Return Bids to :

Retourner Les Soumissions à :
Natural Resources Canada
nrcan.ontariobid-soumissionontario.rncan@canada.ca

Request for Proposal (RFP)
Demande de proposition (DDP)

Proposal To: Natural Resources Canada
We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

Proposition à: Ressources Naturelles Canada
Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments – Commentaires

Issuing Office – Bureau de distribution

Finance and Procurement Management Branch
Natural Resources Canada
183 Longwood Road South
Hamilton, ON
L8P 0A5

Title – Sujet
Fully Integrated Groundwater – Surface Water Model of the Carcajou Watershed, NWT: Regional Modelling Numerical Methods Development

Solicitation No. – No de l'invitation	Date
NRCan-5000060312	July 22, 2021

Requisition Reference No. - N° de la demande
166906

Solicitation Closes – L'invitation prend fin
at – à 02:00 PM (Eastern Daylight Savings Time (EDT))
on – le August 23, 2021

Address Enquiries to: - Adresse toutes questions à:
len.pizzi@canada.ca

Telephone No. – No de telephone	Fax No. – No. de Fax
(905) 645-0676	

Destination – of Goods and Services:
Destination – des biens et services:

Natural Resources Canada
601 Booth Street
Ottawa, ON, K1A 0E8

Security – Sécurité

There are no security requirements associated with this requirement.

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Telephone No.:- No. de téléphone:
Facsimile No.: - No. de télécopieur:
Email – Courriel :

Name and Title of person authorized to sign on behalf of Vendor/Firm (type or print)
Nom et titre de la personne autorisée à signer au nom du fournisseur/de l'entrepreneur (taper ou écrire en caractères d'imprimerie)

Signature **Date**

TABLE OF CONTENTS

The Articles contained in this document are mandatory in their entirety, unless otherwise indicated. Acceptance of these Articles, in their entirety, as they appear in this document, is a Mandatory requirement of this RFP. Suppliers submitting a proposal containing statements implying that their proposal is conditional on modification of these clauses or containing terms and conditions that purport to supersede these clauses or derogate from them will be considered non-responsive.

Bidders with concerns regarding the provisions of the Bid Solicitation document (including the Resulting Contract Clauses) should raise such concerns in accordance with the Enquiries provision of this RFP.

PART 1 - GENERAL INFORMATION

1.1 Introduction

The bid solicitation is divided into seven parts plus attachments and annexes, as follows:

Part 1 **General Information**: provides a general description of the requirement;

Part 2 **Bidder Instructions**: provides the instructions, clauses and conditions applicable to the bid solicitation;

Part 3 **Bid Preparation Instructions**: provides Bidders with instructions on how to prepare their bid;

Part 4 **Evaluation Procedures and Basis of Selection**: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, and the basis of selection;

Part 5 **Certifications and Additional Information**: includes the certifications and additional information to be provided;

Part 6 **Security**: includes specific requirements that must be addressed by Bidders; and

Part 7 **Resulting Contract Clauses**: includes the clauses and conditions that will apply to any resulting contract.

The Annexes include the Statement of Work, the Basis of Payment and any other annexes and attachments.

The Appendixes include the Evaluation Criteria and the Financial Proposal Form.

1.2 Summary

By means of the RFP, Natural Resources Canada (NRCan) is seeking proposals from bidders for….

1.2.1 The objective of this project is to develop a fully integrated groundwater – surface water – climatology model for the Carcajou River watershed, NWT. The model will cover an area of approximately 7800 km^2 and is to be discretized to an extent commensurate with data availability and computational feasibility.

1.3 Debriefings

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days from receipt of the results of the bid solicitation process. The debriefing will be done in writing, by email.

PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003 (2020-05-28) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation with the modifications to the text below. If there is a conflict between the provisions of 2003 and this document, this document prevails.

- **In the complete text content (except Section 1 and 3) Delete:** Public Works and Government Services Canada" and **Insert:** "Natural Resources Canada." **Delete:** "PWGSC" and **Insert:** "NRCan"
- **Section 2: Delete:** "Suppliers are required to" and **Insert:** "It is suggested that suppliers"
- **Subsection 1 of Section 8: Delete entirely**
- **Subsection 2 of Section 8: Delete entirely**
- **Under Subsection 2 of Section 20:** Not applicable

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: 60 days
Insert: 120 days

2.2 Submission of Bids

Bidders must submit all proposals electronically. Given the current constraints on NRCan's networks, the electronic mail system has a limit of 1GB per single message received and a limit of 20GB per conversation. Bidders are asked to contact the Contracting Authority to confirm receipt of their bid. NRCan encourages bidders to submit all bids earlier than the closing time in order to ensure sufficient time to be received in NRCan's server.

It is the Bidders responsibility to ensure that proposals are sent to the following e-mail address, by the time and date indicated on page 1 of this RFP document.

- Send proposals to this email address nrcan.ontariobid-soumissionontario.rncan@canada.ca

  The email address above is reserved for the submission of your proposal. No other communication should be sent to that address.

- Contact the Contracting Authority Len Pizzi at (905) 645-0676 by either telephone call or email for receipt of bid confirmation.

IMPORTANT

It is requested that you write the following information in "Subject" of the e-mail:

NRCan-5000060312 - Fully Integrated Groundwater – Surface Water Model of the Carcajou Watershed, NWT: Regional Modelling Numerical Methods Development

Due to the nature of the bid solicitation, bids transmitted by mail or facsimile to NRCan will not be accepted.

NRCan will not assume responsibility for proposals directed to any other location.

The onus is on the Bidder to ensure that the proposal is submitted correctly to the above address. Not complying with the above instructions may result in NRCan's inability to ascertain reception date and/or to consider the bid prior to contract award. Therefore, NRCan reserves the right to reject any proposal not complying with these instructions.

2.3 Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than five (5) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by Bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated and the enquiry can be answered to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

2.4 Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the Bidders.

2.5 Improvement of Requirement During Solicitation Period

Should bidders consider that the specifications or Statement of Work contained in the bid solicitation could be improved technically or technologically, bidders are invited to make suggestions, in writing, to the Contracting Authority named in the bid solicitation. Bidders must clearly outline the suggested improvement as well as the reason for the suggestion. Suggestions that do not restrict the level of competition nor favour a particular bidder will be given consideration provided they are submitted to the Contracting Authority at least five (5) days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

Canada requests that Bidders provide their bid in separately bound sections as follows:

Section I: Technical Bid (1 electronic copy)

Section II: Financial Bid (1 electronic copy) in a separate file and document

Section III: Certifications (1 electronic copy)

Prices should appear in the financial bid only. No prices should be indicated in any other section of the bid.

Canada requests that Bidders follow the format instructions described below in the preparation of their bid:

(a) use 8.5 x 11 inch (216 mm x 279 mm) format;
(b) use a numbering system that corresponds to the bid solicitation.

Section I: Technical Bid

In their technical bid, Bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability in a thorough, concise and clear manner for carrying out the work.

The technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that Bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, Bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

Section II: Financial Bid

Bidders must submit their financial bid in accordance with the Financial Proposal Form in Appendix "2". The total amount of Applicable Taxes must be shown separately.

Exchange Rate Fluctuation

C3011T (2013-11-06), Exchange Rate Fluctuation

Section III: Certifications

Bidders must submit the certifications and additional information required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 Evaluation Procedures

(a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical evaluation criteria.

(b) An evaluation team composed of representatives of Canada will evaluate the bids.

4.1.1 Technical Evaluation

Mandatory and point rated technical evaluation criteria are included in Appendix "1" – Evaluation Criteria.

4.2 Basis of Selection

4.2.1 Highest Combined Rating of Technical Merit and Price

1. To be declared responsive, a bid must:

    a. comply with all the requirements of the bid solicitation; and

    b. meet all mandatory criteria; and

    c. obtain the required minimum of 69 points overall for the technical evaluation criteria which are subject to point rating.
    The rating is performed on a scale of 115 points.

2. Bids not meeting (a) or (b) or (c) will be declared non-responsive.

3. The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be 70% for the technical merit and 30% for the price.

4. To establish the technical merit score, the overall technical score for each responsive bid will be determined as follows: total number of points obtained / maximum number of points available multiplied by the ratio of 70%.

5. To establish the pricing score, each responsive bid will be prorated against the lowest evaluated price and the ratio of 30%.

6. For each responsive bid, the technical merit score and the pricing score will be added to determine its combined rating.

7. Neither the responsive bid obtaining the highest technical score nor the one with the lowest evaluated price will necessarily be accepted. The responsive bid with the highest combined rating of technical merit and price will be recommended for award of a contract.

The table below illustrates an example where all three bids are responsive and the selection of the contractor is determined by a 70/30 ratio of technical merit and price, respectively. The total available points equal 135 and the lowest evaluated price is $45,000 (45).

Basis of Selection - Highest Combined Rating Technical Merit (70%) and Price (30%)				
		Bidder 1	**Bidder 2**	**Bidder 3**
Overall Technical Score		115/135	89/135	92/135
Bid Evaluated Price		$55,000.00	$50,000.00	$45,000.00
Calculations	**Technical Merit Score**	115/135 x 70 = 59.63	89/135 x 70 = 46.15	92/135 x 70 = 47.70
	Pricing Score	45/55 x 30 = 24.55	45/50 x 30 = 27	45/45 x 30 = 30
Combined Rating		84.18	73.15	77.70
Overall Rating		1st	3rd	2nd

PART 5 - CERTIFICATIONS AND ADDITIONAL INFORMATION

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue, whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

5.1 Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

5.1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the Integrity Provisions of the Standard Instructions (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/1/2003/25#integrity-provisions) , all bidders must provide with their bid, **if applicable**, the Integrity declaration form available on the Forms for the Integrity Regime website (http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html), to be given further consideration in the procurement process.

5.2 Certifications Precedent to Contract Award and Additional Information

The certifications and additional information listed below should be submitted with the bid but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame specified will render the bid non-responsive.

5.2.1 Integrity Provisions – Required Documentation

In accordance with the section titled Information to be provided when bidding, contracting or entering into a real property agreement of the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

- Bidders who are incorporated, including those bidding as a joint venture, must provide a complete list of names of all individuals who are currently directors of the Bidder or, in the case of a private company, the owners of the company.

- Bidders bidding as sole proprietorship, as well as those bidding as a joint venture, must provide the name of the owner(s).

- Bidders bidding as partnerships do not need to provide lists of names.

Name of Bidder: _____

OR

Name of each member of the joint venture:

Member 1: _____
Member 2: _____
Member 3: _____
Member 4: _____

Identification of the administrators/owners:

SURNAME	NAME	TITLE

5.2.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the Employment and Social Development Canada (ESDC) - Labour's website. (https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

5.2.3 Status and Availability of Resources

The Bidder certifies that, should it be awarded a contract as a result of the bid solicitation, every individual proposed in its bid will be available to perform the Work as required by Canada's representatives and at the time specified in the bid solicitation or agreed to with Canada's representatives. If for reasons beyond its control, the Bidder is unable to provide the services of an individual named in its bid, the Bidder may propose a substitute with similar

qualifications and experience. The Bidder must advise the Contracting Authority of the reason for the substitution and provide the name, qualifications and experience of the proposed replacement. For the purposes of this clause, only the following reasons will be considered as beyond the control of the Bidder: death, sickness, maternity and parental leave, retirement, resignation, dismissal for cause or termination of an agreement for default.

If the Bidder has proposed any individual who is not an employee of the Bidder, the Bidder certifies that it has the permission from that individual to propose his/her services in relation to the Work to be performed and to submit his/her résumé to Canada. The Bidder must, upon request from the Contracting Authority, provide a written confirmation, signed by the individual, of the permission given to the Bidder and of his/her availability. Failure to comply with the request may result in the bid being declared non-responsive.

5.2.4 Education and Experience

The Bidder certifies that all the information provided in the résumés and supporting material submitted with its bid, particularly the information pertaining to education, achievements, experience and work history, has been verified by the Bidder to be true and accurate. Furthermore, the Bidder warrants that every individual proposed by the Bidder for the requirement is capable of performing the Work described in the resulting contract.

5.2.5 Former Public Servant

Contracts awarded to former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts awarded to FPSs, bidders must provide the information required below before contract award. If the answer to the questions and, as applicable the information required have not been received by the time the evaluation of bids is completed, Canada will inform the Bidder of a time frame within which to provide the information. Failure to comply with Canada's request and meet the requirement within the prescribed time frame will render the bid non-responsive.

Definitions

For the purposes of this clause,"former public servant" is any former member of a department as defined in the *Financial Administration Act*, R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police. A former public servant may be:

a. an individual;

b. an individual who has incorporated;

c. a partnership made of former public servants; or

d. a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

"**lump sum payment period**" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"**pension**" means a pension or annual allowance paid under the *Public Service Superannuation Act* (PSSA), R.S., 1985, c. P-36, and any increases paid pursuant to the *Supplementary Retirement Benefits Act*, R.S., 1985, c. S-24 as it affects the PSSA. It does not include pensions payable pursuant to the *Canadian Forces Superannuation Act*, R.S., 1985, c. C-17, the *Defence Services Pension Continuation Act*, 1970, c. D-3, the *Royal Canadian Mounted Police Pension Continuation Act* , 1970, c. R-10, and the *Royal Canadian Mounted Police Superannuation Act*, R.S., 1985, c. R-11, the *Members of Parliament Retiring Allowances Act*, R.S. 1985, c. M-5, and that portion of pension payable to the *Canada Pension Plan Act*, R.S., 1985, c. C-8.

Former Public Servant in Receipt of a Pension

As per the above definitions, is the Bidder a FPS in receipt of a pension? **Yes** ( ) **No** ( )

If so, the Bidder must provide the following information, for all FPSs in receipt of a pension, as applicable:

a. name of former public servant;_____

b. date of termination of employment or retirement from the Public Service. _____

By providing this information, Bidders agree that the successful Bidder's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

Work Force Adjustment Directive

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of the Work Force Adjustment Directive? **Yes** ( ) **No** ( )

If so, the Bidder must provide the following information:

a. name of former public servant; _____

b. conditions of the lump sum payment incentive; _____

c. date of termination of employment; _____

d. amount of lump sum payment; _____

e. rate of pay on which lump sum payment is based; _____

f. period of lump sum payment including:

- start date _____
- end date _____
- and number of weeks _____

g. number and amount (professional fees) of other contracts subject to the restrictions of a work force adjustment program.

Professional fees	Amount
_____	_____
_____	_____

For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is $5,000, including Applicable Taxes.

5.2.6 Aboriginal Designation

Who is eligible?

a) An Aboriginal business, which can be:

i) a band as defined by the Indian Act

ii) a sole proprietorship

iii) a limited company

iv) a co-operative

v) a partnership

vi) a not-for-profit organization

in which Aboriginal persons have at least 51 percent ownership and control,

OR

b. A joint venture consisting of two or more Aboriginal businesses or an Aboriginal business and a non-Aboriginal business(es), provided that the Aboriginal business(es) has at least 51 percent ownership and control of the joint venture.

When an Aboriginal business has six or more full-time employees at the date of submitting the bid, at least thirty-three percent of them must be Aboriginal persons, and this ratio must be maintained throughout the duration of the contract.

The bidder must certify in its submitted bid that it is an Aboriginal business or a joint venture constituted as described above.

☐ Our Company is NOT an Aboriginal Firm, as identified above.
☐ Our Company is an Aboriginal Firm, as identified above.

Signature

Date

PART 6 – SECURITY REQUIREMENTS

6.1 Security Requirements

There are no security requirements associated with this requirement.

PART 7 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

7.1 Statement of Work OR Requirement

The Contractor must perform the Work in accordance with the Statement of Work at Annex "____" and the Contractor's technical bid entitled _____, dated _____.

7.2 Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual(https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

7.2.1 General Conditions

2010B (2020-05-28), General Conditions – Professional Services - Medium Complexity, apply to and form part of the Contract.

- As applicable, replace references to Public Works and Government Services Canada (PWGSC) with Natural Resources Canada (NRCan).

7.3 Dispute Resolution

Mediation

If a dispute arising from this contract cannot be settled amicably through negotiation, then the parties agree in good faith to submit the dispute to mediation as administered by the Arbitration and Mediation Institute of Canada Inc. (AMIC). The parties acknowledge receipt of the rules of AMIC. The cost of mediation shall be borne equally by the parties.

Arbitration

If the parties cannot resolve the dispute through mediation within sixty (60) days, the parties agree to submit the dispute to arbitration pursuant to the Commercial Arbitration Act (Canada). The party requesting such arbitration shall do so by written notice to the other party/parties. The cost of the arbitration and fees of the arbitrator shall be borne equally by the parties. The arbitration shall take place in the city where the contractor carries on business before a single arbitrator to be chosen jointly by the parties. If the parties cannot agree on the choice of arbitrator within thirty (30) days of written notice to submit the dispute to arbitration, each party will choose a representative who will select the arbitrator.

The parties may determine the procedure to be followed by the arbitrator in conducting the proceedings, or may ask the arbitrator to do so. The arbitrator shall issue a written award within thirty (30) days of hearing the parties. The award may be entered in any court having jurisdiction and enforced as a judgment of that court.

Meaning of "Dispute"

The parties agree that the word "dispute" in this clause refers to a dispute of fact or of law, other than a dispute of public law.

The parties understand that the Procurement Ombudsman appointed pursuant to Subsection 22.1(1) of the *Department of Public Works and Government Services Act* will, on request or consent of the parties to participate in an alternative dispute resolution process to resolve any dispute between the parties respecting the interpretation or application of a term and condition of this contract and their consent to bear the cost of such process, provide to the parties a proposal for an alternative dispute resolution process to resolve their dispute. The Office of the Procurement Ombudsman may be contacted by telephone at 1-866-734-5169 or by e-mail at boa.opo@boa.opo.gc.ca.

7.4 Security Requirements

7.4.1 There is no security requirement applicable to the Contract.

7.5 Term of Contract

7.5.1 Period of the Contract

The period of the Contract is from date of Contract to March 31, 2022 inclusive.

7.6 Comprehensive Land Claims Agreements (CLCAs)

The Contract is not subject to any Comprehensive Land Claims Agreements.

7.7 Authorities

7.7.1 Contracting Authority

The Contracting Authority for the Contract is:

Name:	Len Pizzi
Title:	Senior Procurement Officer
Organization:	Natural Resources Canada
Address:	183 Longwood Road South, Hamilton, ON, L8P 0A5
Telephone:	(905) 645-0676
E-mail address:	len.pizzi@canada.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

7.7.2 Project Authority (*to be provided at contract award*)

The Project Authority for the Contract is:

Name:
Title:
Organization:
Address:
Telephone:
Facsimile:
E-mail address:

The Project Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Project Authority; however, the Project Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

7.7.3 Contractor's Representative (*to be provided at contract award*)

Name:
Title:
Organization:
Address:
Telephone:
Facsimile:
E-mail address

7.8 Proactive Disclosure of Contracts with Former Public Servants

By providing information on its status, with respect to being a former public servant in receipt of a *Public Service Superannuation Act* (PSSA) pension, the Contractor has agreed that this information will be reported on departmental websites as part of the published proactive disclosure reports, in accordance with Contracting Policy Notice: 2012-2 of the Treasury Board Secretariat of Canada.

7.9 Payment

7.9.1 Basis of Payment – Firm Price, Firm Unit Price(S) or Firm Lot Price(s)

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price, as specified in Annex "B" for a cost of $ _____. Customs duties are included and Applicable Taxes are extra.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

7.9.2 Method of Payment

Milestone Payments

Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Contract and the payment provisions of the Contract if:

a. an accurate and complete claim for payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
b. all work associated with the milestone and as applicable any deliverable required has been completed and accepted by Canada.

7.10 Invoicing Instructions

Invoices shall be submitted using **one of the following methods:**

E-mail: nrcan.invoiceimaging-servicedimageriedesfactures.rncan@canada.ca **Note:** Attach "PDF" file. No other formats will be accepted
OR
Fax: Local NCR region: **613-947-0987** Toll-free: **1-877-947-0987** **Note:** Use highest quality settings available.

Please do not submit invoices using more than one method as this will not expedite payment.

Invoices and all documents relating to a contract must be submitted on the Contractor's own form and shall bear the Contract number: _____

Invoicing Instructions to suppliers: http://www.nrcan.gc.ca/procurement/3485

7.11 Certifications

7.11.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

7.12 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

7.13 Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

a) the Articles of Agreement;
b) the general conditions 2010B (2020-05-28), General Conditions – Professional Services - Medium Complexity;
c) Annex A, Statement of Work;
d) Annex B, Basis of Payment; and
e) the Contractor's bid dated _____.

7.14 Foreign Nationals (Canadian Contractor OR Foreign Contractor)

SACC Manual clause A2000C (2006-06-16) Foreign Nationals (Canadian Contractor)

OR

SACC Manual clause A2001C (2006-06-16) Foreign Nationals (Foreign Contractor)

7.15 Insurance

The Contractor is responsible for deciding if insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any insurance acquired or maintained by the Contractor is at its own expense and for its own benefit and protection. It does not release the Contractor from or reduce its liability under the Contract.

7.16 Contract Administration

The parties understand that the Procurement Ombudsman appointed pursuant to Subsection 22.1(1) of the *Department of Public Works and Government Services Act* will review a complaint filed by [*the supplier or the contractor or the name of the entity awarded this contract*] respecting administration of this contract if the requirements of Subsection 22.2(1) of the *Department of Public Works and Government Services Act* and Sections 15 and 16 of the *Procurement Ombudsman Regulations* have been met, and the interpretation and application of the terms and conditions and the scope of the work of this contract are not in dispute. The Office of the Procurement Ombudsman may be contacted by telephone at 1-866-734-5169 or by e-mail at boa.opo@boa.opo.gc.ca.

ANNEX "A" - STATEMENT OF WORK

SW.1.0 TITLE

Fully Integrated Groundwater – Surface Water Model of the Carcajou Watershed, NWT: Regional Modelling Numerical Methods Development

SW.2.0 BACKGROUND

The Geo-Mapping for Energy and Minerals (GEM) program is led by the Geological Survey of Canada (GSC), part of the Lands and Minerals Sector (LMS) of Natural Resources Canada. The program is intended to provide geoscience for sustainable and economic resource development in the context of a changing climate. It is focused on areas of the North where economic and/or infrastructure development is likely to occur to benefit Northern communities. Groundwater modelling is a component of the complementary scientific research for the program, providing quantitative methods to forecast climate change risks, support environmentally sustainable resource development, and enhance the use of water chemistry in mineral exploration.

Due to challenges associated with access and data collection, the understanding of regional groundwater flow and its interaction with surface water is limited in the region north of the discontinuous permafrost zone. Advancing the state of this understanding is required to support sustainable resource development through efficient water management, inform the assessment of cumulative effects, better characterize implications from a changing climate, and support groundwater based mineral exploration methods. The development of regional scale integrated groundwater – surface water models for Canada's north provides a framework to improve the conceptual and quantitative understanding of hydrologic behavior in this economically important area, and to better anticipate future conditions. For regional modelling to be tenable, ongoing development of model construction strategies and the numerical representation of northern hydrologic processes is required.

HydroGeoSphere (HGS), the proposed modelling platform, couples groundwater, surface water, and climatology, reflecting the leading edge in physics based predictive analytics for Earth System Science. Recently this technology has been deployed experimentally in Southern Ontario across an 80,000 km^2 area (Frey et al, 2019), and used as a projection tool for simulating climate change impacts to water resources (Erler et al., 2019a, and Erler et al., 2019b). Modelling in permafrost regions presents challenges distinct from other regional modelling applications. Seasonal freezing of the active layer limits groundwater flow, and has distinctly different computational needs relative to the continuously flowing surface water network. Methods to optimize computational efficiency, such as Subtime stepping (Park et al., 2009) may improve efficiency in modelling these variable computational demands. Discontinuous land surface depressions in permafrost environments related to subsidence may exert control on water storage at an extent that is essential to model performance, but are of a size that cannot be individually resolved within regional scale models. Subgrid parameterization has been implemented within HGS and has been successfully deployed to represent this type of storage, but remains to be tested within permafrost regions.

The GSC is undertaking a research project develop a fully integrated groundwater-surface water model for a gauged basin within the discontinuous permafrost zone in the North West Territories (The Carcajou Watershed) to develop a framework for efficient regional scale modelling in permafrost environments. It is expected that the project will: 1)

develop the conceptual approach to representing regional scale flows in permafrost environments 2) determine the numerical approach needed to ensure computational feasibility, and 3) generate a model that can be used to support climate change assessment and mineral exploration in the central Mackenzie Valley. It is expected that the model and results will support further assessment efforts by stakeholders throughout northern Canada. Due to resourcing limitations within the GSC this initiative is being contracted to ensure delivery within the 2021-2022 fiscal year. Following completion of the project, all data and modelling files are to be returned to the GSC for continued application.

Erler, A.R., Frey,S.K., Khader, O., d'Orangeville, M., Park, Y.-J., Hwang, H.-T., Lapen, D.R., Peltier, W.R., and Sudicky, E.A., 2019a. Simulating Climate Change Impacts on Surface Water Resources Within a Lake-Affected Region Using Regional Climate Projections. Water Resources Research, 55:130-155. https://doi.org/10.1029/2018WR024381.

In this study we investigate the impact of climate change on water resources using state-of-the-art computer simulations. The simulations were conducted using physically based models, which simulate the circulation of the atmosphere, rainfall, and the flow of water above and below the surface. The region of interest here is the Grand River Watershed, located in the Great Lakes region (southern Ontario, Canada). We show that with high resolution and a physical representation of the Great Lakes, only a simple correction—much less than for global climate models—is necessary, in order to simulate a realistic climate. We find that predicted climate change impacts on water resources depend strongly on some approximations commonly made to represent thunderstorms and precipitation in climate models. The most likely scenario, based on our analysis, is an increase in precipitation and streamflow in all seasons except spring, but some scenarios also show less precipitation in summer, which results in lower streamflow year-round. A major result is that differences in summer precipitation can affect streamflow in all seasons, but only if the interaction with groundwater is properly accounted for. At the moment uncertainty in future summer precipitation changes limits our ability to predict impacts on water resources.

Erler, A.R., Frey, S.K., Khader, O., d'Orangeville, M., Park, Y.-J., Hwang, H.-T., Lapen, D.R., Peltier, W.R., and Sudicky, E.A., 2019b. Simulating Climate Change Impacts on Soil Moisture and Groundwater Resources Within a Lake-Affected Region Using Regional Climate Projections. Water Resources Research, 55:8142-8163. https://doi.org/10.1029/2018WR0223822.

In many watersheds groundwater maintains minimum flows and soil moisture during dry periods. In this study we investigate the possible impacts of different climate change scenarios on groundwater and soil moisture in a major watershed in southern Ontario, Canada. We use a state-of-the-art hydrologic model that simulates groundwater and surface water, together with climate scenarios that are derived from an ensemble of high-resolution regional climate projections. The main result is that changes in groundwater and soil moisture generally follow the direction of changes seen in net precipitation from the climate models, but the spatial pattern and magnitude of changes are strongly modulated by local topography and geology. In general, regions that have a deeper groundwater table today are more sensitive and may experience larger changes in the future. As expected, our simulations do not match observations perfectly, but we believe that we are able to identify uncertainties that are likely to affect the conclusions. The primary uncertainty here lies in the change in summer precipitation, which dominates the climate change response: it is large enough to either cause a drier or a wetter future, and the interaction between surface water and groundwater appears to spread changes in summer across the entire year.

Frey, S.K., Khader, O., Taylor, A., Erler, A.R., Lapen, D.R., Sudicky, E.A., Berg, S.J., Russell, H.A.J., 2019. A fully integrated groundwater-surface-water model for southern Ontario: proof-of-concept and data release; Geological Survey of Canada, open File 8639, 1 .zip file https://doi.org/10.4095/321042

A numeric groundwater - surface-water model for the entire region of southern Ontario has been constructed in Hydrogeosphere (HGS) software. The publication provides model development documentation and the model files in a format for operation in HGS

Park, Y.-J., Sudicky, E.A., Panday, S., Matanga, G., 2009. Implicit Subtime Stepping for Solving Nonlinear Flow Equations in an Integrated Surface–Subsurface System. Vadose Zone Journal 8, 825–836. https://doi.org/10.2136/vzj2009.0013

A diverse group of problems requires quantification of the entire hydrologic cycle by the integrated simulation of water flow in the surface and subsurface regimes. In a transient integrated simulation of the water cycle, the time step size is a key factor in controlling the solution accuracy and the simulation efficiency for a given spatial discretization. In general, if the time step size is sufficiently small, the resulting solution becomes more accurate but with higher computational cost. Thus, to maintain an acceptable level of solution accuracy in the entire simulation domain, the time step size is restricted by the relatively rapid responses in the surface flow regime. As the relatively rapid responses are typically limited to a small portion of the surface domain compared with the groundwater system, a large portion of the domain tends to be temporally overdiscretized. The implicit subtime stepping approach described here can apply smaller subtime steps only to the subdomain where the accuracy requirements are needed. In this work, generalized formulations for implicit subtime stepping in the numerical solution of the nonlinear coupled surface–subsurface equations were derived and implemented into the integrated model HydroGeoSphere. Application to several problems showed that implicit subtime stepping can significantly improve the simulation efficiency with minimal loss in accuracy. The methodology was successfully applied to enhance the computational efficiency of an integrated flow simulation in the San Joaquin Valley, California, where the characteristic response time near surface drainage streams is orders of magnitude shorter than in the groundwater regime.

SW.3.0 OBJECTIVES

A 45-year gauging record is available for the watershed and is to be used for calibration purposes. While other site specific data may be limited it is expected that the extensive regional baseline data available within the Central Mackenzie Valley will be used to inform model development such that key components of the groundwater and surface water flow systems, and their interaction with permafrost at a regional scale are represented. Collaboration with GSC scientific staff is expected throughout the numerical implementation of the conceptual model to ensure representation of these key processes. The objectives of the model building exercise are to: develop and implement a numerical model of groundwater-surface water flow within permafrost environments at a regional scale; verify the use of existing numerical methods within this region (i.e. subtime stepping and subgrid parameterization); and, create a framework for future conceptual model testing and development in permafrost regimes.

SW.4.0 PROJECT REQUIREMENTS

SW.4.1 Tasks Deliverables, Milestones and Schedule

SW.4.1.1 Tasks and Associated Requirements

Task 1: Conceptual Model Implementation and Data Preparation
Upon award of the contract, the successful bidder will be provided with a compilation of readily available data and an initial conceptual understanding of the key components of groundwater and surface water flows. Available data may include geological mapping, information on inferred permafrost distribution, depth to bedrock and surficial geological data from seismic shot holes, the ArcticDEM, LiDAR data, and stream gauging data. It is expected that the contractor will compile the additional necessary input data, which may include but is not limited to land cover, soils, surficial and bedrock hydrostratigraphy, and climatology data.

The successful bidder should then assemble this data and prepare it at a scale commensurate with the regional scale of the numerical model. This task may include construction of a 3D geological-permafrost model, the compilation of the required hydraulic properties (i.e., hydraulic conductivity, storage, and unsaturated zone parameters), repair of the ArcticDEM in zones where holes or anomalies are present, and the development of a framework for implementation of the conceptual model within the numerical model.

Throughout this task, the contractor is expected to collaborate with GSC technical stuff to achieve consensus on the conceptual and numerical approach. The contractor is required to have experience with the relevant data sets at scales greater than 5000 km^2. A brief presentation summarizing the outcome of this task is the expected as a deliverable.

Task 2: Model Construction and Calibration
Using the input information compiled under Task 1 the contractor is expected to construct the fully integrated groundwater – surface water numerical model. HydroGeoSphere (HGS) is the code of choice, as established by its ability to simulate temporally variable groundwater- surface water interaction, employ subgrid parameterization to simulate surface storage related to topographic variability, and facilitate continued use by current GSC staff.

Calibration of the model is to be achieved via historic long-term average climate simulations under average climate conditions. Input parameters are to be adjusted to the extent that model output achieves a scientifically acceptable match to average long-term hydrologic data (surface water flow and groundwater elevation data (where available)).

As project objectives relate to seasonally variable flow it, this task also involves the assessment of the model's ability to represent average long-term monthly average variability in surface water flow and groundwater elevation (where observation data is available). Long-term monthly average climate variability is the expected forcing data. It is expected that model calibration results will be summarized as a brief presentation to satisfy the deliverables for this Task.

Task 3: Assessment of the effect of subgrid parameterization and spatial resolution on model output
Discontinuous land surface depressions (i.e. small ponds and wetlands) are present within low-lying areas of the model domain. While these features may be of smaller scale than model resolution, their hydrologic influence cannot be negated. Using the calibrated model the contractor is to utilize the subgrid feature parameterization function in HGS to determine the influence of this parametrization on the hydrologic simulation results. As LiDAR data is available for 25% of the model domain, is also to include an assessment of the effect of the topographical spatial resolution on parameterization options and simulation output. A brief presentation summarizing the resulting best practice methodology for this parametrization and its sensitivity to spatial resolution is the deliverable for this task. The contractor is required to demonstrate experience in the application of the subgrid parameterization of surface features within HGS for regional scale model applications.

Task 4: Investigation of numerical strategies for computational efficiencies in representation of seasonally inactive (i.e., active layer) groundwater flow in fully integrated groundwater- surface water models

Regional scale fully integrated numerical models are computationally intensive. Simulations efficiencies may be gained by limiting the computational requirements for groundwater witihin the active layer during the period in which it remains frozen, while maintaining optimal mass balance for the surface water domain during the same period. Using the calibrated model, a numerical strategy to optimize computational efficiency for this setting is to be applied, and the effect on model simulation time and simulation output be documented. An example of a viable method applicable to HGS is subtime stepping (Park et al., 2009) which has not yet been tested for permafrost environments. The numerical strategy and its implications for model runtime and results are to be presented to GSC technical staff as an interim deliverable.

Task 5: Technical Summary Report

A technical report summarizing model construction and application will be delivered to close the project. Input data and assumptions used in model construction will be included in the reporting for reference in any future model development in the Mackenzie Corridor. Results of Tasks 4 and 5 should be presented as a framework for efficient future model application in the north. The report should be delivered in MSWord format and suitable for Open File publication. All files need to re-run the model (for those with the software requirements) are to be included with the final deliverable.

SW4.1.2 Deliverables, Milestones and Schedule

The time schedule below is presented as a guideline and any deliverable can be submitted in advance of the dates below.

Tasks/Activities	Deliverables/Milestones	Time Schedule
Task 1: Conceptual Model Implementation and Data Preparation	Presentation to GSC Technical Staff through virtual interim meeting	2 Months from Contract Award
Task 2: Model Construction and Calibration	Presentation to GSC Technical Staff through virtual interim meeting	5 Months from Contract Award
Task 3: Assessment of the effect of subgrid parameterization and spatial resolution on model output	Presentation to GSC Technical Staff through virtual interim meeting	2022-02-25
Task 4: Investigation of numerical strategies for computational efficiencies in representation of seasonally inactive (i.e., active layer) groundwater flow in fully integrated groundwater- surface water models	Presentation to GSC Technical Staff through virtual interim meeting	2022-02-25

Task 5: Technical Summary Report	Report - MSWord Document, submitted electronically. All input data and model files such that the model can be modified and run at the GSC.	2022-03-30

SW.4.2 Reporting Requirements
The contractor and scientific authority will communicate at the convenience of the respective parties. The final report deliverable will be submitted in a suitable format for a GSC Open File publication with the contractor's authors and affinity as the publication authors.

SW.4.3 Method and Source of Acceptance
All deliverables and services rendered under any contract are subject to inspection GSC technical staff (Ottawa) by the Project Authority. The Project Authority shall have the right to reject any deliverables that are not considered satisfactory, or require their correction before payment will be authorized.

SW.4.4 Technical, Operational and Organizational Environment
The contractor is to ensure that required expertise is on staff to deliver a project to the GSC that is scientifically and technically valid. Staff should be capable of documenting model construction and use such that other scientists with similar technical expertise are able to expand upon model application upon project completion.

SW.5.0 OTHER TERMS AND CONDITIONS OF THE SOW

SW.5.1 Contractor's Obligations
In addition to the obligations outlined in Section 2 of this Statement of Work, the Contractor shall:

- submit all written reports in electronic Microsoft Word and PDF formats
- provide all data, model input, and model output files required to successfully run the model upon project completion
- prepare all deliverables such that they can be published as a GSC Open File report with the contractors

SW.5.2 Estimated Period of the Contract
The estimated period of the contract is from the date of Contract Award to March 31, 2022.

SW.5.3 Location of Work, Work Site and Delivery Point
Work is to be completed at the Contractor's place of business and electronic files will be sent to the GSC (Ottawa) upon project completion.

ANNEX “B” - BASIS OF PAYMENT

APPENDIX "1" - EVALUATION CRITERIA

Bidders are advised to address these criteria in the following order and in sufficient depth in their proposals to enable a thorough assessment. NRCan's assessment will be based solely on the information contained within the proposal. NRCan may confirm information or seek clarification from bidders.

Bidders are advised that only listing experience without providing any supporting data to describe responsibilities, duties and relevance to the criteria will not be considered demonstrated for the purpose of this evaluation.

The Bidder should provide complete details as to where, when (month and year) and how (through which activities/ responsibilities) the stated qualifications/experience were obtained. Experience gained during formal education shall not be considered work experience. All criteria for work experience shall be obtained in a legitimate work environment as opposed to an educational setting. Co-op terms are considered work experience provided they are related to the required services.

Bidders are also advised that the month(s) of experience listed for a project whose time frame overlaps that of another referenced project will only be counted once. For example: project one time frame is July 2001 to December 2001; project two time frame is October 2001 to January 2002; the total months of experience for these two project references is seven (7) months.

1. Technical Criteria

1.1 Mandatory Evaluation Criteria

The Mandatory Criteria listed below will be evaluated on a simple pass/fail basis. Proposals which fail to meet the mandatory criteria will be deemed non-responsive.

Criterion ID	Mandatory Criteria	Proposal Page #	Pass/Fail
M1	**General Description of the work to be performed** The bidder **must** provide a proposal including a detailed work plan for fulfilling the objectives of each task listed in the Statement of Work, and describing how all deliverables will be met. The work plan must include: • A detailed description of the activities to be carried out and the resources used A table showing the breakdown of work including the number of hours allowed for each task, and delivery dates for each deliverable.		

Criterion ID	Mandatory Criteria	Proposal Page #	Pass/Fail
M2	**Conceptual and Numerical Modelling** The bidder **must** have completed in the last ten (10) years from bid closing, at least one (1) project that involves a conceptual hydrogeological model and best practices in the domain of regional (i.e., at scales greater than 5000 km^2) groundwater modelling with a physically based fully integrated groundwater-surface water model. It is required that the bidder provide the following information: • A brief description of the project; • Date of the project (start date and ends date of the work); • Activities performed by the bidder during the project including: experiencing in researching, gathering, compiling analyzing, and summarizing data, and publishing the information; and • Name and contact information (telephone and/or email) of client organization or company to whom the services were provided.		
M3	**Proposed Software** At least one resource proposed by the bidder **must:** • Have a minimum of five (5) years of experience with HydroGeoSphere (HGS); • Have a PhD or equivalent (3 journal publications) and a publication history in peer reviewed journals; and • Have developed a numeric fully integrated groundwater-surface water model for a region of at least 5000 km^2 using HGS *A copy of the curriculum vitae (CV) is to be required as an Annex to this proposal to have this experience shown.*		
M4	**Methods to Optimize Numerical Model efficiency** The bidder **must** have completed in the last fifteen (15) years from bid closing, at least one (1) study that involves a developing and testing a numerical method to improve computational efficiency. It is required that the bidder provide the following information: • A brief description of the study objective, methods and results; • Activities performed by the bidder during the study including: experiencing in researching, gathering, compiling analyzing, and summarizing data, and publishing the information.		

1.2 Evaluation of rated criteria

The criteria contained herein will be used by NRCan to evaluate each proposal that has met all of the mandatory criteria.

Proposals must achieve the stated minimum points required overall for the rated criteria to be assessed as

responsive under the point rated technical criteria section; proposals not meeting the minimum required points will be deemed non-responsive.

Proposals will be evaluated based on the following criteria:

Item	Rated Requirements	Points Breakdown	Max Points	Demonstrated Compliance, cross reference to Resume and Page number or proposal and/or resume
R1	**RESOURCE QUALIFCATION** The proposal **should** demonstrate that the proposed resource(s) has (have) knowledge and experience directly related to the project requirements (CV of resources including the list of projects completed). If the supplier proposes more than one resource, the final score of each resource will be added and the cumulative score recorded. Publications can be counted multiple times as applicable for the different evaluation criteria at each level (R1, R2, etc.)		**60**	
R1.1	The proposed resource(s) **should** have experience in the field of fully integrated groundwater-surface water modelling at regional scales >5000 km^2. The experience should be demonstrated through the execution of project documented by technical report, published abstracts, and/or peer reviewed journal publications.	• **1 point** per project documented by technical report, published abstracts (minimum title page and contact reference to be provided); and • **2 points** per project documented in a peer reviewed journal (title page and journal citation required)	**10**	
R1.2	The proposed resource(s) **should** have experience in researching, gathering, compiling, analyzing and summarizing data in order to inform conceptual model development and the numerical implementation of conceptual models. The experience should be demonstrated through the execution of projects documented by technical report and/or peer	• **1 point** per project documented by technical report(minimum title page and contact reference to be provided); and • **2 points** per project documented in a peer reviewed journal (title page	**20**	

Item	Rated Requirements	Points Breakdown	Max Points	Demonstrated Compliance, cross reference to Resume and Page number or proposal and/or resume
	reviewed journal publications in the following modelling domains: • Groundwater – surface water • Climate • Regional Models	and journal citation required) To a maximum of **10 points** per domain to a maximum or **20 points** total. *Publications will only be counted once if applicable to multiple domains		
R1.3	The proposed resource(s) **must** have experience in the use of HydroGeoSphere (HGS) The experience should be demonstrated through the resource(s) publication record in technical reports, published abstracts, and peer reviewed journals such as, but not limited to WRR, Journal of Hydrology, Groundwater, Canadian Water Resources Journal.	• **1 point** per project documented by technical report(minimum title page and contact reference to be provided); and • **2 points** per project documented in a peer reviewed journal (title page and journal citation required) To a maximum of **10 points** per domain to a maximum of **20 points** total.	**20**	
				Subtotal for C1 out of 60
R2	**APPROACH AND METHOD** The bidder **should** present a method clearly demonstrating an approach that will lead to the successful completion of the project. The method presented in the proposal will be evaluated based on the following factors:		**40**	
R2.1	Comprehension of the project needs and objectives	A score between zero and the total points will be given according to the level of satisfaction the bidder obtains for each of the criteria.	**10**	
R2.2	Understanding of the information sources that will be used in model development		**10**	
R2.3	research method, schedule, information-gathering		**10**	

Item	Rated Requirements	Points Breakdown	Max Points	Demonstrated Compliance, cross reference to Resume and Page number or proposal and/or resume
	mechanisms, tools used in data gathering and model building	• 0 = unacceptable • 2 = poor • 4 = unsatisfactory • 6 = good • 8 = very good • 10 = excellent		
R2.4	Documentation of transfer to the client of model and supporting parameterization and data sets		**10**	
				Subtotal for C2 out of 40
R3	**Numerical methods development experience and application in regional modelling**			
R3.1	The proposed resource(s) **must** be able to document the use of subgrid parameterization to represent surface depression storage in fully integrated groundwater-surface water modelling. The experience should be demonstrated through the resource(s) publication record in technical reports, published abstracts, and peer reviewed journals.	• **2 points** per project documented by technical report(minimum title page and contact reference to be provided); and • **5 points** per project documented in a peer reviewed journal (title page and journal citation required)	**5**	
R3.2	The proposed resource(s) must have experience in developing new numerical methods to optimize computational efficiency, including: • Development of testing procedures and criteria, and • Conducting the testing of new methods. The experience should be demonstrated through the resource(s) publication record in technical reports, published	• **2 points** per project documented by technical report(minimum title page and contact reference to be provided); and • **5 points** per project documented in a peer reviewed journal (title page	**5**	

Item	Rated Requirements	Points Breakdown	Max Points	Demonstrated Compliance, cross reference to Resume and Page number or proposal and/or resume
	abstracts, and peer reviewed journals.	and journal citation required)		
R3.3	The proposed resource(s) must be able to document previous experience with the proposed optimization approach. The experience should be demonstrated through the resource(s) publication record in technical reports, published abstracts, and peer reviewed journals.	• **2 points** per project documented by technical report(minimum title page and contact reference to be provided); and • **5 points** per project documented in a peer reviewed journal (title page and journal citation required)	**5**	
				Subtotal for C3 out of 15
Total Points Available (A Minimum Score of 60% (69 Points) is required):			**115**	

APPENDIX "1" - FINANCIAL PROPOSAL FORM

1. Firm Price

Bidder tendered all-inclusive firm price to perform the work is Canadian funds, applicable taxes excluded. Any Travel and Living Expenses and other miscellaneous expenses must be included in the firm price.

Description	**Firm Price** (Applicable Taxes Excluded)
Fully Integrated Groundwater – Surface Water Model of the Carcajou Watershed, NWT: Regional Modelling Numerical Methods Development	$ _____
Total Firm Price for Financial Proposal Evaluation (Taxes Extra):	$ _____