City of Denton

City Hall
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AGENDA INFORMATION SHEET

DEPARTMENT: Water Production

CM/ DCM/ ACM: Mario Canizares, Utilities, 349-8232

DATE: November 13, 2017

SUBJECT

Receive a report, hold a discussion, and provide staff with direction concerning the approval of a Professional Services Agreement for engineering design services relating to the design, bid phase and construction services for the Lake Lewisville Water Treatment Plant Phase II Rehabilitation project which includes the design of a new main electrical control building, drainage improvements, zebra mussels control measures for both Lake Ray Roberts and Lake Lewisville raw water pump stations, and additional upgrades to improve operations of the water treatment plant; providing for the expenditure of funds therefor; and providing an effective date (RFQ 6305 awarded to Freese and Nichols, Inc. in the not-to-exceed amount of $1,529,180).

BACKGROUND

In negotiating the fee for this project, the staff referred to the PSMJ Public Works Benchmark Survey of 2011, a compilation of service fee data from 500 engineering, architectural and environmental firms that serve both public agencies and private-sector owners. Engineering fees for construction projects are frequently negotiated on the basis of a percentage of the estimated construction cost of the project. The CIP budget for this project included an original estimated construction cost of $10,000,000 for Lake Lewisville Phase II rehabilitation and $5,000,000 for Zebra Mussel Control measures (Exhibit 2) and was used as the basis for the original fee negotiations with Freese & Nichols, Inc. for the final design Professional Service Agreements (PSA).

Using PSMJ Benchmark Survey for fee estimation related to construction costs, full basis engineering services (without a full time resident construction manager) for a project of this size, cost and complexity would typically be around 10% of construction cost or approximately $1,500,000. The budget for professional services for Final Design in the capital improvement plan was $1,700,000 including the resident construction manager. Based upon the prior experience and comparison with other projects, staff prepared these budget numbers to reflect current market conditions for engineering fees for a water plant rehabilitation and upgrade project of this size, scope and complexity.

The original proposal from Freese & Nichols, Inc. was submitted to staff in July, 2017 and included all three phase of the project (design, bid and construction service). These fee proposals were based upon the initial draft scope of services prepared by the consultant. The original fee proposal was in the amount of $1,991,000. This fee for basic services through construction was 14.9 % of the consultant's estimated construction cost of $13,300,000. Staff negotiated both the scope of services as well as the consultant's fees and reduced the fee for basic design and construction phase's services from the initial $1,991,000 proposal to $1,529,180 for the revised construction cost of $13,850,800 (which represent 11.0 % of the construction cost of the project).

In 2006, Malcolm Pirnie Inc. was selected to conduct a facility assessment and process selection to upgrade the Lake Lewisville water treatment plant (LLWTP). The Lake Lewisville water plant originally designed in 1957 as a 4 million gallon per day (MGD) facility and subsequently expanded in 1964, 1972, and 1988 to its current capacity of 30 MGD. The consultant conducted a study to determine improvements necessary for LLWTP to comply with applicable regulatory standards (drinking water and codes); achieve consistent system-wide customer water quality goals; upgrade plant components to improve maintainability and operability; and extend the water plant's service life. The LLWTP upgrade preliminary design technical memorandum of 2007 provided the City a plan that meets these stated objectives by including all the required improvements and prioritized them as critical (Group 1), high priority (Group 2), necessary (Group 3) and deferrable until planned (Group 4).

Malcolm Pirnie Inc. (now Arcadis, Inc.) completed the final design for Phase I rehabilitation of the Lake Lewisville water treatment plant in 2010. Construction work started in 2011 and included all items listed in groups 1, 2 & 3 and some of group 4. Phase I rehabilitation included modification of the raw water pump station, flocculation and sedimentation basins, gravity filters including new under drains and granular activated carbon (GAC) filter media. The rehabilitation replaced two (2) ferric sulfate and two (2) caustic bulk storage tanks. The rehabilitation also included the installation of new rapid mix, ozone facilities and low lift pump station, blower building, non-chlorinated backwash pump station and storage tank, caustic mixing facility, chemical storage tanks and feed pumps, wash water equalization basin. The rehabilitation, replaced gas chlorine and ammonia with hypochlorite and liquid ammonium sulfate feed system, and added biological filtration.

The remaining improvement items from the facility assessment report group 4 will be addressed in Phase II rehabilitation of the LLWTP and will include a new motor control center (MCC) as indicated in the 2010 "LLWTP Upgrade Electrical Design Basis Summary" report (Exhibit 2). The existing motor controllers are in poor condition due to age and corrosion, repair parts are becoming more difficult to obtain, cannot meet the Arc Flash requirement due to lack of available room and there is a water line directly above the existing motor controllers which is a violation of the National Electric Code (NEC). The need for a new electrical building is driven by the requirement and recommendations associated with replacing the motor controllers. LLWTP Phase II rehabilitation will include the new electrical building to house the new electrical switch gear and motor control center (MCC) for the high service pumping equipment. This new building will also include new office spaces, a secured communication building for emergency backup of all Water Production communications and process control software. This project will also replace a number of water meters and valves to improve accuracy and efficiency. This project will address existing chemical to process water mixing issues, replace aging polymer feed equipment, provide drainage improvements around the treated water storage tanks (Clearwells) and Lake Lewisville raw water intake structure & pump building improvements and additional upgrades to improve operations of the water treatment plant.

Zebra Mussels were found in Lake Ray Roberts in July 2012 and within the Lake Ray Roberts Water Treatment Plant (RRWTP) and raw water piping system in 2013. The zebra mussel infestation affected other lakes in North Texas including Lake Lewisville placing the Lake Lewisville raw water intake structure and pipelines in jeopardy in addition to the Lake Ray Roberts facilities. In 2015, Arcadis consulting engineers were selected to perform a study on the zebra mussel issue for both raw water sources and develop zebra mussel management approaches that balance the risk of future infestations with capital spending and potential unintended downstream consequences.

Arcadis Inc. completed the study in September, 2016 and developed a manual for the control, operation and maintenance of Zebra mussels at both raw water intake structures. The control measures in the manual includes modification of the raw water structures and installation of dual chemical feed systems at Lake Lewisville and Lake Ray Roberts. LLWTP phase II rehabilitation will install the chemical feed systems and modify raw water structures as recommended in the Manual for the control, operation and

maintenance of zebra mussels developed by Arcadis, Inc. Construction of zebra mussel control measures were combined with LLWTP Phase II rehabilitation to benefit from the economy of scale of the combined project and avoid construction issues since both projects includes modification of the Lake Lewisville raw water facility.

RFQ INFORMATION

Staff requested informal pre-qualification statement of qualification (SOQ) for the phase II rehabilitation work of Lake Lewisville water treatment plant from nine (9) engineering consulting firms and received requested SOQ from four (4) firms. One of the four (4) consultants later withdrew their proposal.

Formal requests for qualifications (RFQ) were issued to three (3) pre-selected consulting firms with prior experience to provide engineering design and construction administration services for Phase II rehabilitation of the Lake Lewisville water treatment plant (LLWTP) and zebra mussels control measures for both Lake Ray Roberts (RRWTP) and Lake Lewisville (LLWTP) raw water pump stations. Statement of qualifications were received from three (3) firms. The Staff Screening and Selection Committee met May 3, 2017, to evaluate the qualifications. The Committee selected Freese & Nichols, Inc., based on the proposal and selection criteria. Freese & Nichols, Inc. is partnering with Arcadis for their familiarity to the LLWTP Phase I project improvements and the zebra mussel study.

A formalized scope of work was developed by staff and the consultant submitted a proposal with a price quote in the amount $1,991,000. Staff negotiated with Freese and Nichols, Inc. and modified the scope and received a revised fee proposal in the amount of $1,529,180. The PSA will include final design, bid phase services and construction administration services for the LLWTP Phase II rehabilitation and zebra mussel control measures for both Lake Ray Roberts and Lake Lewisville raw water pump stations.

RECOMMENDATION

Staff recommends approval of the Professional Services Agreement between the City of Denton and Freese & Nichols, Inc. in the amount of $1,529,180 for engineering services for Phase II rehabilitation & upgrade of the Lake Lewisville water treatment plant (LLWTP) and zebra mussels control measures for both Lake Ray Roberts and Lake Lewisville raw water pump stations.

ESTIMATED SCHEDULE OF PROJECT

Freese & Nichols, Inc. agrees to complete the services in accordance with the following schedule:

Final Design Phase:	10 months from NTP
Bid Phase:	3 months from completion of the Final Design Phase
Construction Phase (Resident Rep.):	18 months from Contractor NTP

PRIOR ACTION/REVIEW (Council, Boards, Commissions)

January 26, 2015	PUB approval of a "Professional Service Agreement" with Arcadis U.S., Inc. to identify control measures to combat zebra mussels for the Lake Ray Roberts and Lake Lewisville water treatment facilities; authorizing the expenditure of funds in an amount not-to-exceed $148,623.00
February 3, 2015	City Council approval of the "Professional Service Agreement" with Arcadis U.S. Inc. and associated cost of $148,623.00.

FISCAL INFORMATION

A total of $1,000,000 was included in the capital improvement plan for fiscal year 2016 (Exhibit 2) for final design of the lake Lewisville Water Treatment Plant Phase II upgrade project. A total of $500,000 including $200,000 in the capital improvement plan for fiscal year 2015 and $300,000 in fiscal year 2016

were included for the final design of the Lake Ray Roberts zebra mussel control measures. A total of $200,000 in the capital improvement plan for fiscal year 2016 was included for the final design of the Lake Lewisville zebra mussel control measures. The total budget for the engineering service portion of the project is $1,700,000 including final design and resident construction manager.

A cost summary for the Professional Services Agreement (PSA) is detailed below:

Final Design Phase:	$1,028,665
Bid Phase:	$ 59,995
Construction Phase:	$ 440,520
Total Basic Services	$1,529,180

Current revenue reserves will be used to fund the Professional Services Agreement with Freese & Nichols, Inc.

STRATEGIC PLAN RELATIONSHIP

The City of Denton's Strategic Plan is an action-oriented road map that will help the City achieve its vision. The foundation for the plan is the five long-term Key Focus Areas (KFA): Organizational Excellence; Public Infrastructure; Economic Development; Safe, Livable, and Family-Friendly Community; and Sustainability and Environmental Stewardship. While individual items may support multiple KFAs, this specific City Council agenda item contributes most directly to the following KFA and goal:

Related Key Focus Area: **Public Infrastructure**
Related Goal: **2.3 Promote superior utility services and City facilities**

EXHIBITS

1. AIS
2. Screening and Selection Committee Evaluation Report
3. FY 2015, 2016, 2017 and 2018 Detail Sheet
4. Zebra Mussel Control Manual (2016)
5. LLWTP Upgrade Electrical Design Basis Summary (2010)
6. Scope of Work
7. Opinion of Probable Construction Cost (OPCC)
8. Professional Service Agreement (PSA) with Freese & Nichols, Inc.

Respectfully submitted:
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