

Sault Ste. Marie Region Conservation Authority



REQUEST FOR PROPOSAL (RFP)

Hydrology, Flood Inundation Study and Topographic Survey of FORT CREEK DAM

July 2021

Final Date for Submission: August 13, 2021 @ 4:00 p.m.

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1. SCOPE OF WORK

1.1 INTRODUCTION

The Sault Ste. Marie Region Conservation Authority (SSMRCA) is requesting proposals from suitably qualified consulting engineering firms (“Consultants”) to provide professional engineering services to conduct a detailed flood (IDF and PDF) and inundation study and hydrological investigation of the Fort Creek Dam, including a dam topographic survey to update existing Dam reference elevations. The study must meet the requirements of Fort Creek Dam Safety Review (2015), in accordance with the Ontario Dam Safety Regulation and the relevant Ministry of Natural Resources guidelines. The proposed study was recommended by a Dam Safety Review (2015) and a Geotechnical Study (2019).

1.2 BACKGROUND

The SSMRCA owns and operates the Fort Creek Dam. A geotechnical study was carried out for the Fort Creek Dam in 2019 as recommended by the Dam Safety Review (2015). The geotechnical study further recommended that a Dam topographic survey, updated hydrology, and flood inundation study be conducted of the downstream areas. The Dam Safety Review (2015) resulted in a “High” hazard potential of the dam as defined by the Hazard Potential Classification, and concluded that currently there is insufficient topography, hydrology, and downstream flood inundation information to verify design performance assumptions and recommended an update of these parameters to support the long-term performance of the Dam.

The Consultant will be required to complete a review of Fort Creek Dam flood analysis which includes the following work:

- Review of previous hydrologic studies to confirm the design flows.
- Hydraulic calculations to establish the hydraulic capacity of the existing outlet and downstream channel.
- Hydraulic calculations to determine the potential impacts of dam failure on the downstream reaches.
- Determine flood frequency flows, probable maximum flood, and inflow design flood.
- Prepare a hydrologic model of the tributary watershed.
- Develop flood routing model.
- Undertake dam break analysis & inundation mapping if required by using GIS data and orthophotos available from the Conservation Authority, MNR, City of Sault Ste. Marie and private suppliers to build up the hydraulic model for calculation of hydraulic capacity and dam break dynamic wave modelling.

1.3 PROJECT SCOPE

Hydrologic Investigation

The hydrologic investigations will comprise a flood frequency analysis of the stream flow data recorded for the Fort Creek. The study will include determination of an Inflow Design Flood. The computation of that flood will encompass regional flood frequency analysis and hydrologic modeling of the watershed.

Hydraulic Investigations

The hydraulic investigations will comprise the following tasks:

- Computation of the hydraulic characteristics of the hydraulic structures of the dam.
- Computation of flood levels in the reach downstream of the dam.
- Preliminary dam break routing in the same reach.
- Delineation of the preliminary dam break results on topographic maps, in sufficient detail to determine incremental flooding resulting from the Normal and Flood failure of the dams.

Dam Break Analysis

As part of the preliminary dam classification activities, carry out a preliminary dam break analysis for the dam. Depending on the results of the dam classification, a detailed dam break analysis will be required. The dam break analysis will include survey of selected valley cross-sections to validate the information obtained from the maps and other background information. The inundation limits will be presented on Ontario Base Mapping maps, at a scale of 1:10,000, or the largest scale available.

Topographic Survey of Dam

This part will include site reconnaissance, field data collection, topographic survey of dam, and producing certified survey maps of Fort Creek Dam and relevant structures.

This Project will be separated into two (2) main tasks:

Task 1 – Hydrology, Flood Inundation study and Topographic Survey of Fort Creek Dam

Task 2 – Final report signed and sealed by professional engineer (both hard copy and digital format)

Further details can be found in APPENDIX A – TERMS OF REFERENCE. Location specifics can be found in APPENDIX B.

1.4 PROJECT BUDGET

The Terms of Reference may have to be adjusted to ensure that the cost of the Project remains within budget. If requested, the Proponent shall identify possible changes in the Terms of Reference proposed in order to keep this Project within budget.

2. CONTENT OF PROPOSAL

2.1 COVER LETTER

Provide a cover letter signed by an authorized representative of the Consultant, stating the Proposal describes the Work to be provided for this Project.

2.2 PROJECT TEAM

Provide a list of key staff, their related experience in Ontario and role on this project. Include their role as it relates to the Terms of Reference as shown in Appendix A. Previous experience or projects as it relates to this RFP should also be included. Resumes are required with the Proposal submission. Also include any sub-consultants to be used, their role, corporate experience in Ontario, key personnel, per diem rates and the mark-up rate to be used.

Team Member Requirements:

Professional Engineer

The Professional Engineer must:

- Hold current registration as a Professional Engineer within the province of Ontario;
- Have at least 5-10 years of experience in the design, construction supervision, performance evaluation of hydrology and hydraulic work; and
- Be familiar with the OMNR's Dam Safety Guidelines.

2.3 CORPORATE INFORMATION AND REFERENCES

Provide corporate background information as well as information directly related to the Project showing experience and qualifications. Provide a list of applicable Projects of comparable size describing the nature of the project, the level of involvement of your company, the specific staff members involved and the value of the Project. Include a minimum of three (3) project references that relate specifically to work on dams.

2.4 METHODOLOGY

The Proponent shall provide a detailed work plan, schedule and methodology clearly describing all tasks proposed to fulfill the objectives. Include in this plan an indication of when meetings will be required with SSMRCA staff.

2.5 FEES

The Proponent shall provide a Fee Summary Sheet. In addition, the Proponent shall also provide a "task-fee" schedule showing total cost. The mark-up and calculation method shall be clearly described. Pricing should be in Canadian dollars and include HST.

Provide fees based on the following Phases as discussed in Appendix A – Terms of Reference, the fees are to be separated as shown below.

- Task 1
Hydrology, Flood Inundation Study and Topographic Survey of Fort Creek Dam.
- Task 2
Provide Final Report (both Hard Copy and Digital format).

2.6 SCHEDULE

Site Visit: August 2021.

Data Review: August / September 2021.

Task 1 and Task 2 Draft Report submissions: October 31, 2021.

Review comments returned: November 30, 2021.

Final Report Submission: January 14, 2022.

The final draft must be completed for January 14, 2022. The consultant shall submit a schedule with their proposal demonstrating their ability to complete the project in a timely fashion.

2.7 SUMMARY OF KEY DATES

July 26, 2021 – RFP Posted

August 4, 2021 12:00 p.m. – Cut off for Questions

August 9, 2021 – Response to Questions

August 13, 2021 4:00 p.m. – Submission of Proposals

August 18, 2021 – Notification of Award

2.8 DISCLOSURES

The Proponent shall provide a brief consolidated listing of all proposed modifications and/or deletions to these Terms of Reference, or it will be deemed that every clause will be strictly adhered to.

2.9 PROPOSAL SUBMISSION

Two (2) hard copies and one digital copy of the proposal shall be submitted no later than 4:00 pm, Friday, August 13, 2021. Copies of the proposals shall be delivered to:

Sault Ste. Marie Region Conservation Authority
1100 Fifth Line East
Sault Ste. Marie, ON
P6A 6J8

Attention: Corrina Barrett

Digital versions are to be included on a USB drive with the package. Emailed Proposals will not be accepted.

Consultants intending on submitting a proposal are asked to send an e-mail with “Fort Creek Dam RFP – Intent to Bid” in the subject line to cbarrett@ssmrca.ca. This will ensure you are on the list in the event of an Addendum being released.

Any questions on the RFP must be submitted to SSMRCA by Wednesday, August 4, 2021 at 12:00 noon. Please send questions by email to cbarrett@ssmrca.ca with “Fort Creek Dam RFP – Question” in the subject line.

2.10 SELECTION CRITERIA

SSMRCA will select the successful consultant based on an assessment of the submitted proposals based on criteria such as meeting the project requirements, project team experience, and project cost. SSMRCA will select the successful consultant based on an assessment of the submitted proposals using the following weighted criteria:

- Meeting TOR requirements and Proposed Workplan 35%
- Project team experience 40%
- Project cost 25%

The proposal with the lowest bid may not necessarily be accepted.

3. GENERAL TERMS AND CONDITIONS

3.1 ACCEPTANCE OF PROPOSALS

This RFP neither expresses nor implies any obligation on the part of the SSMRCA to enter into a contract with any consultant submitting a proposal.

3.2 REJECTION OF PROPOSALS

The selection committee reserves the right to reject any or all proposals for failure to fully satisfy the specifications and requirements of the RFP.

Any award resulting from this RFP is subject to the successful completion of a contract between the Consultant and the SSMRCA.

3.3 RIGHT TO AMEND

The SSMRCA reserves the right to amend or supplement the RFP, giving equal opportunities to all consultants who have bid, by way of an issued addendum.

3.4 ACCEPTANCE OR NON-ACCEPTANCE OF PROPOSAL

Neither the lowest priced nor any proposal shall necessarily be accepted, and the decision of the selection committee is final. If the selection committee decides to accept a proposal, then the acceptance and the making of an award will be in writing. Unless and until such written notification has been given, there is no successful consultant and no award has been made.

3.5 ASSOCIATED COSTS

There will be no payment to consultants for the work related to and material supplied in the preparation of responses to this RFP.

3.6 CONFIDENTIALITY AND OWNERSHIP OF DOCUMENTS

The consultant is advised that confidentiality issues may arise with respect to this project and will need to be cognizant of these issues.

The information contained in this RFP is confidential and proprietary. This RFP is provided for the exclusive use of the Respondent (potential "Contractor") and copies shall not be made available to any other party, without written consent from SSMRCA. No other distribution of submissions or proposals is to be made by the Respondent. All proposals and supporting documentation shall become the property of SSMRCA and will not be returned.

Intellectual Property arising as a result of the Contract, including reports and drawings, will be the property of SSMRCA.

3.7 MUNICIPAL FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT (MFIPPA)

All correspondence, documentation and information provided shall become the property of SSMRCA. Any personal information required on the documentation presented is received under the authority of the *Municipal Freedom of Information and Protection of Privacy Act, 1989, RSO, 1990*. This information will be an integral component of the quote submission. All written Proposals received by SSMRCA become a public record, once a Proposal is accepted by SSMRCA, and a contract is signed, all information contained in them is available to the public, including personal information.

Questions about collection of personal information and the *Municipal Freedom of Information and Protection of Privacy Act, 1989, R.S.O. 1990, Chapter M.56*, as amended, should be directed to: Sault Ste. Marie Region Conservation Authority, 1100 Fifth Line East, Sault Ste. Marie, ON P6A 6J8, Phone: 705-946-8530.

3.8 INSURANCE

The successful bidder shall carry and maintain insurance written by an insurance company licensed to do business in Ontario for the term of the contract and must provide for the following:

- Workplace Safety & Insurance Board (WSIB) clearance certificate
- General Liability Insurance – minimum \$2 million coverage with Sault Ste. Marie Region Conservation Authority as an additional insured
- Automobile Liability – minimum \$2 million coverage
- Professional Liability - minimum \$2 million coverage

All policies and certificates shall provide for 30 days notification to SSMRCA in the event of cancellation, reduction in limits or changes in coverage.

3.9 PREVIOUS COMMUNICATIONS

This RFP document and attachments and any addenda contain the entire requirements relating to this RFP. Other information and/or documentation provided to a prospective consultant or obtained by a prospective consultant prior to the release of this RFP or any other time shall not have any force or effect.

3.10 CONFLICT OF INTEREST

It is the consultant's responsibility to ensure that no real or perceived conflict of interest exists for any of the consultant's personnel involved in the study.

3.11 CANCELLATION OF RFP

Due to unanticipated expenditure constraints, this RFP may be cancelled at any time without liability by the SSMRCA to prospective consultants or to any other entity.

3.12 AUTHORIZATION

To be considered a valid response, a consultant's submission must be completed and signed by an authorized company official.

3.13 IRREVOCABLE

Bid submissions will be irrevocable for a period of sixty days from the closing date.

APPENDIX A – TERMS OF REFERENCE (TOR)

TASK 1 – Hydrology, Flood Inundation Study and Topographic Survey of Fort Creek Dam

A Fort Creek Dam safety study conducted in 2015 concluded insufficient information to verify design performance assumptions and recommended an updated hydrology, flood inundation study and topographic survey to support the long-term performance of the Dam.

As a minimum, The Consultant will be required to complete:

- Review of previous hydrologic studies to confirm the design flows,
- Hydraulic calculations to establish the hydraulic capacity of the existing outlet and downstream channel.
- Hydraulic calculations to determine the potential impacts of dam failure on the downstream reaches.
- Determine flood frequency flows, probable maximum flood, and inflow design flood.
- Prepare a hydrologic model of the tributary watershed.
- Develop flood routing model.
- Undertake dam break analysis & inundation mapping if required by using GIS data and orthophotos available from the Conservation Authority, MNR, City of Sault Ste. Marie and private suppliers to build up the hydraulic model for calculation of hydraulic capacity and dam break dynamic wave modelling.
- The hydrologic investigations will comprise a flood frequency analysis of the stream flow data recorded for the Fort Creek. The study will include determination of an Inflow Design Flood. The computation of that flood will encompass regional flood frequency analysis and hydrologic modeling of the watershed.
- Computation of the hydraulic characteristics of the hydraulic structures of the dam.
- Computation of flood levels in the reach downstream of the dam.
- Preliminary dam break routing in the same reach.
- Delineation of the preliminary dam break results on topographic maps, in sufficient detail to determine incremental flooding resulting from the Normal and Flood failure of the dams.
- As part of the preliminary dam classification activities, carry out a preliminary dam break analysis for the dam. Depending on the results of the dam classification, a detailed dam break analysis will be required. The dam break analysis will include survey of selected valley cross-sections to validate the information obtained from the maps and other background information. The inundation limits will be presented on Ontario Base Mapping maps, at a scale of 1:10,000, or the largest scale available.
- Site reconnaissance, field data collection, topographic survey of dam, and producing certified survey maps of Fort Creek Dam and relevant structures.
- Identification of issues or deficiencies that require further investigation which will be completed under a separate project.

Hydrology, Flood Inundation Study and Topographic Survey will be separated into the following three phases:

Phase 1 – Reconnaissance and Document Review

Phase 2 – Site Visit and Detailed Work

Phase 3 – Final Report Sign and Seal by Professional Engineer

PHASE 1 – RECONNAISSANCE AND DOCUMENT REVIEW

The Project will commence with a start-up meeting to scope the particular areas to be covered or excluded under this review.

- Identify requirements based on the most recent OMNR's Guidelines.
- Review available documents for evidence of conformance.
- obtain information relevant to dam hydrology and hydraulics.
- Other available documents related to design, operation, maintenance, improvement, condition, and performance of the dam.
- Discuss the methodology to summarize and prioritize the study. If the available information is not adequate to draw such a conclusion, the inadequacy of the information should be noted.

At the end of Phase I the Consultant is expected to:

- Have acquired sufficient knowledge and understand hydrology and hydraulic aspects of the dam to identify the data requirement for flood inundation analysis.
- Conduct technical review meetings with the SSMRCA staff.

PHASE 2 – SITE VISIT AND DETAILED WORK

The Consultant shall analyze information developed by site investigation, review of previous engineering documents and studies. Based on such analysis and consultation, the professional engineer shall submit a professional evaluation and recommendations for the tasks as stated above under TASK 1. All data collected for the report shall meet current government standards, which includes all metadata and a data dictionary. It is expected that the Consultant will have made significant progress in the preparation of a Draft Report during Phase 2.

At the end of Phase 2 the Consultant is expected to:

- Have obtained all information required to complete the Study Report.
- Be at least 80% complete on the Draft Report.

PHASE 3 – FINAL REPORT

A Hydrology, Flood Inundation Study and Topographic Survey, covering all aspects of the analysis, shall be prepared. The Report shall quantify deficiencies and recommend priorities with associated cost estimates for future remedial measures.

The Consultant is expected to:

- Submit a draft report to SSMRCA for review.
- Complete and finalize the report.

TASK 2 – Submit Final Report

The Consultant is expected to:

- Prepare and submit final report on Fort Creek Dam Hydrology, Flood Inundation Study (signed and sealed by professional engineer) and Topographic Survey (By Licensed Surveyor).

DELIVERABLES:

The final report shall be prepared by the Consultant with its own cover design, signature page, etc. and include:

- Three (3) bound copies.
- One (1) digital copy in pdf format
- One (1) digital copy of photos, if applicable, in .tiff format

APPENDIX B – LOCATION AND PHOTOS OF DAM



Figure 1: Fort Creek Area Watershed



Figure 2: Fort Creek Dam and Reservoir (Aerial view).



Figure 3: Fort Creek Dam and Reservoir (Dam holding flood flows in 2013).