Publics Services and Procurement Canada

Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec)

Environmental Impact Statement
PART F – Summary of the Environmental Effect Assessment
Chapter 18 Effects on the Physical Environment

TETRA TECH

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PUBLIC SERVICES AND PROCUREMENT CANADA

Environmental Impact Statement
Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec)

Our Reference: 32760TT (60ET)

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REVISIONS

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PART F - SUMMARY OF THE ENVIRONMENTAL EFFECT ASSESSMENT

18 EFFECTS ON THE PHYSICAL ENVIRONMENT

Table 18.1 presents the effects of the Project on elements of the physical environment, applicable mitigation measures and the significance and likelihood of those effects.

During construction, the machinery will emit contaminants likely to affect air quality at times. Those emissions and the transportation of materials are also likely to emit greenhouse gases. The work could create dust and increase noise levels around the site. Numerous mitigation measures have been included to limit those effects or contain them to the immediate area of the site. Incentive clauses will also be included in the specifications in the invitation to tender to reduce GHG emissions and PSPC will explore options for carbon neutrality for the Project.

Soils could be contaminated by spills of hydrocarbons or other products, which could also have effects on the quality of surface water and groundwater. Several mitigation measures commonly used on sites and an emergency plan for accidental spills will minimize these effects. Soil erosion and the resulting production of suspended solids will be controlled by appropriate measures, including sediment barriers and turbidity curtains.

The various phases of the work will result in changes to flow distribution between the Ontario and Quebec dams at the Timiskaming Dam Complex. This will change flow velocities to the right of the structures. There should be very little impact on water levels. An emergency plan for significant flows will be prepared and put in place to manage such situations with the least impact possible. As a result of reduced flow velocities during Phase 1, ice cover may appear upstream and downstream of the work area on the Quebec side.

All mitigation measures will be monitored during the work and there will also be follow-up on certain aspects, such as SS. Chapters 22 and 23 provide more details on this topic.

Table 18.1 Summary of effects on the physical environment

Valued component affected	Area of federal jurisdiction (√)	Project activities	Potential effects	Proposed mitigation measures	Key criteria for determining the significance of effects					Significance of residual adverse effects	Likelihood of significant residual adverse effects
					Extent	Geographic extent	Duration	Frequency	Reversibility		
Air quality	-	Construction	Air contaminant emissions	1. Requirement to limit idling (shut off engines when truck or vehicle is stopped for extended periods of time). 2. Off-road construction equipment and on-road transport truck engines would be required to meet the latest Tier 4 emission standards of the U.S. Environmental Protection Agency (EPA). 3. Machinery and transportation trucks should be well maintained and kept in good working condition (e.g., exhaust system in good condition). 4. Manage loading and unloading activities to minimize idling time. 5. Cover loads on trucks transporting materials to and from the site. 6. Minimize any blasting.	Low	Local	Medium	Continuous	Reversible	Non-significant	N/A
	-	Construction	Dust emissions	1. Visual inspection and monitoring of dust emissions on and around the Project site should be carried out on a regular basis (i.e. daily or weekly). 2. Activities involving significant emissions of dust, or causing nuisance due to air emissions, should be identified, and mitigation measures should be implemented if necessary (i.e. dust clouds reaching privately owned or publicly accessible areas). 3. Complaints from neighbours regarding dust or air quality should be registered, analyzed, and addressed with the adequate mitigation measures. 4. Water work areas (water-based dust suppressants due to the proximity of an aquatic environment). 5. Clean public roads with sweeper trucks, cover stored materials. 6. Sweeping the access roads and circulation areas. 7. Cover truck loads with tarps. 8. During the cutting of concrete, water the work area. 9. During demolition, all measures must be put in place to limit dust emissions. Work should be stopped during high winds if a significant amount of dust is moved. 10. Limit speed to 20 km/h on on-site roads. 11. Prevent dirt track-out from the Project site to the public road network, using track-out grates or other technology. 12. Applying water to stockpiles that are causing dust emissions due to wind erosion. 13. Cover stockpiles that are causing dust emissions due to wind erosion. 14. When available, dust control systems such as wet suppression systems (water sprays) and enclosures should be used. This applies most notably to drilling, crushing, and screening activities.	Low	Project footprint to local	Medium	Cyclic	Reversible	Negligeable to non-significant	N/A
	-	Construction	GHG emissions	1. Explore the option to install a portable concrete plant near the site to reduce transportation distances. 2. Assess the possibility of using materials with a lower carbon footprint, particularly low-carbon concrete. 3. Explore options for carbon neutrality.	Low	Local to regional	Medium	Continuous	Reversible	Non-significant	N/A
	-	Construction	Increased noise level	1. If levels are too high based on actual site conditions, quickly adopt solutions to meet the Project targets as set out in the project noise monitoring plan. 2. During certain construction phases, the noise can affect the staff and costumers of the Algonquin Canoe Company. If the proposed measures do not mitigate adequately the effects, modifications to the mitigation measures will be discussed and determined in consultation with WLFN. 3. Provide advance notification to residents and Indigenous communities concerning construction duration, activities and their expected duration. 4. Provide information to neighbours and Indigenous communities before and during construction through media. 5. Install an information board in front of the Project site with contact information for Project and the Project's website address. 6. Regularly train workers and contractors to use equipment in ways that minimize noise.	Low	Local	Medium	Continuous	Reversible	Non-significant	N/A

Valued component affected	Area of federal jurisdiction (√)	Project activities	Potential effects	Proposed mitigation measures	Key criteria for determining the significance of effects					Significance of residual adverse effects	Likelihood of significant residual adverse effects
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				7. Ensure that site managers periodically check the site, nearby residences and other noise-sensitive receptors to identify and quickly address problems. 8. Avoid the use of radios and stereos outdoors and the overuse of public address systems where neighbours can be affected. 9. Keep truck drivers informed of designated vehicle routes, parking locations, acceptable delivery hours and other relevant practices (e.g. minimizing the use of engine brakes and periods of engine idling). 10. Examine and implement, where feasible and reasonable, alternatives to rock-breaking work methods, such as hydraulic splitters for rock and concrete, hydraulic jaw crushers, chemical rock and concrete splitting, and controlled blasting, such as penetrating cone fracture. 11. Consider alternatives to diesel and gasoline engines and pneumatic units, such as hydraulic or electric-controlled units, where feasible and reasonable. When there is no electricity supply, consider using an electrical generator located away from residences. 12. The shock absorbers on dump trucks help reduce noise levels during trucking operations. There should also be ongoing monitoring to remind truck drivers who needlessly bang the panels on their dump trucks. 13. Avoid the use of reversing alarms by designing the site layout to avoid reversing, such as by including drive-through for parking and deliveries. 14. Smart alarms can be used for the contractor's equipment that will be on site throughout the work. However, it would be hard to install reversing alarms for suppliers or subcontractors who occasionally come to the site. 15. The smart alarm must be adjusted to a maximum of 10 dB(A) above the ambient noise on the site. However, the installation of smart reversing alarms must take into account the safety of workers on the site. 16. The ECCO SA914, GROTE 73080 and PRECO 1048 models are examples of smart reversing alarms that can be used for equipment on the site. 17. When materials or equipment are delivered, they must be carefully placed on the ground and not dropped, to avoid impact noises. 18. The use of engine brakes is prohibited on site and on access roads except where safety may be compromised. 19. To limit noise and air pollution, idling of truck engines is limited to a maximum of five minutes. After that time, the engine must be shut down. 20. If blasting is required, ensure that a 150 m radius around the site to be blasted is cleared and ensure that there is a delay between charges.							
	-	Operation	Change in noise level	None	Low or nil	Local	Permanent	Continuous	Irreversible	Non-significant or NIL	N/A
Soil	-	Construction	Contaminated or non-contaminated sediment emission	1. Install and maintain sediment barriers around the areas of the site. This turbidity curtain will be secured to the riverbed and all contours 2. Conduct sampling by divers where sediment is visible once the existing dam is closed and turbidity curtain is in place (and before the construction of the cofferdam). Sediment will be managed based on their level of contamination. If the sediments are contaminated, a protocol will be developed to recover them before the cofferdam is built. 3. Install and maintain a turbidity curtain downstream of the cofferdam throughout Phase 1, and when possible, during Phases 2 and 3). 4. Develop appropriate work methods with adequate measures to protect the shoreline. 5. Train employees to react and take action quickly in case of an accidental spill. 6. Recover most particles from the cofferdam before removing the turbidity curtain. 7. Use the new dam as a cofferdam during the demolition of the current dam and install a turbidity curtain upstream of the work area (Phase 4).	Low	Local	Medium	Cyclic	Reversible	Non-significant	N/A

Valued component affected	Area of federal jurisdiction (√)	Project activities	Potential effects	Proposed mitigation measures	Key criteria for determining the significance of effects					Significance of residual adverse effects	Likelihood of significant residual adverse effects
					Extent	Geographic extent	Duration	Frequency	Reversibility		
				8. Develop appropriate work methods for the demolition of the existing dam. 9. Recover all debris and fine particles from the demolition of the current dam before opening the new dam. 10. Provide preventive measures to avoid accidental spills and prepare an emergency plan in the event of a spill. 11. Conduct regular checks for floating rafts of organic matter and recover them, as needed. 12. If measures to limit the erosion and transportation of sediment are deficient, stop the work until more effective measures are in place or the current measures are corrected. 13. Prepare a soil and sediment management plan and an erosion and sediment control plan.						
	-	Construction/Operation	Soil contamination	1. Inspect machinery on a daily basis to detect the presence of hydrocarbon leaks, etc. 2. Have an accidental spill recovery kit on the site at all times. 3. Limit storage of hydrocarbons onsite for one work week for the equipment used during that week. 4. Require double containment structures for the storage of hydrocarbons. 5. Prohibit the storage of hazardous equipment or materials in the area drained by the cofferdam. 6. Report any spill as soon as possible in order to react quickly. 7. Develop and implement a detailed environmental emergency plan. 8. Require the use of vegetable-based hydraulic oils in machinery when working in water and in close proximity to water. 9. Prepare a sediment and soil management plan to address unexpected, contaminated sediments and soils.	Low	Project footprint	Short	Punctual	Reversible	Negligible	N/A
Water	-	Construction	Change to the water table level	None	Low	Project footprint	Short	Cyclic	Reversible	Negligible	N/A
	-	Construction/Operation	Groundwater contamination	1. Limit storage of hydrocarbons onsite for one work week for the equipment used during that week 2. Require secondary containment for the storage of hydrocarbons. 3. Report any spill as soon as possible in order to react quickly. 4. Develop and implement a detailed environmental emergency plan.	Low	Project footprint	Short	Punctual	Reversible	Negligible	N/A
	-	Construction	Change in flows, velocities and levels during construction	1. Prepare an emergency plan for high flow rates during phases when a cofferdam is present and follow the communication procedure included in the Emergency plan presented in Chapter 15. 2. Ensure construction staging area and activities don't impact the dam operations.	Low	Local	Medium	Cyclic	Reversible	Non-significant	N/A
		Construction/Operation	Change in surface water quality (SS and other contaminants)	<u>Work preparation</u> 1. Begin work on the start-work date. 2. Limit work to the designated work areas. 3. Recover trees and arable land. 4. Follow natural drainage patterns. 5. Avoid work and storage in the riparian strip (RS). 6. Provide areas for disposing of waste materials (and prepare a Waste Management Plan that will include waste reduction workplans). 7. Provide sediment and erosion control plan. 8. Provide a spill response plan. 9. Provide a health and safety plan. 10. Stabilize soils and plant vegetation.	Low	Local	Medium	Cyclic	Reversible	Non-significant	N/A

Valued component affected	Area of federal jurisdiction (√)	Project activities	Potential effects	Proposed mitigation measures	Key criteria for determining the significance of effects					Significance of residual adverse effects	Likelihood of significant residual adverse effects
					Extent	Geographic extent	Duration	Frequency	Reversibility		
				<u>Construction</u> Motors 11. Ensure they are in good condition, maintained and inspected. 12. Circulate in designated areas, outside waterways and RS, except when required and providing for cleanup. 13. Provide a response plan in the event of a leak or spill. 14. Handle petroleum products outside waterways and at least 30 m from them. Turbidity, SS and other contaminants. 15. Sample and analyze sediments between the current dam and the turbidity curtain before the cofferdam is in place and manage them based on their level of contamination. 16. Avoid the discharge of turbid water (treat pump water before discharging it into an aquatic environment). 17. Control waters with sediment or other barriers and treat waters using appropriate methods, settling tanks, etc. 18. Install a turbidity curtain downstream before construction of the cofferdam begins. This turbidity curtain will be secured to the riverbed and all contours. 19. Install a turbidity curtain upstream before the demolition of the current dam. 20. Provide appropriate cleaning areas. 21. Recover all debris from the demolition of the existing dam before the new dam is opened. 22. Use clean equipment and avoid cleaning it in the waterways or in the RS. 23. Provide portable toilets. 24. Work in the waterway in designated areas and ensure containment of all work in water. 25. Sample concrete mixer wash water daily and treat them, if needed, so they respect water quality criteria before its release in the environment (prepare a Waste Water Management Plan) Debris and residual materials 26. Contain materials outside the waterway. 27. Provide appropriate storage areas. 28. Place residual hazardous materials (RHM) at least 30 m from the waterway. 29. Ensure that all discharged material is removed from the waterway. 30. Refuel equipment more than 30 metres from the river. End of work 31. Recover at least 97.5% of the cofferdam construction material from Phase 1 during removal. 32. Provide for site cleanup. 33. Plant vegetation and stabilize the site and shoreline. 34. Restore the riverbed. <u>Operation period</u> 35. Ensure the containment of work to avoid discharges in the water. 36. Decontaminate and restore sites in the event of a spill. <u>Emergency situations</u> 37. Provide an emergency procedure. 38. Provide sediment and erosion control measures. 39. Stabilize soils and plant vegetation. 40. Decontaminate and restore sites in the event of a spill.							

Valued component affected	Area of federal jurisdiction (√)	Project activities	Potential effects	Proposed mitigation measures	Key criteria for determining the significance of effects					Significance of residual adverse effects	Likelihood of significant residual adverse effects
					Extent	Geographic extent	Duration	Frequency	Reversibility		
	-	Construction	Change to the extent of ice cover	None	Low	Project footprint to local	Medium	Cyclic	Reversible	Negligeable to non-significant	N/A