



Santa Clara Valley Water District

File No.: 18-1016

Agenda Date: 1/8/2019

Item No.: 5.2.

BOARD AGENDA MEMORANDUM

SUBJECT:

Sole Source Purchase of Electromagnetic Inspections and Acoustic Fiber Optic Monitoring System(s) (AFO System) Installation, and Services for the AFO System(s) Operation, Maintenance, Monitoring, and Reporting, from Pure Technologies U.S. Inc., for the 10-Year Pipeline Inspection and Rehabilitation Program, Project No. 95084002, for a Not-to-Exceed Fee of \$13,880,314.

RECOMMENDATION:

- A. Approve a sole source purchase of equipment and services from Pure Technologies U.S., Inc. (Pure), to provide Electromagnetic Inspection, Acoustic Fiber Optic (AFO) Monitoring System Installation, and AFO System Services for the 10-Year Pipeline Inspection and Rehabilitation Program (Program), Project No. 95084002 for a not-to-exceed amount of \$13,880,314; and
- B. Authorize the CEO to negotiate, execute, and amend purchase order(s) as-needed with Pure Technologies U.S. Inc. for these Electromagnetic Inspections, AFO System installation, and AFO System Services.

SUMMARY:

On January 17, 2018, the Santa Clara Valley Water District (District) commissioned a proactive AFO System, installed by Pure, along 8.7 miles of pre-stressed concrete cylinder pipe (PCCP) within the District-managed Pacheco Conduit. On March 17, 2018, the District expanded its PCCP monitoring with the commissioning of an AFO System, installed by Pure, along 8.0 miles of PCCP within the District's Almaden Valley Pipeline and Santa Teresa Force Main. To date, the District's purchase orders for Pure's AFO system installation and monitoring of the District's PCCP have totaled \$4,479,785.

Staff recommends the Board authorize the CEO to negotiate and execute additional sole source purchase order(s) with Pure to continue supporting the District's 10-Year Pipeline Inspection and Rehabilitation Program with:

- A. Electromagnetic inspections of PCCP and installation of AFO System(s) within the Cross Valley Pipeline, Calero Pipeline, Santa Clara Conduit, Penitencia Delivery Main, and Penitencia Force Main, for a period of five years, for up to \$10,367,190; and
- B. Continuing services for real-time AFO System operations, maintenance, monitoring, and reporting of changes in PCCP conditions identified by AFO System(s) within the District-managed

Pacheco Conduit, Almaden Valley Pipeline, Santa Teresa Force Main, and proposed AFO System expansions, for a period of five years, for up to \$3,513,124.

These efforts support the Board's governance policy and objective E-2.2.1, "Raw water transmission and distribution assets are managed to ensure efficiency and reliability."

Background

On April 15, 2016, the Board held a special meeting to discuss the major pipeline failure on a section of the Santa Clara Conduit that had occurred in August 2015. This conduit forms a portion of the 30-mile federal San Felipe System pipeline, which transports Central Valley Project water from San Luis Reservoir to District facilities. Failure of this section of the pipe highlighted durability issues inherent in the use of PCCP. Subsequent to this meeting, the Board authorized electromagnetic inspection and the installation of AFO Systems within the Pacheco Conduit, Almaden Valley Pipeline, and Santa Teresa Force Main.

Approximately 77 miles of the 145 miles of pipelines and tunnels managed by the District consist of PCCP. District staff analysis of the Santa Clara Conduit pipeline failure provided recommendations to increase frequency of inspections to identify structurally-distressed pipe sections; undertake proactive monitoring of PCCP in the District's pipeline systems; and identified the need for prompt repair of severely distressed pipe sections discovered during previous inspections.

PCCP Inspection and Condition Assessment

Pre-stressed concrete cylinder pipe is composed of a thin steel cylinder embedded in concrete that is reinforced with pre-stressed steel wire. These materials can degrade individually, at various rates, resulting in variable impacts on the structural integrity of the pipe. As the reinforcement wires in PCCP break, pipe strength is reduced and the structural integrity of the pipe is compromised. A pipe section will fail catastrophically when its strength is reduced below the pipe operating pressure because of wire breakage. For this reason, assessment and monitoring of breaks in PCCP reinforcement wire is a critical component to analyzing failure risk and remaining service life of PCCP.

Earlier methods in the industry for assessing the condition of buried PCCP included visual and sound inspection either internally or externally. The number and size of visual cracks and delamination of the concrete help to estimate pipeline sections close to failure. However, the other materials in PCCP can be in a degraded state even when there are no visual cracks or delamination of the concrete.

An electromagnetic method of inspection accesses, in more detail, the condition of the reinforcement wire in buried PCCP. This inspection method can be performed in conjunction with a visual and sounding inspection, either internally or externally. The electromagnetic inspection method provides a direct means to detect the location and number of breaks along the reinforcement wire in PCCP. The information gathered on wire breaks can be used to calculate the structural integrity and remaining service life of the pipe at the time of inspection.

The District began using specialized electromagnetic inspection technology in 2002, in conjunction

with visual and sounding inspection, and has assessed the baseline structural integrity of approximately 62 miles of District-managed PCCP. In terms of procurement, the assessment efforts from 2002 through 2010 utilized a competitive procurement process between two vendors, Pure and Pressure Pipe Inspection Company (PPIC). Pure purchased PPIC in 2010 and since then, the District has relied upon a sole source on-call electromagnetic inspection services agreement with Pure.

Acoustic Fiber Optic (AFO) Monitoring System Provides Real-time Information on Wire Breaks

The results from the electromagnetic inspection provide an assessment and baseline condition of the PCCP at the time of inspection. This information is useful, but does not provide information about the rate of deterioration of the PCCP between inspections for ongoing risk analysis and improved asset management.

AFO System technology enables continuous monitoring, in real-time, of PCCP, to detect acoustic events associated with the location of a wire break in a given PCCP section. Other available technologies use an approach that provides an indication of the general condition of a pipe segment, but not the location and quantity of wire breaks in a pipe section.

Since the beginning of 2018, the District has been using AFO System(s) to proactively monitor the District-managed Pacheco Conduit, Almaden Valley Pipeline, and Santa Teresa Force Main. Staff receives notification and information as soon as an event has been located and classified by Pure's processing team. This information is classified and stored on a web-based management site where more detail on the event can be determined and analyses can be conducted to determine the need for further action, including whether a pipeline shutdown is warranted.

Sole Source Justification

Per Board Policy No. EL-5.2, a purchase of greater than \$50,000 that is completed without a competitive solicitation process is subject to approval by the Board, unless there is an applicable policy exemption. There are no applicable policy exemptions for sole/single source procurements greater than \$50,000; procurements larger than this amount are subject to Board approval. The recommended procurement is estimated to be \$13,880,314.

A sole source determination is necessary for this procurement because the firm utilizes proprietary inspection and monitoring equipment. Pure has developed, patented and/or purchased the proprietary rights for the equipment, methodology and technology required to conduct coordinated electromagnetic inspections and AFO System monitoring of PCCP (see Attachment 1). Patent rights prohibit other firms from utilizing this technology.

The District has conducted background research on companies that possess technology to assess and report on the number of broken wires along a pipe section for PCCP and correlate the broken wires to remaining lifespan of the pipeline. Pure is the only firm capable of conducting these very specialized non-destructive electromagnetic inspections (Remote Field Eddy Current/Transformer Coupling (RFEC/TC) Method), as the firm utilizes propriety electromagnetic inspection and AFO System equipment. Other available technologies use an approach that provides an indication of the

general condition of the pipeline segment, by measuring the deterioration of the pipe wall stiffness, but do not provide a direct location and measure of wire breaks in PCCP. Additionally, Pure's technology is the only American Water Works Association (AWWA) Research Foundation-validated, non-destructive condition assessment technique for evaluating prestressed wire breaks in PCCP.

Next Steps

If the Board approves the recommendations, the District will proceed with negotiating and executing purchase order(s) with Pure to acquire the electromagnetic inspection, AFO System monitoring installation, and AFO System Services.

FINANCIAL IMPACT:

Staff estimates the recommended purchase orders with Pure will cost up to \$13,880,314 over a five-year period. Funding for the first year's work is included in the Fiscal Year 2019 Board-approved Project budget. Projected expenditures for Fiscal Years 2020 thru 2024 will be included in the annual budget process for these fiscal years. Additional detail of the projected schedule of annual encumbrances is provided in Attachment 2.

CEQA:

An Environmental Impact Report (EIR) was prepared by the District, the lead agency under the California Environmental Quality Act (CEQA). In November 2007, the Board certified the Pipeline Maintenance Program (PMP) EIR. The PMP provides for the maintenance of the District's fourteen raw water pipelines and nine treated water pipelines. Potential impacts related to all components of the Project have been evaluated and mitigated in the final EIR. The District and Pure will comply with applicable BMPs and mitigation measures in the final EIR during Program implementation.

ATTACHMENTS:

Attachment 1: Sole Source Letter
Attachment 2: Estimated Schedule of Expenditures
Attachment 3: PowerPoint

UNCLASSIFIED MANAGER:

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