hope and Bear Flat, incorporating geometric and cross-section improvements. On Canyon Drive west of Hudson's Hope, construct a paved brake check before the start of the 10% grade, and make it a mandatory requirement for Project-related trucks to stop and check vehicle brakes. Explore opportunities for constructing, and install if feasible, either arrestor beds or runaway lanes, or both, on Canyon Drive above Hudson's Hope.	Not significant
			Highway 29 South Provide shuttle service between Chetwynd and dam site, based on demand. Work with District of Chetwynd to identify suitable parking locations for workers using shuttles.	
			Jackfish Lake Road Provide a shuttle service between Chetwynd and the Project site, based on demand Equip Project vehicles travelling on Project access road with radios. Control access to Project access road at north end of Jackfish Lake Road. Strengthen road base and hard-surface 31 km of Jackfish Lake Road, widening where required. Examine the feasibility of widening the shoulders along the first 30 km of Jackfish Lake Road to meet current BC Ministry of Transportation and Infrastructure rural collector standards, potentially	

			including two 1.5 m wide paved shoulders.	
			North Bank Minor Roads Provide carpool programs, such as preferred parking, for regional workforce commuters, to reduce the number of private vehicles commuting to site Use conveyor belt for transport of materials from 85th Avenue Industrial Lands to dam site. Hard-surface 240 Road and the portion of 269 Road south of the intersection with 240 Road. Realign a portion of Old Fort Road south of 240 Road. Potentially widen shoulders or add a path on Old Fort Road between Highway 97 and the realigned segment, and between the end of the realigned segment and the gravel pit entrance at km 5.5. Widen shoulders or add a path on 271 Road between the Wuthrich Quarry and Highway 97. Conduct intersection lighting calculations to determine if illumination is warranted and then, in collaboration with BC Ministry of Transportation and Infrastructure, consider installing intersection lighting.	

Road safety during operations – Potentially higher accident rate due to poor visibility caused by fog Improved road safety on some routes due to permanent road upgrades	Operations	Operation of the reservoir and change to microclimate and fog conditions Permanent road upgrades	**Taylor Bridge and Approaches** Monitor Taylor Bridge and low-lying approaches for changes in fog hours and density during the early years of Project operations. If required, implement mitigation measures to reduce driver speed, minimize fog-related collisions and maintain overall road safety by considering the following: • Illumination on, and on the approaches to, the Taylor Bridge • Changeable message signs that are visible in dense fog • Radio broadcasts and other forms of public communication	Not significant Project benefit to road safety due to permanent road upgrades

Section 32 – Heritage Resources				
During construction: Changes to resource integrity: ▪ Surface disturbance ▪ Disturbance of structures ▪ Subsurface disturbance ▪ Compaction ▪ Erosion Changes to resource accessibility: ▪ Increased access ▪ Unauthorized collection ▪ Lack of access Other relevant considerations raised by Aboriginal groups	Construction	Construction of the Project	Implement the following: ▪ Heritage Resources Management Plan ▪ Chance find management procedure ▪ Construction monitoring ▪ Erosion monitoring Depending on the nature and importance of identified heritage resources, various mitigation measures will be used: ▪ Avoid sites and reduce resource damage where possible ▪ Clear under winter conditions ▪ Manage any found burials following provincial guidelines (disinter or reinter burial) ▪ Conduct additional reconnaissance and field surveys as warranted ▪ Document historical sites and relocate important structures, if found ▪ Class I Staged Scientific Excavation ▪ Class II Stratified Sample Excavation ▪ Systematic surface collection ▪ Resource capping ▪ Commemorate heritage resources as appropriate ▪ Provide funds to local museums to support heritage programming Through implementation of Heritage Resources Management Plan any specific issues raised by Aboriginal groups can be addressed.	Not significant
Changes to resource integrity: • Surface disturbance	Operations	Operation of the reservoir	Implement the following: ▪ Heritage Resources Management Plan ▪ Chance find management	Not significant

• Disturbance of structures • Subsurface disturbance • Compaction • Erosion Changes to resource accessibility: • Increased access • Unauthorized collection • Lack of access Other relevant considerations raised by Aboriginal groups			procedure ▪ Reservoir erosion monitoring in conjunction with E-PAST ▪ Resource Capping ▪ Resource Monitoring ▪ Conduct reconnaissance and systematic surface collection of exposed resources) or installation of protective measure Clear under winter conditions	

NOTE: N/A – not applicable

Table 38.2 Summary of Effects on Federal Considerations

Federal considerations	How Addressed in the EIS
Changes to the Environment	
	An understanding of the changes the Project may cause to the environment is presented in Volume 2 Section 11 Environmental Background, including: ▪ Geology, terrain and soils ▪ Surface water regime ▪ Water quality ▪ Groundwater regime ▪ Thermal and ice regime ▪ Fluvial geomorphology and sediment transport ▪ Methylmercury ▪ Microclimate ▪ Air quality ▪ Noise and vibration ▪ Electric and magnetic fields Changes to the environment as a result of the Project are used to assess the potential environmental effects of the Project on Fish and Fish Habitat (Volume 2 Section 12), Vegetation and Ecological Communities (Volume 2 Section 13), and Wildlife Resources (Volume 2 Section 14)

Federal considerations	How Addressed in the EIS
Changes to components of the environment within federal jurisdiction	
Fish and Fish Habitat	The assessment of Project effects on fish and fish habitat and aquatic species was undertaken in consideration of the federal *Fisheries Act*, and the federal *Species at Risk Act*. The results of the assessment are presented in Volume 2 Section 12 Fish and Fish Habitat, and are summarised in Volume 1 Executive Summary.
Wildlife	The assessment of Project effects on wildlife resources was undertaken in consideration of the federal *Migratory Birds Convention Act* and the federal *Species at Risk Act*. The results of the assessment are presented in Volume 2 Section 13 Vegetation and Ecological Communities and Section 14 Wildlife Resources, and are summarised in Volume 1 Executive Summary.
Changes to the environment that would occur on federal or transboundary land	
Federal land	There are no aspects of the Project directly on federal land, and there are no changes to the environment predicted on federal land including Indian Reserves. (see Volume 1 Section 4.1 Project Location)
Transboundary land: the Project is approximately 62 river km upstream of the BC-Alberta border 1,300 river km upstream of the Alberta – Northwest Territory border (Slave River)	The Project changes to environmental conditions on the Peace River downstream of the Project are described in Volume 2 Section 11 Environmental Background. The technical study areas extend into Alberta for: ▪ Surface water regime (Section 11.4), the downstream study boundary extends to Peace Point, Alberta ▪ Thermal and ice regime (Section 11.7), downstream study boundary for ice study extends to Fort Vermilion, Alberta ▪ Fluvial geomorphology and sediment transport (Section 11.8), the downstream study boundary extends to Peace Point, Alberta No technical study areas extended into Northwest Territory. The Local Assessment Areas for the following Valued Components extended into Alberta: ▪ Fish and Fish Habitat (Volume 2 Section 12 Fish and Fish Habitat), the downstream assessment boundary extends to Many Islands, Alberta ▪ Current Use of Lands and Resources for Traditional Purposes (Volume 3 Section 19) extends downstream to Many Islands, Alberta (based on the LAA for fish and fish habitat) ▪ Navigation (ice bridges at Shaftesbury and Tomkins Landing) (Volume 3 Section 26 Navigation), the downstream assessment boundary includes the locations of ice bridges in Alberta at Shaftesbury and Tompkins Landing No Local Assessment Areas extended into Northwest Territory.
Changes to the environment that are directly linked or necessarily incidental to federal decisions	
Fisheries Act	The assessment of Project effects on fish and fish habitat and aquatic species was undertaken in consideration of potential federal decisions under the federal *Fisheries Act*, and the federal *Species at Risk Act*. The results of the assessment are presented in Volume 2 Section 12 Fish and Fish Habitat, and are summarised in Volume 1 Executive Summary.
Navigable Waters Protection Act	The assessment of the Project effects on navigation was undertaken in consideration of potential federal decisions under the *Navigable Waters Protection Act*. The results of the assessment are presented in Volume 3 Section 26 Navigation, and are summarised in Volume 1 Executive Summary.

Federal considerations	How Addressed in the EIS
Explosives Act	Project activities that include the manufacture, storage and use of explosives would require federal decisions under the federal *Explosives Act*. Detailed planning and permitting for the manufacture, storage, handling and use of explosives would be undertaken, including development of detailed environmental and safety management plans, prior to the associated Project construction activities.
Radiocommunication Act	Project activities that include the installation and operation of radio communication equipment would require federal decisions under the federal *Radiocommunication Act*. Detailed planning and licensing for installation and operation of radiocommunication equipment would be undertaken, including development of detailed environmental and safety management plans, prior to the associated Project construction activities.
Effects of changes to the environment on Aboriginal peoples	
	Where Aboriginal groups identified interests in any valued component, additional baseline information was incorporated into the assessment as made available. Traditional land use studies and community baseline studies were requested for First Nations near the Project area to provide baseline information and information about aboriginal interests in any valued component. The following sections of the EIS address potential changes to the environment that may affect Aboriginal people: ▪ Volume 3 Section 19 Current Use of Lands and Resources for Traditional Purposes (using in particular information drawn from Volume 2 Section 11 Environmental Background, Section 12 Fish and Fish Habitat, Section 13 Vegetation and Ecological Resources, Section 14 Wildlife Resources and Volume 3 Section 24 Harvest of Fish and Wildlife Resources) ▪ Volume 3 Section 24 Harvest of Fish and Wildlife Resources (where information was provided aboriginal interests in commercial guide-outfitting and trapping were specifically considered) ▪ Volume 4 Section 32 Heritage Resources (aboriginal interests and traditional use studies, where provided, were considered in the assessment of effects on archaeological and historic resources) ▪ Volume 4 Section 33 Human Health (aboriginal receptors were specifically considered in the human health assessment) ▪ Volume 5 Section 34 Asserted or Established Aboriginal Rights and Treaty Rights, Aboriginal Interests and Information
Effects of changes to the environment that are directly linked or necessarily incidental to federal decisions	
	The assessment of Project effects on fish and fish habitat and aquatic species was undertaken in consideration of potential federal decisions under the federal *Fisheries Act*, and the federal *Species at Risk Act*. The results of the assessment are presented in Volume 2 Section 12 Fish and Fish Habitat, and are summarised in Volume 1 Executive Summary.
	The assessment of the Project effects on navigation was undertaken in consideration of potential federal decisions under the *Navigable Waters Protection Act*. The results of the assessment are presented in Volume 3 Section 26 Navigation, and are summarised in Volume 1 Executive Summary.