



Date: September 17, 2019

To: Thomas J. Bonfield, City Manager
Through: W. Bowman Ferguson, Deputy City Manager
From: Donald F. Greeley, Director, Water Management
Subject: 2019 Dam Inspections and Maintenance Services Project - Award of Professional Engineering Services Contract to Schnabel Engineering South, P.C.

Executive Summary

In March of 2019, the Department of Water Management (DWM) issued a Request for Qualifications (RFQ) for Professional Engineering Services for Dam Inspections and Maintenance Services. The project includes annual dam safety inspections, annual updates of Emergency Action Plans (EAPs), and annual updates of Operation and Maintenance (O&M) Plans for Lake Michie Dam and Little River Dam for a period of five years. The project also includes professional services for miscellaneous maintenance of dam and reservoir facilities as detailed below.

The DWM received five Statements of Qualifications (SOQ) on May 9, 2019. The firm Schnabel Engineering South, P.C., was selected based on the qualifications presented. A scope of services and fee have been negotiated for professional services for the project.

Recommendation

To authorize the City Manager to execute a contract with Schnabel Engineering South, P.C., for professional engineering services for Dam Inspections and Maintenance Services at a contract cost of \$729,150;

To establish a contingency fund in the amount of \$73,000; and

To authorize the City Manager to negotiate change orders provided the cost of all change orders does not exceed \$73,000 and the total project cost does not exceed \$802,150.

Background

The DWM operates two source water supply reservoirs controlled by Lake Michie Dam and Little River Dam. Lake Michie Dam was constructed between 1924 and 1927, measures 96 feet in height, and provides approximately 3.6 billion gallons of raw water storage. Little River Dam was constructed between 1984 and 1987, measures 95 feet in height, and provides approximately 4.9 billion gallons of raw water storage. Both dams are classified as large, high hazard structures by North Carolina Dam Safety. Raw water from Lake Michie and Little River Reservoir is delivered to and stored in terminal reservoirs located at the Brown Water Treatment Plant and Williams Water Treatment Plant prior to treatment and distribution to water system customers.

Comprehensive safety inspections must be conducted on the dams at least annually, along with EAP updates to ensure protection of the City's water supply and downstream property owners. O & M Plans must be updated periodically to document new or modified equipment and resultant changes in

operating procedures. Several miscellaneous maintenance concerns have been identified during previous inspections that need to be addressed in order to prevent serious dam safety issues from developing. In addition, professional service assistance is sometimes necessary outside of scheduled inspections or planned maintenance projects in order to address unexpected dam safety concerns that may arise quickly, such as during or immediately following hurricane events.

Professional services to be provided will include the following:

1. Annual Dam Safety Inspections for Lake Michie and Little River Dams: The Consultant will observe, document, and evaluate the conditions of both the concrete and embankment sections of the dams, abutments, spillways, gates, intake structures, outlet structures, and other appurtenances to identify and prioritize potential dam safety, long-term reliability, and/or operation and maintenance issues. This includes analysis of monitoring data collected by the City to evaluate subsurface embankment conditions. Annual inspection reports will be submitted for each dam and the Consultant will present inspection summaries at a meeting for City staff.
2. Annual O & M Manual Updates for Lake Michie and Little River Dams: New equipment and changes in operating procedures will be documented in both hard copy and digital format.
3. Annual EAP Updates for Lake Michie Dam, Little River Dam, Brown Water Treatment Plant Terminal Reservoir, and Williams Water Treatment Plant Terminal Reservoir: The Consultant will review and update notification flow charts and all emergency communication contacts and identify any changes to downstream inundation areas. Consultant will facilitate one tabletop exercise during the five year contract term to serve as refresher training for all emergency responders for potential dam safety events.
4. Rehabilitation Items: Consultant will provide design drawings, specifications, construction cost estimates, bid services, and construction related services to provide corrective action for several maintenance issues identified during previous annual inspections. Projects will include:
 - a. Repairs of cracked spillway pier at Little River Dam
 - b. Replacement of spillway slab sealant at Little River Dam
 - c. Replacement of access hatches on seepage measurement stations at Little River Dam
 - d. Replacement of embankment drain clean out covers and pressure relief drain covers at Little River Dam
 - e. Installation of new debris barriers and safety buoys for the spillways at Lake Michie Dam and Little River Dam

This task will also include professional service assistance that may be necessary outside of scheduled inspections or defined maintenance projects in order to address any unexpected dam safety concerns that may arise quickly, such as during or immediately following hurricane events. The cost for this item is estimated on a time-and-materials basis. If no emergency or unexpected issues arise requiring professional service assistance during the contract term, these funds will not be spent.

5. Gallery Piezometer Cleaning at Lake Michie Dam: Consultant will utilize a subcontractor to flush clogged piezometers (wells used to measure hydraulic pressure within the dam) located inside the drainage gallery tunnel of Lake Michie Dam spillway. Flushing will include treatment with a biodegradable dispersant to inhibit biological growth and prevent future clogging of the piezometers.
6. Spillway Gate Inspections and Repair at Little River Dam:
 - a. Consultant will perform hands-on inspection of spillway Gate 6 using a tripod or rope system for access to damaged seal on bottom of gate. Using information from the hands-on inspections, Consultant will develop repair details, obtain quotes for repair

from qualified specialty contractors, and assist the City with contractor oversight of repair.

- b. Depending on the conditions observed during inspection of Gate 6, additional inspection of the remaining 8 gates may be conducted on a time and materials fee basis at City’s discretion.
- 7. Structure Monitoring Point (SMP) Surveys: Consultant will utilize a Professional Land Surveyor subcontractor to survey thirty-eight (38) structure monitoring points (SMPs) at Little River Dam and four (4) structure monitoring points at Lake Michie Dam. SMPs at Lake Michie Dam will be surveyed once during the five year contract period. Due to recent evidence of embankment settlement, the SMPs at Little River Dam will be surveyed annually over the five year contract period. Surveying will be performed around the same time as annual inspections, and evaluation of results and conclusions will be documented in the annual inspection reports.
- 8. Brown Water Treatment Plant Terminal Reservoir Dredging Investigation: Consultant will utilize a subcontractor to perform a bathymetric survey determine the quantity of residuals that have settled to the bottom of the terminal reservoir and the resulting reduction in storage volume. Residuals sampling and laboratory analysis will be conducted to determine the chemical composition and solids content of residuals. This information will be used to estimate the cost of dredging and develop bid documents for a future dredging project.

Issues and Analysis

The RFQ was advertised in March of 2019. The DWM received five Statements of Qualifications (SOQ) on May 9, 2019 from: Freese and Nichols, GEI Consultants, Hazen and Sawyer, LJB Inc., and Schnabel Engineering. The selection committee was made up of five members from the DWM and one member from the Equity and Inclusion Department. Proposals were evaluated based on the following criteria, as outlined in the RFQ: project approach, qualifications of proposed team, past performance on similar projects, and availability. The committee selected Schnabel Engineering based on their demonstrated expertise with large, high hazard dams in North Carolina and the exemplary level of service provided to the City on past inspections and maintenance projects at both Lake Michie and Little River Dams.

The table below shows the cost breakdown for the professional services tasks described above. All professional services activities are to be performed on a time and materials basis. The total contract price of \$729,150.00 is based on the following assumed distribution of compensation:

Task	Description	Time and Materials Cost
1	Annual Dam Safety Inspections	\$147,050.00
2	Annual O&M Manual Updates	\$88,500.00
3	Annual EAP Updates	\$54,600.00
4	Miscellaneous Rehabilitation Items	\$190,950.00
5	Lake Michie Piezometer Cleaning	\$18,700.00
6	Little River Spillway Gate Inspection/Repair	\$119,350.00
7	SMP Surveys	\$83,400.00
8	Brown Terminal Reservoir Dredging Investigation	\$26,600.00
Total Contract Cost		\$729,150.00

Alternatives

Alternative 1: Do not move forward with the project. This alternative is not recommended. The annual inspection, plan updates, and miscellaneous maintenance tasks described herein are needed in order to

protect the City's source water supply and downstream property owners from potential dam safety issues.

Financial Impact

The required funds are available as follows:

ORG	OBJ	PROJ	AVAILABLE
4100P002	731004	P0516	\$729,150.00
4100P002	731900	P0516	\$73,000.00

UBE Requirements

The goals are MUBE 0% and WUBE 6% goals for this project. This project exceeded the WUBE goal.

Schnabel will subcontract the following:

Firm	ID	City/State	Amount	%of Contract
CH Engineering, PLLC	WUBE	Raleigh, NC	\$74,068	10.2%
Elite Techniques, Inc.	WUBE	Camden, SC	\$9,890	1.4%

WORKFORCE STATISTICS

Total Workforce:

Employment Category	Total Employees	Total Males	Total Females
Project Managers	3	3	0
Professional	32	26	6
Technical	1	1	0
Clerical	4	1	3
Labor	0	0	0
Total	40	31	9

Male:

Employment Category	White	Black	Hispanic	Asian or Pacific Islander	Indian or Alaskan Native	Two or More Races
Project Manager	3	0	0	0	0	0
Professional	22	1	1	2	0	0
Technicians	1	0	0	0	0	0
Clerical	1	0	0	0	0	0

Labor	0	0	0	0	0	0
Total	27	1	1	2	0	0

Female:

Employment Category	White	Black	Hispanic	Asian or Pacific Islander	Indian or Alaskan Native	Two or More Races
Project Manager	0	0	0	0	0	0
Professional	5	0	1	0	0	0
Technicians	0	0	0	0	0	0
Clerical	2	1	0	0	0	0
Labor	0	0	0	0	0	0
Total	7	1	1	0	0	0