7.0 SUMMARY AND CONCLUSION

7.1 Mitigation Measures

WST is committed to sound environmental management. The project description as described by WST in Chapter 2 incorporates both standard and project-specific mitigation measures to eliminate or minimize any environmental effects. These measures will be in place throughout highway construction and operation. The various components of WST's environmental management strategy include the Precautionary Principle, incorporation of environmental protection measures (project-specific mitigation), environmental protection planning, rehabilitation of disturbed areas, and environmental monitoring. VEC-specific mitigation measures, as described in each VEC section (Chapter 6), are summarized in Table 7.1.

Table 7.1 VEC-Specific Mitigation Measures

VEC	Mitigative Measures
Raptors	• WST will confer with Inland Fish and Wildlife Division on mitigation for all active raptor nests within 800 m of the highway. • Drainage to and through wetlands will be maintained to prevent loss of water supply to downslope areas. • Harassment of raptors by project personnel will be prohibited. • Construction vehicles will remain in the right-of-way and all-terrain vehicles will use designated routes. • Locations of raptors nests will not be released to the public. • Fuel and other hazardous material spill contingency plans and emergency response measures will be in place and implemented in the event of an accident.
Waterfowl and Passerine Birds	• Vegetation removal will be restricted to 30 m in the right-of-way, with removal of forest vegetation in areas where active nests are identified occurring outside of the nesting period in sensitive areas. • Blasting activities will be coordinated to avoid sensitive areas such as incubation and early brood rearing areas. • Instream activity will be reduced or avoided. • Erosion control and slope stabilization will use accepted practices. • Drainage to and through wetlands will be maintained to prevent loss of water supply to downslope areas. • Harassment or feeding of waterfowl by project personnel will be prohibited. • Construction vehicles will remain in the right-of-way and all-terrain vehicles will use designated routes, avoiding wetland areas wherever possible. • All construction personnel will be required to follow all applicable legislation for hunting and using and storing firearms. • At locations along the highway where active migratory bird nests are present or suspected, maintenance activities will be restricted until eggs have hatched and broods are mobile. • Fuel and other hazardous material spill contingency plans and emergency response measures will be in place and implemented in the event of an accident.

VEC	Mitigative Measures
Caribou	• Areas of vegetation clearing and grubbing will be limited to 30 m within the right-of-way. • Blasting will comply with government laws and regulations, and instantaneous peak noise levels minimized by time-delay blasting cycles. • High disturbance activities, such as blasting, will be scheduled to occur outside of sensitive periods such as calving when caribou are present in the area of construction. • Walls of decommissioned borrow pits will be graded to slopes less than 2:1. • Slopes of the highway will be graded for ease of passage at potential crossing points for caribou. • Vehicles will be operated at appropriate speeds and yield to wildlife. • Project personnel will not chase, harass, or feed caribou. • Construction vehicles will remain in the right-of-way and all-terrain vehicles will use designated routes, avoiding wetland areas wherever possible. • Fuel and other hazardous material spill contingency plans and emergency response measures will be in place and implemented in the event of an accident.
Furbearers	• Vegetation removal will be limited to 30 m within the right-of-way. • A minimum 20-m buffer zone will be maintained around waterbodies, where possible. • Instream activity will be reduced or avoided. • Erosion control measures will be implemented. • Drainage to and through wetlands will be maintained to prevent loss of water supply to downslope areas. • Harassment or feeding of furbearers by project personnel will be prohibited. • All construction personnel will be required to follow all applicable legislation for hunting and trapping and using and storing firearms. • Construction camp garbage and refuse will be properly stored and disposed of to avoid attracting wildlife. • All vehicles will yield to wildlife. • Fuel and other hazardous material spill contingency plans and emergency response measures will be in place and implemented in the event of an accident.
Fish and Fish Habitat	• Watercourse crossing installation will be carried out in the dry by diverting or pumping water around the construction area. • Pipe arch culverts will be used on many watercourses. • Culverts will be countersunk, where required, to maintain a water depth in the pipe and reduce any drop at the outlet. • Where the existing stream gradient warrants, baffles will be installed in the corresponding culverts to maintain a water depth to facilitate fish passage and provide shelter from flow for smaller fish. • All instream work will be carried out between June 30 and September 1, unless otherwise approved by DFO, to avoid sensitive periods for fish. • Fish removed from de-watered areas will be returned unharmed to the watercourse. • Fording activities will be minimized or avoided, where possible. • A 20-m buffer will be maintained along watercourses, where possible. • Riparian areas that must be disturbed will be stabilized to control erosion. • During right-of-way clearing, a temporary buffer zone will be left in place at each stream crossing until such time as the crossing is constructed. • ARD potential will be investigated along the highway route to identify areas of potential acid generation and areas of acceptable source materials. Additional measures will be defined based on the results of the initial investigation. • Work will be carried out according to regulations, guidelines, and codes of good practice. • Follow-up inspections will be conducted to verify culvert installation and operation. • Specific details will be provided in the construction EPPs.

VEC	Mitigative Measures
Species at Risk	• Inland Fish and Wildlife Division will be notified if an active owl nest is encountered. • Vegetation removal will be limited to a maximum of 30 m within the right-of-way. • Highway right-of-way will be located a minimum of 20 m from the shoreline of waterbodies, where possible. • Drainage to and through wetlands will be maintained to ensure continued wetland function. • Removal of riparian vegetation will be restricted to that required for construction of water crossings. • Construction camps, laydown areas and borrow pits will be located outside of riparian zones. • Blasting activities will be coordinated to avoid sensitive areas such as active nest sites, and sensitive areas, such as incubation and early brood rearing areas. • Construction vehicles will remain in the right-of-way and all-terrain vehicles will use designated routes, avoiding wetland and riparian areas wherever possible. • Harassment of raptors (including short-eared owl) and harlequin duck by project personnel will be prohibited. • Locations of raptors nests (including short-eared owl) will not be released to the public. • WST will confer with Inland Fish and Wildlife Division on appropriate mitigation for all active short-eared owl nests found within 800 m of the highway. • Vehicles will adhere to established speed limits and will yield to all wildlife. • Instream activity will be reduced and avoided, where possible. • Erosion control or slope stabilization will use accepted practices. • Re-vegetation activities will use only native species. • Fuel and other hazardous material spill contingency plans and emergency response measures will be in place and implemented in the event of an accident.
Geomorphology	• Highway will be designed according to acceptable standards of practice, reflecting the geotechnical characteristics of the native soils and fill materials. • Source materials for highway construction will be tested for acid-generating potential and only materials with less than 0.3 percent total sulphur would typically be used for construction. • Disturbance to eskers and other landforms will be minimized, where possible. • Material obtained from excavations within the right-of-way will be used, where possible. • Number of borrow pits established will be minimized and borrow pit resources will be depleted, where practical, before establishing new borrow pits. • Geotechincal field investigation will be carried out to determine the best design of highway embankments and slopes (areas of cuts and in-fill). • Field investigation will be conducted to examine areas of potential permafrost.
Water Resources	• Water conveyance structures (culverts and bridges) will be designed and installed to accommodate extreme flow conditions and to reduce the potential effects of ice and other blockages. • Bedrock geology along the proposed route has been examined for ARD potential, confirmatory sampling will be conducted and the risk evaluated to determine final alignment and appropriate mitigation to limit ARD. • Watercourse crossing structures will be installed in the dry by diverting or pumping water around area. • Pipe arch culverts will be used on many streams. • Fording activities will be minimized or avoided, where possible. • Proper buffers will be maintained along watercourses, where possible, and riparian areas that must be disturbed will be stabilized to control erosion. • Measures will be taken to control erosion. • Work will be carried out according to regulations, guidelines, and codes of good practice. • Specific details will be provided in the construction EPPs.

VEC	Mitigative Measures
Wetlands	• Highway route will avoid wetlands where feasible. • Vegetation removal will be restricted to 30 m within the right-of-way. • Natural hydrologic regime of wetlands will be maintained using appropriate construction technologies. • Construction vehicles will remain in the right-of-way and all-terrain vehicles will use designated routes, avoiding wetland areas wherever possible. • WST will conduct a field investigation of potential areas for rare or endangered plant species. • Erosion control or slope stabilization will use accepted practices. • Any re-vegetation activities will use only native species. • If construction machinery from outside Labrador is used, it will be washed prior to arrival in Labrador to avoid spread of invasive, non-native plant species. • Fuel and other hazardous material spill contingency plans and emergency response measures will be in place and implemented in the event of an accident.
Riparian Habitat	• Highway right-of-way will be located a minimum of 20 m from the shoreline of waterbodies, where possible. • Natural hydrologic regime of adjacent wetlands will be maintained using acceptable construction techniques, including culverts, to ensure natural flows through riparian zones. • Construction vehicles will remain in the right-of-way and all-terrain vehicles will use designated routes, avoiding riparian areas wherever possible. • WST will conduct a field investigation of potential areas for rare or endangered plant species. • Erosion control or slope stabilization will use accepted practices. • Riparian vegetation removal will be restricted to the required construction of water crossings. • Fill areas typical of riparian stream approaches will not be grubbed. • Re-vegetation activities will use only native species. • A 20 m temporary buffer zone of vegetation will be maintained on each side of a stream crossing until such time as subgrade construction begins. • If construction machinery from outside Labrador is used, it will be washed prior to arrival in Labrador to avoid spread of invasive, non-native species. • Construction camps, laydown areas and borrow pits will be located outside of riparian zones. • Fuel and other hazardous material spill contingency plans and emergency response measures will be in place and implemented in the event of an accident.
Historic Resources	• An archaeological aerial field survey will be conducted, while the centreline is being surveyed and cut, to ensure that the correct area was assessed for historic resources. • If the original highway corridor is altered, affected areas will be assessed for historic resources potential. • More detailed investigation will be conducted, after the highway centerline has been surveyed and cut, in areas where forest cover or other factors limited the original survey. • An archaeological survey of laydown areas, construction camps, borrow pits and maintenance depots locations will be conducted prior to any ground disturbance. • If information on Settler and Québec Innu land use becomes available, it will be considered in any further archaeological study. • The PAO will be consulted regarding necessary mitigative measures for sites discovered within the project area. • EPPs will be designed and implemented in consultation with the PAO, including response procedures for inadvertent encountering of archaeological sites or artifacts during construction. • Personnel will be informed, as part of the environmental awareness training, about procedures for handling and reporting archaeological sites. • The contractors will take all reasonable precautions to prevent personnel from disturbing or destroying archaeological sites or artifacts encountered. • The PAO will be informed of any archaeological findings. • Construction activity will cease until an archaeologist from the PAO authorizes work to continue. • In the event that a important archaeological site is encountered on the 40 m right-a-way during future historic resources field assessment or construction, appropriate measures for excavating the site or possibly re-routing the highway will be developed in consultation with the PAO.

VEC	Mitigative Measures
Resources Use and Users (not including Innu land and resource use, see Armitage and Stopp (2003))	• WST will commit to meeting relevant terms and conditions of an Innu land claim settlement. • WST will comply with all relevant provincial and federal legislation and regulations. (Table 2.1). • Environmental protection measures for construction and operation, including contingency and emergency response measures, as identified in Section 2.10.3, will be implemented. • Work will be carried out according to relevant WST Specifications (Appendix D.) • Harassment or feeding of wildlife during construction will be prohibited. • Any hunting, fishing or trapping activities by project personnel will be carried out according to applicable legislation. • Buffer zones will be maintained around all waterbodies, where possible. • The area disturbed by the project will be minimized (i.e., limiting vegetation clearing to 30 m). • Construction vehicles will remain in the right-of-way and all-terrain vehicles will use designated routes, avoiding wetland areas wherever possible. • Waste from construction camps and maintenance depots will be properly stored and disposed, as approved by the regulatory agencies. If waste is to be disposed in a municipal waste site, approval will be obtained from the local council. • Commercial operators (e.g., outfitters) and other users of the area will be notified about planned project activities. • Mitigation measures for wildlife, fish, the proposed Mealy Mountains National Park, and tourism and recreation will also be implemented.
Mealy Mountains National Park	• Harassment or feeding of wildlife by project personnel will be prohibited. • Vegetation removal will be limited to 30 m within the right-of-way. • A 20 m buffer zone will be maintained around all waterbodies, where possible. • Drainage to and through wetlands will be maintained to preserve the natural hydrological regime. • Construction vehicles will remain in the right-of-way and all-terrain vehicles will use designated routes, avoiding wetland areas wherever possible. • Fuel and other hazardous material spill contingency plans and emergency response measures will be in place and implemented in the event of an accident.
Tourism and Recreation	• WST will consult regularly with tourism operators regarding project-related activities and scheduling. • Where possible, the transport of personnel, equipment and materials will be scheduled to take place during non-peak periods. • Local administrators will be consulted regularly regarding transportation plans and requirements. • Any hunting, fishing or trapping activities by project personnel will be carried out according to applicable legislation. • Waste from construction camps and maintenance depots will be properly stored and disposed, as approved by the regulatory agencies. If waste is to be disposed in a municipal waste site, approval will be obtained from the local council.
Employment and Business	• Highway construction will be carried out through public tendering process. • Relevant agencies and organizations will be informed about ongoing and upcoming activities.
Community Life	• WST will commit to meeting relevant terms and conditions of an Innu land claim settlement. • Environmental protection measures for construction and operation, including contingency and emergency response measures, as identified in Section 2.10.3, will be implemented. • Posted speed limits will be lower than the design standards. • Local administrators and other relevant agencies will be regularly informed about project activities and progress. • Measures will be put in place for fire and spill prevention. • Appropriate health and safety planning, measures and equipment will be put in place for construction and operation. • Fuel and other hazardous material spill contingency plans and emergency response measures will be in place and implemented in the event of an accident.

7.2 Monitoring and Follow-up Commitments

WST will conduct ECM throughout project construction to ensure that all provisions of the EPP, permits, approvals and authorizations are followed. ECM will assure WST, regulators and the public that standards and regulations are followed. The monitoring programs proposed will allow early detection of any problems and quick response in the event of any failure of planned protection measures. Specific details for ECM will be determined in consultation with the appropriate regulatory agency when the detailed project design is complete. VEC-specific monitoring measures are described in Table 7.2.

WST's ESO will be responsible for ensuring that requirements outlined in the EPP are followed throughout construction, and conditions of environmental authorizations are met. The ESO will be responsible for ensuring that all personnel are familiar with any identified monitoring requirements and that the outlined practices are followed. Each site will have a Resident Engineer who will be responsible for carrying out any required monitoring and compliance activities on-site, and reporting to the ESO as appropriate. The ESO will hold environmental awareness training sessions prior to the start of construction, conduct any required sampling, carry out inspections, and liaise with appropriate regulatory agencies.

Regular inspection and maintenance will occur throughout operation (e.g., drainage structures will be inspected regularly to ensure that they are functioning properly). At the end of construction, WST will consult with regulatory agencies to determine appropriate monitoring and reporting procedures for operations. Monitoring activities implemented during operation will be reviewed and adapted, as necessary, on an ongoing basis.

Table 7.2 VEC-specific Monitoring and Follow-up

VEC	Monitoring
Raptors	• Prior to each construction season, a survey for active raptor nests (specifically osprey and bald eagle) will be completed within 800 m of the proposed construction zone. • Appropriate mitigation for active raptor nests will be determined in consultation with the Inland Fish and Wildlife Division.
Waterfowl and Passerine Birds	• No monitoring has been identified. • Breeding songbirds surveys will be conducted in representative habitat types prior to construction.
Caribou	• Collared caribou will to be monitored through to Summer 2003.
Furbearers	• No monitoring has been identified.
Fish and Fish Habitat	• Resident engineer or ESO will be onsite during highway construction and watercourse crossings construction. • Regular monitoring along the highway route will be carried out to evaluate flow, erosion, debris and sedimentation at watercourse crossings. • Regular monitoring of public use of the highway, including accidents, spills and waste disposal, will occur throughout operation.
Species at Risk	• No monitoring has been identified for this VEC. • The Inland Fish and Wildlife Division will be notified in the event of encounters with active short-eared owl nests. • CWS will be notified in the event of any harlequin duck observations.
Geomorphology	• A field investigation will be conducted, in areas identified as having acid-generating potential, to further assess the condition of the bedrock.

VEC	Monitoring
Water Resources	• Field investigations will be undertaken to characterize the nature and geotechnical parameters of materials to be used for highway construction. • Compliance monitoring for water quality will be conducted in accordance with provincial and federal regulatory requirements, or as deemed necessary by WST. • Regular inspection and maintenance of all watercourse crossing structures to ensure that they are performing properly.
Wetlands	• No monitoring has been identified.
Riparian Habitat	• No monitoring has been identified.
Historic Resources	• A pre-construction historic resources survey of the final cut/marked route will be conducted.
Resources Use and Users (not including Innu land and resource use, see Armitage and Stopp (2003)).	• Monitoring for biophysical resources will indirectly benefit resource use and users. • WST will cooperate, by providing project-related information, to government departments and agencies responsible for managing biophysical resources and resource use activity. • Regular monitoring of public use of the highway, including accidents, spills and waste disposal, will occur throughout operation.
Mealy Mountains National Park	• No monitoring has been identified.
Tourism and Recreation	• No specific monitoring programs are required for this VEC. • WST will cooperate with relevant organizations by providing project-related information as required.
Employment and Business	• WST will monitor project-related expenditures and labour during the construction phase of the project, including providing numbers on occupations, gender and period of employment for each year of construction. • Monitoring any changes in employment and business activity and identifying potential opportunities for growth during the operation phase of the highway is the responsibility of provincial and federal government departments, local economic development agencies, and other applicable public and private-sector organizations.
Community Life	• WST will cooperate with the various departments and organizations responsible for aspects of community life by providing project-related information as required.

7.3 Rehabilitation Measures

WST's mitigation measures include rehabilitation measures designed to reduce or eliminate the effects of construction activities (Section 2.5.2.7). All infrastructure associated with construction camps, laydown areas, borrow pits and other construction sites will be removed when the sites are no longer required. The sites will be rehabilitated according to WST specifications and any permits or approval requirements for rehabilitation. Rehabilitation may include such activities as seeding, sodding or stabilization to prevent erosion. All rehabilitation efforts will be inspected periodically to ensure the required results are achieved.

7.4 Residual Environmental Effects

The significance (negligible (not significant), minor (not significant), moderate (significant) and major (significant)) of residual environmental effects of the project on the selected VECs (after the application of proposed mitigation) are summarized in Table 7.3 and discussed below.

Table 7.3 Summary of Residual Environmental Effects

VEC	Construction	Operation	Accidental Events
Raptors	Not Significant (Minor)	Not Significant (Minor)	Significant (Moderate)
Waterfowl and Passerine Birds	Not Significant (Minor) (Waterfowl and Passerines)	Not Significant (Minor) (Waterfowl and Passerines)	Not Significant (Minor) (Waterfowl) Significant (Moderate) (Passerines)
Caribou	Not Significant (Minor)	Not Significant (Minor)	Not Significant (Minor)
Furbearers	Not Significant (Minor)	Not Significant (Minor)	Significant (Moderate)
Fish and Fish Habitat	Not Significant (Minor)	Not Significant (Minor)	Significant (Moderate)
Species at Risk	Not Significant (Minor)	Not Significant (Minor)	Not Significant (Minor)
Geomorphology	Not Significant (Minor)	Not Significant (Minor)	Not Significant (Minor)
Water Resources	Not Significant (Minor)	Not Significant (Minor)	Significant (Moderate)
Wetlands	Not Significant	Not Significant	Not Significant
Riparian Habitat	Not Significant	Not Significant	Not Significant
Historic Resources	Not Significant (Minor)	Not Significant (Minor)	Significant (Major)
Resource Use and Users	Not Significant (Minor)	Not Significant (Minor)	Not Significant to Significant (Minor to Major)
Mealy Mountains National Park	Not Significant	Not Significant	Not Significant
Tourism and Recreation	Not Significant (Negligible)	Not Significant (Minor)*	Not Significant to Significant (Negligible to Major)
Employment and Business	n/a	Not Significant (Negligible)	Not Significant (Minor)
Community Life	Not Significant (Minor)	Not Significant (Minor)	Not Significant (Minor)
* With appropriate enforcement and planning by relevant agencies, effects will not be significant.			

The residual effects during construction and, operation on raptors are assessed as minor (not significant), while accidental events are assessed as moderate (significant). The magnitude of effects during construction and operation is predicted to be low, with a specific group of individuals in a population in a localized area being affected. During an accidental event, the magnitude of residual effects is unknown and predicted to affect a portion of the population or species dependant on the raptors over one or more generations; however, the frequency of a accidental event is predicted to be less than 10 events per year. The likelihood of such events occurring is low. Overall, the project is not likely to result in significant adverse environmental effects on raptors.

For waterfowl and passerine birds, the residual effects during construction, operation and accidental events are assessment as minor (not significant), except for the residual environmental effects during accidental events on passerine birds, which are assessed as moderate (significant). The magnitude of effects during construction and operation is predicted to be low, with a specific group of individuals in a waterfowl or passerine birds population in a localized area being affected. This is also the case for waterfowl during an accidental event. For passerine birds an accidental event is predicted to affect a portion of the population of passerine birds or species that depend on passerine birds for one or more generations; however, the likelihood of such an event is low. Overall, the project is not likely to result in significant adverse environmental effects on waterfowl or passerine birds.

The residual effects during construction, operation and accidental events on caribou are assessed as minor (not significant). The magnitude of effects during construction and operation is predicted to be low and unknown for accidental effects. Effects of construction, operation and any accidental events will affect a specific group of individuals in a population in a localized area. Overall, the project is not likely to result in significant adverse environmental effects on caribou.

The residual effects during construction and operation on furbearers are assessed as minor (not significant), while the residual effects of accidental events are assessed as moderate (significant). The magnitude of effects during construction and operation is predicted to be low and affect a specific group of individuals in a population in a localized area. During an accidental event, the magnitude or residual effects is unknown and predicted to affect a portion of furbearer populations or populations or populations of other species dependent on furbearer populations over one or more generations. However, the likelihood of any accidental events occurring is low. Overall, the project is not likely to result in significant adverse environmental effects on furbearers.

The implementation of effective mitigation and environmental measures will result in minor (not significant) residual effects on fish and fish habitat during project construction and operation. The magnitude of such effects is rated as low to nil. The residual effects of accidental events are assessed as moderate (significant), but the likelihood of such events occurring is low given the construction and design standards, operating and maintenance procedures, and routine monitoring. Overall, the project is not likely to result in significant adverse environmental effects on fish and fish habitat.

For species at risk, the residual effects during construction, operation and accidental events are assessed as minor (not significant). The magnitude of effects during construction and operation is predicted to be low and unknown for accidental effects. Effects will likely affect a specific group of individuals in a population in a localized area. Overall, the project is not likely to result in significant adverse environmental effects on harlequin duck or short-eared owl (species at risk).

The residual effects during construction, operation and accidental events on geomorphology are assessed as not significant. The magnitude of any effects is assessed as low, and not likely to alter geomorphological features along the highway right-of-way in such a way that there is a measurable, sustained degradation in water quality due to exposed AGR, slumping, erosion and /or permafrost disturbance.

The implementation of effective mitigation and environmental measures will result in minor (not significant) residual effects on water resources during project construction and operation. The magnitude of such an effect, is rated as low. The residual effects of accidental events are assessed as moderate (significant), but the likelihood of such events occurring is low given the construction and design standards, operating and maintenance procedures, and routine monitoring. Overall, the project is not likely to result in significant adverse environmental effects on water resources.

The residual effects during construction, operation and accidental events on wetlands are assessed as not significant. While effects are expected to be continuous through construction and operation, and irreversible, the magnitude of effects during construction, operation and accidental events is predicted to be low. Overall, the project is not likely to result in significant adverse environmental effects that will impair wetland function.

The residual effects during construction, operation and accidental events on riparian habitat are assessed as not significant. While effects are expected to be continuous through construction and operation, and irreversible, the magnitude of effects during construction, operation and accidental events is predicted to be low. Overall, the project is not likely to result in significant adverse environmental effects that will impair the function of riparian habitat.

The residual effects during construction and operation on historic resources are assessed as minor (not significant), while effects due to accidental events are assessed as major (significant). The magnitude of effects during construction is rated as high, because any historic resources encountered would be permanently destroyed. The magnitude of effects during operation and accidental events is predicted to be low, because any disturbance of historic resources would be similar to natural variation. While the frequency of effects is considered low, any effects that do occur (during either phase of the project) will be irreversible. Overall, the project is not likely to result in significant adverse environmental effects on historic resources.

The residual effects during construction on resource use and users are assessed as minor (not significant) during construction. While the effects are likely to be experienced continuously during construction, the effects will be of low magnitude and reversible. During operation, residual effects are also assessed as minor (not significant), but with a higher magnitude. These effects will be experienced throughout highway operation and will likely be irreversible. The residual effects of an accidental event could range from minor (not significant) to major (significant), but the likelihood of such an event occurring is low. However, the potential for sustainable use of resources is rated as medium in the event that an accidental event should occur as the magnitude, geographic extent and reversibility of any effects associated with an accidental event are unknown. Overall, the project is not likely to result in significant adverse environmental effects on resource use and users.

The residual effects during construction, operation and accidental events on Mealy Mountains National Park are assessed as not significant. The magnitude of effects during construction, operation and accidental events is predicted to be low. Effects associated with construction and operation are predicted to be irreversible, while it is unknown for an accidental event whether effects would be reversible. Overall, the project is not likely to result in significant adverse environmental effects that will preclude establishment of the Mealy Mountains National Park.

The residual effects on tourism and recreation are assessed as negligible (not significant) during construction and minor (not significant) during operation (assuming that appropriate enforcement and planning is carried out by relevant agencies). During an accidental event, effects the assessed as negligible to major (not significant to significant) due to the potential of an major accidental effect to disrupt tourism and recreation activity for several years. The magnitude of any effects is predicted to range from low for construction to medium for operation, and will likely be reversible in both cases. For accidental events, the magnitude and reversibility are unknown. Overall, the project is not likely to result in significant adverse environmental effects on tourism and recreation.

No adverse residual effects on employment and business are predicted for the construction phase of the project. The residual effects on employment and business are assessed as negligible (not significant) during operation, and minor (not significant) during accidental events. Residual effects from operations will be short-term, but have no measurable effect on the economy of the affected area. Residual effects from an accidental event will also be short-term, but would affect employment and business activity for one or more years. Again, there would be no measurable adverse effect on the economy of the affected area. Overall, the project is not likely to result in significant adverse environmental effects on employment and business. In most cases, the positive effects of the project on employment and business will compensate for any potential negative effects.

The residual effects during construction, operation and accidental events on community life are assessed as minor (not significant). The magnitude of effects during construction and operation is predicted to be low, and is unknown for accidental effects. There is not likely to be any measurable adverse affect on aspects of community life or the affected community. Effects associated with construction and operation are considered to be reversible, while it is unknown whether effects associated with an accidental event would be reversible. Overall, the project is not likely to result in significant adverse environmental effects on community life.

7.5 Summary

Based on the environmental effects assessment presented in Chapter 6 and taking into consideration the mitigation measures identified for the TLH - Phase III project, overall project construction and operation are not likely to result in significant adverse environmental effects on any of the VECs identified for the environmental assessment. The potential residual effects of accidental events, depending on the nature, timing and duration of the events, may range from negligible (not significant) to major (significant). However, the potential for an accidental occurring at anytime during the project is low.

No significant adverse cumulative effects have been identified for the TLH - Phase III project. While increased use of the area may result due to the improved access provided by the highway, the planning and control measures in place by various agencies, to govern other activities and development that may be carried out in the area, act to reduce the potential adverse cumulative effects.

Subsection 16(2)(d) of CEAA indicates that a comprehensive study must consider the capacity of renewable resources, that are likely to be significantly affected by a project, to meet the needs of the present and those of the future. As the proposed project is not likely to cause significant adverse environmental effects, there

are not likely to be adverse effects on renewable resources that will reduce the capacity of any resources so that the needs of future generations are compromised.

Sustainable development seeks to ensure that the needs of the present are met without reducing the ability of future generations to fulfill their needs (World Commission on Environment and Development 1987). The TLH - Phase III project will not change the capability of natural systems to maintain their structure and functions, and support biodiversity. The ability of future generations to use renewable resources will not be compromised. While there area likely to be minor (not significant) effects during project construction and operation, the highway will have positive contributions at both the local and regional level. Many of the potential effects on employment and business, and community life are predicted to be positive.

The mitigation measures outlined for the project (Table 7.1) will be in place throughout the project, ensuring that the objectives of sustainable development, as noted in the guidelines, are outlined. The monitoring and follow-up initiatives (Table 7.2) indicate WST's commitment to further study and working with mandated agencies.

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