

**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 0A1 / Noyau 0A1
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 Single Use Bioreactor 50-200L		
Solicitation No. - N° de l'invitation 31241-138728/A	Date 2013-10-28	
Client Reference No. - N° de référence du client 31241-13-8728		
GETS Reference No. - N° de référence de SEAG PW-\$\$PV-938-63779		
File No. - N° de dossier pv938.31241-138728	CCC No./N° CCC - FMS No./N° VME	
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2013-12-09		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: Roy, Paul		Buyer Id - Id de l'acheteur pv938
Telephone No. - N° de téléphone (819) 956-6919 ()		FAX No. - N° de FAX (819) 956-3814
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: CONSEIL NATIONAL DE RECHERCHES DU CANADA 6100 ROYALMOUNT AVE. (Portes 6 et 7 VIA ENTRÉE RÉCEPTION MARCHANDISES MONTREAL Québec H4P2R2 Canada		

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 .	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



Item Article	Description	Dest. Code Dest.	Inv. Code Fact.	Qty Qté	U. of I. U. de D.	Unit Price/Prix unitaire FOB/FAM Destination Plant/Usine	Delivery Req. Livraison Req.	Del. Offered Liv. offerte
1	Single Use Bioreactor 50-200L Compétitif - Aléna Délai livraison: 3 mois Contact CNRC: Chung Fang Shen 514-496-7881	31241	31241	1	Chaque	\$XXXXXXXXXXXX	.	

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PART 1 - GENERAL INFORMATION

1. Security Requirement

There is no security requirement associated with the requirement.

2. Requirement

The Animal Cell Scale-Up Team at the National Research Council of Canada (NRC) has a requirement for a 200L working volume single use bioreactor system with one (1) cylindrical disposable bioreactor bag and outer support container. Specification details as per Annex A .

2.1 Optional Requirement

The Bidder grants to Canada the irrevocable option to purchase two (2) additional Mass Flow Controllers (MFC) to the 4 MFCs described in section 2.5. of Annex A. One calibrated for Air in DO control submerged aeration line. Another one calibrated for CO2 in pH control through overlay line. 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 within two (2) years of contract award by sending written notice to the Contractor at the prices stated at Annex B - Basis of payment.

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.

PART 2 - BIDDER INSTRUCTIONS

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 (2012-11-19) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

1.1 SACC Manual Clauses

B1000T Condition of Material (2007-11-30)

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.

3. Enquiries - Bid Solicitation

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 is eliminated, and the enquiry can be answered with copies to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

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 Québec.

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

1. Bid Preparation Instructions

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

Section I: Technical Bid (two (2) hard copies), consisting of technical brochures/literature to verify compliancy and test data, if applicable.

Section II: Financial Bid (one (1) hard copy)

Section III: Certifications (one (1) hard copy)

If there is a discrepancy between the wording of the soft copy 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 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](#)

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pv938

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CCC No./N° CCC - FMS No/ N° VME

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pv93831241-138728

Procurement

(<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.

1.1 Delivery

Delivery must be completed by March 31, 2014.

Although it is expected that the equipment be delivered within this time frame, the earliest date that can be achieved is : _____ (State your best delivery possible)

The system must be delivered at 6100, Royalmount Avenue, Montréal, Québec, H4P 2R2.

1.2 Installation and Start-Up

The installation and start-up of the Bioreactor is the responsibility of the vendor, and must be performed by vendor factory-trained, certified technical representative.

Start-up procedure will be performed (simulated) using RO1 water.

1.3 Training

The vendor must include on-site (NRC Montreal) training for at up to two (2) operators for a period of up to three (3) days at the time of start-up

All travel and accommodation costs must also be included. These service costs must be inserted separate from the equipment cost in the proposal.

1.4 Service and Support

1. The vendor must offer on site technical support for the system. This support must be available during normal business hours, Monday to Friday between 08:00 to 16:00. Response time for on site technical support must not exceed 48 hours following request.

2. Technical phone support, support via the Internet must also be included with the purchase. Response for service queries must be within 48 hours or less.

Also, provide the following with your bid:

- 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 for consumables to major components.

1.5 Manuals

The following documentation must be included upon delivery of the proposed single use bioreactor system:

Must include at least one copy of all available up to date operation and maintenance manuals in English and/or French for the corresponding proposed single use bioreactor system

1.6 Contacts

Bidders are requested to provide the following: Information pertaining to Article 5.3 Contractor Representatives under Part 6, Resulting Contract Clauses

1.7 Performance Testing

Following delivery, installation and start-up, the proposed single use bioreactor system will have to successfully complete the following tests:

1.7.1 Temperature control performance test: The temperature control will be tested for set points of 15°C and 40°C at minimum and maximum working volume. RO1 water will be used for testing. The controller must work according to the essential specifications (section 2.3 of Annex A) over a 24-hours period for each set points and working volume conditions.

1.7.2 Agitation rate control performance test: During the testing period of test 4.1, the agitation rate control will be tested for a set point of 20 rpm for both working volume conditions. The controller must work according to the essential specifications (section 2.4 of Annex A).

1.7.3 pH control performance test: After completion of tests 4.1 & 4.2, the pH control will be tested for set points of 6.0 and 8.0 pH unit for both working volume conditions. The controller must work according to the essential specifications (section 2.8 of Annex A).

1.7.4 Dissolved oxygen control performance test: The culture will be inoculated and the DO control will be tested for set points of 10%, 40% and 80% of air-saturation for the provided control strategy. The controller must work according to the essential specifications stated in the section 2.6 of Annex A.

1.8 Spare parts List

The Bid should include a spare parts price list (unit and quantity prices) for all replacement parts and consumables for the bioreactor

The submitted price list is provided for price support purposes only. The Bidder hereby acknowledges that, terms and conditions submitted as part of price lists do not form part of the Contract and are superseded by PWGSC terms and conditions.

Section II: Financial Bid

The bidder must quote a firm price all inclusive Delivery Duty Paid (DDP), Montreal, Québec, Incoterms 2000, the Goods and Services Tax (GST) and/or the Harmonized Sales Tax (HST) extra, as applicable. Freight charges to destination and all applicable Customs duties and Excise taxes must be included.

Section III: Certifications

Bidders must submit the certifications required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

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.

1.1 Technical Evaluation

All proposals submitted shall be completed in full and provide all of the information requested in the Request for Proposal (RFP) detailed in the line item details 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.

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 must cross reference the mandatory technical criteria contained herein to their supporting technical documentation.
 - b) Provision of Supporting Technical Documentation:

Supporting technical documentation 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.
- 3. **COMPLIANCE WITH THE TERMS AND CONDITIONS OF THIS REQUEST FOR PROPOSAL (MANDATORY)**
- 4. **FOR CANADIAN SUPPLIERS ONLY:** Please note that the requirements of the Federal Contractors Program for Employment Equity may apply - see herein. (MANDATORY if applicable)

1.2 Financial evaluation

A0220T Evaluation of Price 2010-01-11

2. Basis of Selection

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 including the optional requirement will be recommended for award of a contract.

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and related documentation to be awarded a contract. Canada will declare a bid non-responsive if the required certifications and related documentation are not completed and submitted as requested.

Compliance with the certifications bidders provide to Canada is subject to verification by Canada during the bid evaluation period (before award of a contract) and after award of a contract. The Contracting Authority will have the right to ask for additional information to verify bidders' compliance with the certifications before award of a contract. The bid will be declared non-responsive if any certification made by the Bidder is untrue, whether made knowingly or unknowingly. Failure to comply with the certifications, to provide the related documentation or to comply with the request of the Contracting Authority for additional information will also render the bid non-responsive.

1. Mandatory Certifications Required Precedent to Contract Award

1.1 Code of Conduct and Certifications - Related documentation

By submitting a bid, the Bidder certifies that the Bidder and its affiliates are in compliance with the provisions as stated in Section 01 Code of Conduct and Certifications - Bid of Standard Instructions 2003. The related documentation therein required will assist Canada in confirming that the certifications are true.

1.2 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_equality/eq/emp/fcp/list/inelig.shtml) available from Human Resources and Skills Development Canada (HRSDC) - 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

1. Security Requirement

There is no security requirement applicable to this Contract.

2. Requirement

The Animal Cell Scale-Up Team at the National Research Council of Canada (NRC) has a requirement for a 200L working volume single use bioreactor system with one (1) cylindrical disposable bioreactor bag and outer support container. Specification details as per Annex A Requirement .

2.1 Optional Requirement

The Contractor grants to Canada the irrevocable option to purchase two (2) additional Mass Flow Controllers (MFC) to the 4 MFCs described in section 2.5. of Annex A. One calibrated for Air in DO control submerged aeration line. Another one calibrated for CO2 in pH control through overlay line. 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 within two (2) years of contract award by sending written notice to the Contractor at the prices stated at Annex B - Basis of payment.

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.

3.1 General Conditions

2010A (2013-04-25), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

4. Term of Contract

4.1 Delivery Date

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

4.2 Shipping Instructions - Delivery at Destination

Must be delivered DDP Delivery Duty Paid (Montreal, Quebec) Incoterms 2000 for shipments from a commercial contractor.

The Contractor will be responsible for all delivery charges, costs, and risks of transport, shipping insurance and customs clearance, including the payment of customs duties and taxes.

The system must be delivered and installed at 6100, Royalmount Avenue, Montréal, Québec, H4P 2R2.

5. Authorities

5.1 Contracting Authority

The Contracting Authority for the Contract is:

Paul Roy
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) 956-6919
Facsimile: (819) 956-3814
E-mail address: paul.roy@tpsgc-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.

5.2 Technical Authority (*to be filled in only at contract award*)

The Technical Authority named above 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 Technical Authority, however the Technical 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.

5.3 Contractor's Representative (*to be filled in by the Bidder*)

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. Payment

6.1 Basis of Payment - Firm Price

1. In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor shall be paid a firm price of \$ to be filled in at contract award, Goods and Services Tax or Harmonize Sales Tax extra, if applicable.
2. No increase in the total liability of Canada or in the price of the Work resulting from any design changes, modifications or interpretations of the Specifications, will be authorized or paid to the Contractor unless such design changes, modifications or interpretations have been approved, in writing, by the Contracting Authority prior to their incorporation in the Work.

6.2 Milestone Payments

Canada will make milestone payments in accordance with the following schedule:

90% payment of the firm price stated at 6.1 will be made upon delivery of the system.

10% payment of the firm price stated at 6.1 will be made upon successfully completing the Performance Testing detailed at of 1.7 of the Solicitation.

6.3 SACC Manual Clauses

H1001C Multiple Payments (2008-05-12)

7. Invoicing Instructions

The Contractor must submit invoices in accordance with the information required in section 10 of 2010A General Conditions - Goods (Medium Complexity).

Original copy to consignee with one copy to the **Contracting Authority**.

8. Certifications

8.1 Compliance

Compliance with the certifications and related documentation provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the term of the Contract. If the Contractor does not comply with any certification, provide the related documentation 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.

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 Quebec.

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) 2010A (2013-04-25) General Conditions - Goods (Medium Complexity);
- (c) Annex A, Requirement;
- (d) Annex B, Basis of payment
- (e) the Contractor's bid dated (insert date of bid) _____

Annex A Requirement

The Animal Cell Scale-Up Team at the National Research Council of Canada (NRC), Montreal Has a requirement for one (1) 200L working volume single use bioreactor system dedicated to the production of recombinant proteins and viruses using animal cell expression systems. The proposed single use bioreactor system must include one (1) cylindrical disposable bioreactor bag and outer support container. All necessary accessories for control and/or monitoring of temperature, pH, dissolved oxygen and agitation rate must be included. The proposed single use bioreactor system must comply with all essential specifications and requirements found in the bidding document.

2.0 Mandatory Technical Specifications

The delivered equipment must have the following specifications:

2.1. The Single Use Bioreactor System:

2.1.1 The proposed single use bioreactor system must use stirrers like the ones used in continuous stir tank bioreactors.

2.1.2 The single use bioreactor system must include at least the following components:

2.1.2.1 One cylindrical disposable bioreactor bag: The bag must be supplied with agitator assembly (stirrer), sparger, filter inlet and outlet ports, plus ports for integration of sensor probes and line sets. The bag must be supplied sterile and ready-to-use. More specifically, the bag must minimally provide apertures for the following connections:

- 1)One (1) for base solution addition.
- 2)One (1) for medium addition.
- 3)One (1) for inoculum addition (seeding).
- 4)One (1) for overlay aeration.
- 5)One (1) for gas exhaust.
- 6)One (1) for bottom drain harvest.
- 7)One (1) for extra addition needs.
- 8)One (1) for submerged aeration (DO control).
- 9)At least three (3) side ports for temperature, DO and pH sensors.

Reference in Bid:

2.1.2.2 The cylindrical disposable bioreactor bag: The bag must allow operating cell culture at working volumes between 50 and 200 liters.

Reference in Bid:

2.1.2.3 One outer support container (or bagholder): The bagholder must be able to support the operation with the cylindrical disposable bioreactor bag up to ≥ 200 L.. The bagholder must be jacketed for temperature control via water circulation. The bagholder must also be:

- a. constructed with 304 L or better grade stainless steel.

- b. installed on mobile skid.
- c. equipped with a motor fixation device.

Reference in Bid: _____

2.1.2.4 Control & monitoring unit: The control & monitoring unit must provide control and/or monitoring of at least the following culture parameters further detailed in the indicated sub-sections:

- Temperature (2.3)
- Agitation Rate (2.4)
- Overlay and submerged aerations (2.5)
- Dissolved Oxygen (2.6)
- pH (2.8)

Reference in Bid: _____

2.2. The control & monitoring unit must also include an operator interface to provide displays of the actual values of monitored parameters and to allow entries of desired set-point values for controlled parameters.

Reference in Bid: _____

2.3 Temperature control:

- 2.3.1 The proposed single use bioreactor system must use the degree Celsius scale and must use a jacketed vessel for heating and cooling.
- 2.3.2 The bioreactor system must be able to maintain the culture temperature of the bioreactor to a desired set point within the range from 15°C to 40°C within a +/- 0.5°C deviation range.
- 2.3.3 The bioreactor's temperature controller must allow for set point entry to the 0.1°C accuracy.

Reference in Bid: _____

2.4 Agitation rate control:

- 2.4.1 The proposed single use bioreactor system must include a motor, able to maintain the agitation rate of the bioreactor's culture to a desired set point within the minimal range from 20 to 100 rpm within a +/- 5 rpm deviation range
- 2.4.2 The bioreactor's agitation rate controller must allow for set point entry to at least the 5 rpm accuracy.

Reference in Bid:**2.5 Configuration of gas controllers for overlay and submerged aerations:**

The proposed single use bioreactor system must be equipped with at least 4 electronic Mass Flow Controllers (MFC) with the following specific configuration:

- a. One MFC calibrated for Air in overlay aeration.
- b. One MFC calibrated for CO₂ in submerged aeration.
- c. One MFC calibrated for O₂ in submerged aeration.
- d. One MFC calibrated for N₂ in submerged aeration.
- e. All MFC must be equipped with a solenoid valve to prevent gas leak when gassing is not required.
- f. The entry increment precision for each of the above MFC must be equal or better than 0.2 L/min.
- g. The accuracy of each of the above MFC must be equal or better than $\pm 1\%$ of set point.

Reference in Bid:**2.6 Dissolved oxygen control:**

- 2.6.1 The proposed single use bioreactor system must be able to maintain the dissolved oxygen concentration (DO) of the culture in the bioreactor vessel to a desired set point within the minimal range from 0 to 100% of air-saturation and within a $\pm 5\%$ deviation range.
- 2.6.2 The bioreactor's DO controller must allow for set point entry to at least the 1% air-saturation accuracy.

Reference in Bid:

- 2.7 The DO sensor measurements(s) must be inside the cylindrical disposable bioreactor bag.

Reference in Bid:

- 2.8 pH Control: The proposed single use bioreactor system must be able to maintain the pH of the culture in the bioreactor vessel between 6 and 8 pH unit within a ± 0.1 pH unit deviation range.

Reference in Bid:

- 2.9 The pH sensor measurement(s) must be inside the cylindrical disposable bioreactor bag.

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Reference in Bid: _____

- 2.10** The proposed single use bioreactor system must have at least three (3) fixed-speed peristaltic pumps for liquid addition, each equipped with a pump head.

Reference in Bid: _____

- 2.11** The proposed single use bioreactor system must be equipped with load cells.

- 2.12** Electrical/electronic module(s): Power supply must be 208VAC; 60Hz; 3 Ph. and/or 208VAC; 60Hz; 1 Ph., and/or 110-120 VAC; 60Hz

Reference in Bid: _____

Annex B BASIS OF PAYMENT

	Qty	Unit Price
A) Single Use Bioreactor System as described in Annex A Section 2.0 Mandatory technical Specifications - Requirement	01	_____ \$
B) Installation of the Single Use Bioreactor System and training on system use as described in Section 1.3 of PART 3 - Training	01	_____ \$
C) Delivery of the system as described in Section 1.1 of PART 3, Delivery and Section 1.2 of PART 3, Installation and Start-up".	01	_____ \$
<u>Optional Requirements:</u>		
D) Mass Flow Controllers (MFC) calibrated for Air in DO control submerged aeration line	01	_____ \$
E) Mass Flow Controllers (MFC) calibrated for CO2 in pH control through overlay line	01	_____ \$
Total (A+B+C+D+E):		_____ \$

The options may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.