

**“RECOVERY ACT”
REQUEST FOR PROPOSAL
NO. 103960**

for

**HIGH COUNT RATE X-RAY PHOTOELECTRON SPECTROMETER
SYSTEM WITH CONTROLLED ENVIRONMENT SAMPLE TRANSFER**

**July 14, 2009
Proposals Due August 28, 2009**

**Battelle Memorial Institute,
Pacific Northwest Division
3200 Q Avenue
P. O. Box 999, MSIN K9-15
Richland, WA 99354**

**Kathy Whelan
Sr. Contracts Specialist
Phone (509) 372-6212
Fax (509) 375-3818
email: kathy.whelan@pnl.gov**

INSTRUCTIONS AND SOLICITATION PROVISIONS

THE REQUIREMENTS IDENTIFIED HEREIN WILL BE FUNDED BY THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009. (RECOVERY ACT)

BATTELLE CONTRACTS REPRESENTATIVE

The Battelle Contracts Representative, Kathy Whelan, is the sole point of contact for any communications or questions regarding this acquisition.

SUBMISSION OF PROPOSALS

Proposals should be prepared simply and economically, and provide a straightforward, concise delineation of the information required to be furnished. Emphasis should be on completeness and clarity. Elaborate brochures or other presentations are neither required nor desired.

Each proposal submitted should include:

1. A statement of acceptance of the conditions referenced in the General Provisions below.
2. Completed Commercial Representations and Certifications found at <http://www.pnl.gov/contracts/documents/forms/repscerts-ci.pdf>
 - The NAICS code for section 2(a)(1) is 334516
 - The size standard for section 2(a)(2) is 500 Employees
3. Submit all offers on the attached Price Proposal Form showing unit prices for meeting the stated required delivery date. **Offerors should note that the option items will not be included when evaluating price for determination of the lowest, technically responsive offer.**
4. A Technical Proposal, prepared in a manner consistent with the attached Specification dated 06/29/09. The Technical Proposal shall definitively indicate compliance, paragraph by paragraph, with the requirements outlined in the Specification and shall be supported by cross-referenced documentation as necessary.

Proposals are preferred to be electronically submitted to kathy.whelan@pnl.gov. Transmittals containing proposals should include "Proposal to RFP No. 103960" in the subject line. Proposals must be received by Battelle no later than August 28, 2009.

Proposals may also be submitted via facsimile at the number above or by hard copy the address above. Correspondence must include "Proposal to RFP No. 103960." Proposals submitted by overnight mail must be mailed to:

Battelle, Pacific Northwest Division
6th Street Warehouse
790 6th Street
ATTN: Kathy Whelan, K9-15
Richland, WA 99354

GENERAL PROVISIONS

Each proposal submitted shall include a statement of acceptance of the conditions referenced below. The conditions may be viewed as at <http://www.pnl.gov/contracts/documents/>

- Commercial Terms and Conditions, titled Form A-409-CI-R1
- General Provisions Supplement – Recovery Act (Form A-409-ARRA-Suppl)

RECOVERY ACT REQUIREMENTS

The following Recovery Act forms will be applicable to the successful Offeror and may be viewed at <http://www.pnl.gov/contracts/documents/>

- Recovery Act Reporting Requirements (Form Suppl-409-ARRA-Reporting)
- Monthly Contract Cost-to-Date Estimate (Form A-409-ARRA-Accrual)

INSURANCE/PRELIMINARY HAZARDS ASSESSMENT (PHA)

As required in the referenced General Provisions, the successful Contractor must provide a valid insurance certificate and completed PHA prior to any work being performed on-site.

PERFORMANCE SCHEDULE

Offerors shall note that any resulting contract shall include the following provision for submittal of a Performance Schedule:

“Contractor shall provide a performance schedule identifying major production milestones and deliverables to accomplish the requirements of this contract. Contractor shall submit the performance schedule to the Battelle Contracts Representative not later than ten days following contract award and provide written, electronic status reports by the 15th of each succeeding month. If at any time the Contractor has reason to believe that a production milestone or delivery date may not be met, Contractor shall immediately notify the Battelle Contracts Representative in writing, outlining the milestone or delivery date in jeopardy, the reasons, and steps the Contractor will take to recover the schedule in order to meet delivery requirements.”

EXPLANATION TO PROSPECTIVE OFFERORS

Any prospective Offeror desiring an explanation or interpretation of the RFP must request it in writing soon enough to allow a reply to reach all prospective Offerors before the submission of their offers. Oral explanations or instruction given before the award of the contract will not be binding. Any information given to a prospective Offeror concerning the RFP will be furnished promptly to all other prospective Offerors as an amendment of the solicitation, if that information is necessary in submitting offers or if the lack of it would be prejudicial to any other prospective Offeror.

PROPOSAL DUE DATE AND VALIDITY PERIOD

Proposals shall be delivered to Battelle on or before the proposal due date and shall be valid for a minimum of 90 days.

AMENDMENTS TO RFP

If this RFP is amended, all provisions which are not modified remain unchanged.

Offerors shall acknowledge receipt of any amendment of this RFP (a) by signing and returning the form provided for such purpose; (b) by stating in its proposal that the amendment (date and number) was received and considered in formulating the proposal; or (c) by letter or E-mail. Battelle must receive the acknowledgement by the time specified for receipt of proposals.

SUBMISSION, MODIFICATION, REVISION, AND WITHDRAWAL OF PROPOSALS (CL 605, OCT 2007)

1. Offerors are responsible for submitting proposals, and any modifications or revisions, so as to reach the Battelle office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:00 p.m., local time, for the designated Battelle office on the date that proposal or revision is due.
2. Any proposal, modification, or revision received at the Battelle office designated in the solicitation after the exact time specified for receipt of offers is "late" and will not be considered unless it is received before award is made, the Battelle Contracts Representative determines that accepting the late offer would not unduly delay the acquisition; and--
 - A. If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Battelle, Pacific Northwest Division, infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or
 - B. There is acceptable evidence to establish that it was received at the Battelle site designated for receipt of offers and was under Battelle's control prior to the time set for receipt of offers; or
 - C. It is the only proposal received.
3. However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Battelle, will be considered at any time it is received and may be accepted.
 - A. Acceptable evidence to establish the time of receipt at the Battelle site includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Battelle personnel.
 - B. If an emergency or unanticipated event interrupts normal Battelle processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Battelle requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Battelle processes resume.
 - C. Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award. Proposals may be withdrawn in person by an Offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

- D. Unless otherwise specified in the solicitation, the Offeror may propose to provide any item or combination of items.
 - E. Offerors shall submit proposals in response to this solicitation in English and in U.S. dollars unless otherwise permitted by the solicitation.
 - F. Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.
 - G. Offerors may submit revised proposals only if requested or allowed by the Battelle Contracts Representative.
 - H. Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Battelle Contracts Representative
4. Offer expiration date. Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the Offeror).
5. Restriction on disclosure and use of data. Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by Battelle except for evaluation purposes, shall--
- A. Mark the title page with the following legend:

This proposal includes data that shall not be disclosed outside Battelle and shall not be duplicated, used, or disclosed--in whole or in part--for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this Offeror as a result of--or in connection with--the submission of this data, Battelle shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit Battelle's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [*insert numbers or other identification of sheets*]; and
 - B. Mark each sheet of data it wishes to restrict with the following legend:

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

TREATMENT OF PROPOSAL DATA

- A. Although not specifically requested by the RFP, the proposal may include technical data and other data, including trade secrets and/or privileged or confidential commercial or financial information, which the Offeror does not want disclosed to the public or used by PNNL or the Government for any purpose other than proposal evaluation. To protect such data, the Offeror will specifically identify each page including each line or paragraph thereof containing the data to be protected and mark the cover sheet of the proposal with the following notice:

NOTICE

The data contained in pages _____ of this proposal have been submitted in confidence and contain trade secrets and/or privileged or confidential commercial or financial information, and such data shall be used or disclosed only for evaluation purposes. PNNL and the Government shall have the right to use or disclose the data herein to the extent provided in the contract. This restriction does not limit PNNL's and the Government's right to use or disclose data obtained without restriction from any source, including the Offeror.

Reference to this notice on the cover sheet should be placed on each page to which the notice applies. PNNL assumes no liability for disclosure or use of unmarked data and may use or disclose such data for any purpose.

- B. Should a contract be awarded based on a proposal, it is policy, in consideration of the award, to obtain unlimited rights for the Government in technical data contained in the proposal unless the prospective contractor marks those portions of the technical information that he asserts as "proprietary data," or specifies those portions of such technical data that are not directly related to or will not be utilized in the work to be funded under this subcontract. "Proprietary data" are defined as technical data which embody trade secrets developed at private expense, such as design procedures or techniques, chemical composition of materials, or manufacturing methods, processes, or treatments, including minor modifications thereof, provided that such data: (1) are not generally known or available from other sources without obligation concerning their confidentiality; (2) have not been made available by the owner to others without obligation concerning their confidentiality; and (3) are not already available to the Government without obligation concerning their confidentiality. An Offeror who receives a contract award shall mark the data identified as proprietary by specifying the appropriate proposal page number to be inserted in the Rights to Proposal Data clause below. Subject to the concurrence of PNNL, information unrelated to the subject may be deleted from the proposal by the Offeror. The responsibility, however, of identifying technical data as proprietary or deleting it as unrelated rests with the Offeror.
- C. The following clause shall be included in any contract based on a proposal. This clause is intended to apply only to technical data and not to other data, such as privileged or confidential commercial or financial information.

RIGHTS TO PROPOSAL DATA

Except for technical data contained on pages ____ of the contractor's proposal dated _____, which are asserted by the Contractor as being proprietary data, it is agreed that as a condition of the award of this contract, notwithstanding the provisions of any notice appearing on the proposal, the Government shall have the right to use, duplicate, and disclose and have others do so for any purpose whatsoever, the technical data contained in the proposal upon which this contract is based.

BID AND PROPOSAL COSTS

Battelle is not obligated to pay any cost incurred in the preparation and submission of a proposal, nor to enter into a contract or any other arrangement with any Offeror.

ALTERNATE PROPOSALS

Battelle is inviting proposals in full accordance with the attached specifications or description. In the event that Offeror is unable to submit a proposal responsive to this requirement and Offeror believes they have an item(s) which may otherwise be acceptable, Offerors are invited to submit a proposal for Battelle's consideration, stating item by item each incidence of noncompliance. Offerors are hereby advised that Battelle shall not be obligated to evaluate this proposal, but if acceptable, this Solicitation will either be canceled and reissued or revised to incorporate any appropriate changes. In the event Offeror chooses not to submit a proposal, a short note of explanation would be appreciated.

TYPE OF CONTRACT

Battelle contemplates awarding a fixed price contract for this request.

SITE VISITS

Approximately two (2) weeks following the issuance of this RFP, certain Battelle officials shall visit each Offeror's plant or manufacturing facility for the sole purpose of ensuring Offeror's understanding of Battelle's requirements as outlined in the Specification. Additional information and/or clarifications arising from these discussions shall be provided to all Offerors prior to the proposal due date. Offerors shall be contacted separately to schedule these visits.

INTENT TO PROPOSE

Offerors shall indicate their intent to propose not later than July 17, 2009. It is requested that this be accomplished via email.

TECHNICAL SPECIFICATIONS

The enclosed Technical Specification dated 06/29/09, attached hereto, outlines the requirements for this solicitation.

DELIVERY

The required date for delivery and installation is May 31, 2010. Delivery shall be FOB Destination and shipping charges shall be included in the price. Foreign Item Note: FOB Point shall be Richland, WA and all freight, duties, customs fees, freight forwarder fees, and other taxes shall be included door-to-door to Richland, WA in Offeror's total price.

PROMPT PAYMENT DISCOUNTS

In addition to normal payment terms, please advise amount and details of other cash discounts or savings available to Battelle for more expeditious or favorable methods of payment or for other reasons.

AUTHORIZED NEGOTIATORS

If a negotiation meeting is held, the Offeror shall designate as its negotiator a person who is authorized to make legally binding commitments without further review or approval. If, for any reason, it is impractical for the Offeror to be represented at a negotiation meeting by other than a person fully authorized to act in its behalf, Battelle shall be notified sufficiently in advance to allow a decision to be made whether the negotiations should proceed as scheduled or be postponed. The Offeror's notice, if originally given orally, shall be confirmed in writing.

CONTRACT AWARD

a) Battelle may evaluate proposals received in response to this solicitation without discussion. Contract award, if any, will be made to the responsive, responsible Offeror whose evaluated proposal will be most advantageous to Battelle, considering only price and any price-related factors specified elsewhere in the solicitation, or

(b) Battelle may reject any or all proposals, and waive informalities or minor irregularities in proposals received, or

(c) Battelle may accept any item or combination of items, unless doing so is precluded by a restrictive limitation in the solicitation or the proposal, or

(d) Battelle may reject a proposal as non-responsive if the prices proposed are materially unbalanced between line items or sub-line items. A proposal is materially unbalanced when it is based on prices significantly less than prices for some items and prices which are significantly overstated in relation to prices for other items, and if there is a reasonable doubt that the proposal will result in the lowest overall price to Battelle even though it may be the low evaluated proposal, or if it is so unbalanced as to be tantamount to allowing an advance payment.

(e) Funding is obligated for this procurement; however, contract award is subject to Availability of Funds at the time of award.

**PRICE PROPOSAL FORM
RFP 103960**

HIGH-SENSITIVITY XPS SYSTEM

\$ _____

OPTIONS

- 1. Data Analyses Software (1) – 3 additional copies \$ _____
- 2. Data Analyses Software (2) – site license \$ _____
- 3. Extended Warranty and Maintenance
 - Year 2 \$ _____
 - Year 3 \$ _____
 - Year 4 \$ _____
- 4. Al/Mg Dual-anode Non-Monochromatic X-ray Source \$ _____
- 5. Ultra-Violet Light Source \$ _____
- 6. C₆₀ or Other Cluster Ion Gun System \$ _____

Offeror takes no exception to Battelle's General Provisions.

FOB Point: Destination – Richland, WA
Warranty Period: One Year Minimum
All Shipping Costs: Included in Total Price
Terms of Payment: Net 30 Days after Acceptance
Delivery and Installation
Completed By: May 31, 2010

PRICING INFORMATION

- [] A. Prices proposed herein are substantiated with enclosed copy of published price lists and/or catalog price sheets including conditions of any available discounts and are not more than those offered our most favored purchasers for similar quantities under like conditions.
- [] B. Published price list and/or catalog price sheets are not available. The prices proposed herein are not more than those offered our most favored purchasers including the United States Government for similar quantities under like conditions. If checked, include copies of recent invoices, sales slips, etc., for similar quantities of like material or services to at least two (2) other firms for verification.

Company: _____

Signed: _____

Title: _____

Date: _____

Request for Proposal 103960
High-Sensitivity XPS System
June 29, 2009

Battelle requires a high-sensitivity and high-throughput XPS imaging and spectroscopy instrumentation that includes:

- a monochromatic Al K α x-ray sources,
- an electron energy analyzer with high-sensitivity and high-energy and spatial resolution, and
- an argon ion sputtering capability.

Sample transfer under control environment is required for most of the work; an introduction chamber with a glove box for sample transfer under anaerobic conditions is required. The system shall have controlled cooling and heating capabilities both at the introduction chamber and the analysis position for carrying out measurements on biological and wet samples (we must be able to load sample on pre-cooled stage in the sample introduction chamber through the glove box). The UHV system shall be maintained by combination of ion pump, Ti sublimation pump and turbo molecular pumps backed by dry roughing pumps.

Overall System

- A computer controlled UHV system is required. The main system shall be pumped by the combination of ion pump, Ti sublimation pump and turbo-molecular pumps backed by dry roughing pumps (no oil pumps). Appropriate pumping systems for Ar ion gun and introduction chamber are required. All the turbo molecular pumps on the system shall be isolated with gate valves which are interlocked to ion gauges to avoid venting the chambers when power fails. The base pressure in the main chamber and the introduction chamber shall be 5×10^{-10} Torr and 1×10^{-7} Torr, respectively.
- The instrument shall have an automatic baking function.
- The system shall have digital camera capability to visualize enlarging micron-scale features on the sample and carry out micro-area spectroscopy (separate monitor).
- Contractor shall install the system at the EMSL facility and perform acceptance testing in accordance with the requirements outlined herein.

Al K α Monochromatic X-ray Source

- The x-ray source shall provide high-flux Al K α monochromatic x-ray beam.
- A minimum analysis area of 20 μm diameter shall be obtained; Offeror shall specify the size of possible analysis areas and the corresponding count rates for Ag 3d_{5/2} peak at 0° emission (sample normal to the analyzer) with $\leq 0.6\text{eV}$ energy resolution.
- X-ray source shall be capable of providing secondary electron or other imaging of the sample surface; Offeror shall specify the spatial resolution of the imaging with the

minimum size of the feature that can be identified on the surface and the time required for the imaging.

Argon Ion Gun System

- Ion gun system shall provide surface cleaning capability, chemical depth profiling at normal or low ion impact energies with high resolution and ISS capability; Offeror shall specify the resolution for both depth-profiling and ISS .
- Ion gun system shall provide high current densities with low ion energies, minimizing surface damage.
- The ion energies shall be in the range of 0.25-5.0 keV; Offeror shall specify the current and the beam size as a function of energy and Ar pressure in the chamber.
- The chamber Ar pressure shall be at most 5×10^{-8} Torr for the normal operation of ion gun; Offeror shall specify the Ar pressure range for normal operation.
- The ion gun system shall provide a continuous long-term stability and sputter rate reproducibility.
- The ion gun shall have neutral suppressor.
- The gas pressure in the ion gun shall be monitored and controlled.
- The ion gun shall be digitally controlled to provide different effective beam sizes and the corresponding beam currents. Offeror shall specify the currents on a clean Ag surface with varying ion impact energies.
- Digital control of gas pressure in the ion gun shall be provided.
- Offeror shall specify “standard” and “optimum” operating conditions and the corresponding beam size, beam current on a clean Ag surface, ion impact energy and the chamber pressure.

Sample Stage

- The system shall have at least four axes (x, y, z and tilt) computer driven sample stage providing a stable analytical platform with high degrees of accuracy and reproducibility.
- In addition, the sample stage shall be equipped with azimuthal rotation for high resolution sputter depth profiling; Offeror shall specify the angular range and the repeatability.
- x, y and z directions shall have translations of ± 25 mm, ± 7.5 mm and ± 7.5 mm, respectively, with the repeatability of ≤ 5 μ m .
- The tilt angle range shall be $\pm 45^\circ$ with the repeatability of $\leq 0.2^\circ$.
- Various sample mounts shall be provided with the system. These mounts shall have a capability of mounting multiple samples, powder samples, and can be used for angle resolved measurements.
- The temperature range shall be between -120°C to 250°C . Offeror shall specify the cooling and heating rate and the time required to reach the specified temperatures.
- When the sample stage at $\geq 250^\circ\text{C}$ in the absence of sample, the base pressure in the analyses chamber shall be $\leq 1.0 \times 10^{-8}$ Torr.

- The system shall have an automated sample handling and analysis area identification tools.

Sample Introduction Chamber and Glove Box

- The sample introduction chamber (load-lock) shall be attached to a glove box for an anaerobic sample transfer.
- The sample introduction chamber shall have a quick sample entry doors for mounting samples on to the stage from air as well as from the glove box.
- The stage in the introduction chamber shall have controlled cooling and heating capabilities between -120°C to 250°C. Offeror shall specify the cooling and heating rate and the time required to reach the specified temperatures.
- Samples shall be loaded on pre-cooled stage in the sample introduction chamber through the glove box.
- The introduction chamber shall be pumped down to 1.0×10^{-7} Torr in ≤ 10 minutes in the absence of any sample.
- The sample transfer (after the chamber reached the desired vacuum) shall be completed in ≤ 5 minutes.
- Offeror shall provide with its proposal the conceptual design with detail descriptions. The glove box shall be a complete system with integrated purifier, controls, display and stand. The glove box system shall be capable of achieving < 1 ppm O₂ and H₂O equilibrium. This system shall provide at least an antechamber for transfer of samples to and from the glove box while maintaining < 1 ppm O₂ levels. Glove box pumping shall be performed using a 120 VAC, BOC Edwards style scroll pump. The system shall include a pre-calibrated oxygen monitor with display with a range from 0.1 ppm to 25% O₂ and a moisture monitor with that displays the glove box levels to 0.5 ppm moisture (-80 degrees C dew point)

Charge Compensation System

- The system shall have a charge compensation for carrying out measurements on insulators. The system must be capable of making measurements on PET (polyethylene terephthalate) with O-C=O peak resolution of ≤ 0.85 eV within 60 seconds of turning on the neutralization system after system as been set up for routine operation. Offeror shall describe the details of charge compensation system for insulators.
- The difference between the binding energies of the corresponding C 1s peaks from PET collected at 0° and 45° emission angles using monochromatic x-ray beam with an energy resolution of ester (O-C=O) peak at ≤ 0.85 eV shall be ≤ 0.5 eV .
- The count rate of C 1s scan from PET collected at an emission angle of 0° using monochromatic x-ray beam with an energy resolution of ester (O-C=O) peak at ≤ 0.85 shall be $\geq 30,000$ cps using large area x-ray beam ($\geq 20,000 \mu\text{m}^2$).
- The difference in the background counts from the survey scans collected in 5 minutes each (monochromatic x-rays operating at maximum power that is recommended for

routine operation of the instrument, FWHM of Ag 3d_{5/2} ≤ 0.6 eV) recorded on a lightly etched Ag surface with and without neutralizer shall be ≤ 500 counts.;

Electron Energy Analyzer

- The energy analyzer shall provide a full-featured XPS imaging and spectroscopy, UPS, depth profile, line / area scans and angle-resolved analyses.
- The detection system shall be efficient enough to provide high sensitivity and high dynamic range.
- The divergence from linearity of count rates obtained from $M_H(E_J) / M_L(E_J)$ vs $N_H(E_J)$ (ISO/DIS 21270) shall be within ± 2.5% at 5 million CPS.
- The instrument must have imaging capabilities that provide a spatial resolution of ≤ 6 μm spatially resolved chemical state information.
- Offeror shall specify the size of possible analysis areas and the corresponding count rates for Ag 3d_{5/2} peak at 0° emission (sample normal to the analyzer) with ≤ 0.6eV energy resolution using monochromatic x-ray source operating at maximum power that is recommended for routine operation of the instrument.
- In a large area (≥ 20,000 μm²), the count rate for Ag 3d_{5/2} peak at 0° emission (sample normal to the analyzer) with ≤ 0.6eV energy resolution using monochromatic x-ray source shall be ≥ 900,000 cps. If this count rate involves magnetic lenses, the count rate without the magnetic lenses shall be at least one third of this count rate.
- The sensitivity of ≥ 2 Mcps shall be obtained for Ag 4d peak with an energy resolution of ≤ 140 meV using He I ultra-violet light source.
- The degradation rate (atom% Cl per minute) from PCEMA (using the same analysis parameters used above in measuring FWHM of C 1s peak and monochromatic x-rays operating at maximum power that is recommended for routine operation of the instrument) shall be ≤ 0.05 atom% Cl per minute .

Computer and Software Requirements

- The data acquisition computer shall have provisions to network. Offeror shall provide detailed computer feature specifications.
- The software for instrument control, data acquisition, and, data analyses shall be provided with the system. This shall include (but not be limited to) the ability for peak quantification (with defined sensitivity factors), the ability to test and alter the instrument transmission function, the ability to transfer data files for other types of analysis in a batch mode, the ability to repeat or batch analyze similar spectra without repeated entry of all analysis parameters, the ability to export data in the ISO format, the ability to curve fit and the ability to do multi-layer analysis.
- The software shall be user-friendly and easy to navigate the system for diagnostics purposes.
- Data acquisition for multiple samples shall be automated with different tasks for a period of 24 hrs. or more.
- Multiple depth profiling followed by data acquisitions and their analyses shall be automated for an easy extraction of the results.

- Software shall have provisions to navigate sample positions.
- Minimum two copies (licenses) of the data analyses software shall be provided with the system and this software shall run on personal computers in order to process the data in the office. A digital operations manual shall be provided.

Spares

Contractor shall provide a complete set of spare filaments, detectors, and gaskets.

Warranty and Maintenance Services

Since EMSL is a national scientific user facility, the system must be fully operational for more than 90% of the time. A standard one-year onsite warranty, including all parts, labor, travel, lodging and expenses, shall be provided for the system. In addition, a minimum of one maintenance service call, including all parts, labor, travel, lodging and expenses, per year shall be provided. Contractor shall provide guaranteed on-site response and spare parts available within 72 hours of the service call.

Training

Basic operator training shall be provided at EMSL following installation and acceptance testing of the system. Within six months following installation or by November 15, 2010, whichever comes first, Contractor shall provide advanced operator training for up to three employees at the EMSL facility.

Installation and Acceptance Test Procedures

Offeror shall provide its standard procedures for installation and acceptance testing of the system at the EMSL facility. In addition to applying its standard procedures to installation and acceptance testing activities, Contractor shall collaborate with PNNL scientists to develop and perform additional onsite testing procedures that may be required to ensure the system meets the requirements specified herein.

OPTIONAL CAPABILITIES

Data Analyses Software (1)

Three (3) additional copies (licenses) of the data analyses software.

Data Analyses Software (2)

Site license for the data analyses software, such license to allow remote access by multiple EMSL users (non-Battelle staff members).

Extended Warranty and Maintenance

- Year 2 warranty and maintenance (consistent with Year 1 as described above);
- Year 3 warranty and maintenance (consistent with Year 1 as described above); and
- Year 4 warranty and maintenance (consistent with Year 1 as described above).

Al/Mg Dual-anode Non-Monochromatic X-ray Source

- Dual-anode shall be operated independently and/or simultaneously.
- The Offeror shall provide availability and pricing of a Zr/Mg anode as a replacement for an Al/Mg dual anode.
- The non-monochromatic dual anode x-ray source shall operate at ≥ 350 Watts; and the Offeror shall specify the count rate as a function of the power indicating the optimum power conditions and the spot size.

Ultra-Violet Light Source

- The light source shall provide very stable and highly collimated beam. The Offeror shall provide information confirming the stability and collimation of the light source.
- The ratio of He I/He II shall be $\geq 3/1$.
- The chamber pressure shall be $\leq 5 \times 10^{-8}$ Torr when UV light source is operating.
- The discharge current on a clean Ag surface shall be ≥ 75 mA; Offeror shall specify the maximum discharge current on a clean Ag surface that can be obtained and the corresponding beam size and the chamber pressure.
- The Offeror shall provide the optimum operating conditions and the corresponding discharge current on a clean Ag surface, beam size and the chamber pressure.
- The Offeror shall provide details of how the gas pressure in the UV source is monitored and how the UV light from the source to the sample is collimated.

C₆₀ or other Cluster Ion Gun System

- Ion gun system shall provide surface cleaning capability and chemical depth profiling at normal or low ion impact energies with a high resolution; **Offeror shall** specify the resolution.
- Ion gun system shall provide high current densities with low ion impact energies, minimizing surface damage.
- The ion gun shall have the beam energy: at least 1KeV to 10 KeV.
- The ion current (mass filtered) shall be ≥ 20 nA; Offeror shall specify the maximum current and the beam size as a function of ion energy (at least at 1 KeV, 5 KeV and 10 KeV).
- The ion gun system shall provide a continuous long-term stability and sputter rate reproducibility; Offeror shall specify the chamber pressure range during the normal operation of the ion gun

- Provide the optimum operating conditions and the corresponding beam size, beam current on a suitable surface (either a clean Ag surface or organic material or both); Offeror shall specify the impact energy, the chamber pressure and carbon deposition on the sample after certain amount of time of operation for this optimum condition.