



## SCOPE OF SERVICES

Solicitation Number: CLMP191

Project Name: Engineering Services for the Albert H. Ullrich WTP Conversion To On-Site Generation Of Sodium Hypochlorite (OSGSH)

---

### **PROJECT FOR:**

CITY OF AUSTIN, AUSTIN WATER, THROUGH ITS CAPITAL CONTRACTING OFFICE

### **PROJECT TITLE:**

Albert H. Ullrich WTP Conversion to On-Site Generation of Sodium Hypochlorite (OSGSH)

### **OBJECTIVES OF THE PROJECT:**

The City of Austin (City) seeks a qualified professional engineering firm (Consultant) to convert the existing chlorine process at the A. H. Ullrich Water Treatment Plant (WTP) to an on-site generation and use of sodium hypochlorite process. Pending available funds, the Consultant shall also provide for the conversion from the existing anhydrous ammonia process to a liquid ammonia sulfate (LAS) process.

### **BACKGROUND:**

The City utilizes surface water resources from impoundments of the Colorado River for its drinking water supply. The City operates three (3) major water treatment plants; Ullrich WTP, Davis WTP and Water Treatment Plant No. 4.

The Ullrich WTP has a firm treatment capacity of 167 million gallons per day (MGD) and utilizes chloramine for disinfection. The chloramine process requires the combined use of a chlorine system and an ammonia system. The chlorine system includes bulk storage of liquid chlorine (Cl<sub>2</sub>), evaporators, chlorinators and an injector water pump feed system that delivers chlorine solution to one of five possible injection points along the raw water pipelines. The ammonia system consists of liquid/gas storage of ammonia (NH<sub>3</sub>), vaporizers, ammoniators and pressure reducing and backpressure valves that maintain feed of ammonia gas to various injection points in the process. As a preventive maintenance measure, the plant also alternates chlorine solution feed to the upflow clarifier (UFC) basins through the lime slurry feed lines in order to prevent lime buildup in these lines.

The chlorine process was replaced in whole as part of the 2003 Ullrich WTP 160 MGD Expansion project and has been in continuous operation since that time. As part of this project, a scrubber system (neutralization with sodium hydroxide) was included as part of the life safety system for the building. Although the City has successfully and safely used chlorine throughout its various treatment facilities for more than 80 years, the City desires to incorporate inherently safer technologies when available and where feasible. Environmental sensitivities, issues associated with the transport, supply and price volatility of liquid chlorine and the recent implementation of OSGSH at Water Treatment Plant No. 4 also led to the decision to

---

implement this change. Furthermore, the City initiated a feasibility study for implementing OSGSH at the Davis and Ullrich Water Treatment Plants. Results of the Ullrich WTP study may be referenced as **Attachment A: Technical Memorandum: "On-Site Generation of Sodium Hypochlorite (OSGSH) Evaluation"**, August 2011 by Carollo Engineers.

### **ANTICIPATED SERVICES:**

The selected Consultant shall develop at a minimum three options and make recommendations. Subsequently, the selected Consultant shall perform design and develop construction documents that shall achieve the option the City has selected. Proposed options shall maximize the repurposing and reuse of existing systems, structures and processes, where practical. The selected firm shall also develop options and make recommendations to convert the existing ammonia system to liquid ammonia sulfate (LAS) as part of the preliminary design phase. Depending on available budget, the City will determine whether to proceed with the proposed LAS improvements in the final design and construction of this project. Flow pacing of the disinfection process with limited to no need for manual operation/interaction in the field or at the top end control system is an additional goal of this project.

### PRELIMINARY PHASE

- Review & utilize the Technical Memorandum: "On-Site Generation of Sodium Hypochlorite (OSGSH) Evaluation", August 2011 by Carollo Engineers, as a basis for preliminary engineering. The selected Consultant shall build on recommendations, provide any additional options related to OSGSH improvements and perform a life-cycle cost analysis for each.
- Develop alternatives for LAS improvements that integrate with proposed sodium hypochlorite improvements and perform a life-cycle cost analysis for each of the alternatives.
- Address demolition and repurposing/modifications of existing chemical processes, systems and structures.
- Identify necessary improvements/modifications to the existing chemical feed and distribution systems for both OSGSH and LAS, including how maintenance of the lime slurry feed lines to the UFC basins will be accommodated.
- Recommendations to be based upon TCEQ requirements, COA and AW standards, record documents, field surveys, geotechnical evaluations (previous geotechnical reports and additional field investigations, as needed), and a hydraulic analysis of the chemical distribution systems.
- Identify field I&C, electrical service, and changes to the plant's top end control system necessary to achieve flow pacing of the disinfection process.
- Codify preliminary engineering efforts into a Draft Preliminary Engineering Report (PER) and incorporate City comments and selected recommendations for design into a Final PER, following the City's review. This Final PER will be used as the basis for design.
- Deliverables
  - Draft PER and Final PER that presents recommended improvements complete with supporting data such as calculations, condition assessment, hydraulic

analysis, monetary and non-monetary evaluations performed for estimated life cycle and construction costs.

#### DESIGN PHASE

- Design the decommissioning and demolition/repurposing plan of the existing chlorine system (including the chlorine scrubber) while maintaining the City's ability to feed disinfectant during the conversion to OSGSH.
- Complete all engineering investigations and analysis required to ensure a fully operating OSGSH system and chemical feed system including design of all civil, structural, mechanical, Electrical and Instrumentation & Controls engineering, security, architectural elements and applicable permitting requirements of the proposed improvements.
- Deliverables:
  - Detailed engineering documents and associated services required for the bidding and construction of the proposed improvements. Engineering documents shall be delivered to the City for review at 30%, 60%, 95% and 100% stages of completion.
  - Design schedule that includes the above noted progress milestones together with anticipated advertise/award and construction timelines.
  - Opinion of Probable Construction Cost with each associated design deliverable (30%, 60%, 95% and 100%) based on the AACE (formerly known as the Association for the Advancement of Cost Engineering) Estimate Classification System, per AACE International.
  - Responsibility Assignment Matrix that fully integrates the responsibilities of the Owner, Engineer, Programmer and Contractor necessary for the complete start-up and commissioning of the proposed improvements.
  - Monthly updates of design schedule and Resource Allocation Plan (RAP), submitted with each payment application.

#### BID PHASE

- Support the City during the Bid, Award and Execution of a construction contract(s) by responding to technical/design questions, issuing addenda, participating in pre-bid meetings and review of contractor bids.

#### CONSTRUCTION PHASE

- Provide construction phase support to the City, to include the processing and review of submittals, requests for information and change orders, attending construction meetings, making periodic site visits to ensure project is constructed in accordance with engineer's design intent, supporting and participating in start-up and commissioning efforts and other construction-related activities, as requested by Owner.
- Deliverables:
  - Monthly construction status reports, submitted with each payment application.

**WARRANTY PHASE**

- Provide support to City, as needed, to evaluate and make engineering recommendations regarding project-related warranty issues.

**PROPOSED PROJECT SCHEDULE:**

The architectural and engineering services are anticipated to last at approximately four and one-half (4½) years: Anticipated schedule is:

- PRELIMINARY PHASE: 6 months
- DESIGN PHASE 10 months
- BID PHASE 6 months
- CONSTRUCTION PHASE 18-24 months
- WARRANTY PHASE 12 months

**PROPOSED PROCUREMENT SCHEDULE**

Pre-Response Meeting - Wednesday, October 28, 2015

Interview, if applicable - Thursday, January 21, 2016

Council Award - March 2016

Contract Execution - June 2016

**COST ESTIMATE:**

Estimated budget for Consultant services for all phases of work is \$2M.

**MAJOR AND OTHER SCOPES OF WORK:**

Below is a list of the major scopes of work that the City has identified for this project. ***\*There must be representation for all major scopes of work listed in the prime's statement of qualifications. The experience of the firms listed to perform the Major Scopes of Work, whether a subconsultant or prime firm, will be evaluated under Consideration Item 6 – Major Scopes of Work – Comparable Project Experience.***

In addition, the City has identified Other Scopes of work that MAY materialize during the course of the project. The City does not guarantee that the scopes listed under Other Scopes of work will materialize on this contract. If the prime consultant intends to enter into a subconsulting agreement on a scope of work not listed below, the prime consultant is required to contact SMBR and request an updated availability list of certified firms in each of the scopes of work for which the prime consultant intends to utilize a subconsultant.

**\* Major Scopes of Work**

Environmental Engineering

Civil Engineering  
 Structural Engineering  
 Electrical Engineering  
 Instrumentation Engineering  
 Controls Engineering

**Other Scopes of Work**

Mechanical Engineering  
 Geotechnical Soils Engineering  
 Architectural Services  
 Scheduling Services  
 Land Surveying Services  
 Cost Estimating Services

**Notes:**

- Construction Inspection and Public Information and Communications are **NOT** a subconsultant opportunity . These services will be performed in-house or under a separate contract, if needed, and will be determined when project assignment is made.
- Participation at the prime or subconsultant level may create a conflict of interest and thus necessitate exclusion from any contracts resulting from the work performed in the design phase.
- If the City determines that a conflict of interest exists at the prime or subconsultant level, the City reserves the right to replace/remove the prime or instruct the prime consultant to remove the subconsultant with the conflict of interest and to instruct the prime consultant to seek a post-award change to the prime consultant’s compliance plan as described in City Code § 2-9B-23. Such substitutions will be dealt with on a case-by-case basis and will be considered for approval by Small and Minority Business Resources (SMBR) in the usual course of business. The City’s decision to remove a prime or subconsultant because of a conflict of interest shall be final.
- For Subproject assignments that include construction activities performed by the CONSULTANT or Subconsultants, workers shall be paid not less than the prevailing wage rates, as referenced in Section 00830.
- A consultant performance evaluation will be performed on all professional services contracts. This evaluation will be conducted at the end of each Preliminary, Design and Construction phase.