

Lompoc City Council Agenda Item



City Council Meeting Date: February 16, 2010

TO: Lompoc City Council

FROM: Ronald V. Stassi, Utilities Director

SUBJECT: SCADA SYSTEM UPGRADE - WATER TREATMENT PLANT

Recommendation: That the City Council dispense with public bidding and approve the award of contract for professional services to Merlin CSI to perform professional services to design and modernize the existing Supervisory Control and Data Acquisition (SCADA) system at the Lompoc Water Treatment Plant for a cost not to exceed \$ 537,500, to be funded under Water Utility Account 51200-79615.

Background: SCADA systems are widely used in water, wastewater and electric facilities to assist operators by automating certain operating, trouble shooting and data logging functions. Such is the case in Lompoc where SCADA components of various vintage and manufacture are currently being utilized as a result of the existing Water Division SCADA system, having evolved in piecemeal fashion over the past years. The system now consists of various programmable, logic controllers and other devices that have been cobbled together resulting in a functional but inefficient amalgamation of equipment and interfacings that only minimally integrate older components. Because of this, there is a need for a state-of-the-art SCADA network for operating the City's water treatment, storage and distribution facilities more effectively.

A Capital Improvement Project for upgrading the Water Division's SCADA system was approved during the 2007/2009 budget process and budgeted for an amount of \$653,270. In the fall of 2008, exploratory talks with the Boyle Engineering Corporation Firm (now AECOM USA, Inc.), resulted in estimates that the total cost of the project would likely exceed one million dollars. At that time, the project was put on hold since the staff estimate for the project was found to exceed the authorized funding by approximately 50%. Staff decided to look at other ways to get the project "built and operational" for a cost that was within its approved funding level and considered the possible benefits of working with Merlin CSI, the firm that was designing and building a similar SCADA system for the City's Wastewater Treatment Plant.

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One of the more technical elements of the City's Wastewater Treatment Plant Upgrade Project was the SCADA portion of the project. In January 2009, Merlin CSI was brought in by Smith Electric, the firm that was serving as a subcontractor to Parsons, the prime contractor, to develop and commission the SCADA system for the Lompoc Wastewater Treatment Plant (LWTP) because the system integrator that was originally hired by Smith Electric was unable to successfully perform the work and left the project. A second contractor was brought onto the project but was also unable to successfully perform the assignment. It was at that time that Merlin CSI was contacted to troubleshoot and correct the SCADA problems. Merlin CSI was successful in making the SCADA system operational.

Utilizing Merlin CSI became a logical option to competitive bidding to provide the Water Division with a standardized SCADA network design, as the SCADA system developed by Merlin CSI for the LWTP is to some degree, directly applicable to the Water Treatment Plant. Water Division staff met with Merlin CSI with the objective of learning if the Water Division could take advantage of the "learning curve" that they developed through their work at the LWTP. Based upon that review, staff believes that this "knowledge transfer" will allow Merlin CSI to provide the detailed system engineering, design and software at a significantly reduced cost. This savings has been estimated by staff to be approximately \$250K based upon the transferable components and coding of the Wastewater Treatment SCADA system.

An indication of the approximate expected savings that will occur from sole sourcing this project is that Merlin CSI utilized three software developers over three months, working 50 hours a week, to complete the LWTP SCADA system corrective work. This comes out to 50 hours per week, times 12 weeks, times 3 (number of software developers) totaling 1,800 hours. At an average hourly rate of \$125, this translates into \$225,000. This does not include travel time, fuel, hotel and meal expenses which are estimated to cost an additional \$25,000.

Staff asked a second engineering firm to look over its analysis of potential cost savings. Carollo Engineering confirmed that the operations, alarming, reporting and data management portions of the Wastewater SCADA system can be reused to a large part in the Water Treatment Plant SCADA system. This includes (a) the data acquisition and data logging system programming logic, (b) the data presentation and charting system, (c) the operations reporting system, and (d) the operations data entry system. All of these systems use embedded programming that is not easily reusable without the system's engineer or programmer's knowledge. Of particular importance, the data reporting system developed for the LWTP is also directly applicable to the Water Treatment Plant, as Merlin CSI will be able to use the majority of this software at the Water Treatment Plant.

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An additional benefit is that data that is acquired at the Wastewater and Water Treatment Plants can be shared and integrated. This data sharing will also allow data reports to be developed which include data from both the Wastewater and Water Treatment Plant databases. For example, reports can be provided which show the relationship between effluent water treatment plant flows and influent wastewater treatment plant flows. This may allow wastewater flows to be forecasted and/or water treatment effluent flows to be forecasted. This data sharing capability would be unique to the City of Lompoc. Additionally, both the Water and Wastewater Divisions recently hired SCADA systems specialists for each facility to maintain and repair their respective SCADA systems. These employees provide redundancy for both divisions if compatible SCADA systems are in place as both SCADA System Specialists will be able to learn about how to maintain both systems, thus, permitting either specialist to assist in repairing and maintaining either system as needed, as well as responding to emergency call outs.

There are times when it makes good economic sense to standardize products or services on a sole source/brand basis. Regulations and case law supports these exceptions to competitive bidding. Criteria that may be considered in determining sole source/brand includes, but is not limited to unique features, availability, operational familiarity, part interchangeability, compatibility, programming ease, size limitations, service and support reliability, repair ease and training issues. Lompoc City Code Section 2604.E. Standardization provides for the following: "When supplies, materials, equipment, or services have been uniformly adopted or otherwise standardized, or when an item is designated to match others in use by the City, the purchase is not subject to this Chapter. Justifications for standardizations shall be recorded and maintained as a public record."

A decision to standardize is not a contract with or a commitment to a manufacturer or vendor, but an internal City policy about how to procure certain types of products or services and as such, it may be changed without notice at the wish of the City as conditions change.

Fiscal considerations: Funding for the SCADA system project was included in a City capital lease that the Finance Department entered into for water, electric and some vehicle purchases in 2007. The escrow fund has been accumulating interest since its funding and is available for use.

Attached is a cost estimate for the design and engineering and programming work (\$537,500) and hardware needed for the project (\$127,000). The total cost of the project is now expected to be \$664,500. To date, \$91,920 has been expended on this project from Water Utility Account 51200-79615. The bulk of this has been spent to update the current SCADA programming and SCADA controlling equipment needed for the upgrade project.

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Having a modern SCADA system in place will increase the security and reliability of the City of Lompoc's water resource. In addition, the alarming, monitoring and recording of all water processing equipment, will allow a quicker response time to troubleshoot failing or malfunctioning equipment as well as responding to vandalizing activities and terrorism, thus improving efficiency and effectively protecting the City's water source.

Conclusion: Staff recommends that this work be accomplished by sole sourcing the project to a firm that is familiar with our requirements as a result of having completed a similar task as part of the Lompoc Regional Waste Water Treatment Plant Upgrade Project. City purchasing procedures specify that sole sourcing is permitted for those conditions where the service must exactly match the existing brand of equipment for compatibility and is available from only one vendor.

The Water Division is now in a position to proceed with acquiring and installing an upgraded SCADA system with an estimated total cost in line with the original budgeted amount. Currently, there is not a comprehensive network integrating the City's water treatment, storage and distribution facilities. The SCADA upgrade project will improve system reliability and improve accuracy of water production measurement.

Ronald V. Stassi, Utilities Director

APPROVED FOR SUBMITTAL TO THE CITY COUNCIL:

Laurel M. Barcelona, City Administrator

Attachments:

[Engineering estimate](#)

[Equipment estimate](#)