Long Point Region Conservation Authority
Request for Proposals
For
Deer Creek Dam – Dam Safety Review

Date Issued: August 12, 2024

Closing Date and Time: 3:00 p.m. on Thursday August 29th, 2024

Closing Location:

By email to: aleduc@lprca.on.ca

Long Point Region Conservation Authority

4 Elm Street, Tillsonburg ON N4G 0C4

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1 INTRODUCTION

The Long Point Region Conservation Authority (LPRCA) currently owns and operates twelve dams and water control structures within its watershed. Historically these structures were constructed for flood control, low flow augmentation, recreation, erosion control, and municipal drinking water sources. Most of these structures were constructed in the 1960's while others were built over 100 years ago.

The Deer Creek Dam was originally constructed in 1969 by the Big Creek Region Conservation Authority approximately 21 km upstream from Lake Erie on Deer Creek, a tributary of Big Creek. In 1971, the dam came under the ownership of the LPRCA after the Big Creek and Big Otter Conservation Authorities merged. Surrounding the dam and its reservoir is the Deer Creek Conservation Area owned by LPRCA. The dam currently serves as a feature to the Deer Creek Conservation Area and has historically provided low flow augmentation.

The dam consists of earth embankments and concrete spillway, with two bays of stop logs, which control headpond water levels. Norfolk County Road 45 runs atop the entire length of the dam embankment with a bridge over the spillway section of the dam. A low-level intake is located to the north east of the spillway that facilities lowering of water levels and provides low flow augmentation to Deer Creek.

The structure is approximately 54 years old and its condition is typical for a structure of its age. In 2014, Riggs Engineering undertook a close-up visual inspection of the Deer Creek Dam. The inspection identified that the structure is in generally good condition with only the upstream wingwalls being areas of concern. The Riggs Engineering inspection is attached to this Request for Proposal for information.

In 2019 LPRCA retained G. Douglas Vallee to design drawings for concrete repairs for the Dam's upstream wingwalls. In 2022, LPRCA retained Watech Services Inc. to undertake the concrete repairs which were carried out under the direction of G. Douglas Vallee.

LPRCA is soliciting proposals, though this Request for Proposal (RFP), to undertake a Dam Safety Review of the dam and its associated features including the reservoir, in accordance with the Technical Bulletins and Best Management Practices by the Ministry of Natural Resources (MNR). The report must include recommendations with preliminary cost estimates for all identified items requiring corrective actions.

2 SUBMISSION DETAILS

The proposal must be marked "**Long Point Region Conservation Authority – Deer Creek Dam, Dam Safety Review - Proposal**" addressed to Aaron LeDuc, Manager of Corporate Services. Digital submissions of the proposal will only be accepted by email, until **3 pm (EST) on August 29, 2024**. Submitted proposals received after this time will not be considered. Proposal must be submitted to:

Aaron LeDuc
Manager of Corporate Services
aleduc@lprca.on.ca
Long Point Region Conservation Authority

A read receipt must be requested by the submitting bidder and an acknowledgement of the submitted proposal will be provided by LPRCA. It is the responsibility of the bidder to obtain acknowledgement of submission.

The budget for this project, including all subcontractors and applicable taxes, shall not exceed **$100,000**.

All enquiries and request for information will be addressed by addendum. All issued addendums will form part of the RFP. Receipt and acknowledgement of all issued addendums shall be included in the submitted proposal.

All submitted proposals including costs are public information and subject to the Freedom of Information and Privacy Acts. LPRCA reserves the right to cancel this RFP for any reason without any liability. Awarding of the contract based on the RFP may have to go before the LPRCA Board of Directors for final approval.

3 PROPOSAL CONTENTS

The proposal must contain sufficient information to allow LPRCA staff to adequately evaluate the consultant's ability and qualifications. As a minimum, the following information must be provided:

a) Response to the RFP including details outlining the approach and methodology.
b) Breakdown of tasks with hours of staff time and cost.
c) The consultant's commitment to assign necessary resources to complete the study by February 28th 2025 .
d) Three (3) references of previous clients for similar projects relating to small and medium sized dams in Ontario.
e) Lump sum fee for completing the project as described in the scope of work and in accordance with the MNR Technical Bulletins and Best Management Practices for Dam Safety Reviews.

4 SCOPE OF WORK

The Dam Safety Review must be undertaken for the Deer Creek Dam in accordance with the Technical Bulletins and Best Management Practices of the Lakes and Rivers Improvement Act (LRIA) as administered by the MNR for Dam Safety Reviews. The purpose of this study is to complete a systematic review and evaluation of all aspects of the design, construction, maintenance, operation, surveillance and all other factors affecting the dam's safety. The study shall include, but is not limited to, the main water control structure and all associated features such as the embankments, abutments, wingwalls, low water intake, and reservoir.

The description of the work described in Section 4 of this RFP is only a summary of the anticipated work required to comply with all applicable MNR Technical Bulletins and Best Management Practices. Any scope of work not explicitly detailed in this RFP, but which is necessary for the successful completion of the project, shall be considered included in the contract and must be provided by the consultant without extra cost.

4.1 Data Collection

The consultant shall review all pertinent files, hydraulic models, flood mapping and engineering drawings. Interviews between dam operating staff, managers and the consultant shall be conducted as necessary.

An onsite inspection shall be completed by the consultant with a representative of LPRCA. The consultant shall become familiar with all associated features of the structure in addition to relevant hydrology and hydraulic aspects of the site and structure.

Engineering drawings of the dam will be provided to the consultant.

4.2 Hydrology and Hydraulic Analysis

4.2.1 Flood Flow Calculations

Peak flows shall be determined in accordance with the MNR LRIA Technical Guidelines appropriate for the Deer Creek Dam. Acceptable computational computer models shall be utilized to determine flood flow calculations. Modeled flow should be compared with available regional frequency indexes.

4.2.2 Flood Routing Through Structure

Flows specified in Section 4.2.1, including the PMF (if required), shall be routed through the structure.

4.2.3 Preliminary Hazard Potential Classification

A preliminary hazard potential classification shall be completed for the dam based on the MNR Technical Bulletins of the Lakes and Rivers Improvement Act. Characteristics of the dam, reservoir, watershed, topography, structure, downstream structures, and public use shall be considered when determining the preliminary hazard potential classification. The preliminary hazard potential classification shall be used to determine the extent of dam break modeling and inundation mapping required.

4.2.4 Dam Break Analysis

The dam break analysis for the Deer Creek Dam shall be completed to the extent as determined necessary in Section 4.2.3 in accordance with the LRIA Technical Guidelines. The analysis shall produce a set of inundation maps showing the worst-case scenario as a result of failure.

4.2.5 Confirmation of the Hazard Potential Classification

Confirmation of the Hazard Potential Classification shall be completed as necessary, or if the Preliminary Hazard Potential Classification is determined to be moderate or higher. As necessary, confirmation of the Hazard Potential Classification may include (but not limited to):

a) Evaluation of the hydrological and hydraulic conditions that result in failure of the dam. The evaluation is to include the effects of infrequent flooding and frequent flood resulting from ice, debris, etc.
b) Assessment of the potential for loss of life and property damage prior to dam failure.
c) Effect on life, property, environment, and cultural losses completed as a result of dam failure.
d) If necessary, a numerical analysis to determine the downstream effect of the failure which incorporates downstream water control structures.
e) Final hazard potential classification completed considering incremental effect of failure.

4.2.6 Inflow Design Flood (IDF) Conditions

The IDF shall be determined for the Deer Creek Dam and shall assess the adequacy of the hydraulic and structural characteristics of the dam. It is currently unknown what IDF the Deer Creek Dam was designed for or can currently pass.

4.3 Structural Assessment

A structural assessment shall be completed by the consultant to determine the integrity of the structure under standard and a combination of loadings based on probability of occurrence. The assessment of the dam shall be completed for all above-water and underwater structural elements of the dam including, but not limited to, stoplogs, spillway, concrete and earthen components.

4.3.1 Concrete Elements of the Dam

All concrete portions of the dam including, but not limited to, the foundation, wing walls, supports, and piers shall be included in the structural assessment.

a) Assessment of the structural stability of the dam using appropriate loading conditions.
b) The assessment shall evaluate concrete conditions and make appropriate recommendations as necessary to address any concerns identified. Preliminary engineering plans for repairs shall be prepared with estimated costs. Appropriate timelines shall be made for implementing repairs recommended based on urgency.
c) The proposal should clearly state if intrusive investigations are proposed and their methodology.

4.3.2 Earthen Berm Portions of the Dam

All aspects and components of the dam's earthen berm shall be inspected as part of the study. Although it is unknown to what extent intrusive investigation (geotechnical investigation) is required, the approach should be clearly identified in the proposal. It should also be clearly identified whether a subconsultant will undertake all or portions of the geotechnical investigation. The following should be considered:

a) Complete an intrusive geotechnical investigation to all applicable standards.

b) Conduct above and below water survey on upstream and downstream slope of left embankment to identify zones of possible slope erosion.
c) Conduct a topographic survey (or otherwise) probe the channel downstream of stilling basin or indications of channel bed erosion.
d) Make appropriate recommendations as necessary to address any concerns identified in the assessment with preliminary engineering plans for repairs and estimated costs. Appropriate timelines shall be made for implementing repairs recommended based on safety considerations.

4.3.3 Mechanical and Additional Dam Equipment

All equipment related to the integrity, operation and maintenance of the dam must be inspected and its condition documented. Such equipment includes the low-flow valve, safety equipment, fencing, signs, drains, etc.

4.4 Safety

4.4.1 Occupational Health and Safety Act

The study shall include a review to identify any and all deficiencies associated with the Occupational Health and Safety Act (OHSA) regarding the operation, maintenance and access of all associated features of the dam. Appropriate recommendations are to be made to address any the deficiencies to ensure compliance with the OHSA.

4.4.2 Public Safety

The Deer Creek Dam and its associated reservoir partially comprises the Deer Creek Conservation Area that is promoted to, and utilized by the public for a variety of uses including canoeing, camping, hiking, picnicking, and recreational fishing. LPRCA is concerned and committed to public safety and the study will include an assessment of the potential dangers to the public and make the necessary recommendations to improve safety. Recommendations shall be made (e.g., signage, fencing and necessary upgrades) to improve and promote safety to meet or exceed all applicable standards. A signage plan shall be developed as necessary showing location and wording of necessary signage.

4.5 Preliminary Rehabilitation Measures and Options

Potential deficiencies identified by the consultant through the assessment and review process shall have corrective measures identified with costs estimates for engineering and capital. Potential deficiencies shall be assessed relating to all aspects to the dam. Recommendations and rehabilitation measures shall be shown on drawings in plan and profile sections to outline the recommended measures.

In addition to corrective actions required as identified in the stability and condition assessment, the report shall further explore additional potential options for the dam to ensure safe operation.

5 AVAILABLE INFORMATION

5.1 Data

All information known and available to LPRCA regarding Deer Creek Dam will be made available to the consultant as part of the project. The consultant shall allocate time to review LPRCA files to determine if further engineering reports and studies may be available. A preliminary review of files and information summarizes the following information that may be of assistance:

a) OMAFRA LiDAR DTM 2016-2018 – Lake Erie:
    i. Digital Elevation Model (available directly from MNR – Land Information Ontario)
    ii. Ontario Digital Terrain Model (LiDAR Derived) User Guide

b) Hydrometric Data - Water Survey of Canada Gauges:

Gauge Name	Water Survey of Canada ID	Coordinates	Period of Record
Big Creek near Delhi	02GC006	42° 50' 15" N 80° 30' 35" W	1955-2024
Big Creek near Walsingham	02GC007	42° 41' 08" N 80° 32' 18" W	1955-2024
Big Creek near Kelvin	02GC011	42° 59' 12" N 80° 26' 40" W	1963-1978; 2005-2024
Venison Creek near Walsingham	02GC021	42° 39' 12" N 80° 32' 54" W	1966-1993; 2005-2024

c) Deer Creek Dam concrete repair drawings, G Douglas Vallee, 2019
d) Dam Operation and Maintenance Manual – LPRCA, Revised 1999
e) Dam Inspection – B.M. Ross and Associates Limited, 1987
f) Long Point Region, Kettle Creek and Catfish Creek Integrated Water Budget – AquaResouce Inc., April 2009
g) 2020 Southwest Ontario Orthophotography (SWOOP)
h) Deer Creek Lift Chamber Repair Drawings, G Douglas Valee, 2019
i) Norwich Dam, Deer Creek Dam and Hay Creek Dam Fencing Design, 2018

Location maps, aerial imagery, photographs, engineering drawings, and the Riggs Engineering inspection are provided in Appendix A to D respectively. These documents and the LPRCA Flood Hazard Mapping Project including the technical report and mapping are available for download:

https://longpoint-my.sharepoint.com/:f:/g/personal/dproracki_lprca_on_ca/EmQ126EKu1FIgp4mVEOLaVQBs00IDaUE3_VmqGRpdPWn-Q?e=rdlvsY

5.2 Pre-Bid Site Meeting

A Pre-Bid Site Meeting will be held before the closing date as follows:

Pre-Bid Site Meeting date: **August 20, 2024, at 10:00 AM**
Meeting Location: 1929 Norfolk County Rd 45, Langton, ON N0E 1G0

Attendance at pre-bid site meeting is optional but recommended before submission of proposal. Own PPE shall be required for site visit including hard hat, steel toed safety boots, glasses, and high visibility vests.

6 DELIVERABLES

6.1 Reports

All final reports and documents shall be stamped and sealed by a professional engineer licensed to practice professional engineering in Ontario. A draft final report shall be provided to LPRCA for review with the opportunity for staff to provide comment. The final report shall be prepared after written comments from LPRCA have been received and satisfactorily addressed. The final report shall be provided in a digital form of Adobe Acrobat (pdf). All information, reports, drawings and model input and output produced shall be the property of LPRCA.

Drawings completed by the consultant shall be prepared in AutoCAD with approved standards and conventions for scale, size, line weights, title block, logo, etc. Final drawings shall be provided in a digital (Adobe Acrobat – .pdf and AutoCAD – dwg) format.

All relevant information included in the analysis of the hydrologic, hydraulic, routing, models, dam break analysis, etc. shall be provided as an electronic copy. Digital input and output files including executable code shall be provided electronically and be indexed appropriately. A “readme” file shall be included to assist the user in locating and using the data.

6.1.1 Final Report Requirements

The final report shall include all necessary information to meet the requirements of the LRIA, Technical Guidelines and Best Management Practices, and all other applicable legislation and regulations. The final report shall include, but not be limited to the following information:

a) Site location layout(s) and survey(s)
b) Drawings
c) Background Information
d) Operating rule curve
e) Stage-storage and stage-discharge curves
f) Map showing dam site, location, drainage area, hydraulic and hydrology characteristics, etc.
g) Input and interviews with dam operating staff
h) Review of design, construction and maintenance records
i) Results of inspections of dam and associated features
j) Results of all intrusive inspection including the geotechnical investigation
k) Analysis of design loading conditions including uplift, ice pressures and stability analysis
l) Hazard classification potential
m) Flood frequency flows, IDF and PMF
n) Routing of floods through the dam
o) Review of all relevant operating procedures, records required to operate the structure
p) Ability of the dam to pass the IDF
q) Dam break and inundation mapping (as required)
r) Assessment of structural condition and stability of the dam

s) Adequacy of dam surveillance and monitoring programs
t) Emergency preparedness and public safety plan (as required)
u) Recommendations for follow-up actions, priorities, costs and preliminary designs
v) The report shall explore potential options for the dam with associated estimated costs and lifespan of the structure
w) The report shall provide an estimate of the full replacement cost of the structure

6.1.2 Interim Reports

Interim reports shall be submitted to LPRCA for comment and include information summarizing the progress to date, significant findings of the phase and possible implications to the project. Interim reports shall be submitted following completion of the following phases:

a) Data collection and site visits (including geotechnical investigation).
b) Flood flow estimating, routing and preliminary hazard classification potential.
c) Confirmation of the hazard classification potential, dam breaks analysis and determination of IDF conditions.

6.1.3 Meetings

Meetings shall be held at key times throughout the project at a mutually agreed location or online via Microsoft Teams. The consultant is to allow for a minimum of three (3) formal meetings with the LPRCA Project Team at various key points throughout the project implementation. At a minimum, meetings shall be held as per the following schedule:

a) Start-up to confirm methodology, schedule and expectations following award of the project.
b) Upon submission of the draft Interim Report.
c) Upon completion of the project to present the project and answer questions.

During meetings the consultant will take and complete minutes that will be circulated to LPRCA for review and comment. A contingency fee for additional Project Team meetings should be identified in the Consultant's proposal.

7 INSURANCE & OTHER REQUIREMENTS

The successful consultant must obtain, maintain and provide proof of Work Place Insurance Board (WSIB) clearance certification and two million dollars of liability/errors and omissions insurance (minimum). Any subconsultant hired by the successful consultant must also provide, maintain and provide proof of WSIB clearance certificate, two million dollars of liability and two million dollars of errors and omissions insurance (minimum).

All employees and subconsultants shall be certified and in compliance with the Accessibility for Ontarians with Disability Act.

8 ENQUIRIES AND CLARIFICATION

Proponents with questions related to this proposal may forward written submissions by EMAIL to:

Saifur Rahman, M.Eng., P.Eng.
Manager of Engineering and Infrastructure
519-842-4242 ext. 265
srahman@lprca.on.ca

Questions shall be received via email until **3:00 PM (EST) on August 21st, 2024**. If the LPRCA Project Team determines that an amendment is required to this RFP, the LPRCA will issue an addendum. Verbal clarification should not be interpreted to change the intent of the RFP. Any revision to this RFP will be issued as an addendum. The addendum shall be included as part of the RFP. Receipt and acknowledgement of all issued addendums shall be included in the submitted proposal. The study must be complete in its entirety by **February 28th, 2025**.

9 SELECTION CRITERIA

An Assessment Team will consider all proposals that have been submitted before **3:00 PM (EST) on August 29th 2024**. The assessment team may consult with LPRCA staff and Board Members, third party consultants and references as determined necessary in the evaluation. The Assessment Team will review, evaluate and compare all submissions to determine the strengths and qualifications which are most advantageous to LPRCA in accordance with the following criteria:

- Proposal completeness and quality;
- Qualifications and experience of the firm, project manager, and team;
- Understanding and approach;
- Cost; and
- Ability to complete the project within the required timeline.

The Assessment Team shall not be bound by the above criteria and may consider all factors identified during the review process. All factors and criteria considered throughout the process will be applied to all submissions. The proposal with the lowest bid may not necessarily be accepted. The Assessment Team will make a recommendation to LPRCA's Board of Directors or delegated authority for awarding the work to a successful consultant.

The successful consultant will be required to sign an agreement for services as attached in Appendix F. Any concern that the consultant may have with the attached agreement must be included in the proposal.

10 RIGHT TO REJECT OR MODIFY OR NEGOTIATE

LPRCA reserves the sole right to reject any and/or all proposals submitted at its sole discretion. In the event that a prepared Proposal does not precisely and entirely meet the requirements of the Request for Proposal, the LPRCA reserves the right to enter into negotiations with the selected consultant(s) to arrive at a mutually satisfactory arrangement with respect to any modifications to the proposal.

11 References

Ontario Ministry of Natural Resources. Dam Safety Reviews - Best Management Practices, *Technical Bulletins and Best Management Practices.*

Lakes and Rivers Improvement Act, R.S.O. 1990

Appendix A

Site Location and Aerial Photography

Appendix B

Structure Photographs

Appendix C

Drawings

Appendix D

Riggs Engineering Inspection

Appendix E

Agreement for Professional Consultant Services

Appendix F

Declaration of Disclosure