

JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION

Solicitation No.	R09PS34129/R10PS34034	Contract Specialist:	Myra Cordero
Solicitation Title: Development of Desalination Membranes—Separation Systems Technology			

Introduction: As required by Federal Acquisition Regulation 6.303-2, this Justification for Other Than Full and Open Competition (JOTFOC) is prepared to document the facts and rationale justifying the authority cited in Paragraph 4 to negotiate with a sole offeror for the above requirement. This JOTFOC follows the format and contains all the information required under FAR 6.303-2.

1. Identification of Agency, Contracting Activity and Document. U. S. Bureau of Reclamation, Yuma Area Office, Justification for other than Full and Open Competition.

2. Nature and/or Description of Action Being Approved.

Approval to issue contract to Separation Systems Technology (SST), a Small Business, on a sole source basis in accordance with the authority of FAR 6.302-1—Only One Responsible Sources and No Other Supplies or Services Will Satisfy Agency Requirements.

3. Description of the Supplies or Services Required to Meet Agency's Need

The requirement is for procurement of membrane development services, to generate novel membranes (which currently do not exist) to purify water through the process of forward osmosis (FO) and reverse osmosis (RO). These newly-developed membranes will be evaluated for possible use in the Yuma Desalting Plant (YDP).

The purpose of the services being procured is to develop and investigate these novel membranes as part of an integrated operating process. The transaction is unusual for several reasons:

- Over a period of years, the government has invested significant amounts of funding in the research/development of the membranes to be developed, and the processes are close to completion;
- The government and this company co-share a patent application (US 2008/0277333 A1), and have mutual interests in developing this technology;
- No membranes currently on the market provide the required features of the membranes to be developed;
- The primary inventor/developer has extensive technical background and more than 30 years experience in membrane development, thus is near or at retirement age.

The proposed service provider, SST, has been working with membrane development for more than 30 years. The company owner directed the research department for one of the companies that supplied the YDP's original membrane elements, so he is familiar with the YDP operating processes, equipment, and conditions.

4. Statutory Authority Permitting Other Than Full and Open Competition.

The statutory authority for use of other than full and open competition for this transaction is as follows:

- FAR 6.302-1 Only one responsible source and no other supplies or services will satisfy agency requirements (41 U.S.C 253(c)(1)).

5. Statutory Proposed Contractor's Unique Qualifications/Nature of Acquisition Requiring Use of Cited Authority.

The YDP and many other plants around the world utilize RO membranes to purify water. Pressurizing feedwater to force it to diffuse through RO membranes requires large amounts of energy, so much energy that in many places RO seems uneconomical. As part of the YDP's congressionally-mandated research

programs, YAO is funding the development of innovative membranes to reduce energy requirements. Reducing energy requirements will also reduce the costs of operating the Yuma Desalting Plant.

Reclamation and SST have pooled their individual efforts and previously-existing intellectual property (methods, formulae, recipes, equipment, and processes) to formulate new membranes through previous contracts with Government agencies. The research work is a follow-on contract to previous Government contracts with the Army Research Office (Contract DAAD 19-03-C-0042) and Reclamation (Contract 06CR30807) for the development of chlorine-resistant membranes and with DARPA (Contract DAAH01-00-C-R102), Army TARDEC (Contract DAAE 07-02-C-L078), and the Office of Naval Research (Contract N0013-06-C-0403) for the development of hollow-fiber forward osmosis membranes. Projects have progressed to the point that SST and Reclamation are able to generate actual membranes for testing as an integrated part of the respective production processes (i.e., forward osmosis membranes in the FO process, and reverse osmosis membranes in the RO process). Because of the significant Government time (8 years) and money (approximately \$4 million) invested, it is in the Government's best interest to continue with the same source to ensure continuity of efforts towards completing the development of these new desalination membranes.

Developing the membranes will help achieve the need to purify low-quality water using less energy than required by current technology. The FO membranes will serve as the key component in a low-energy, novel desalting process. The process can be used globally-wherever someone wants to purify low-quality water, even in situations where little or no electrical power is available. Also it can replace higher-energy processes that cost more to use and which reduce the amount of energy available for use by others.

The RO membranes under development are low-energy membranes that can resist chlorine degradation. The YDP uses membranes made from cellulose acetate, which tolerate low-levels of chlorine but require more energy to purify water. Membranes most commonly used in treatment plants today are formulated from polyamide materials. Polyamide membranes can purify water using less energy than CA membranes, which generates cost savings. However, commercial polyamide membranes degrade and fail quickly in the presence of chlorine. The membranes under development (chlorine-resistant PA membranes) will replace the existing non-chlorine resistant PA membranes and they may replace the somewhat-chlorine resistant CA membranes.

Creating membranes is a complex, multi-phase project. It involves working with a team that can deliver novel chemical monomers for testing purposes. These many recipes must be studied and tested until you find one or more that is effective, feasible, stable and replicable. It then involves identifying the optimum configuration for the membrane to enable it to purify a required minimum volume of water, while not disintegrating under the required operating pressures or when exposed to various water chemistries. The next step is integrating the membrane into an operating process and exploring ways to modify the process to enable the membrane to purify the maximum quantity of water possible. These types of activities constitute the lion's share of work under this purchase agreement.

Specific services to be provided under this contract include:

- **Developing membrane components** – consisting of developing molecular-scale materials and binding them into organic compounds to be used in both cellulose acetate and polyamide formulations. If raw materials are not readily available, they may need to be synthesized in-house or under contract.
- **Developing membranes** – consisting of developing membrane fabrication methods based on existing methods, or requiring development of novel methods; determining the optimum membrane backing materials, and determining the optimum configuration for the candidate membranes and continue with post-treatment experiments.
- **Integrating the membranes** into the processes and optimizing the process – consisting of testing membrane swatches, testing membrane modules individually and as part of a full-recovery process, and testing various driving solutes for the FO process.

No other source has the required expertise and capabilities developed through work on the previously awarded Government contracts. Award to any other source would result in substantial duplication of cost to the Government that is not expected to be recovered through competition and would create a delay of several years.

6. Efforts Made to Ensure That Offers are Solicited From as Many Potential Sources as Possible.

Pursuant to FAR 5.101(a), a synopsis notice of the contract action (Notice of Intent) was posted to the Federal Business Opportunities (FedBizOpps) website on Wednesday, July 15, 2009, with a due date of July 30, 2009, for any interested parties to respond. Only one email inquiry was received from Mr. David Komoroske (GE Business Development Manager) on Thursday, July 16, 2009. The inquiry from GE resulted in a conference call on Friday, July 17, 2009, between the GE representatives and the Government. GE Representatives: Gary Yeager, Hua Wang, and Joseph Suriano (GE Business Development Manager) Government Representatives: Myra Cordero (Contract Specialist) and Chuck Moody (Technical Representative for this Requirement). The conference call was to discuss the work to be performed and the Governments intent to work with Separation System Technology to further the work that has already been started and is a continuation of efforts in the development of Forward Osmosis Membranes (FO Membranes). GE did acknowledge SSTs' role in the "membrane field" and expressed their interest as GE is also involved with membrane research work. During the conference call, it became apparent that GE at this time was not interested in this particular work as GE realized the amount of SST efforts already invested and the patent SST holds. However, GE did become aware of SST business situations and was interested in working with SST as SST is a small business who once it realizes the "FO membranes" would need assistance in its mass production and perhaps sale of the product. Additionally, Mr. Chuck Moody did convey to them that if they are interested in working with the Bureau of Reclamation for membrane research or testing there are CRADAs which allow for the team work between both parties and can be used for such efforts.

The conference call/discussion did not result in GE submitting a capability statement or proposal documentation for consideration by the Government.

7. Determination of Fair and Reasonable Price.

The Independent Government Cost Estimate (IGCE) has been prepared and received by the Acquisitions Office. This requirement will result in a Cost Reimbursement Contract; Cost plus Fixed Fee. The IGCE for the development of the membranes is \$1,200,000. The IGCE, previous U.S. Army contracts, and DCAA audits will be used to evaluate SST's proposed costs/rates. Additionally, the requirement will be negotiated and a fair and reasonable determination of rates will be made using cost and pricing information to be provided by SST.

8. Market Survey. Not applicable.

9. Additional Supporting Facts for Use of Other Than Full and Open Competition. Not applicable.

10. Listing of Sources Expressing Interest in Acquisition. See No. 6.

11. Action Taken to Remove and Overcome Barriers to Competition.

12. Approvals. The supporting data, which is the responsibility of the Bureau of Reclamation technical personnel forms the basis for this justification, have been certified as complete and accurate by means of the below signature on this document. As required by FAR 6.303-2(a)(12) and 6.304(1), (a) the Contracting Officer certifies that the justification is accurate and complete to the best of her knowledge and belief and (b) the signatures demonstrate the certifications and approvals necessary for this Justification for Other Than Full and Open Competition.

