



**RETURN BIDS TO:  
RETOURNER LES SOUMISSIONS À:**

**Bid Receiving  
PWGSC  
33 City Centre Drive  
Suite 480C  
Mississauga  
Ontario  
L5B 2N5  
Bid Fax: (905) 615-2095**

**REQUEST FOR PROPOSAL  
DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government  
Services 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 aux: Travaux Publics et Services  
Gouvernementaux 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**

**Vendor/Firm Name and Address**

**Raison sociale et adresse du  
fournisseur/de l'entrepreneur**

**Issuing Office - Bureau de distribution**

Public Works and Government Services Canada  
Ontario Region  
33 City Centre Drive  
Suite 480  
Mississauga  
Ontario  
L5B 2N5

<b>Title - Sujet</b> Radiation Flux Sensor Suite	
<b>Solicitation No. - N° de l'invitation</b> K8D22-180455/A	<b>Date</b> 2017-09-14
<b>Client Reference No. - N° de référence du client</b> K8D22-180455	
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$TOR-031-7361	
<b>File No. - N° de dossier</b> TOR-7-40035 (031)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2017-10-25</b>	<b>Time Zone Fuseau horaire</b> Eastern Daylight Saving Time EDT
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Schmidt, Jeff	<b>Buyer Id - Id de l'acheteur</b> tor031
<b>Telephone No. - N° de téléphone</b> (905) 615-2058 ( )	<b>FAX No. - N° de FAX</b> ( ) -
<b>Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:</b> DEPARTMENT OF THE ENVIRONMENT Atmospheric Science and Technology Observation-Based Research Section 4905 Dufferin Street Toronto Ontario M3H5T4 Canada	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

<b>Delivery Required - Livraison exigée</b> See Herein	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Telephone No. - N° de téléphone</b> <b>Facsimile No. - N° de télécopieur</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

## TABLE OF CONTENTS

<b>PART 1 - GENERAL INFORMATION.....</b>	<b>3</b>
1.1 REQUIREMENT.....	3
1.2 DEBRIEFINGS.....	3
1.3 TRADE AGREEMENTS.....	3
<b>PART 2 - BIDDER INSTRUCTIONS.....</b>	<b>4</b>
2.1 STANDARD INSTRUCTIONS, CLAUSES AND CONDITIONS.....	4
2.2 SUBMISSION OF BIDS .....	4
2.3 ENQUIRIES - BID SOLICITATION.....	4
2.4 APPLICABLE LAWS.....	4
<b>PART 3 - BID PREPARATION INSTRUCTIONS .....</b>	<b>5</b>
3.1 BID PREPARATION INSTRUCTIONS .....	5
<b>PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION.....</b>	<b>7</b>
4.1 EVALUATION PROCEDURES .....	7
4.2 BASIS OF SELECTION - HIGHEST COMBINED RATING OF TECHNICAL MERIT AND PRICE.....	7
<b>PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION.....</b>	<b>9</b>
5.1 CERTIFICATIONS REQUIRED WITH THE BID.....	9
5.2 CERTIFICATIONS PRECEDENT TO CONTRACT AWARD AND ADDITIONAL INFORMATION.....	9
<b>PART 6 - RESULTING CONTRACT CLAUSES.....</b>	<b>10</b>
6.1 SECURITY REQUIREMENTS .....	10
6.2 REQUIREMENT .....	10
6.3 STANDARD CLAUSES AND CONDITIONS.....	10
6.4 TERM OF CONTRACT .....	10
6.5 AUTHORITIES .....	11
6.6 PAYMENT .....	12
6.7 INVOICING INSTRUCTIONS .....	12
6.8 CERTIFICATIONS AND ADDITIONAL INFORMATION .....	13
6.9 APPLICABLE LAWS.....	13
6.10 PRIORITY OF DOCUMENTS .....	13
6.11 INSURANCE - NO SPECIFIC REQUIREMENT.....	13
<b>ANNEX A.....</b>	<b>14</b>
REQUIREMENT .....	14
<b>ANNEX B.....</b>	<b>17</b>
BASIS OF PAYMENT.....	17
<b>ANNEX 1 TO PART 3 OF THE BID SOLICITATION .....</b>	<b>19</b>
ELECTRONIC PAYMENT INSTRUMENTS.....	19
<b>ANNEX C.....</b>	<b>20</b>
TECHNICAL EVALUATION .....	20
<b>ANNEX D.....</b>	<b>24</b>

ADDITIONAL CERTIFICATIONS ..... 24

**ANNEX E .....25**

OEM CERTIFICATION ..... 25

## **PART 1 - GENERAL INFORMATION**

### **1.1 Requirement**

The requirement is detailed under Article 2 of the resulting contract clauses.

### **1.2 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 may be in writing, by telephone or in person.

### **1.3 Trade Agreements**

The requirement is subject to the provisions of the North American Free Trade Agreement (NAFTA), and the Canadian Free Trade Agreement (CFTA).

## **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 (2017-04-27) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

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

Delete: 60 days

Insert: 90 days

### **2.2 Submission of Bids**

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

### **2.3 Enquiries - Bid Solicitation**

All enquiries must be submitted in writing to the Contracting Authority no later than 10 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.

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## **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 (2 hard copies)

Section II: Financial Bid (1 hard copy)

Section III: Certifications (1 hard copy)

Prices must appear in the financial bid only. No prices must 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) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, Bidders should:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

#### **Section I: Technical Bid**

In their technical bid, Bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

#### **Section II: Financial Bid**

Bidders must submit their financial bid in accordance with the Basis of Payment.

##### **3.1.1 Electronic Payment of Invoices – Bid**

If you are willing to accept payment of invoices by Electronic Payment Instruments, complete Annex “1” Electronic Payment Instruments, to identify which ones are accepted.

If Annex “1” Electronic Payment Instruments is not completed, it will be considered as if Electronic Payment Instruments are not being accepted for payment of invoices.

Acceptance of Electronic Payment Instruments will not be considered as an evaluation criterion.

##### **3.1.2 Exchange Rate Fluctuation**

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

Solicitation No. - N° de l'invitation

K8D22-180455/A

Client Ref. No. - N° de réf. du client

K8D22-180455

Amd. No. - N° de la modif.

File No. - N° du dossier

TOR-7-40035

Buyer ID - Id de l'acheteur

tor031

CCC No./N° CCC - FMS No./N° VME

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### **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 and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

#### **4.1.1 Technical Evaluation**

See Annex C, Technical Evaluation

#### **4.1.2 Financial Evaluation**

- i. Bidders must submit pricing in accordance with Annex B, Basis of Payment, with their bid at bid closing;
- ii. The Total Evaluated Price will be the sum of the Extended Prices (Column C) calculated by multiplying the Quantity (Column A) by the Firm Unit Prices (Column B) for the Firm and Optional Requirements at Annex B, Basis of Payment;
- iii. *SACC Manual* Clause A0220T (2014-06-26), Evaluation of Price – Bid

### **4.2 Basis of Selection - 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 95 points overall for the technical evaluation criteria which are subject to point rating.  
The rating is performed on a scale of 190 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 60% for the technical merit and 40% 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 60%.
- 5. To establish the pricing score, each responsive bid will be prorated against the lowest evaluated price and the ratio of 40%.
- 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 60/40 ratio of technical merit and price, respectively. The total available points equals 135 and the lowest evaluated price is \$45,000 (45).

**Basis of Selection - Highest Combined Rating Technical Merit (60%) and Price (40%)**

		Bidder 1	Bidder 2	Bidder 3
<b>Overall Technical Score</b>		115/135	89/135	92/135
<b>Bid Evaluated Price</b>		\$55,000.00	\$50,000.00	\$45,000.00
<b>Calculations</b>	<b>Technical Merit Score</b>	$115/135 \times 60 = 51.11$	$89/135 \times 60 = 39.56$	$92/135 \times 60 = 40.89$
	<b>Pricing Score</b>	$45/55 \times 40 = 32.73$	$45/50 \times 40 = 36.00$	$45/45 \times 40 = 40.00$
<b>Combined Rating</b>		83.84	75.56	80.89
<b>Overall Rating</b>		1st	2 <sup>nd</sup>	3rd

## 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, all bidders must provide with their bid, if applicable, the 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 provided will render the bid non-responsive.

#### 5.2.1 Integrity Provisions – Required Documentation

In accordance with 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.

#### 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.

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## PART 6 - RESULTING CONTRACT CLAUSES

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

### 6.1 Security Requirements

6.1.1 There is no security requirement applicable to the Contract.

### 6.2 Requirement

The Contractor must provide the items detailed under the "Requirement" at Annex A.

#### 6.2.1 Optional Goods and/or Services

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described at Annex A, Requirement of the Contract under the same conditions and at the prices and/or rates stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.

The Contracting Authority may exercise the option at any time before the expiry of the Contract by sending a written notice to the Contractor.

### 6.3 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.

#### 6.3.1 General Conditions

2010A (2016-04-04), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

#### 6.3.2 Supplemental General Conditions

4001 (2015-04-01) Hardware Purchase, Lease and Maintenance, apply to and form part of the Contract.

### 6.4 Term of Contract

#### 6.4.1 Period of the Contract

The period of the Contract is from date of Contract to \_\_\_\_\_ inclusive (*two years after contract award, to be completed upon contract award.*)

#### 6.4.2 Delivery Date – Firm Requirements

All the deliverables must be received on or before March 1, 2018

#### 6.4.3 Delivery Date – Optional Requirements

Delivery of the Optional Goods must be completed within 8 weeks from the date the option is exercised.

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#### 6.4.4 Delivery Points

Delivery of the requirement will be made to delivery point(s) specified at Annex A of the Contract.

#### 6.5 Authorities

##### 6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Jeff Schmidt  
Title: Supply Specialist  
Public Works and Government Services Canada  
Acquisitions Branch  
Address: 33 City Centre Dr, Suite 480C  
Mississauga, ON L5B 2N5

Telephone: 905-615-2058  
Facsimile: 905-615-2060  
E-mail address: [jeff.schmidt@pwgsc.gc.ca](mailto:jeff.schmidt@pwgsc.gc.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.

##### 6.5.2 Project Authority

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.

##### 6.5.3 Contractor's Representative (*Bidder to complete*)

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Address: \_\_\_\_\_

Telephone: \_\_\_\_\_  
Facsimile: \_\_\_\_\_  
E-mail address: \_\_\_\_\_

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## 6.6 Payment

### 6.6.1 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 firm unit prices, as specified in Annex B, Basis of Payment 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.

### 6.6.2 Limitation of Price

SACC Manual clause C6000C (2011-05-16) Limitation of Price

### 6.6.3 Single Payment

SACC Manual clause H1000C (2008-05-12) Single Payment

### 6.6.4 Advanced Payment

For item 2.2, Extended Warranty at Annex B, Basis of Payment

Canada will pay the Contractor in advance for the Work if:

- a. an accurate and complete invoice and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b. all such documents have been verified by Canada.

### 6.6.5 Electronic Payment of Invoices – Contract

The Contractor accepts to be paid using any of the following Electronic Payment Instrument(s):

- a. Visa Acquisition Card;
- b. MasterCard Acquisition Card;
- c. Direct Deposit (Domestic and International);
- d. Electronic Data Interchange (EDI);
- e. Wire Transfer (International Only);
- f. Large Value Transfer System (LVTS) (Over \$25M)

## 6.7 Invoicing Instructions

6.7.1 The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.

Each invoice must be supported by:

- a copy of the invoice(s),
- contract number

6.7.2 Invoices must be distributed as follows:

- a) The original and one (1) copy must be forwarded to the address shown on page 1 of the Contract for certification and payment.
- b) One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

## **6.8 Certifications and Additional Information**

### **6.8.1 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.

## **6.9 Applicable Laws**

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

## **6.10 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 supplemental general conditions 4001 (2015-04-01) Hardware Purchase, Lease and Maintenance;
- (c) the general conditions 2010A (2016-04-04), General Conditions - Goods (Medium Complexity);
- (d) Annex A, Requirement;
- (e) Annex B, Basis of Payment;
- (f) the Contractor's bid dated \_\_\_\_\_.

## **6.11 Insurance - No Specific Requirement**

SACC *Manual* clause G1005C (2008-05-12), Insurance – No Specific Requirement

## **ANNEX A**

### **REQUIREMENT**

#### **Radiation Flux Sensor Suite**

##### **1.0 Introduction**

Environment and Climate Change Canada (ECCC), Toronto, ON, requires a radiation flux sensor suite for research and meteorological observation purposes. This includes the supply and delivery of one (1) fully automated and calibrated radiation flux sensor suite of instruments with training documentation, hardware and software user manuals. Shortwave up/downwelling, and longwave up/down/north/south/east/west radiation components will be measured alongside snow depth and soil temperature and moisture by a suite of instruments attached to a single platform. The suite of instruments required to perform these observations will make up the 'radiation flux sensor suite.'

The prime purpose is to study fluxes of radiation in order to monitor meteorological conditions near the Iqaluit airport (65° N). The suite of sensors will be mounted onto an existing flux tower in order to complement a research network of meteorological instruments at Iqaluit in order to improve weather forecasting and conduct satellite validation. The instruments may also be used for physical field studies of high impact weather in both warm season and cold season environments.

##### **2.0 Technical Specifications**

All instruments and sensors must operate autonomously (no operator required) and from a remote location. They must operate continuously in extreme weather conditions (Canada's High Arctic) year-round completely unattended, as specified in Annex A, Requirement.

The radiation flux sensor suite, consisting of several independent instruments and sensors, must measure all parameters and include data quality parameters. This must include shortwave up/downwelling, longwave up/down/north/south/east/west radiation, snow depth, and soil temperature and moisture, as specified in Annex A, Requirement.

##### **2.1 Overall System Requirements for All Instruments (2.2 to 2.5) and Data Loggers (2.6)**

All instruments part of the flux sensor suite must include:

- 2.1.1 Must have power requirements between 12 to 24 VDC and an AC power supply option;
- 2.1.2 Must have an operating temperature between -35 °C to +25 °C;
- 2.1.3 Must be fully automated and remote controlled with no operator required on-site;
- 2.1.4 Must allow for mounting on a stand attached to a mounting arm. The mounting arms must be mountable on a tower mast, cross arm, or user-supplied pole;
- 2.1.5 Must operate in humidity ranges between 10% to 100%;
- 2.1.6 Must provide cable lengths of a minimum of 20 feet and all required cable modems and data loggers;
- 2.1.7 Must operate during precipitation, frost, snow, rim ice, and other severe weather conditions without operator support;
- 2.1.8 Must provide quality control software with documentation describing the algorithm and operation manual;
- 2.1.9 Must provide data processing algorithm, information on data format as well as the necessary software to read output data.

## **2.2 Pyranometer Technical Requirements**

Pyranometer must include:

- 2.2.1 Must provide two (2) instruments to independently measure the up- and down-welling solar irradiance up to a minimum of 2500 W/m<sup>2</sup>;
- 2.2.2 Must cover the spectral range between 300 to 2800 nm;
- 2.2.3 Must have a sensitivity of at minimum of 7-14  $\mu\text{V/W/m}^2$ ;
- 2.2.4 Must have a field of view of at a minimum 160 degrees.

## **2.3 Pyrgeometer Technical Requirements**

Pyrgeometer must include:

- 2.3.1 Must provide six (6) instruments to independently measure longwave radiation in the up and down vertical (2), north and south horizontal (2), and east and west horizontal (2) directions;
- 2.3.2 Must cover the spectral range between 4.5 to 40  $\mu\text{m}$ ;
- 2.3.3 Must have a sensitivity of a minimum 5-15  $\mu\text{V/W/m}^2$ ;
- 2.3.4 Must have a field of view of a minimum 160 degrees;
- 2.3.5 Must not require dome temperature measurements or dome shading.

## **2.4 Snow Depth Sensor Technical Requirements**

Snow Depth Sensor Performance must include

- 2.4.1 Must provide two (2) instruments to independently measure snow depth;
- 2.4.2 Must have a beam acceptance angle < 40°;
- 2.4.3 Must output a temperature-corrected distance reading.

## **2.5 Soil Temperature and Moisture Sensor Technical Requirements**

Soil Temperature and Moisture Sensor must include:

- 2.5.1 Must provide a single instrument that can independently measure soil volumetric-water content and temperature simultaneously;
- 2.5.2 Must have a sensing volume of a minimum 2800 cm<sup>3</sup>;
- 2.5.3 Must have a volumetric water content accuracy of a minimum  $\pm 4\%$ ;
- 2.5.4 Must have a soil temperature precision of a minimum  $\pm 0.75$  °C;
- 2.5.5 Must include a sensor insertion tool with pilot rod for dense or rocky soils;
- 2.5.6 Must have the ability to protect itself against electrical surges.

## **2.6 Detailed System Requirements – Signal Processing Unit(s) For All Instruments**

A signal processing unit that integrates all observations from the flux sensor suite must include:

- 2.6.1 Must record high-temporal resolution observations at least every 1 minute;
- 2.6.2 Must have an Ethernet output port and analog inputs compatible with all instruments included as part of the radiation suite;
- 2.6.3 Must have storage capacity for a minimum 30 days' worth of data;
- 2.6.4 Must have the capacity to view the status of each instrument, start and stop each instrument, and perform basic system maintenance (check disk usage, download data, delete and edit files) either remotely or locally;
- 2.6.5 Must be compatible with Windows 7 (or newer) or Linux;



- 2.6.6 The processing unit (micrologger) must support complex applications and many sensors. The unit must come with a carrying case and base. The unit must contain a programmable on-board processor and operating system which includes measurement, processing, and output.

### **3. General Specifications**

The radiation flux sensor suite must include the necessary mounts so it can be made securable to prevent damage and loss.

All instruments included as part of the radiation flux sensor suite must adhere to World Meteorological Organization (WMO) observational guidelines for their respective observational parameter(s).

### **4. Additional Requirements**

#### **4.1 Output File Format**

While not a mandatory requirement, it is preferred that the final output file format is compliant with the WMO data file format standards (if any). Otherwise, ASCII and NetCDF file formats are required where applicable.

#### **4.2 Transportability and Housing**

ECCC is planning to permanently locate the radiation flux sensor suite in Iqaluit, NU. The flux sensor suite will be required to operate continuously without an operator in extreme weather conditions.

All instruments and sensors as part of the radiation flux sensor suite must be delivered complete with power supplies, required mounting and leveling platforms, cables, weatherproof housing, and transportation case(s).

It is expected that the setup and installation could be accomplished within a day.

#### **4.3 Documentation**

The Contractor must provide at the time of delivery, in English, user manuals, guides or both relating to the instrument's installation, calibration and alignment, operation, troubleshooting, and data processing.

The Contractor must provide when required, in English, all necessary circuit diagrams, details of calibration checks and acceptable limits. The user software must document the underlying algorithms used in signal, data and product processing. The output data formats must be documented for decoding for external processing. Maintenance procedures must be documented.

#### **4.4 Delivery**

All deliverables must be in accordance with best commercial standards. The Contractor must deliver the product in satisfaction of the contract requirements to:

Environment and Climate Change Canada  
Atmospheric Science and Technology Directorate  
Observation-Based Research Section  
4905 Dufferin Street  
Toronto, ON  
M3H 5T4

## ANNEX B

### BASIS OF PAYMENT

Firm, all-inclusive pricing in Canadian funds. Canadian customs duties, excise taxes, F.O.B. destination and any delivery charges. Applicable Taxes are extra, if applicable.

**Note:** *The wording in italics is for evaluation purposes only and upon contract issuance, will be removed from Annex B, Basis of Payment.*

#### 1. Firm Requirement

Item #	Description	Quantity	Firm Unit Price	Extended Price
		<i>A</i>	<i>B</i>	<i>C = (AxB)</i>
1.1	For the supply and delivery of one (1) fully automated and calibrated radiation flux sensor suite of instruments with training documentation, hardware and software user manuals (English) in accordance with Annex A, Requirement.  The system must include one (1) integrated system that consists of:  2 pyranometers; 6 pyrgeometers; 2 snow depth sonic ranggers; 1 soil temperature and moisture probe; and other related components (mounting arms, radiation shields, etc.)	1	\$ _____	\$ _____

#### 2. Optional Requirement

ECCC may exercise the option to purchase up to two (2) additional systems from the date of contract award. The optional systems may be purchased separately or together prior to the end of the Period of the Contract.

Item #	Description	Quantity	Firm Unit Price	Extended Price
		<i>A</i>	<i>B</i>	<i>C = (AxB)</i>
2.1	The system must include one (1) integrated system that consists of:  2 pyranometers; 6 pyrgeometers; 2 snow depth sonic ranggers; 1 soil temperature and moisture probe; and other related components (mounting arms, radiation shields, etc.)	2	\$ _____	\$ _____
2.2	For the supply of a second year Extended			

Solicitation No. - N° de l'invitation

K8D22-180455/A

Client Ref. No. - N° de réf. du client

K8D22-180455

Amd. No. - N° de la modif.

File No. - N° du dossier

TOR-7-40035

Buyer ID - Id de l'acheteur

tor031

CCC No./N° CCC - FMS No./N° VME

	Warranty for the Firm and Optional Requirements following the standard 12-month warranty identified in Section 09 <u>Warranty</u> of the 2010A General Conditions – Goods (Medium Complexity).  The Extended Warranty may be exercised individually for each system.	3	\$ _____	\$ _____
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***TOTAL EVALUATED PRICE (1.1 + 2.1 + 2.2) \$ \_\_\_\_\_***

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## **ANNEX 1 to PART 3 OF THE BID SOLICITATION**

### **ELECTRONIC PAYMENT INSTRUMENTS**

The Bidder accepts any of the following Electronic Payment Instrument(s):

- ☐ ( ) VISA Acquisition Card;
- ☐ ( ) MasterCard Acquisition Card;
- ☐ ( ) Direct Deposit (Domestic and International);
- ☐ ( ) Electronic Data Interchange (EDI);
- ☐ ( ) Wire Transfer (International Only);
- ☐ ( ) Large Value Transfer System (LVTS) (Over \$25M)

## ANNEX C

### TECHNICAL EVALUATION

#### Mandatory Technical Evaluation Criteria

At bid closing time, the Bidder must provide documentation which may include but is not limited to discussion points, equipment specifications, charts and diagrams to support compliance.

Proposals will be evaluated first on the basis of the mandatory requirements. Failure on the part of the bidder to meet one (1) or more of the mandatory requirements will result in the proposal being deemed non-compliant and ineligible for further consideration or evaluation.

#### 1.0 Overall System Performance For All Instruments (1.1 to 1.4) and Data Loggers (2.0) Must Include:

Item	Mandatory Technical Requirement	Identify where the supporting documentation is located in the bid package (page number(s))
1.0.1	Must have power requirements between 12 to 24 VDC and an AC power supply option;	
1.0.2	Must have an operating temperature between -35°C to +25 °C;	
1.0.3	Must be fully automated and remote controlled with no operator required on-site;	
1.0.4	Must allow for mounting on a stand attached to a mounting arm. The mounting arms must be mountable on a tower mast, cross arm, or user-supplied pole;	
1.0.5	Must operate in humidity ranges from 10% to 100%;	
1.0.6	Must provide cable lengths of at least 20 feet and required cable modems and data loggers;	
1.0.7	Must operate during precipitation, frost, snow, rim ice, and other severe weather conditions without operator support;	
1.0.8	Must provide quality control software with documentation describing the algorithm and operation manual;	
1.0.9	Must provide data processing algorithm, information on data format as well as the necessary software to read output data.	

#### 1.1 Pyranometer Performance Must Include:

Item	Mandatory Technical Requirement	Identify where the supporting documentation is located in the bid package (page number(s))
1.1.1	Must provide two (2) instruments to independently measure the up- and down-welling solar irradiance up to at least 2500 W/m <sup>2</sup> ;	
1.1.2	Must cover the spectral range between 300 to 2800 nm;	

1.1.3	Must have a sensitivity of a minimum 7-14 $\mu\text{V/W/m}^2$ ;	
1.1.4	Must have a field of view of a minimum 160°.	

## 1.2 Pyrgometer Performance Must Include:

Item	Mandatory Technical Requirement	Identify where the supporting documentation is located in the bid package (page number(s))
1.2.1	Must provide six (6) instruments to independently measure longwave radiation in the up and down vertical (2), north and south horizontal (2), and east and west horizontal (2) directions;	
1.2.2	Must cover the spectral range between 4.5 to 40 $\mu\text{m}$ ;	
1.2.3	Must have a sensitivity of at least 5-15 $\mu\text{V/W/m}^2$ ;	
1.2.4	Must have a field of view of at least 160°;	
1.2.5	Must not require dome temperature measurements or dome shading.	

## 1.3 Snow Depth Sensor Performance Must Include:

Item	Mandatory Technical Requirement	Identify where the supporting documentation is located in the bid package (page number(s))
1.3.1	Must provide two (2) instruments to independently measure snow depth;	
1.3.2	Must have a beam acceptance angle $\leq 40^\circ$ ;	
1.3.3	Must include a radiation shield and/or an external temperature sensor that outputs a temperature-corrected distance reading;	

## 1.4 Soil Temperature and Moisture Sensor Performance Must Include:

Item	Mandatory Technical Requirement	Identify where the supporting documentation is located in the bid package (page number(s))
1.4.1	Must provide a single instrument that can independently measure soil volumetric-water content and temperature simultaneously;	
1.4.2	Must have a sensing volume of a minimum 2800 $\text{cm}^3$ ;	
1.4.3	Must have a volumetric water content accuracy of a minimum $\pm 4\%$ ;	
1.4.4	Must have a soil temperature precision of a minimum $\pm 0.75^\circ\text{C}$ ;	

1.4.5	Must include a sensor insertion tool with pilot rod for dense or rocky soils;	
1.4.6	Must have the ability to protect itself against electrical surges.	

## 2. Detailed System Requirements – Signal Processing Unit(s) For All Instruments Must Include:

Item	Mandatory Technical Requirement	Identify where the supporting documentation is located in the bid package (page number(s))
2.1	Must record high-temporal resolution observations at least every 1 minute;	
2.2	Must have an Ethernet output port and analog inputs compatible with all instruments included as part of the radiation suite;	
2.3	Must have storage capacity for at minimum 30 days' worth of data	
2.4	Must have the capacity to view the status of each instrument, start and stop each instrument, and perform basic system maintenance (check disk usage, download data, delete and edit files) either remotely or locally;	
2.5	Must be compatible with Windows 7 (or newer) or Linux;	
2.6	The processing unit (micrologger) must:  1. Support complex applications and all instruments, 2. Come with a carrying case and base; 3. Contain a programmable on-board processor and operating system which includes measurement, processing, and output.	

### 3.0 Point-rated Features

Bidders must achieve a minimum of 95 points out of 190 to be considered responsive.

The Contractor shall provide the following features:

Item	Specifications	Points	Maximum Points	Identify where the supporting documentation is located in the bid package (page number(s))
3.1	All instruments shall have the functionality to defrost on a schedule or on demand to minimize the impact of heat on the measurement during defrosting	20 points	20 points	

3.2	Shall have extended weatherproofing to protect the system at temperatures -35°C or below	> -40 to -35 °C = 10 > -45 to -40 °C = 15 ≤ -45 °C = 20	20 points	
3.3	Pyranometer shall have an internal drying cartridge that can last for at least X years	2 years = 10 > 2 to 3 years = 15 > 3 to 4 years = 20 > 4 years = 25	25 Points	
3.4	Pyranometer shall have a spectral range at 300 nm or below	> 290 to 300 nm = 10 > 280 to 290 nm = 15 > 270 to 280 nm = 20 > 260 to 270 nm = 25 ≤ 260 nm = 30	30 Points	
3.5	Pyrgometer shall have a spectral range at 4.5 µm or below	> 4.25 to 4.5 µm = 5 > 4 to 4.25 µm = 10 ≤ 4 µm = 15	15 Points	
3.6	Shall have a volumetric water content accuracy at ± 4% or lower	> 3.5 to 4% = 10 > 3 to 3.5% = 15 > 2.5 to 3% = 20 > 2 to 2.5% = 25 ≤ 2 % = 30	30 Points	
3.7	Shall have a soil temperature precision at ± 0.75 °C or lower	> 0.6 to 0.75 °C = 10 > 0.5 to 0.6 °C = 15 > 0.4 to 0.5 °C = 20 ≤ 0.4 °C = 25	25 Points	
3.8	Pyranometer is self-powered (does not require power supply to operate)	25	25 points	
<b>TOTAL POINTS</b>				<b>/ 190</b>



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## ANNEX D

### ADDITIONAL CERTIFICATIONS

#### 1. Board of Directors

In accordance with Section 01, Integrity Provisions – Bid of the 2003 (2017-04-27) Standard Instructions - Goods or Services - Competitive Requirements, Bidders are required to provide a complete list of names of all individuals who are currently directors of the Bidder before contract award. Bidders are requested to provide this information in their bid.

Director Name - \_\_\_\_\_

Director Name - \_\_\_\_\_

Director Name - \_\_\_\_\_

Director Name - \_\_\_\_\_

Director Name - \_\_\_\_\_

Director Name - \_\_\_\_\_

Director Name - \_\_\_\_\_

Director Name - \_\_\_\_\_

#### 2. Procurement Business Number (PBN)

In accordance with Section 02, Procurement Business Number of the Standard Instructions, Suppliers are required to have a Procurement Business Number (PBN) before contract award.

Procurement Business Number - \_\_\_\_\_

Suppliers may register for a PBN online at [Supplier Registration Information](#). For non-Internet registration, suppliers may contact the InfoLine at 1-800-811-1148 to obtain the telephone number of the nearest Supplier Registration Agent.

Solicitation No. - N° de l'invitation  
K8D22-180455/A  
Client Ref. No. - N° de réf. du client  
K8D22-180455

Amd. No. - N° de la modif.  
File No. - N° du dossier  
TOR-7-40035

Buyer ID - Id de l'acheteur  
tor031  
CCC No./N° CCC - FMS No./N° VME

## ANNEX E

### OEM CERTIFICATION

Form 1 OEM Certification Form	
This confirms that the original equipment manufacturer (OEM) identified below has authorized the Bidder named below to provide and maintain its products under any contract resulting from the bid solicitation identified below.	
Name of OEM	_____
Signature of authorized signatory of OEM	_____
Print Name of authorized signatory of OEM	_____
Print Title of authorized signatory of OEM	_____
Address for authorized signatory of OEM	_____
Telephone no. for authorized signatory of OEM	_____
Fax no. for authorized signatory of OEM	_____
Date signed	_____
Solicitation Number	_____
Name of Bidder	_____