RFP AND SOW FOR VENDORS

Evaluation of Mercury Waste Stabilization Technologies

January 26, 2001

Prepared by:

UT-Battelle, LLC
Acting Under Contract with the U.S. Department of Energy
for Management and Operation of Oak Ridge National Laboratory

OAK RIDGE NATIONAL LABORATORY

MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

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January 26, 2001

CLOSING DATE: February 26, 2001

Request for Proposal (RFP) No. 3400007805

UT-Battelle, LLC, acting under its contract DE-AC05-00OR22725 with the U. S. Department of Energy for management and operation of Oak Ridge National Laboratory, invites you to submit a fixed-price proposal for testing program to evaluate stabilization technologies to treat >260 ppm mercury waste sludges. The work is described more fully in the Statement of Work of the attached draft subcontract. The resulting subcontract will be a fixed-price subcontract.

Address your proposal and all questions concerning this request to:

UT-Battelle, LLC
Bethel Valley Road
Post Office Box 2008
Oak Ridge, Tennessee 37831-6192

Attention: Karen Bradley

Telephone: 865-576-1431

The closing time and date for receipt of proposals are 4:00 p.m. at Oak Ridge on February 26, 2001.

Please let me know if you do not intend to submit a proposal.

NOTE: Standard government forms (SF) mentioned in this RFP are available at http://www.gsa.gov/forms**.** Other forms and clauses are available at our web site. http://www.ornl.gov/Procurement**.**

The Company may award multiple, firm-fixed price subcontracts upon initial proposals received.

Offeror's will participate in this demonstration at their expense except for the analytical costs incurred from the use of an outside laboratory to perform the surrogate waste characterization, TCLP testing on the treated waste forms, and the cost of shipping the treated waste forms to the University of Cincinnati and Oak Ridge National Laboratory (ORNL).

1. **EVALUATION CRITERIA**

The following evaluation criteria are listed in descending order of importance.

A. Technical Approach to the Treatment Process

Methodology of the proposed treatment process. What is the likelihood of success using the Offeror's proposed plan and equipment? Is the proposed treatment process scientifically sound, complete, and well-thought out?

B. Cost Factors

The Company will be concerned with striking the most advantageous balance between expected performance and overall price to the Company. Cost factors will be considered in the overall evaluation of proposals, the Company is willing to pay a higher price for higher technical merit, but only to the extent of comparative worth among the competing proposals. The Company may solicit, from available sources, relevant information concerning the Offeror's record of performance and use this information in evaluation and selection.

C. Past Performance

Offeror's experience and past performance of the process in treating similar types of wastes. Background qualifications, specific experience, and expertise of key personnel to be assigned to this demonstration in the development and operation of this process or similar process. The Company may solicit, from available sources, relevant information concerning the Offeror's record of performance and use this information in evaluation and selection.

D. Schedule

Is the Offeror's proposed schedule credible, realistic and reasonable for completion of all deliverables and all phases of the work? Has the vendor demonstrated, via his schedule, a thorough understanding of what steps are required to demonstrate the proposed process?

In evaluating proposals, the Company will be concerned with finding the most advantageous balance between expected performance and overall price to the Company. Offeror's must therefore be persuasive in describing the merit and value of methods, characteristics, and/or features that enhance potential performance/application or otherwise contribute to achieving the Company's objectives. The Company will select the firm whose proposal contains the combination of price and technical factors offering the best overall value to the Company.

2. PROPOSAL AUTHORIZATION

The proposal must be signed by an official authorized to bind your organization and must be accompanied by a statement to the effect the proposal is firm for a period of not less than 60 calendar days after closing date for receipt of proposals.

To aid in our evaluation, you proposal shall be in two parts: Part I – Technical Proposal; and Part II – Business Proposal. Format instructions for submission of the separate proposals described below:

3. TECHNICAL PROPOSAL

The technical proposal will indicate your capability to provide a testing program to evaluate stabilization technologies to treat >260 ppm mercury waste sludges as described in this Request for Proposal, it shall be specific and complete in every detail. The Proposal should not merely offer to perform the project in accordance with the Statement of Work, but shall outline the technical and implementation approach as specifically as possible.

Part I – Technical Proposal should not exceed five (5) 8 l/2 x 11-inch, single spaced pages with text of no more than 14 characters per inch, exclusive of other required enclosures or attachments per the statement of work.

The technical proposal should generally follow the attached evaluation criteria outline and should contain the following:

A. Table of Contents

Provide table of contents with page numbers for each chapter or section and subsections.

B. Regulatory Permits

The Offeror's shall be responsible for and obtain all necessary regulatory (local, state and federal) permits and licenses as appropriate to perform this study. Offeror's will be required to supply copies of all permits.

C. Short Introduction and Summary

Provide a concise summary of your proposal addressing all evaluation criteria as follows:

1. Technical Approach to the Treatment Process

This section shall include a detailed presentation of the proposed treatment process and the equipment to be used in the tests. Statements made by the Offeror regarding the efficiency of the treatment process, waste loadings, and scaling factors must be supported by sound engineering calculations or results of past experience treating similar types of waste. Address the issues of how reliability and maintainability of the process will be demonstrated for the testing.

2. Past Performance

This section shall include a description of the Offeror's past accomplishments and experience in the waste treatment area, specifically elemental mercury and mercury-contaminated wastes. Focus shall be placed on past experience (including experimental results) in utilizing the proposed process in treating wastes similar to that described in the SOW.

3. Schedule

This section shall include the proposed schedule adequately detailing and identifying work elements from subcontract receipt through completion of all tasks

in the SOW. The requested completion schedules for the tasks are depicted in the SOW. The performance requirements, as outlined in the SOW, must be strictly adhered to and positive proof of the ability to perform to the standards must be submitted with the proposal.

4. BUSINESS PROPOSAL

A. Cost or Pricing Data

You must include in this section a completed "Contract Pricing Proposal Cover Sheet (Standard Form 1411) and Contract Pricing Proposal (Form UCN-4638A)" or your own cost pricing proposal form with supporting cost. The form must contain a complete breakdown of the cost to perform the work proposed; including, at a minimum, the number of hours and total cost for each separate direct labor category proposed. Direct materials, travel and subsistence, and other direct costs also must be detailed, together with all indirect costs.

B. Other Information

This section of your proposal shall contain all information as listed below. Information should appear in the order as it appears below:

1. Any exceptions that you take to the provisions of the attached draft subcontract.
2. A completed, signed copy of the form entitled "Representations and Certifications.
3. A completed, signed copy of the form entitled "Exhibit 2 – Representations of Limited Rights Data and Restricted Computer Software.
4. If applicable, completed copy of Exhibit 2D, "Refund of Royalties", (3/95)

5. RESTRICTION ON DISCLOSURE AND USE OF DATA

If your proposal contains data that you do not want disclosed to the public or used by the Company or the Government except for evaluation purposes, you must –

(1) Mark the title page with the following legend:

The proposal contains data that shall not be disclosed outside the Company or the Government 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 subcontract is awarded as a result of or in connection with the submission of these data, the Company and the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting subcontract. This restriction does not limit the Company's or the Government's right to use data obtained from another source without restriction. The data subject to the restriction are contained in pages [*insert numbers or other identification of pages*];

(2) Mark each page containing data that you wish to restrict with the following legend:

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

A. The Government may need to acquire unlimited rights in technical data (but not commercial or financial information) in a proposal upon which a subcontract award is based. However, before such unlimited rights are acquired, the proposer will be afforded the opportunity either –

(1) To advise that the technical data, or identified portions thereof, are covered by any restrictive notice regarding the disclosure and use of proposal information authorized by FAR subparts 15.2 or 15.6 (or any agency supplement thereto), and request that such protection be maintained by excluding the data from the Government's rights; or

(2) To establish that identified portions of the technical data do not relate directly to or will not be used in the work to be performed under the subcontract and request that such portions be excluded from the Government's rights.

A. Unlimited rights to clause in (D) below. Technical data in successful proposals are acquired by use of the Excluded technical data are identified by inserting appropriate proposal page numbers in the clause.

B. The following clause (Ref.: FAR 52.227-23) shall be included in any subcontract awarded based on consideration of a technical proposal:

Rights to Proposal Data (Technical)

Except for data contained on pages _____, it is agreed that as a condition of the award of this subcontract and notwithstanding the conditions of any notice appearing thereon, the Government shall have unlimited rights (as defined in the Technical Data clause contained in this subcontract) in and to the technical data contained in the proposal dated _____, upon which this subcontract is based.

6. PROPOSAL EXPENSES AND PRECONTRACT COSTS

This RFP does not commit us to pay for any costs incurred in the preparation and submission of a proposal or for any other costs incurred before the execution of a subcontract.

7. CLAUSES

The following clauses shall be included in any resulting subcontract:

INDEMNIFICATION

Seller agrees to indemnify, save harmless and defend the Company, from and against any and all liabilities, claims, penalties, forfeitures, suits and the costs and expenses incident thereto (including costs of defense, settlement and reasonable attorneys' fees), which it may hereafter incur, become responsible for or pay out as a result of death or bodily injuries to any person, destruction or damage to any property, contamination of or adverse effects on the environment, or any violation of governmental laws, regulations or orders, caused, in whole or in part, by (i)

Seller's breach of any term or provision of this Agreement or (ii) any negligent or willful act or omission of the Seller, its employees or subcontractors in the performance of this Agreement.

Seller further agrees to indemnify, save harmless and defend the Company from and against any and all liabilities, claims, penalties, forfeitures, suits, and the costs and expenses incident thereto (including costs of defense, settlement, and reasonable attorney's fees)[hereinafter collectively referred to as "liabilities"] which it may incur, become responsible for or pay out as a result of releases or threatened release of hazardous substances, contaminants and pollutants (as defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended), which occur at a facility owned or operated by the Seller or a subcontractor of the Seller or during transportation or disposal arranged by the Seller or a subcontractor. This agreement applies to all liabilities arising under any federal or state law relating to the management and remediation of hazardous substances, pollutants and contaminants, including but not limited to, liabilities for remediation, personal injury, property damage, or natural resources damages, which are predicated upon fault or upon strict liability.

INSURANCE

1. Seller will be responsible for, and assumes all liability for, loss or destruction, of or physical Evaluation criteria and technical proposal instructions for this RFP are attached. Damage to, all vehicles, equipment, and containers owned or leased by Seller or any subcontractor and all personal property of employees of Seller or of any subcontractor unless such loss or damage was caused by the negligence of the Company or any of its employees or agents.

2. Seller will insure, or cause to be insured, each and every workman employed in the performance of the work, the compensation provided for in and by each and every statute applicable thereto with respect to Workers' Compensation and Employers' liability, and will procure and maintain until termination of this subcontract the following insurance in not less than the following amounts with reputable and financially responsible insurance companies:

    a. Seller's public liability insurance properly safeguarding Seller against liability for injuries to persons, including injuries resulting in death and damage to or destruction of property, in no less than the following amounts: $500,000 for injuries to one person and $1,000,000 for injuries to two or more persons in any one accident; and $500,000 for damage to or destruction of property in any one accident.

    b. Contractual liability insurance properly safeguarding Seller against liability assumed by Seller for injuries to persons including injuries resulting in death, in amounts of not less than $500,000 for injuries to one person and $1,000,000 for injuries to two or more persons, in any one accident; and $500,000 for damage to or destruction of property in any accident.

    c. Automobile liability insurance properly safeguarding Seller against liability for injuries to persons, including injuries resulting in death and damage to or destruction of property, arising out of the ownership, maintenance or use of automobiles in not less than the following amounts:

        $500,000 for injuries to one person and $1,000,000 for injuries to two or more persons, in any one accident; and $500,000 for damage to or destruction of property in any one

accident.

d. If any portion of the work is subcontracted, Seller's protective liability insurance properly safeguarding Seller against claims for injuries to persons, including injuries resulting in death, and damage to or destruction of property, in not less than the following amounts: $500,000 for injuries to one person and $1,000,000 for injuries to two or more persons, in any one accident; and $500,000 for damage to or destruction of property in any one accident.

e. Before commencing work under this Subcontract, the Seller shall certify to the Company, in writing, that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective: (1) for such period as the laws of the State in which this Subcontract is to be performed prescribe, or (2) until 30 days after the insurer or the Seller gives written notice to the Company, whichever period is longer.

f. The Seller shall insert the substance of this clause, including this paragraph (f), in subcontracts under this Subcontract that require work on a Government installation and shall require subcontractors to provide and maintain the insurance required in paragraph (a-d) above. At lease five (5) days before entry of each subcontractor's personnel on the Government installation, the Seller shall furnish (or ensure that there has been furnished) to the Company a current certificate of insurance, meeting the requirements of paragraph (b) above, for each such subcontractor.

8. ACKNOWLEDGMENT OF AMENDMENTS

If we amend this RFP, you must acknowledge receipt of the amendments (by number and date) in your proposal.

Very truly yours,

Karen Bradley
Subcontract Administrator
ORNL Procurement

DRAFT SUBCONTRACT NO. _____

DRAFT SUBCONTRACT between **UT-BATTELLE, LLC** (the "Company") and _____ (the "Seller").

This Subcontract is entered into by the Company acting under its Prime Contract No. DE-AC05-00or22725 with the United States Department of Energy (DOE).

ARTICLE I. SCHEDULE

A. Statement of Work

The Seller hereby undertakes and agrees to furnish personnel, facilities, equipment, materials, supplies, and services (except such as are furnished by the Company) necessary to provide support as described in the Statement of Work dated January 16, 2001, as follows:

DEMONSTRATION OF THE STABILIZATION PROCESS FOR TREATMENT OF MERCURY SLUDGE WASTES CONTAINING > 260 PPM MERCURY

INTRODUCTION

The Environmental Protection Agency's (EPA) Land Disposal Restrictions (LDR) program currently has technology-specific treatment standards for hazardous wastes containing greater than or equal to 260 ppm total mercury (Hg) (i.e. high Hg subcategory wastes). The treatment standards specify RMERC for high Hg subcategory wastes and IMERC if the high Hg subcategory wastes contain organics. RMERC requires retorting or roasting in a thermal processing unit, while IMERC specifies incineration. Both of these standards are based on the premise of recovering the Hg for recycle. In the case of radioactively-contaminated Hg, when the Hg is recovered, it is typically still radioactive and therefore can not be recycled. EPA requires that this recovered radioactively contaminated Hg undergo additional treatment, specifically amalgamation, prior to disposal. The Department of Energy (DOE) TRU and Mixed Waste Focus Area (TMFA) and the Mercury Working Group (HgWG) chartered under the TMFA are working with EPA to validate technologies that can directly treat radioactively contaminated high Hg subcategory wastes without removing the mercury from the waste.

To date under this program a waste soil from Brookhaven National Laboratory (BNL) containing approximately 4,800 ppm of Hg and radioactive contaminants has been successfully treated by several different vendors to meet a Hg Toxic Characteristic Leaching Procedure (TCLP) treatment goal of 0.025 mg/l or less. These treated waste forms are now undergoing additional evaluations using new analytical protocols, developed by Dr. David Kosson of Vanderbilt University. The data generated will be compared to the standard TCLP results. These new protocols provide another methodology to determine how the treated waste form will behave in a variety of disposal environments.

To supplement the data on treatment of soils EPA needs additional data for stabilization of high Hg subcategory waste sludges. The data gathered from the demonstration of treatment of this sludge should then provide EPA with enough information to support a revision to allow stabilization of all high Hg subcategory wastes.

As in the demonstration on the BNL soils referenced above, this effort will also have two major objectives. The first objective is to evaluate alternative processes to RMERC and IMERC for DOE's legacy mixed waste. To that end, the processes will treat a high Hg subcategory surrogate waste to meet a TCLP treatment goal of 0.025 mg/l or less. A non-radioactive surrogate waste sludge has been selected to eliminate the added cost and requirements for handling, treatment, and disposal of an actual radioactive mixed waste. The surrogate sludge will contain five different forms of mercury including elemental. The second objective is to provide EPA with the treated waste forms which EPA will test to again compare proposed new analytical protocols to the standard TCLP results. These comparisons will be used by EPA in their efforts to revise the LDR treatment standards for Hg-bearing hazardous wastes. Technology vendors will participate in this demonstration at their expense except for the analytical costs incurred from the use of an outside laboratory to perform the surrogate waste characterization, TCLP testing on the treated waste forms and the costs of shipping the treated waste forms to the University of Cincinnati (UC) where the new protocol testing will be performed and to Oak Ridge National Laboratory (ORNL) where vapor pressure testing will occur. UC will provide the raw materials and the protocols to make up the surrogate waste. All testing data from the study will be shared with the vendors.

For the demonstration the seller will make up and process two 100 lb batches of the same formulation surrogate waste. The seller shall perform all chemical, physical, and engineering analyses, as well as any preliminary treatability studies in addition to the final demonstration on each batch that the seller deems necessary to ensure the successful demonstration of the seller's stabilization process to achieve the performance targets established. Upon completion of the testing the seller shall prepare a report documenting the methods and results of this work.

Multiple contracts will be awarded up to the available funding. The available funding will pay for the raw materials, shipment of the raw materials to the various treatment vendors, analytical costs for waste characterization and the final waste forms at an outside laboratory, and shipment of these treated waste forms from the treatment facilities to UC and ORNL.

WASTE DESCRIPTION

The surrogate waste to be tested, as described by this SOW, is a surrogate sludge containing approximately 5,000 ppm of various mercury species. The composition of the mercury surrogate is:

PARAMETER	Weight Percentage %	Mercury Concentration ppm
Mercury Chloride	0.1	1,000
Mercury Nitrate	0.1	1,000
Mercury Oxide	0.1	1,000
Mercury Elemental	0.15	1,500
Phenyl Mercury (organic)	0.05	500
Diatomaceous Earth	20	
Aluminum Hydroxide	10	
Ferric Chloride	10	
Sodium Chloride	10	

Motor Oil	1	
Water	48.5	
Total	**100**	**5000**

FINAL WASTE FORM SAMPLING & ANALYSIS FOR WASTE FORM EVALUATION

In a cooperative effort with the EPA, several additional analytical protocols are to be run on the untreated and treated surrogate waste. These protocols will be run by the University of Cincinnati on both the untreated and treated surrogate waste. The seller will be required to take the samples from the treated waste for each run, package them, and ship them to the University of Cincinnati. The data generated will then provide EPA with a comparison of the TCLP results to these protocols to help in their efforts to rewrite the mercury-related RCRA regulations to make them more environmentally sound. The analyses to be run on the untreated and treated wastes are to help EPA develop a framework for evaluation of contaminant leaching that should:

- provide a conservative but more realistic estimate of mercury leaching.
- use testing approaches that can be carried out using standard laboratory practices in a reasonable time frame.
- provide release limits and estimates that consider site-specific conditions;
- encourage improvements in waste management practices (assuming that the TCLP results are, at times, misleading); and,
- provide flexibility to allow level of evaluation (and, hence, degree of over conservatism) to be based on the user's requirements.

The following intrinsic waste characteristics will be used to estimate the mercury release for the scenario outlined above:

Samples of successfully stabilized surrogate (TCLP < .025 ppm) will be characterized and leached by ALTER Corporation at the University of Cincinnati's ALTER facility. The following testing will provide information on the characteristics and stability of the stabilized surrogate.

Characterization testing will consist of bulk density, moisture content, percent organic matter, cation exchange capacity and particle size distribution.

Leach testing will consist of multiple TCLP extractions followed by pH based leaching. The pH based leaching will provide data on the leachability of the stabilized surrogate at pH 2, 4, 6, 8, 10 and 12. Acidity/alkalinity will also be determined.

Only the TCLP data will be assessed as deviation from a standard value (.025 ppm), all other data will be reported with the intent of providing information on the applicability of stabilization as a treatment for mercury wastes.

Mercury vapor pressure testing will also be performed on the seller's final treated waste. Therefore the seller will be required to take the samples from the treated waste for all runs on each waste stream, package and then ship them to Oak Ridge National Laboratory for this testing.

PERFORMANCE GOAL

The performance goal for treatment by stabilization for both batches of the surrogate waste sludge is to meet the Universal Treatment Standards (UTS) for the category of "Mercury-All Other" wastes and the Land Disposal Restriction (LDR). **That mercury standard is 0.025 mg/L TCLP**. Mercury analysis is defined in 40 CFR Part 261, Appendix II. The detection limit for this analysis should be a minimum of 0.0002 mg/l Hg. The vendors' waste form must meet the performance goal in order to have that waste form tested and evaluated at the University of Cincinnati using the new protocols and at ORNL for the vapor pressure.

OTHER FUNCTIONAL PERFORMANCE REQUIREMENTS

The seller process must also be able to perform to the following standards:

1. The mercury stabilization process shall stabilize mercury containing wastes without removing the mercury from the waste matrix; processes that involve separating the mercury from the waste matrix followed by amalgamation are not within the scope of the demonstration.

2 The mercury stabilization process must stabilize all forms of mercury including organic and halogenated mercury compounds, elemental mercury, mercury oxides, and mercury nitrates.

3 The mercury stabilization process should minimize secondary wastes. The waste volume increase of the final waste form due to the stabilization process should also be minimized .

4 During the stabilization process demonstration, a chemical reaction may result that increases the temperature and releases undesired off-gases. If this is the case, the demonstration must include control technology to ensure waste integrity and contain both mercury and organic emissions.

5 The stabilization process is to accomplish mercury stabilization within the boundaries of worker and public exposure limits as required by OSHA and local radiation control requirements. The process shall be developed to ensure worker exposure to mercury vapors is below 0.05 g/m^3

QUALITY ASSURANCE (QA)

Before beginning any work, the seller will submit to the company a QA Plan for approval that complies with the intent of DOE order 414.1A (can be seen or downloaded at website www.explorer.doe.gov). The plan shall represent the seller's approach to ensuring that quality data are generated from all analyzes, performed. The plan shall contain the following provisions as a minimum; however, they may be presented in any order that the seller desires:

1. Organization and Personnel. The roles, responsibilities, and authorities of key laboratory personnel are described. All management personnel responsible for performing analytical work will be listed, along with their job assignments and years of experience in performing applicable work.

2. Personnel Training. The plan will address how personnel are trained in laboratory analytical methods, quality control/QA procedures, and safety policies. Frequency of training and training records will be addressed.

3. Sample Practices. This section will include procedures for the tracking of samples through the laboratory, receipt of samples, verification of preservation, log-in of samples, and chain of custody documentation. Sample storage and disposal will also be included, along with preparation of sample bottles and glassware cleaning.

4. Material Procurement and Control. This section will include a description of procedures for purchasing materials, quality inspection before use in sample analysis, chemical standard inventory procedures, solvent storage policies, and laboratory waste disposal.

5. Facilities and Equipment. This section will include a list of basic types of equipment, and general description of the facility to ensure that the laboratory is large enough to handle the sample load expected and that the equipment is capable of performing the required analyses.

6. Analytical Procedures. This section will contain a list of procedures the laboratory offers (by method number and matrix), and will ensure that controlled copies of analytical procedures and Standard Operating Procedures are available to the analysts. This will also address approvals and changes to the procedures.

7. Calibration. This section will include calibration procedures by instrument type. Calibration frequency, reference standards, calibration acceptance criteria, and calibration documentation procedures must be addressed. Procedures must be defined for ensuring that balances, refrigerators, and ovens are accurate and that their performances are monitored and documented.

8. Limits of Detection. This section will delineate procedures for determining limits of detection, and the frequency of detection-limit verification will be outlined.

9. Analysis of Samples and Documentation. This section will summarize procedures and documentation to be used in the day-to-day operation. Emphasis shall be on the following:

    - Analysis of field, method, and reagent blanks.
    - Analysis of duplicates, spiked samples, spiked laboratory blanks, and reference or control standards, such as EPA check standards.
    - Criteria used to establish warning and action limits for the above types of samples.
    - Documentation and examples of control data and control charts.
    - Frequency of blanks and other samples, including laboratory control sample.
    - How data from samples are reported and reviewed.
    - How requirements of the minimum control program will be met.
    - Verification of calibration.

10. Corrective Action. This section will define types of nonconforming occurrences, how these occurrences are documented, and who is responsible for correction and documentation.

11. Documents and QA Records Control. This section will provide the controls necessary for all data packages, calibration records, and other QA-related records until transmittal to the Company. Procedures will provide instructions for recording, storage, and document control to include tracking and retrieval.

12. Data Evaluation. This section provides instructions for data evaluation for each analytical method, as well as for an entire data set. The process for data review and approval will be outlined. Data qualification and flagging procedures will be implemented.
13. Holding Times and Preservatives. This section will include instructions for holding times and for ensuring sample analysis procedures are met.

14. Internal Audits. The frequency and method of documentation for self assessments by the seller will be provided in this section.

15. Independent Assessment. The seller shall afford access to the company at all tiers to the seller's facilities and records for inspection or audit by the company, a designated representative, or other parties authorized by the company.

SELLER'S RESPONSIBILITIES:

The Seller is responsible for complying with all applicable laws and regulations.

Task 1. Plans and Permits

The seller shall be responsible for and obtain all necessary regulatory (local, state, and federal) permits and licenses as appropriate to perform this study. The seller shall furnish copies of all permits to the Company to demonstrate compliance. The seller shall also prepare or have already existing plans for addressing the following:

1. Project work
2. Health and safety
3. Waste management
4. QA
5. Sampling and analysis
6. Compliance with 40 CFR 260 etal.

All of these plans may be incorporated into one overall test plan that addresses each of these topics.

All these plans must be submitted to the company and approved in writing by the company before initiation of the following tasks.

The waste management plan must include the name and address of the site where the seller plans to dispose of the material if it does not meet the treatment standard.

The safety and health plan must demonstrate the methods used to ensure the safety and health of vendor employees, ensure employee understanding of hazards and controls, and methods to ensure compliance with occupational safety and health requirements. At a minimum, safety and health plans should provide information regarding:

1. The vendor safety and health policy statement
2. Safety and health training requirements for personnel engaged in hazardous operations
3. Hazard identification and communication methods
4. Appropriate controls for hazardous operations, including monitoring, engineering controls and use of personal protective equipment

The project work plan must delineate how the seller will address the issues surrounding the stabilization of sludges containing > 260 ppm of mercury. These include, but may not be limited to:

1. Required pretreatment mechanisms, times, throughput, waste loadings, costs, and wastes generated during the process(es).

2. A thorough description of the processes to be used and the range of variables considered by the seller to be important to the successful operation of the process. These could include the waste loading, the amounts of treatment agents and other necessary ingredients, and the speeds and residence times for each step in the process.

3. In addition to the operational parameters mentioned in No. 2 above, the seller shall identify the

specific processing limits, if any, associated with possible co-contaminants. The seller shall provide the test results to support these limits.

All work performed by the seller, within the scope of the contract for this demonstration, shall be performed in accordance with these approved plans and appropriate permits and licenses.

Approval of Plans

The Company will review the plans. If these are found to be acceptable, the seller will be given written instruction by the Company to proceed.

Task 2. Surrogate Waste Preparation

The seller shall prepare the surrogate waste by mixing the individual constituents as provided by the Company. UC will provide and ship all needed raw materials to the seller's specified facility for makeup of the surrogate. The seller shall provide the mixing procedure as part of their project plan which must be approved by the Company prior to the seller making up of the surrogate.

Task 3. Waste Characterization

The seller shall characterize the waste surrogate to establish/confirm the baseline for assessing treatment performance. The seller shall do any other characterization deemed necessary to facilitate the determination of their operating conditions and to optimize their process. The seller shall include in their proposal a table that describes all the analyses to be performed by an outside laboratory, the corresponding reference procedure for each analysis it is proposing, and the cost. The seller shall also take samples of the raw surrogate and ship them to the University of Cincinnati. The Company is responsible for all analytical costs by an outside laboratory and the shipping costs incurred under this task.

Task 4. Equipment Cleanliness

Before conducting any testing, the seller shall survey the equipment to be used for the study to ensure that it is not contaminated with any radioactive or hazardous materials such that the proposed equipment would not contaminate the mercury waste as the demonstration is conducted. The seller will document to the Company that the equipment is free of any contamination.

Task 5. Pilot-Scale and/or Full-Scale Experiments

The seller shall conduct pilot-scale and/or full-scale experiments using its stabilization process equipment including all unit operations required on the full-scale system to meet regulatory requirements and to produce a waste form that meets the treatment goals. The seller shall determine the significant process variables and their ranges and shall determine the optimum set of conditions for achieving the treatment goals.

Task 6. Analysis of the Final Waste Forms

After completion of task 5, the seller shall send samples of the waste forms from both batches of the final test runs to an outside laboratory that complies with EPA's current edition standard SW846 for TCLP analysis. The Company is also responsible for all analytical costs by an outside laboratory incurred under this task.

Task 7. Sampling, Packaging and Shipment of Final Waste Form Samples

If the final test run treated waste forms have met the treatment goal based on the results under task 6, the Seller will package and ship the entire volume of treated waste for both batches as follows:

Sample Volume	Ship to
Approximately 1liter	Oak Ridge National laboratory Oak Ridge, TN
Remainder*	University of Cincinnati Cincinnati, Ohio

* If desired, the seller may keep an archive sample

The Company is responsible for the shipment costs.

If the waste forms do not meet the treatment standard, it will be the responsibility of the seller to dispose of the material. Seller must include in their waste management plan the name and address where they plan to dispose of the material.

Task 8. Final Report

The seller shall prepare and submit to the company 5 copies and an electronic file of a detailed report including a description of the materials and methods, a discussion of results and recommendations for application of the technology/process for full-scale operation. The report shall address, at a minimum, the following:

1. Process description and history.

2. Pre-experimentation computations and analysis.

3. Experimental materials and methods, including:

    - Description of the apparatus and procedures.
    - The statistical design for the experiment.
    - The number of test runs conducted and the conditions for each run.
    - The number of samples taken in each run and the size of the samples.
    - Sampling and analytical procedures, including the QA procedures to ensure validity of the results.
    - Statistical approach to data analysis.

4. Experimental results, including:

    - All individual data and summaries thereof.
    - Statistical analysis of the data.
    - All QA data and documentation.
    - Waste loading and the conditions for which that waste loading should be valid.

- Change in volume of the treated waste.
- Types and amounts of secondary wastes generated during the studies and the anticipated generation rates for full-scale.
- The mass balance on the system.
- The anticipated operating conditions and throughput.
- The duty cycle, reliability, and maintainability of the integrated system as well as the individual components.

I. Discussion of the results.

7. A life-cycle cost analysis of the proposed full-scale treatment facility. The analysis should include, at a minimum:

   - operating costs
   - capital costs
   - disposal costs
   - transportation costs
   - material costs

8. Conclusions and recommendations. Regarding the design basis for scale-up to a full-scale system if the system is not already at full-scale, a flow sheet of the system, including all unit operations such as sizing, process conditions, material balances, and projected capital and operating costs to treat the waste, must be provided.

Task 9. Disposal of the materials and waste

After completing the testing, the seller will be responsible for disposal of all materials and waste remaining from the demonstration.

PROPOSED SCHEDULE

The following schedule will be completed by the seller:

Company contract award	0 Weeks
Seller submittal of all plans and evidence of permits (if any needed) to the company	
Company approval of plans	3 weeks[a]
Company shipment of raw materials for surrogate preparation	Within 3 weeks after plan approval[a]
Seller Initiate testing	
Completion of seller demonstration testing	
Seller submittal of the draft final report to the company	
Company comments on draft report	3 weeks after submittal[a]
Seller submittal of final report	

[a]The company must complete these tasks within the specified time, or the schedule will be adjusted accordingly.

B. Progress Reports/Deliverables

The Seller shall submit status reports and deliverables to the Company's Technical Project Officer as specified in the Statement of Work.

C. Period of Performance

The period of performance under this Subcontract shall commence on _____ and expire on _____.

D. Key Personnel

The following are identified as "Key Personnel" and are considered to be essential to the work being performed hereunder:

[Insert Name/Title]

Prior to diverting any of the specified person(s) to other programs, the Seller shall notify the Company reasonably in advance and shall submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on the program. No diversion shall be made without the consent of the Company; provided, that the Company may ratify in writing such diversion and such ratification shall constitute the consent of the Company required by this article. The list of key personnel may be amended from time to time during the course of this subcontract to either add or delete personnel, as appropriate.

ARTICLE II. CONSIDERATION AND PAYMENT

A. Consideration

In consideration of the work to be performed under Article I. A., Statement of Work, the Seller shall be paid the fixed price amount of _____.

B. Terms of Payment

Terms of payment are net 30 days from receipt of invoice.

C. Invoicing

An original invoice shall be submitted to:

UT-Battelle, LLC
Accounts Payable
Post Office Box 2308
Oak Ridge, Tennessee 37831-6436

D. Payment

Payment shall be made upon submission and approval of proper invoice after completion and acceptance by the Company's Technical Project Officer and in accordance with the following Milestone Schedule:

Date	Milestone	Amount
TDB	TBD	TBD

ARTICLE III. CONTENTS OF SUBCONTRACT

The provisions of the following attached articles and documents are made a part of this Subcontract:

A.. General Terms and Conditions Fixed Price (Sep 2000)

B. Exhibit 1B, Patent Rights- Acquisition by the Government (9-97)

C. Exhibit 1C, Patent Rights - Retention by the Seller (Short Form), (3-95)

D. Exhibit 4, Authorization & Consent (4/84)

D. Exhibit 9, Technical Data (7-99)

E. Exhibit 17, Rights to Proposal Data (Technical) (10-91)

THE PARTIES, INTENDING TO BE LEGALLY BOUND, have executed this Subcontract as of the dates set forth below.

THE SELLER **UT-BATTELLE, LLC**

BY: _____	BY: _____
TITLE:_____	TITLE:_____
DATE: _____	DATE: _____