



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

**Bid Receiving - PWGSC / Réception des
soumissions - TPSGC**
11 Laurier St./ 11 rue, Laurier
Place du Portage, Phase III
Core 0B2 / Noyau 0B2
Gatineau, Québec K1A 0S5
Bid Fax: (819) 997-9776

**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

Title - Sujet GC-C-IRMS	
Solicitation No. - N° de l'invitation 01755-160674/A	Date 2015-11-10
Client Reference No. - N° de référence du client 01755-160674	
GETS Reference No. - N° de référence de SEAG PW-\$\$PV-915-68343	
File No. - N° de dossier pv915.01755-160674	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2015-12-22	Time Zone Fuseau horaire Eastern Standard Time EST
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Gosselin, Monique	Buyer Id - Id de l'acheteur pv915
Telephone No. - N° de téléphone (873) 469-3194 ()	FAX No. - N° de FAX () -
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: Specified Herein Précisé dans les présentes	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

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

Issuing Office - Bureau de distribution

Scientific, Medical and Photographic Division / Division de l'équipement scientifique, des produits photographiques et pharmaceutiques
11 Laurier St./ 11 rue, Laurier
6B1, Place du Portage
Gatineau, Québec K1A 0S5

Delivery Required - Livraison exigée See Herein	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
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

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PART 1 - GENERAL INFORMATION

1.1 Security Requirement

There is no security requirement associated with this bid solicitation.

1.2 Requirement

The requirement is detailed under Article 6.2.1 of the resulting contract clauses.

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 of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

1.4 Trade Agreements

"The requirement is subject to the provisions of the World Trade Organization Agreement on Government Procurement (WTO-AGP), the North American Free Trade Agreement (NAFTA), and the Agreement on Internal Trade (AIT)."

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 (2015-07-03) 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: sixty (60) days
Insert: ninety (90) days

2.1.1 SACC Manual Clauses

B1000T	Condition of Material	2014-06-26
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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 (to be used for competitive requirements)

All enquiries must be submitted in writing to the Contracting Authority no later than ten (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 questions 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 the province of Ontario, Canada.

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

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 (two (2) copies)
Section II: Financial Bid (one (1) copy)
Section III: Certifications (one (1) 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 printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I: Technical Bid

The following applies to the Requirement and bidders must provide the following information in the bid:

3.1.1 Installation

On-site installation must be provided and be carried out by a qualified service technician.

State your best installation schedule. Installation will be carried out within _____ calendar days of delivery and be completed within _____ calendar days.

3.1.2 Training

On-site user training in French must be provided for up to 5 users. All costs associated with the on-site training must be included in the price.

Agreed: Yes _____

On-site training will be completed within _____ calendar days of installation.

Provide complete details of training e.g. duration, scope, etc.,

3.1.3 Service

Purchase of the system must include: technical support; technical phone support; support via the Internet; and support via a fax-back document system. Service cost must be included in the price.

Response for service must be within 48 hours or less.

Also, provide the following with your bid (for information purposes only):

- a) Location of available service facilities (after sales service and repair). List the service facilities closest to the destination.

- b) Locations of available replacement parts from consumables to major components.

- c) Response time re: service calls, and escalation schedule, i.e. (how many days with no resolution to a problem until a more experienced person is called in, and from which location).

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- d) List the frequency of routine maintenance visits provided by a qualified service technician during the warranty period, if applicable and included in the price.

3.1.4 Product(s) Offered

The Bidder must indicate the make and model number of the products offered (identify specific components which make up the system):

Name of Manufacturer: _____

Model/Part Number: _____

Literature attached: Yes (_____) No (_____) _____

3.1.5 Point of Manufacture/Shipping

The Bidder must state the point of manufacture/shipping of goods:

Location: _____

Postal Code: _____

3.1.6 Delivery

While delivery must be no later than 31st March 2016, the best delivery that could be offered by the Bidder is _____.

3.1.7 Software Upgrades

The Bidder must provide all software updates and new releases to the purchaser for a period of 2 years following the acceptance, at no additional cost.

Note: The word "updates" means all enhancements, extensions or other modifications to the software. The word "releases" means enhancements or modifications to the software or new modules or supplementary modules that function in conjunction with the software, that represent the next generation of software, and which the Contractor has decided to make available to its customers usually for an additional charge.

3.1.8 Contacts

Bidders are requested to provide the following: Information pertaining to Article 6.5.3, Contractor Representatives under Part 6, Resulting Contract Clauses.

Section II: Financial Bid

The Bidder must quote a firm lot price all inclusive of supply, installation, training, performance validation and manuals, DDP (Sherbrooke, Québec), the total amount of applicable taxes must be shown separately. Freight charges to destination and all applicable Customs duties and Excise taxes must be included.

3.2.1 Exchange Rate Fluctuation

C3011TExchange Rate Fluctuation (without protection)

2013-11-06

Section III: Certifications

Bidders must submit the certifications 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

All proposals submitted must be completed in full and provide all of the information requested in the Request for Proposal (RFP) package to enable a full and complete evaluation. If the requirement is not addressed in the Bidder's proposal, the proposal will be considered incomplete or non-responsive and will be rejected. The onus is on the Bidder to provide all the information necessary to ensure a complete and accurate assessment.

Confirm that you have read and understood by checking the: Yes _____

Factors for Evaluation

1. **PRICING BASIS (MANDATORY):** Prices must be firm, DDP Delivered Duty Paid.
2. **ABILITY TO MEET THE TECHNICAL REQUIREMENT (MANDATORY):**
 - a) **For Items Defined by Specifications:**

The bidder is requested to cross reference the mandatory technical criteria contained herein to their supporting technical documentation.
 - b) **Provision of Supporting Technical Documentation:**

Supporting technical documentation for the stores offered must be provided with the bid at time of bid closing.

Technical brochures or technical data **MUST** be provided to verify compliancy to the technical mandatory specifications.

Included: Yes: _____

3. **COMPLIANCE WITH THE TERMS AND CONDITIONS OF THIS REQUEST FOR PROPOSAL (MANDATORY)**
4. Please note that the requirements of the Federal Contractors Program for Employment Equity may apply - (see Part 5).
5. The bidder must provide, at the date of bid closing, a minimum of 1 business/companies/societies/organizations (contact names, address, telephone number, e-mail address and instrument purchased by the customer) where the bidder provided and maintained the same instrument as the one proposed in the bid. All such

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5.1.1 Declaration of Convicted Offences

As applicable, pursuant to subsection Declaration of Convicted Offences of section 01 of the Standard Instructions, the Bidder must provide with its bid, a completed [Declaration Form](#), 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 – List of Names

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.

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 societies, firms or partnerships do not need to provide lists of names.

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 (http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) available from Employment and Social Development Canada (ESDC) - Labour's website.

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.

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 Requirement

6.1.1 There is no security requirement applicable to this contract.

6.2 Requirement

6.2.1 Requirement

The Contractor must provide the items detailed under Annex B – Basis of Payment.

6.2.2 Installation

On-site installation must be provided and be carried out by a qualified service technician.

The following analytical standard specifications must be performed during the installation. The successful achievement of these criteria is the basis for system acceptance.

6.2.1.1 External Precision for the GC

6.2.1.1.1 ^{13}C : 0.18 ‰ (SD 1 σ ; n = 5) using n-C14 to n-C16 alkane mix at natural abundance on 0.8 nmol C on column.

6.2.1.2 External Precision for gas preparation device

6.2.1.2.1 ^{13}C (CO₂) : 0.08 ‰ using $\geq 0.3\%$ CO₂ in He
6.2.1.2.2 ^{18}O (CO₂) : 0.08 ‰ using $\geq 0.3\%$ CO₂ in He

6.2.1.3 External Precision for the IRMS

6.2.1.3.1 Absolute Sensitivity:

800 molecules CO₂ per m/z 44 ion under normal Dual Inlet operating conditions.

6.2.1.3.2 Sensitivity under Continuous Flow Conditions:

1100 molecules CO₂ per m/z 44 ion with He load will guarantee an isotope ratio linearity better than 0.02 ‰/nA.

6.2.1.3.3 System Stability:

< 10 ppm on mass scale.

6.2.1.3.4 Reference Gas Precision (measured under continuous flow conditions):

6.2.1.3.4.1 ^{13}C (CO₂): 0.06 ‰ for 5 nA signal (SD 1 σ for 10 consecutive pulses)

6.2.1.3.4.2 ^{18}O (CO₂) 0.08 ‰ for 5 nA signal (SD 1 σ for 10 consecutive pulses) measured under

6.2.1.3.5 Reference Gas Linearity (measured under continuous flow conditions)

6.2.1.3.5.1 ^{13}C (CO₂) 0.15 ‰ SD 1 σ for 0.02 – 0.2 nmol (2 – 20 nA)

6.2.1.3.5.2 ^{13}C (CO₂) 0.02 ‰/nA for 0.02 – 0.7 nmol (2 – 60 nA)

6.2.3 Manuals

One complete set of user documentation in English and French, if available, must be supplied with the equipment.

6.2.4 Training

On-site user training in French must be provided for up to 5 users.

6.2.5 Service

Purchase of the system must include: technical support; technical phone support; support via the Internet; and support via a fax-back document system.

Response for service must be within 48 hours or less.

6.2.6 Software Upgrades

The contractor must provide all software updates and new releases to the purchaser for a period of one (1) year following the acceptance, at no additional cost.

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 (2015-07-03) General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

The 2010A (2014-11-27), General Conditions - Goods (Medium Complexity) is appended with Section 31 - Intellectual Property Infringement and Royalties, as follows:

- 1) The Contractor represents and warrants that, to the best of its knowledge, neither it nor Canada will infringe any third party's intellectual property rights in performing or using the Work, and that Canada will have no obligation to pay royalties of any kind to anyone in connection with the Work.
- 2) If anyone makes a claim against Canada or the Contractor concerning intellectual property infringement or royalties related to the Work, that Party agrees to notify the other Party in writing immediately. If anyone brings a claim against Canada, according to [Department of Justice Act](#), R.S. 1985, c. J-2, the Attorney General of Canada must have the regulation and conduct of all litigation for or against Canada, but the Attorney General may request that the Contractor defend Canada against the claim. In either case, the Contractor agrees to participate fully in the defence and any settlement negotiations and

to pay all costs, damages and legal costs incurred or payable as a result of the claim, including the amount of any settlement. Both Parties agree not to settle any claim unless the other Party first approves the settlement in writing.

- 3) The Contractor has no obligation regarding claims that were only made because:
- (a) Canada modified the Work or part of the Work without the Contractor's consent or used the Work or part of the Work without following a requirement of the Contract; or
 - (b) Canada used the Work or part of the Work with a product that the Contractor did not supply under the Contract (unless that use is described in the Contract or the manufacturer's specifications); or
 - (c) the Contractor used equipment, drawings, specifications or other information supplied to the Contractor by Canada (or by someone authorized by Canada); or
 - (d) the Contractor used a specific item of equipment or software that it obtained because of specific instructions from the Contracting Authority; however, this exception only applies if the Contractor has included the following language in its own contract with the supplier of that equipment or software: "[Supplier name] acknowledges that the purchased items will be used by the Government of Canada. If a third party claims that equipment or software supplied under this contract infringes any intellectual property right, [supplier name], if requested to do so by either [Contractor name] or Canada, will defend both [Contractor name] and Canada against that claim at its own expense and will pay all costs, damages and legal fees payable as a result of that infringement." Obtaining this protection from the supplier is the Contractor's responsibility and, if the Contractor does not do so, it will be responsible to Canada for the claim.
- 4) If anyone claims that, as a result of the Work, the Contractor or Canada is infringing its intellectual property rights, the Contractor must immediately do one of the following:
- (a) take whatever steps are necessary to allow Canada to continue to use the allegedly infringing part of the Work; or
 - (b) modify or replace the Work to avoid intellectual property infringement, while ensuring that the Work continues to meet all the requirements of the Contract; or
 - (c) take back the Work and refund any part of the Contract Price that Canada has already paid.

If the Contractor determines that none of these alternatives can reasonably be achieved, or if the Contractor fails to take any of these steps within a reasonable amount of time, Canada may choose either to require the Contractor to do (c), or to take whatever steps are necessary to acquire the rights to use the allegedly infringing part(s) of the Work itself, in which case the Contractor must reimburse Canada for all the costs it incurs to do so.

6.3.2 Supplemental General Conditions

4003 (2010-08-16) Licensed Software, and
4004 (2013-04-25) Maintenance and Support Services for Licensed Software,

apply to and form part of the Contract.

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6.4 Term of Contract

6.4.1 Delivery Date

All the deliverables must be received on or before _____ (to be filled in only at contract award).

6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Monique Gosselin
Public Works and Government Services Canada
Acquisitions Branch
Commercial Consumer Products Directorate
11 Laurier Street, 6A2, Phase III
Place du Portage, Gatineau, Quebec, K1A 0S5

Telephone: (819) 956-3803
Facsimile: (819) 956-3814
E-mail address: monique.gosselin@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 AAC Procurement Authority *(to be filled in only at contract award)*

The AAC Procurement Authority for the Contract is:

Name: _____
Telephone: (____) _____
E-mail address: _____

The AAC Procurement Authority is responsible for the AAC contract management and for the authorization of all work against this contract.

6.5.3 Contractor's Representative *(fill in)*

The telephone number of the person responsible for:

General enquiries

Name: _____
Telephone No. _____
Facsimile No. _____
E-mail address: _____

Delivery Follow-up

Name: _____
Telephone No. _____
Facsimile No. _____
E-mail address: _____

6.6 Payment

6.6.1 Basis of Payment - Firm Price

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm lot price, as specified in in Annex B – Basis of Payment for a cost of \$_____ (to be filled in only at contract award). 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 SACC Manual Clauses

C2000C	Taxes - Foreign-Based Contractor	2007-11-30
C2605C	Canadian Customs Duty and Sales Tax	2008-05-12
H1000C	Single Payment	2008-05-12

6.7 Invoicing Instructions

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.
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

6.8.1 Compliance

The continuous compliance with the certifications provided by the Contractor in its bid and the ongoing cooperation in providing additional information are conditions of the Contract. Certifications are subject to verification by Canada during the entire period of the Contract. If the Contractor does not comply with any certification, fails to, provide the additional information, or if it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

6.9 Applicable Laws

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

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6.10 Priority of Documents

If there is a discrepancy between the wordings 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 4003 (2010-08-16) Licensed Software, and 4004 (2013-04-25) Maintenance and Support Services for Licensed Software;
- (c) 2010A (2015-07-03) General Conditions - Goods (Medium Complexity);
- (d) Annex A, Requirement;
- (e) Annex B, Basis of Payment;
- (f) the Contractor's bid dated _____ *(insert date of bid)* .

6.11 SACC Manual clause

B1501C	Electrical Equipment	2006-06-16
A9068C	Government Site Regulations	2010-01-11
A2000C	Foreign Nationals (Canadian Contractor)	2006-06-16
A2001C	Foreign Nationals (Foreign Contractor)	2006-06-16
G1005C	Insurance	2008-05-12

6.12 Shipping Instructions

6.12.1 Shipping Instructions - Delivery at Destination

1. Goods must be consigned to the destination specified in the Contract and delivered:

Delivered Duty Paid (DDP) Sherbrooke, Quebec Incoterms 2000 for shipments from a commercial contractor.
2. The Contractor will be responsible for all delivery charges, administration, costs and risk of transport and customs clearance, including the payment of customs duties and taxes.

ANNEXE A

BESOIN

The GC-C-IRMS must include a gas chromatograph with injector, permit analysis in split and splitless modes, include an automatic liquid sampler, a combustion unit and a pyrolysis unit. The pyrolysis unit interfaces, thru a tube with a hygroscopic membrane (Nafion) and a cryogenic trap, to an elemental analyzer with autosampler, an interface between the elemental analyzer or the GC and an isotope ratio mass spectrometer, a preparation unit for the analysis of gases on continuous flow including an autosampler linked to the isotope ratio mass spectrometer, a control and data acquisition software, and computer system.

Vendors must cross reference the mandatory technical criteria in a concise format by using page, paragraph(s) & sub-paragraphs as applicable to their supporting technical documentation.

MANDATORY SPECIFICATIONS

1.0 GAS CHROMATOGRAPHY – COMBUSTION

1.1 Gas chromatograph

All parameters must be accessible from the GC keypad or from the controlling software. These parameters relate to oven temperature, the injector, the sampler (including injection and rinsing volumes of the syringe), the interface and auxiliary heating zones (Combustion / Pyrolysis), and the flow, pressure and velocity into the column of the carrier gas and auxiliary gas;

Reference in Contractors Proposal: _____

1.1.2 The oven must be programmable to 450° C with a minimum 20 ramps with a minimum heating rate of 100°C/min;

Reference in Contractors Proposal: _____

1.1.3 The injector must operate in split/splitless modes;

Reference in Contractors Proposal: _____

1.1.4 The injector must feed the column by keeping a constant flow or constant pressure during temperature programming;

Reference in Contractors Proposal: _____

1.1.5 The injector must allow temporary pressure increase during sample injection;

Reference in Contractors Proposal: _____

1.1.6 The GC sampler and control software must allow injecting precise sample volumes up to 250 µL, for any of the injection syringe used;

Reference in Contractors Proposal: _____

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1.1.7 The GC must have a conservation mechanism for the carrier gas to decrease the consumption of this gas during periods when the unit is not in use and in idle mode (standby);

Reference in Contractors Proposal: _____

1.1.8 The system must detect gas leaks and stop the gas flow when a leak is detected;

Reference in Contractors Proposal: _____

1.1.9 The retention times in the GC column must be stable, varying at most by 0.05 second;

Reference in Contractors Proposal: _____

1.1.10 The GC must be equipped with a capillary column HP-5MS or equivalent, 30 m long, 0.250 mm in diameter and 0.25 microns of film thickness;

Reference in Contractors Proposal: _____

1.1.11 The GC must have electronic controls;

Reference in Contractors Proposal: _____

1.1.12 The GC must be equipped with a « FID » detector.

Reference in Contractors Proposal: _____

1.2 Autosampler

1.2.1 The autosampler must allow fast or slow injection;

Reference in Contractors Proposal: _____

1.2.2 The following parameters are controlled from the GC or the control software: rinsing the syringe before and / or after sampling with two different solvents, injection volume, compensation for the viscosity of the sample and the depth of the syringe into the sample tube of 1.5-2.0 mL (vial);

Reference in Contractors Proposal: _____

1.2.3 The autosampler must be fully electric;

Reference in Contractors Proposal: _____

1.2.4 The autosampler must require no gas or pneumatic gauge to ensure its operation;

Reference in Contractors Proposal: _____

1.2.5 The autosampler must accommodate a minimum of 80 samples;

Reference in Contractors Proposal: _____

1.2.6 The autosampler plate must allow refrigeration of samples before analysis;

Reference in Contractors Proposal: _____

1.2.7 The autosampler must be supplied with a clamp capping and uncapping kit;

Reference in Contractors Proposal: _____

1.2.8 The autosampler control software must allow sampling of different sample volumes and up to a maximum of 250 µL with no limitation to any one type of injection syringe.

Reference in Contractors Proposal: _____

1.3 Combustion and pyrolysis unit connected to the GC

1.3.1 The unit interface between the GC and the IRMS must allow operating in combustion mode for the analysis of stable isotopes of C, N or pyrolysis mode for stable isotopes of O;

Reference in Contractors Proposal: _____

1.3.2 This module must allow mode change without requiring shutdown of the IRMS for system equilibrium;

Reference in Contractors Proposal: _____

2.0 NAFION TUBING AND CRYOGENIC TRAP

2.1 A tube enclosing a hygroscopic membrane (Nafion) to remove water generated by the combustion must link the GC-C system to IRMS;

Reference in Contractors Proposal: _____

2.2 After the tube containing the hygroscopic membrane, a cryogenic trap must be connected to the Nafion tube to trap water and carbon dioxide produced by the combustion;

Reference in Contractors Proposal: _____

2.3 The trap must consist of a cryogenic container that contains liquid nitrogen into which a portion of the capillary is plunged and transports, with the carrier gas, the gas produced by the samples to be analyzed;

Reference in Contractors Proposal: _____

2.4 This cryogenic trap must be completely automated and controlled by the system control software: the capillary of the cryogenic trap will be immersed in and out of liquid nitrogen automatically.

Reference in Contractors Proposal: _____

3.0 ELEMENTAL ANALYZER

3.1 The elemental analyzer must allow complete combustion of samples in powder or liquid form;

Reference in Contractors Proposal: _____

- 3.2** The analyzer, using system integrated software, must allow for the calculation of the percentage of C or N in the sample (quantitative assay without isotope), before the determination of isotopic ratios; the latter will be analyzed by the IRMS with gas product;

Reference in Contractors Proposal: _____

- 3.3** The elemental analyzer must operate in combustion or pyrolysis mode and support optimization of determination of concentrations (samples vs. reference gas);

Reference in Contractors Proposal: _____

- 3.4** The elemental analyzer must be equipped with an autosampler with a tray offering at least 90 positions;

Reference in Contractors Proposal: _____

- 3.5** The elemental analyzer must be controlled directly on the unit and by the same control software as the GC-C-IRMS;

Reference in Contractors Proposal: _____

- 3.6** The elemental analyzer must be capable of being operated with helium;

Reference in Contractors Proposal: _____

- 3.7** The elemental analyzer must be able to provide accurate results ($cv < 2\%$, $n = 5$) with samples of 10 μg of C or N.

Reference in Contractors Proposal: _____

4.0 SAMPLE PREPARATION DEVICE FOR GASES FOR CONTINUOUS FLOW ANALYSIS

- 4.1** The unit for gas preparation and introduction into the IRMS system must be automated;

Reference in Contractors Proposal: _____

- 4.2** The unit must allow the gas preparation for the precise determination of the isotope ratios of these gases (CO_2 -carbonates released from blood or exhaled CO_2 , N_2 from urea to form the isotopomers of urea ($^{15}\text{N}^{15}\text{N}$ urea, $^{15}\text{N}^{14}\text{N}$ urea, $^{14}\text{N}^{14}\text{N}$ -urea);

Reference in Contractors Proposal: _____

- 4.3** The unit must be capable of recognizing a concentration ranges to automatically optimize the ideal concentration to analyze in the IRMS;

Reference in Contractors Proposal: _____

- 4.4** The unit must have a minimum of three (3) ports for receiving the carrier gas (monitoring gases);

Reference in Contractors Proposal: _____

4.5 The equipment must operate with Exetainer® tubes 10 mL round bottom Labco Ltd and double-needle holes;

Reference in Contractors Proposal: _____

4.6 The autosampler must have a minimum capacity of 40 samples;

Reference in Contractors Proposal: _____

4.7 The unit must be provided with a heating block from which the gas in the "headspace" can be sampled directly;

Reference in Contractors Proposal: _____

4.8 The water must be removed by a non-cryogenic phase separator (Nafion).

Reference in Contractors Proposal: _____

5.0 INTERFACE BETWEEN THE IRMS AND THE GC OR THE ELEMENTAR ANALYZER

5.1 The unit must allow the simultaneous attachment of two high flow units (e.g. elemental analyzer) and one low flow unit (e.g. GC) to the IRMS;

Reference in Contractors Proposal: _____

5.2 The unit must allow fully automated and unattended switches between preparation units (GC, EA, gaz preparation units);

Reference in Contractors Proposal: _____

5.3 The fully automated determination of system parameters including linearity and stability must be available as part of any sequence of samples;

Reference in Contractors Proposal: _____

5.4 All gas species generated from a sample must be individually diluted with helium to allow fractionation free adjustment of IRMS signal heights at runtime;

Reference in Contractors Proposal: _____

5.5 The unit must allow introduction of at least five (5) reference gases plus Helium.

Reference in Contractors Proposal: _____

6.0 ISOTOPE RATIO MASS SPECTROMETER

6.1 Ion Source

6.1.1 The high sensitivity electron impact ion source must be self-aligning;

Reference in Contractors Proposal: _____

6.1.2 The ion source must have a 3 kV acceleration voltage;

Reference in Contractors Proposal: _____

6.1.3 The ion source must retain its linearity even at full speed (100%) at full trap;

Reference in Contractors Proposal: _____

6.1.4 The ion source must have the same filament that is used for all gas species;

Reference in Contractors Proposal: _____

6.1.5 The ion source parameters must be controlled by the data system;

Reference in Contractors Proposal: _____

6.1.6 The ion source parameters must be stored and retrievable;

Reference in Contractors Proposal: _____

6.1.7 The adjustment and calibration parameters of the source must be made automatically but also manual adjustment as required.

Reference in Contractors Proposal: _____

6.2 **Ion Optics**

6.2.1 The ion optic must provide a large mass dispersion, for simultaneous mass range of e.g. m/z 28 to 46;

Reference in Contractors Proposal: _____

6.2.2 The ion optics must have an electromagnet for all gas species allowing a wide angular ion distribution;

Reference in Contractors Proposal: _____

6.2.3 The ion optics must allow configuration of the collector for the detection of high mass elements; e.g. SO₂ (m/z 64, 65, 66).

Reference in Contractors Proposal: _____

6.3 **Mass range and resolution**

6.3.1 The mass range must have at a minimum 1 to 96 u at full acceleration voltage;

Reference in Contractors Proposal: _____

6.3.2 The resolution must be better than 110.

Reference in Contractors Proposal: _____

6.4 Analyzer

6.4.1 Manual alignment of the beam and the source must not be required during installation or maintenance;

Reference in Contractors Proposal: _____

6.4.2 The analyzer must have an integrated and computer controlled heating capability;

Reference in Contractors Proposal: _____

6.4.3 The analyzer must allow for gas entrance control from the reference gas unit.

Reference in Contractors Proposal: _____

6.5 Vacuum System

6.5.1 The vacuum system must include one turbo molecular pump for all applications;

Reference in Contractors Proposal: _____

6.5.2 The vacuum system must have an active air cooling capacity; no cooling water required.

Reference in Contractors Proposal: _____

6.5.3 The vacuum system must have an automatic system protection feature in case of power failures.

Reference in Contractors Proposal: _____

6.6 Collectors

6.6.1 The universal triple collector must be suitable for all standard applications including N₂ and CO (28, 29, 30), NO (30, 31,32), O₂ (32, 33, 34), CO₂ and N₂O (44, 45, 46), and SO₂ (64, 66).

Reference in Contractors Proposal: _____

6.6.2 Analytical fields at dynamic adjustment: the amplification factors must be automatically modified according to the parameters of the analytical method for optimal measurement of isotopic ratios;

Reference in Contractors Proposal: _____

6.6.3 All amplifiers must be designed for fast data acquisition: ≥ 100 ms integration slices;

Reference in Contractors Proposal: _____

6.6.4 The collector must have a total mass m/z variant at minimum 1 to 96.

Reference in Contractors Proposal: _____

6.7 **Électronics**

6.7.1 The electronic modules must be under computer control using a light pipe interface for total elimination of galvanic coupling effects and ground loops;

Reference in Contractors Proposal: _____

6.7.2 All ion source parameters must be set by the data system;

Reference in Contractors Proposal: _____

6.7.3 All ion source parameters must be automatically optimized, stored, loaded and appended to specific gas configurations;

Reference in Contractors Proposal: _____

6.7.4 The read back of system status parameters such as accelerating voltage, emission current, magnet current, turbo molecular pump status and vacuum pressures must be possible after the task performance.

Reference in Contractors Proposal: _____

7.0 **COMPUTER SYSTEM AND CONTROL SOFTWARE AND SYSTEM OPERATION**

7.1 The operating system must be compatible with Windows 7 32-bit;

Reference in Contractors Proposal: _____

7.2 The operating system must allow the execution of several programs simultaneously;

Reference in Contractors Proposal: _____

7.3 The software must control and automate the full analysis of samples, ie the preparation of the sample results report, and devices including the GC-C-IRMS (eg gas station, elemental analyzer, combustion chamber

Reference in Contractors Proposal: _____

7.4 The control software must automate all the functions of sample analyzes. This includes the integration of the results of steps, analysis of target compounds, producing a graphical and tabular report and the automatic transfer of results to a database software (EXCEL) for isotopic ratio calculations and production of automated user-tailored reports;

Reference in Contractors Proposal: _____

7.5 The system control software must enable automatic optimization of the spectrometer and control of all parameters of GC, combustion, the preparation unit gas, elemental analyzer, automatic samplers and IRMS;

Reference in Contractors Proposal: _____

7.6 The software must allow automatic analysis of a large number of samples through the automatic samplers;

Reference in Contractors Proposal: _____

7.7 The software must be able to assess the quality of results to take corrective measures if necessary;

Reference in Contractors Proposal: _____

7.8 The system control software must allow the user to program the simultaneous operation of three (3) sequences without intervention. A typical scenario includes the control software moving from a sample sequence analysis by GC-C to an analysis of sample sequence by elemental analyzer (EA) or by the gas preparation unit and/or to a 3rd sample analysis sequence without manual intervention and reconfiguration of the unit connected to the IRMS.

Reference in Contractors Proposal: _____

7.9 The integrated script language must enable the user to take complete control of all aspects of the IRMS, including standard peripherals and home-build preparation and inlet devices;

Reference in Contractors Proposal: _____

7.10 The system must accommodate the connection (interface) at any time of a minimum of 3 devices (e.g. elemental analyzer, station for gas, combustion unit) and several gases to allow the determination of ¹³C, ¹⁵N, ¹⁸O, and ³⁴S without having to change the physical connections between the units.

Reference in Contractors Proposal: _____

8.0 DATA SYSTEM

8.1 the Personal Computer have the following minimal configuration:

- 8.1.1** 3 year on-site warranty;
- 8.1.2** Intel i5;
- 8.1.3** Minitowerur;
- 8.1.4** 4096MB RAM;
- 8.1.5** 500 GB Hard Disk;
- 8.1.6** DVD+/-RW Drive;
- 8.1.7** 2 PCI- and 1 PCI-Express sockets;
- 8.1.8** Graphics chip (128 MB);
- 8.1.9** Gigabit Ethernet Network Card;
- 8.1.10** Keyboard (US) & mouse;
- 8.1.11** Microsoft Windows 7 (32bit) Professional operating system (English);
- 8.1.12** MS Office 2010 Professional Edition (English);
- 8.1.13** 2 High resolution 22 inches TFT color monitors;
- 8.1.14** Laser printer.

Reference in Contractors Proposal: _____

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ANNEX B

BASIS OF PAYMENT

Agriculture and Agri-food Canada has a requirement for the supply and installation of 1 Gas chromatograph system coupled with a combustion device and an isotope ratio mass spectrometer with user training for up to 5 people in accordance with the mandatory specifications detailed in the Request for Proposal for delivery to Sherbrooke, Quebec. The delivery is required by 31st March 2016.

Item	Description	Unit of Issue	Firm Qty	Firm unit price DDP (Sherbrooke, QC)
1	Gas chromatograph system coupled with a combustion device and an isotope ratio mass spectrometer GC-C-IRMS) in accordance with the mandatory specifications detailed in Annex A.	Lot (includes supply, installation, training, performance validation and manuals)	1	\$ _____

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ANNEX C

**COMPLETE LIST OF DIRECTORS
(As per Standard Instructions, Clauses and Conditions Part 2)**

Name	Position
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____