

**TABLE 6
Sediment Management and Dam Removal Options
Potential Removal of the Coldstream Dam**

Sediment Management and Dam Removal Options	Economic Considerations	Technical Obstacles	Social Impacts	Environmental Impacts	Regulatory Concerns
<p>Option 1: Dredging of sediment with water in head pond followed by complete dam removal.</p>	<ul style="list-style-type: none"> • Very expensive sediment management option as very large volume of sediment/water mixture will be produced. • Dam removal will be relatively inexpensive. 	<ul style="list-style-type: none"> • Onsite sediment dewatering required. Very large settling pond likely required. • Ultimate sediment disposal requirements could be difficult. • Equipment mobilization, operation and demobilization required. 	<ul style="list-style-type: none"> • Large area required for sediment dewatering in current park area. Major impact to park users. 	<ul style="list-style-type: none"> • Aquatic species (fish, turtles, etc.) in the head pond may be entrained in the dredged sediment. • Fish migration provided. • Thermal impacts to water temperature from head pond are eliminated. 	<ul style="list-style-type: none"> • Regulations regarding sediment disposal on off-site lands are now quite stringent.
<p>Option 2: Temporary bypass of river around dam. Excavate sediment "in the dry" and complete dam removal.</p>	<ul style="list-style-type: none"> • Expensive sediment management option. • Temporary bypass pipe or channel around head pond will be expensive to construct. • Least expensive dam removal option. 	<ul style="list-style-type: none"> • Construction of bypass pipe or new channel around the reservoir could be very difficult to design and locate. • Ultimate sediment disposal requirements could be difficult. • Excavating wet sediment with equipment within pond footprint likely difficult. 	<ul style="list-style-type: none"> • Bypass pipe or channel could be a safety hazard until dam and sediments are removed. • Large area of deep, soft sediment could be a danger to pedestrians. 	<ul style="list-style-type: none"> • As head pond level lowers, aquatic species may become trapped in the drying up reservoir. • Fish migration provided. • Thermal impacts to water temperature from head pond are eliminated. 	<ul style="list-style-type: none"> • Regulations regarding sediment disposal on off-site lands are now quite stringent.
<p>Option 3: Remove dam in phases over ± 3 years. Allows slow release of sediment over 3 years.</p>	<ul style="list-style-type: none"> • More expensive dam removal option than Option 4. • No significant cost for sediment management. 	<ul style="list-style-type: none"> • Maintaining structural integrity of dam is required over ± 3 year process. • The long timeline to remove dam may be difficult contractually. 	<ul style="list-style-type: none"> • Current reservoir area could be a safety hazard for multiple years due to large areas of deep, soft sediment. 	<ul style="list-style-type: none"> • Sediment is released downstream at a relatively high rate. • Sydenham River downstream of dam will become turbid following each step of dam removal due to entrained sediment. • Fish migration provided. • Thermal impacts to water temperature from head pond are eliminated. 	<ul style="list-style-type: none"> • LIRA (MNRF) permitting may be complicated due to partial removal of dam in steps. • Regulators may not allow the periodic release of large volumes of sediment.
<p>Option 4: One time removal of complete dam. Allow one time release of sediment.</p>	<ul style="list-style-type: none"> • Relatively inexpensive dam removal option. • No significant cost for sediment management. 	<ul style="list-style-type: none"> • Water velocity management required to allow head pond to drain slowly. 	<ul style="list-style-type: none"> • Current reservoir area could be a safety hazard for one or two years due to large areas of deep, soft sediment. 	<ul style="list-style-type: none"> • Very large amount of sediment will be transported downstream in a relatively short timeframe. • Sydenham River downstream of dam will become turbid due to entrained sediment. • Fish migration provided. • Thermal impacts to water temperature from head pond are eliminated. 	<ul style="list-style-type: none"> • Regulators may not allow the sudden release of large volumes of sediment.

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<p>Option 5:</p> <p>Partial dam removal. Construct "rocky ramp" step pool system to provide fish passage.</p>	<ul style="list-style-type: none"> • Least expensive dam removal option. • No significant cost for sediment management. 	<ul style="list-style-type: none"> • Water velocity management required to allow head pond to drain slowly. 	<ul style="list-style-type: none"> • Current reservoir area could be a safety hazard for one or two years due to large areas of deep, soft sediment. 	<ul style="list-style-type: none"> • Fish migration provided. • Thermal impacts to water temperature from head pond are largely eliminated. • Sediment is partially released downstream at a relatively high rate. • Sydenham River downstream of dam will become turbid following partial dam removal due to entrained sediment. 	<ul style="list-style-type: none"> • Regulators may not allow the sudden release of sediment.
<p>Option 6:</p> <p>Construct permanent new, natural stream channel around dam headpond. Leave dam, head pond and sediment in place as is.</p>	<ul style="list-style-type: none"> • Cost to build permanent bypass stream channel quite high. • Avoids cost of dam removal and cost of removing sediment. 	<ul style="list-style-type: none"> • Geotechnical investigations required to confirm remaining land between water in head pond and new channel will be structurally stable and hydraulically stable. • Bridges (pedestrian and/or vehicle bridges) to cross over new stream channel may be required to access north end of dam. 	<ul style="list-style-type: none"> • This Option maintains a lake environment at the site and provides a new, natural stream channel area for viewing, nature enjoyment and passive recreational use. • As the dam deteriorates it will eventually become safety hazard. 	<ul style="list-style-type: none"> • Fish migration provided. • Thermal impacts to water temperature from head pond are largely eliminated as flow through head pond is significantly reduced. • Sediment release from the head pond is avoided. 	<ul style="list-style-type: none"> • This option requires a large volume of earth fill to be removed to construct new, natural stream channel. Need to follow Excess Fill regulations for disposal of fill elsewhere. • As the dam's structural integrity degrades over time, regulators may be concerned with public safety and dam failure.
<p>Option 7:</p> <p>Do nothing.</p>	<ul style="list-style-type: none"> • No immediate cost. • Potential for increased maintenance costs as the dam deteriorates. 	<ul style="list-style-type: none"> • Dam may need to be structurally reinforced in the future. 	<ul style="list-style-type: none"> • As the dam deteriorates it will eventually become safety hazard. 	<ul style="list-style-type: none"> • The dam obstructs fish migration. • The dam deprives aquatic species (including SAR) downstream of dam of required sediment. • The head pond continues to warm up water temperatures during the summer. 	<ul style="list-style-type: none"> • As the dam's structural integrity degrades over time, regulators may be concerned with public safety and dam failure.