



RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Public Works and Government Services / Travaux
publics et services gouvernementaux
Kingston Procurement
Des Acquisitions Kingston
86 Clarence Street, 2nd floor
Kingston
Ontario
K7L 1X3
Bid Fax: (613) 545-8067

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 / Travaux publics et
services gouvernementaux
Kingston Procurement
Des Acquisitions Kingston
86 Clarence Street, 2nd floor
Kingston
Ontario
K7L 1X3

Title - Sujet Physisorption & Chemisorption Syst.	
Solicitation No. - N° de l'invitation W0046-195081/A	Date 2018-11-23
Client Reference No. - N° de référence du client W0046-19-5081	
GETS Reference No. - N° de référence de SEAG PW-\$KIN-630-7648	
File No. - N° de dossier KIN-8-50126 (630)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2019-01-07	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: Holt, Judy	Buyer Id - Id de l'acheteur kin630
Telephone No. - N° de téléphone (613) 536-4995 ()	FAX No. - N° de FAX (613) 545-8067
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF NATIONAL DEFENCE CFB KINGSTON, LSS SUPPLY RECEIPTS AND ISSUE 5 SOMME AVE, BLDG C-36 KINGSTON Ontario K7K7B4 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

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 Requirement

The requirement is detailed under Article 6.2 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), the Canada-European Union Comprehensive Economic and Trade Agreement (CETA), 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) (<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](#) (2018-05-22) 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 in 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.

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

Due to the nature of the bid solicitation, bids transmitted by epost Connect service will not be accepted.

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

- Section I: Technical Bid (1 hard copy)
- Section II: Financial Bid (1 hard copy)
- Section III: Certifications (1 hard copy)

If there is a discrepancy between the wording of the soft copy on electronic media and the hard copy, the wording of the hard copy will have priority over the wording of the soft 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 hard copy 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](https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573) (<https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573>). 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 "C" Electronic Payment Instruments, to identify which ones are accepted.

If Annex "C" 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

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

4.1.1.1 Mandatory Technical Criteria

See Annex D - Mandatory Technical Evaluation Criteria

4.1.2 Financial Evaluation

SACC Manual Clause [A0220T](#) (2014-06-26), Evaluation of Price

4.2 Basis of Selection

4.2.1 Basis of Selection - Mandatory Technical Criteria

A bid must comply with the requirements of the bid solicitation and meet all mandatory technical evaluation criteria to be declared responsive. The responsive bid with the lowest evaluated price will be recommended for award of a contract.

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](http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html) 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 section titled Information to be provided when bidding, contracting or entering into a real procurement agreement of the [Ineligibility and Suspension Policy](http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) (<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](https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#) 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.

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".

6.3 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) (<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 (2018-06-21), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

The **2010A** (2018-06-21), General Conditions - Goods (Medium Complexity) is appended with Section 32 - 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

4001 (2015-04-01), Hardware Purchase Lease or Maintenance
4003 (2010-08-16), Licensed Software

6.4 Term of Contract

6.4.1 Delivery Date

All the deliverables must be received on or before 22 March 2019.

Installation and training must be completed by 29 March 2019.

6.4.2 Optional Goods and/or Services

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described at Annex A 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.

6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Judy Holt
Supply Specialist
Public Works and Government Services Canada
Acquisitions Branch

86 Clarence Street, 2nd Floor
Kingston, ON K7L 1X3

Telephone: 613 – 536 - 4995
Facsimile: 613 – 545 - 8067
E-mail address: judy.holt@pwgsc-tpsgc.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: *To be determined*

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

Name: _____

Title: _____
Organization: _____
Address: _____

Telephone: _____
Facsimile: _____
E-mail address: _____

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 a firm lot price as specified in Annex B – Basis of Payment for a cost of \$ *to be determined*. 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 (2017-08-17) Limitation of Price

6.6.3 Single Payment

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

6.6.4 SACC Manual Clauses

SACC Manual clause C2000C (2007-11-30) Taxes – Foreign-based Contractor

6.6.5 Electronic Payment of Invoices – Contract

To be determined

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 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 or Maintenance;
- (c) the supplemental general conditions 4003 (2010-08-16), Licensed Software;
- (d) the general conditions 2010A (2018-06-21), General Conditions - Goods (Medium Complexity);
- (e) Annex A, Requirement;
- (f) Annex B, Basis of Payment;
- (g) the Contractor's bid dated _____

6.11 SACC Manual Clauses

SACC Manual clause A9068C (2010-01-11) Government Site Regulations

SACC Manual clause B1501C (2018-06-21) Electrical Equipment

SACC Manual clause B7500C (2006-06-16) Excess Goods

SACC Manual clause G1005C (2016-01-28) Insurance – No Specific Requirement

ANNEX "A"

REQUIREMENT

1. Background

The Department of Chemistry & Chemical Engineering at the Royal Military College of Canada is has faculty investigating a wide variety of materials such as i) heterogeneous catalysts, ii) activated carbons, iii) Metal Organic Frameworks (MOFs), iv) low porosity/low surface materials such as coating and washcoats and v) graphene and nanomaterials. The Dept. requires an integrated Physisorption and Chemisorption system for characterising the surface area and the surface chemistry. Typical characterization tests are, but not limited to, surface area, pore size, pore distribution, mesopore area, micropore volume, metal dispersion, active metal area and surface acidity. The system must be capable of measuring a large range of surface area from 0.0005 m²/gram (surface coatings) to 2629 m²/gram (graphene) and 6000 m²/gram (nanomaterials such as metal organic framework (MOF)).

The supplier must provide a state-of-the-art, brand new unit and all its components. A demo unit or refurbished unit is not acceptable. A demo unit is defined as an instrument that has been used by the company for the promotion or sale of the instrument.

2. Features and Specifications

- .1 The system must be able to carry out sample preparation (degassing), physisorption tests and chemisorption tests.
- .2 The system must have a minimum of two (2) ports for sample preparation.
- .3 The system must have a minimum of two (2) ports for physisorption tests.
 - .3.1 At least one (1) the ports must be capable of a chemisorption test.
 - .3.2 Two of the ports must be able to measure isotherms for microporous materials.
- .4 The system must be computer controlled so that it can operate with minimal or no operator oversight for both sample preparation and analysis.
- .5 As there will be many users, the system must have functionality to gather data from automated sequences and guide the user through the appropriate methodology.
- .6 The system must come with all ancillary pieces of equipment, add-ons, modifications, kits and upgrades required for the system to perform all the tests and analyses detailed in this document.
- .7 The apparatus must have all pumps, vacuum pumps and turbo pumps required for its operation.
- .8 The system must come with all mass flow controllers required for its operation.
- .9 The furnace must be able to operate from ambient to 1100C and maintain 1100C operating temperature. The furnace should have a fan to assist in cooling.

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- .10 The system must be able to conduct physisorption test that require greater than 70 hours of operation.
- .11 The system should have a minimum of 7 inlet ports for gases.
- .12 The system should have a transducer dedicated to measure the saturation pressure (P_0) of the probe gas, which at a minimum, are nitrogen, nitrogen/helium mixtures, argon, krypton and carbon dioxide, hydrogen and carbon monoxide.
- .13 The system must have the capability of carry out an argon gas analysis at argon liquid temperature (87K).
- .14 The system must be able to determine the surface area of the sample at relative pressures, $P/P_0 > 10^{-3}$
- .15 The system must be able to measure the total pore volume and average pore size of porous materials (0.3 nm to 300 nm).
- .16 The system must be able to measure the mesopore size distribution, pore area and average pore size (2 nm to 50 nm).
- .17 The system must be able to measure very low surface area samples (krypton capable, $0.0005 \text{ m}^2/\text{g}$).
- .18 The system must be able to measure microporosity using appropriate probe gas at low relative pressures, $P/P_0 < 10^{-4}$.
- .19 The system must measure low pressure micropore isotherms and generate micropore size distributions (pore size < 2nm).
- .20 The system must be able to carry vapour sorption isotherms for hydrocarbons at a minimum for butane, pentane, hexane and ammonia.
- .20.1 The vapour sorption manifold must be heated.
- .21 The system must be able to measure chemisorption isotherms for at least the following gases and vapours, hydrogen, carbon monoxide, ammonia, carbon dioxide and pyridine.
- .22 Data Analysis – the system must have appropriate software that is able to analyze the collected data and compute parameter estimates from models or data analyses at least for the following tests:
- .22.1 Isotherm
 - .22.2 BET Surface Area
 - .22.3 Langmuir Surface Area
 - .22.4 t-Plot
 - .22.5 Alpha-S Method
 - .22.6 BJH Adsorption and Desorption
 - .22.7 Dollimore-Heal Adsorption and Desorption
 - .22.8 Horvath-Kawazoe
 - .22.9 MP-Method

- .22.10 Dubinin-Radushkevich
- .22.11 Dubinin-Astakhov
- .22.12 Greater than 25 models based on density functional theory (DFT) comprising of both non-linear DFT (NLDFT) and quenched solid DFT (QSDFT), for accurate pore size calculations of carbons, zeolites and silicas of different geometries

.23 The system must permit multiple user-defined reports.

.24 The data analysis for the chemisorption test must generate, at a minimum, reports for monolayer uptake, metal dispersion, metal active area, metal crystallite size and heats of adsorption.

.25 The system must come complete with instrument and user manuals in both hard copy and electronic format.

3. Optional Accessories

The following options to be included in this contract if budget permits:

- .1 To add the capability to do use carbon dioxide as a probe gas for physisorption analyses (carbon dioxide isotherms)
- .2 To add a third port capable of carrying out microporosity analyses.
- .3 To add an extended 3 year warranty, including parts, labour and travel. The extended warranty would complement the vendor's mandatory warranty for the first year and would be in force for years 2, 3 and 4.

4. Computer and operating system

- .1 Computer and interface has sufficient performance to permit complete operation and control of all devices and accessories necessary to operate the equipment
- .2 120/240 VAC operation
- .3 Intel i7 processor, 32 GB SDRAM, 4 TB RAID 1 mirror, 4 USB2, 6 USB3, Win 10 Pro 64 bit
- .4 LANs for instrument + LAN for network, Nvidia GTX 960 performance video card (or equivalent)
- .5 One (1) 24" flat monitor (120/240 VAC)

5. Safety

Instrument and enclosure must be compliant with Canadian regulations (Canadian RED Act, CSA or equivalent) for electrical and mechanical safety. Proof of CSA compliance must be submitted at the time of the bid.

6. Delivery

The instrument must be delivered on or before 22 Mar 2019.

The Contractor must ensure delivery of the instrument to the Sawyer building loading dock of The Royal Military College of Canada with the following address:

Royal Military College of Canada
11 General Crerar Crescent
Kingston, Ontario
Canada
K7K 7B4

7. Installation and Training

Three days of operational training must be conducted on site by a company application scientist for 3 to 5 attendees of RMC by 29 March 2019 in Kingston, Ontario at the Royal Military College during normal business hours between 8am and 4pm. Travel costs related to training must be included as part of the contract.

8. Warranty

The vendor must provide 1 year warranty on parts and labour.

9. Spatial and Electrical Requirements:

Instrument provided must be able to fit through a single door of the following dimension: 34.5" W x 81" H

ANNEX B

BASIS OF PAYMENT

- 1. For the supply, delivery, installation and provision of training of a Physisorption and Chemisorption system as detailed herein.** \$_____lot

Make/Model Offered: _____

2. Optional Accessories

- .1 To add the capability to do use carbon dioxide as a probe gas for physisorption analyses (carbon dioxide isotherms) \$_____lot
- .2 To add a third port capable of carrying out microporosity analyses. \$_____lot
- .3 To add an extended 3 year warranty, including parts, labour and travel. The extended warranty would complement the vendor's mandatory warranty for the first year and would be in force for years 2, 3 and 4. \$_____lot

ANNEX “C” 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 D

Mandatory Technical Evaluation Criteria

Bidders should indicate opposite each specification under MANDATORY SPECIFICATIONS, in the right hand margin under DETAIL OFFERED, whether or not the equipment being offered meets / does not meet the requirements.

It will be to your advantage to furnish as much detail as possible to support your comments / claims of compliance for each specification. If technical literature, etc. is provided, please reference the page number and highlight the specification that supports your compliance. If there is no technical literature to support a specification, you should indicate so.

ITEM	MANDATORY SPECIFICATIONS	DETAIL OFFERED	
		Met	Not Met
2	Features and Specifications		
2.1	The system must be able to carry out sample preparation (degassing), physisorption tests and chemisorption tests.		
2.2	The system must have a minimum of two (2) ports for sample preparation.		
2.3	The system must have a minimum of two (2) ports for physisorption tests.		
2.3.1	At least one (1) the ports must be capable of a chemisorption test.		
2.3.2	Two of the ports must be able to measure isotherms for microporous materials		
2.4	The system must be computer controlled so that it can operate with minimal or no operator oversight for both sample preparation and analysis.		
2.5	As there will be many users, the system must have functionality to gather data from automated sequences and guide the user through the appropriate methodology.		
2.6	The system must come with all ancillary pieces of equipment, add-ons, modifications, kits and upgrades required for the system to perform all the tests and analyses detailed in this document.		
2.7	The apparatus must have all pumps, vacuum pumps and turbo pumps required for its operation.		
2.8	The system must come with all mass flow controllers required for its operation.		
2.9	The furnace must be able to operate from ambient to 1100C and maintain 1100C operating temperature. The furnace should have a fan to assist in cooling.		
2.10	The system must be able to conduct physisorption test that require greater than 70 hours of operation.		
2.11	Not mandatory		
2.12	Not mandatory		
2.13	The system must have the capability of carry out an argon gas analysis at argon liquid temperature (87K).		
2.14	The system must be able to determine the surface area of the sample at relative pressures, $P/P_0 > 10^{-3}$.		
2.15	The system must be able to measure the total pore volume and average		

	pore size of porous materials (0.3 nm to 300 nm).		
2.16	The system must be able to measure the mesopore size distribution, pore area and average pore size (2 nm to 50 nm).		
2.17	The system must be able to measure very low surface area samples (krypton capable, 0.0005 m ² /g).		
2.18	The system must be able to measure microporosity using appropriate probe gas at low relative pressures, P/Po < 10 ⁻⁴ .		
2.19	The system must measure low pressure micropore isotherms and generate micropore size distributions (pore size < 2nm).		
2.20	The system must be able to carry vapour sorption isotherms for hydrocarbons at a minimum for butane, pentane, hexane and ammonia.		
2.20.1	The vapour sorption manifold must be heated.		
2.21	The system must be able to measure chemisorption isotherms for at least the following gases and vapours, hydrogen, carbon monoxide, ammonia, carbon dioxide and pyridine.		
2.22	Data Analysis – the system must have appropriate software that is able to analyze the collected data and compute parameter estimates from models or data analyses at least for the following tests: .22.1 Isotherm .22.2 BET Surface Area .22.3 Langmuir Surface Area .22.4 t-Plot .22.5 Alpha-S Method .22.6 BJH Adsorption and Desorption .22.7 Dollimore-Heal Adsorption and Desorption .22.8 Horvath-Kawazoe .22.9 MP-Method .22.10 Dubinin-Radushkevich .22.11 Dubinin-Astakhov .22.12 Greater than 25 models based on density functional theory (DFT) comprising of both non-linear DFT (NLDFT) and quenched solid DFT (QSDFT), for accurate pore size calculations of carbons, zeolites and silicas of different geometries		
2.23	The system must permit multiple user-defined reports.		
2.24	The data analysis for the chemisorption test must generate, at a minimum, reports for monolayer uptake, metal dispersion, metal active area, metal crystallite size and heats of adsorption.		
2.25	The system must come complete with instrument and user manuals in both hard copy and electronic format.		
4.	Computer and operating system		
4.1	Computer and interface has sufficient performance to permit complete operation and control of all devices and accessories necessary to operate the equipment		
4.2	120/240 VAC operation		
4.3	Intel i7 processor, 32 GB SDRAM, 4 TB RAID 1 mirror, 4 USB2, 6 USB3, Win 10 Pro 64 bit		
4.4	LANs for instrument + LAN for network, Nvidia GTX 960 performance video card (or equivalent)		
4.5	One (1) 24" flat monitor (120/240 VAC)		
5.	Safety		
5.	Instrument and enclosure must be compliant with Canadian regulations (Canadian RED Act, CSA or equivalent) for electrical and mechanical safety. Proof of CSA compliance must be submitted at the time of the bid.		

Solicitation No. - N° de l'invitation
W0046-195081/A
Client Ref. No. - N° de réf. du client

Amd. No. - N° de la modif.
File No. - N° du dossier
KIN-8-50126

Buyer ID - Id de l'acheteur
KIN630
CCC No./N° CCC - FMS No./N° VME

7.	Installation and Training		
	Three days of operational training must be conducted on site by a company application scientist for 3 to 5 attendees of RMC by 29 March 2019 in Kingston, Ontario at the Royal Military College during normal business hours between 8am and 4pm. Travel costs related to training must be included as part of the contract.		
8.	Warranty		
	The vendor must provide 1 year warranty on parts and labour.		
9.	Spatial and Electrical Requirement		
	Instrument provided must be able to fit through a single door of the following dimension: 34.5" W x 81" H		