

Report 5.1 (Amended to Open Session)

Report To: Chair and Directors, Saugeen Valley Conservation Authority
From: Elise MacLeod, Manager, Water Resources
Date: July 20, 2023
Subject: Varney Pond Update – Infrastructure Inspection
Purpose: To provide an update to the SVCA Board of Directors on the status of the Varney Pond infrastructure inspection and communication with other agencies

Recommendation

THAT the Varney Pond Update – Infrastructure Inspection report be received for information.

Background

The Varney Conservation lands were purchased by SVCA 1954. This 4.6-hectare site, in the hamlet of Varney just south of the Town of Durham along Highway 6, offers day-use amenities to the public.

Historically, the pond has been filled with river water every May through a temporary diversion from a tributary of Camp Creek. The pond is then drained after the long weekend in September. However, in April 2023, and through organization wide structural review, senior SVCA staff members became aware of the method employed to fill the pond.

This practice may potentially infringe upon the regulations under the Fisheries Act and/or the Conservation Authorities Act. This staff concern prompted action at the SVCA Board of Directors meeting on May 20, 2023. Motion #G23-60 was passed, mandating that the filling of the Varney Pond be suspended until further notice. This decision was made to allow staff to gain additional insight into the condition of the structure and investigation of applicable environmental approvals.

Discussion

SVCA staff have contacted the Ministry of Transportation regarding their knowledge of the inlet system as well as existing approvals for structures within the right-of-way. A reviewer has been assigned, however SVCA staff have not received any further correspondence.

SVCA staff initially contacted the Department of Fisheries and Oceans in May 2023 over the phone. The historic operational method was described, however additional information including photographs and maps were requested. In July 2023, staff provided the requested

information and await further correspondence and/or comment on current operational procedures.

On June 6, 2023, D.M. Wills Associates completed an inspection of the water and erosion infrastructure at the Varney Conservation Area; this inspection was related to the inlet structure, the earthen berm, the jumping structure (high-level), and the outlet structure. The results are summarized below:

- In general, the dam was observed to be in good condition with some deficiencies in the control structures and pipes, tree growth on the embankment, and public safety concerns.
- Potential public safety concerns:
 - Inadequate railings on the wooden outlet structure
 - The inlet pipe grating is not locked and has sharp edges
 - The grate on the downstream headwall is not properly secured
 - Jumping from the outlet structure may lead to injuries due to the shallow nature of the pond and one may be drawn towards the outlet structure grate due to the flow (documented drowning from someone being sucked into the outlet pipe)
- No significant operational safety issues

Several recommendations were provided in the draft report and are summarized as follows:

High (within the next 2 years) – \$22,500

- Develop routine inspection frequency, internal and external
- Re-evaluate method of filling the pond (no cost was provided in report)
- Prepare a Public Safety Risk Assessment and Safety Plan; establish appropriate swimming boundaries; block access to the jumping platform; review the outlet configuration; consult with local building official for swimming and fencing requirements; remove stairs attached to the jumping platform
- Additional public safety signage

Medium (within the next 5 years) – \$147,500

- Prepare a dam safety assessment/review
- Prepare an operations and maintenance manual
- Complete CCTV inspection of all underground works
- Establish ground cover on earthen berm to reduce erosion
- Replace and/or replace ditch inlet structure, grate into pond, and deteriorated concrete on outlet structure
- Inspection of the footbridge crossing of the adjacent watercourse (the cost associated with this item was not included in the above noted estimate as it relates to the Conservation Area not the swimming pond)

On-going – SVCA Staff

- Tree removals and monitoring of earthen berm

All recommendations from the draft D.M. Wills assessment can be found in the attached. The draft assessment will be finalized following staff review and comment.

The D.M. Wills Associates assessment of the Varney Pond's water and erosion control infrastructure produced several recommendations. One key recommendation is to refrain from filling the pond until appropriate permissions have been granted from relevant environmental agencies, this may include SVCA, MNRF, DFO, MECP, etc. However, this relates to just one of the many recommendations needed to ensure the pond's safety.

In addition to the environmental permissions, a Public Safety Risk Assessment and Public Safety Plan was recommended to be undertaken within the next two years. This would be a forward step towards improving safety measures around the pond. Nonetheless, this plan may not be needed if SVCA doesn't secure the permission to continue filling the pond in the manner practiced historically. It's important to note that securing environmental approvals would address only one of the recommendations in the D.M. Will assessment.

Financial Implications

It is projected that the cost of completing the Varney Public Safety Risk Assessment and Public Safety Plan in conjunction with the assessments for the Glenelg Dam and Durham Lower Dam (slated for completion this year, with funding provided by WECl) would be \$10,000. However, should the Varney assessment be carried out separately, at a future date, the expected cost would rise to \$15,000.

The financial implications concerning environmental approvals required for the Varney Conservation Area remain unknown at this point. Further financial considerations need to be acknowledged, in the form of potential infrastructure modifications advised by D.M. Wills Associates. The estimates provided by D.M. Wills are, however, subject to adjustments due to inflation and are contingent upon the outcomes of the Public Safety Risk Assessment and Safety Plan and other unforeseen factors.

Prepared by:

[Original signed by:]

Elise MacLeod, Manager, Water Resources

Approved by:

[Original signed by:]

Erik Downing, Acting General Manager / Secretary-Treasurer

Table 2 – Dam Inspection Recommendations

Recommendation	Description of Deficiency	Priority	Estimated Cost	Additional Comments
Dam Safety Management				
1. Complete a Dam Safety Assessment/Review for the Varney Dam prior to, or as part of, any major decisions regarding the management and maintenance of the dam. The Dam Safety Assessment/Review should be completed in accordance with the Lakes and Rivers Improvement Act Technical Bulletins and Best Management Practices (MNR, 2011).	There is no dam safety information available for the Varney Dam. The SVCA may benefit from having updated Dam Safety information available when making decisions related to the future management and maintenance of the Varney Dam.	Medium	\$75,000	The estimated cost assumes that the SVCA would retain the services of a qualified consulting engineering firm to complete a full Dam Safety Review. The SVCA may want to consider completing Hazard Potential Classification studies for all of their dams before full Dam Safety Reviews so that the full Dam Safety Reviews can be prioritized for the High hazard structures. The cost of completing the Hazard Potential Classification study would be approximately \$30,000 for this structure. The scope of work would include a hydrology study, the development of a hydraulic model, a dam breach assessment and an incremental loss assessment. The price per structure could be reduced if several Hazard Potential Classification studies are completed by the same consultant at the same time.
2. Establish a regular frequency for engineering inspections (i.e. annually) as well as routine inspections by staff (i.e. monthly while the pond is in use).	There were no records of past engineering inspections by a professional consulting engineer. There were records of past routine inspections, including inspection reports from 2004, 2005, 2007, and 2008; however, the only other records were photos taken in 2010. The SVCA would benefit from establishing a regular frequency of engineering inspections (i.e. annually or bi-annually) as well as routine inspections by staff (i.e. monthly when the pond is filled).	High	\$2,500	The estimated cost shown is for the completion of an annual or bi-annual inspection by a qualified consulting engineering firm and assumes that the SVCA would have a number of flood and erosion control structures inspected as part of the same contract. The cost for a standalone dam inspection would be estimated as \$10,000. It is assumed that the routine inspections would be completed by SVCA staff as part of their regular duties.
3. Develop and Operation, Maintenance, Surveillance and Safety Manual for the Varney Dam.	The SVCA does not have an Operation, Maintenance, Surveillance, and Safety Manual for the Dam	Medium	\$7,500	The estimated cost assumes that the SVCA would retain the services of a qualified consulting engineering firm to prepare the OMSS Manual; however, if staff resources are available, this could be completed by SVCA staff.

Recommendation	Description of Deficiency	Priority	Estimated Cost	Additional Comments
4. Monitor the large woody vegetation on the crest and downstream slopes of the north section of the earth embankment and remove damaged or dead trees. Do not allow additional trees to be planted within 5 m of the toe of the embankment or on the embankment itself and remove existing smaller trees.	There are large trees growing on sections of the embankment. These trees have the potential to cause slope instability and weaken the structure.	Ongoing	\$0	It is assumed that this would be completed by SVCA staff as part of their regular duties.
5. Complete a CCTV inspection of all inlet and outlet pipes to confirm their condition. For the outlet system, the CCTV contractor should be asked to provide a sketch of the outlet system that includes a description of the overflow pipes and how they connect to the main outlet pipe	Some of the inlet/outlet pipes viewed at the ends are in fair condition and a thorough inspection via CCTV camera would better identify the condition of the pipes and identify rehabilitation or replacement recommendations.	Medium	\$15,000	It is assumed that the SVCA would retain a specialized contractor to complete this work; however, the Municipality may have this capability in house which would allow the work to be completed at a lower cost. Depending on the outcome of these inspections, additional work, such as the replacement of the outlet pipes and structure may be required. Complete replacement of the outlet structure could be in the \$75,000 to \$100,000 range, including engineering and permitting.
6. Complete an inspection of the wooden footbridge across the creek and undertake any repairs, or replacement as required, in order to ensure that the bridge is safe for use by members of the public and SVCA staff.	The bridge used to cross the creek and access the dam was not inspected in detail; however, some deterioration and cracking of the timbers and movement of the supporting pier was evident.	Medium	\$7,500	The estimated cost assumes that the SVCA would retain the services of a qualified consulting engineering firm to complete this work.
7. Re-evaluate the use of the temporary dam that is used to supply water to the pond with consideration of other agency approvals that may be required.	When the temporary dam is in place, and water is being diverted, the creek between the temporary dam and pond outlet is almost completely dry. Permits from the Ministry of the Environment, Conservation, and Parks, Ministry of Natural Resources and Forestry, and Conservation Authority may be required to undertake this diversion.	High	\$0	It is assumed that this would be completed by SVCA staff as part of their regular duties.

Recommendation	Description of Deficiency	Priority	Estimated Cost	Additional Comments
Public Safety				
8. Complete a Public Safety Risk Assessment and Public Safety Plan for the Varney Dam/Pond and implement appropriate public safety measures (i.e. railings, fencing, signage, public safety boom/buoys). This work should be completed in accordance with the Best Management Practices for Public Safety Around Dams (MNR, 2011) and the Guidelines for Public Safety Around Dams (CDA, 2011).	There is no Public Safety Risk Assessment or Public Safety Plan for the Varney Dam and it is evident that there is a significant public presence at the site.	High	\$15,000	The cost estimate assumes that the SVCA would retain the services of a qualified consulting engineering firm to complete this work; however, this could be completed by SVCA staff if they have the appropriate knowledge and experience. The appropriate public safety measures and their costs would be identified as part of the Public Safety Risk Assessment.
9. Based on the results of the Public Safety Risk Assessment and Public Safety Plan establish appropriate boundaries for a no swimming zone in relation to the outlet structure and implement the recommended public safety measures to block access to that area.	Swimming in the area around the outlet structure is hazardous and appropriate public safety measures are required.	High	\$0	It is assumed that these recommendations will be provided as part of the Public Safety Risk Assessment and Public Safety Plan. The cost of the actual public safety measures could range from \$2,500 (for a simple buoy line) to \$25,000 for a public safety boom.
10. Continue to block access to the wooden outlet structure until the Public Safety Risk Assessment and Public Safety Plan are completed and the recommended public safety measures are implemented.	Jumping from the wooden outlet structure is a hazardous activity and should be restricted until the Public Safety Risk Assessment and Public Safety Plan are completed and appropriate public safety measures are implemented.	High	\$0	There is no cost associated with this recommendation as it has already been implemented by SVCA staff.
11. Review the configuration of the outlet structure as it relates to public safety.	The existing configuration of the outlet structure may contribute to public safety hazards at the site.	High	\$0	It is assumed that this will be considered as part of the Public Safety Risk Assessment and Public Safety Plan. Any changes to the outlet structure should be considered in conjunction with the results of Recommendation 5.
12. Consult with the local building official regarding the swimming area and fencing requirements.	The requirements for controlling access to the swimming area are unclear.	High	\$0	It is assumed that SVCA staff will complete this as part of their regular duties and incorporated into the Public Safety Risk Assessment and Public Safety Plan.
13. Remove the stairs that are attached to the wooden outlet structure so that people are not swimming in the vicinity of the outlet.	The footings for the stairs are being undermined and accessing the stairs could be a public safety hazard.	High	\$0	It is assumed that SVCA staff will complete this as part of their regular duties.
14. Install additional public safety signage that is consistent with the Best Management Practices for Public Safety Around Dams (MNR, 2011).	The existing public safety signage does not meet the requirements of the Best Management Practices for Public Safety Around Dams (MNR, 2011).	High	\$5,000	Recommendations for additional public safety signage will be provided as part of the Public Safety Risk Assessment and Public Safety Plan.

Recommendation	Description of Deficiency	Priority	Estimated Cost	Additional Comments
Minor Maintenance				
15. Re-establish vegetative ground cover beneath the large trees on the north section of the earth embankment to reduce the risk of erosion. If it is not possible for grass to grow in this area then consider placing gravel along the crest where there is currently exposed soil.	There are exposed soils beneath the large trees on the crest of the earth embankment. This could lead to erosion and potential failure of the earth embankment.	Medium	\$5,000	It is assumed that this work can be completed by SVCA staff as part of their regular duties, with purchased materials.
16. Repair or replace the concrete ditch inlet that serves as the diversion inlet for the pond.	There are large cracks in the ditch inlet that serves as the diversion inlet for the pond.	Medium	\$20,000	The cost estimate assumes that the SVCA would retain a contractor to complete this work. A Conservation Authority permit would be required to work in the water.
17. Replace the grate on the pipe that inlets to the pond. The new grate should fit the pipe properly and have an adequate locking mechanism.	The grate on the end of the inlet pipe is in poor condition and does not properly fit the pipe.	Medium	\$2,500	It is assumed that this work can be completed by SVCA staff as part of their regular duties, with purchased materials.
18. Repair the deteriorated concrete on the upstream side of the outlet structure.	The upstream left end of the outlet headwall is severely spalled, exposing the metal anchors for the wooden outlet structure and steel grating.	Medium	\$20,000	The cost estimate assumes that the SVCA would retain a contractor to complete this work. A Conservation Authority permit would be required to work in the water.
19. Replace the grate on the downstream side of the outlet headwall.	The grate is not connected to the concrete headwall and is in poor condition.	Medium	\$2,500	It is assumed that this work can be completed by SVCA staff as part of their regular duties, with purchased materials.