

## EXHIBIT 3



Hazen and Sawyer  
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**CITY OF HALLANDALE BEACH**  
**FY 2024-2025-014 Continuing Professional Architectural and Engineering Services and Other Services**

**Discipline: Water Resources/Stormwater/Wastewater**

**HAZEN AND SAWYER**  
**WORK AUTHORIZATION No. 002**

**Optimal Corrosion Control Techniques (OCCT) Study**  
**Scope of Services: January 6, 2026**

*In accordance with, RFP #FY 2024-2025-014 Continuing Professional Architectural and Engineering Services and Other Services, the following scope of services is provided by Hazen and Sawyer (CONSULTANT) as requested by the CITY.*

### **BACKGROUND**

The City of Hallandale Beach (CITY) currently operates a Water Treatment Plant (WTP) consisting of a 10 million gallons per day (mgd) rated lime softening (LS) train and a 6 mgd nanofiltration (NF) facility, comprised of two 3.0 mgd skids, for a total finished water capacity of 16 mgd. The CITY's potable water supply is derived from its Biscayne Aquifer production wells and from Broward County's South Regional Wellfield (SRW). Water from the CITY's wells is treated using lime softening, while the SRW supply is treated via nanofiltration at the CITY's membrane treatment facility.

Per- and polyfluoroalkyl substances (PFAS), including PFOA and PFOS, have been detected in both the CITY's Biscayne Aquifer wells and in raw water received from the County's SRW. PFAS are synthetic compounds used in a variety of industrial and consumer applications due to their resistance to heat, oil, stains, grease, and water. These substances are persistent in the environment and can accumulate in water sources over time. The U.S. Environmental Protection Agency (EPA) has established a maximum contaminant level (MCL) of 4 parts per trillion for certain PFAS compounds, with compliance required by March 2031\* (\*presently 2029, but under proposed revision to 2031).

While nanofiltration (NF) and reverse osmosis (RO) are effective treatment technologies for PFAS removal, lime softening is not effective. Accordingly, the CITY plans to decommission the LS train following the current addition of RO treatment capacity and has committed to transitioning to 100% membrane (NF and RO)-based treatment to meet regulatory requirements.

To support this transition, the CITY has installed one 2.0 mgd RO skid and is commencing a second interim project to connect the City's Biscayne Aquifer wells to RO treatment. The second 2.0 mgd RO skid is currently in design to treat the CITY's Biscayne raw water allocation, nominally 4 mgd. These improvements will enable the phased replacement of lime softening and significantly reduce PFAS concentrations in the finished water.

As lime softening is phased out and alternative water supply sources are developed, the CITY

must evaluate and optimize finished water stabilization and corrosion control strategies to ensure continued water quality and regulatory compliance. This includes reassessing the dosage and storage requirements for sodium hydroxide and corrosion inhibitor chemicals currently in use. A finished water stability and corrosion control study will be conducted alongside the design of the new RO skids and associated interconnecting piping. The CITY will utilize the RO skids as redundant skids, maintaining the current 50% membrane to 50% lime softened blend, until the optimal corrosion control treatment (OCCT) study is complete and the updates to the post-treatment chemicals are complete.

This project is a critical component of the CITY's broader strategy to ensure the continued delivery of high-quality, PFAS-compliant drinking water to its residents and neighboring communities, while also preparing for future water supply challenges and regulatory obligations.

*NOTE: The two new skids were designed as RO skids (instead of NF skids) for flexible future treatment of the Floridan Aquifer, if needed, to meet future capacity demand. A projected shortfall in Biscayne Aquifer supply is anticipated by 2029, requiring the CITY to supplement its supply through alternative water sources (AWS) or bulk purchases of finished water. To address long-term capacity needs, the CITY is planning for either 1) the development of a Floridan Aquifer wellfield OR 2) the purchase of finished water peak demands from a neighboring utility). If Floridan Aquifer is developed, the CITY would then add the 2.0 to 3.0 mgd (RO skid).*

## **SCOPE OF SERVICES**

### **Task 1: Corrosion Control Study for Conversion to 100% Membrane Treatment**

#### **1.1 - Desktop Study**

CONSULTANT will first conduct a desktop study prior to initiating the OCCT. The Desktop Study will involve an analysis of historical data to understand past water quality trends and issues. This analysis will help set water quality goals for the project. CONSULTANT will develop a baseline sampling plan to establish current water quality conditions. The plan will include detailed protocols for sampling locations, frequency, and methods. Six distribution system sampling events will be conducted to gather data on water quality throughout the system, at up to ten locations. This data will be crucial for identifying any existing issues and for comparison with post-startup conditions.

#### **1.2 - Post Startup Water Quality Sampling Plan**

CONSULTANT will conduct a post startup water quality sampling plan (Sampling Plan). The Sampling Plan will outline the procedures for monitoring water quality after the startup of the new system. This Sampling Plan will include specific sampling locations, frequency, and methods to ensure comprehensive coverage of the distribution system. The goal is to detect any changes in water quality that may occur because of the new system's operation. Routine sampling will help identify potential issues early and allow for timely corrective actions. The Sampling Plan will also include protocols for data analysis and reporting to ensure that findings are accurately documented and communicated.

#### **1.3 - Distribution System Materials Scale Analysis**

CONSULTANT will develop a protocol for harvesting pipe samples from the distribution system and identifying suitable sites for sampling. CONSULTANT will assist the City to harvest pipes from four selected sites. The harvested pipes will undergo scale analysis to assess the condition of the materials and identify any corrosion or scaling issues. Coordination and review of the scale analysis will ensure that the findings are accurate and comprehensive. This analysis will provide insights into the impact of the new system on the distribution materials and help inform future maintenance and replacement strategies.

#### **1.4 - Corrosion Control Bench-Scale Testing**

CONSULTANT will develop a Bench-Scale Testing Plan to evaluate the impact of changes in water treatment on the corrosion and release of metals from lead distribution system materials. This testing will involve the use of short metal pipe sections used to simulate the materials found in the distribution system. These coupons will be housed in a flow-through setup that operates on an intermittent flow cycle, mimicking real-world conditions. The testing procedure will include periods of stagnation, during which water remains in contact with the pipe sections for a set period of time. After these stagnation periods, samples will be collected on a weekly basis to measure the rates of metal release and corrosion. This will allow for comparisons between different treatment conditions over time.

Up to six different assessment conditions will be evaluated in this study. These preliminarily include:

- The control (current conditions – 50% membrane and 50% lime softened water),
- 100% membrane-treated water adjusted with sodium hydroxide and orthophosphate-based corrosion inhibitor(s);
- 100% membrane-treated water adjusted with sodium hydroxide and orthophosphate-based corrosion inhibitor(s) with degasifiers turned off to retain additional CO<sub>2</sub>;
- 100% membrane-treated water adjusted with calcium hydroxide and orthophosphate-based corrosion inhibitor(s),
- and 100% membrane-treated water adjusted with calcium hydroxide.

The metal pipe sections used in the testing will be composed of brass and copper with lead solder, to represent leaded materials found in distribution systems. Each type of metal pipe section will be evaluated in triplicate to ensure the reliability and reproducibility of the results. The evaluations will be conducted using the membrane plant permeate water for the testing. The testing and evaluations will continue for a duration of up to six months.

#### **1.5 - Copper Pitting Corrosion Testing**

CONSULTANT will develop a low-maintenance, largely flow through copper pipe loop study designed to evaluate copper pitting corrosion.

CONSULTANT will design and construct the pipe loops using new copper piping, with the objective of assessing the propensity for copper pitting corrosion following the treatment change. Water quality monitoring will be minimal, with corrosion assessments based primarily on periodic internal inspections of the pipe surfaces rather than focused on copper levels in the water following stagnation.

Three recirculating pipe loops will be operated by CONSULTANT under the following conditions:

- Baseline (current) drinking water, including blend with lime softened water
- Membrane permeate with NaOH/CaCl<sub>2</sub> stabilization
- Membrane permeate with CO<sub>2</sub>/Ca(OH)<sub>2</sub> stabilization

Additionally, the impact orthophosphate (with and without Zn) at multiple doses will be considered in testing. Water for the membrane-based loops will be collected from the membrane system. The pipe loops will operate for up to ten months, with weekly water changes and water quality adjustments performed three times per week.

Periodically, CONSULTANT will examine the pipe samples to assess the extent and characteristics of pitting corrosion under each test condition.

## **1.6 - Corrosion Control Study Final Report**

CONSULTANT will produce the OCCT report. The OCCT report will provide documentation of the study's findings, including data analysis, conclusions, and recommendations. This report will be used to size finished water stabilization chemicals and for long-term distribution system management under future work authorizations.

## **ASSUMPTIONS**

Key assumptions concerning this scope are:

- CITY will provide access to all necessary facilities for execution of the work.
- CITY will provide location for construction of pipe loops.
- CITY will provide membrane permeate for testing purposes.
- CITY will provide operator assistance as needed to complete the work.
- City will provide assistance with harvesting of pipe samples

PURSUANT TO SECTION 558.0035, FLORIDA STATUTES, A DESIGN PROFESSIONAL WHO IS AN INDIVIDUAL EMPLOYEE OR AGENT OF CONSULTANT MAY NOT BE HELD INDIVIDUALLY LIABLE FOR NEGLIGENCE OCCURRING WITHIN THE COURSE AND SCOPE OF THIS CONTRACT.

**SCHEDULE OF COMPLETION**

The TM will be delivered within 300 days of receipt of notice to proceed.

**COMPENSATION**

Compensation shall be made to CONSULTANT for a total amount not to exceed Lump Sum of \$413,860 and up to \$80,000 for materials, testing and laboratory analyses for a total not to exceed of \$ 493,860.

Task	Description	Compensation Type	Estimated Fee
Corrosion Control Study			
1	Corrosion Control Study for Conversion to 100% Membrane Treatment	Lump Sum	\$413,860
Direct Expenses			
	Laboratory Testing and Materials Costs	Reimbursables	\$80,000
<b>TOTAL</b>		<b>Lump Sum</b>	<b>\$493,860</b>

**AUTHORIZATION - HAZEN AND SAWYER**



Accepted: Janeen M. Wietgreffe, PE, PMP  
Vice President

January 6, 2026

Date:



EXHIBIT B – HOURLY BILLING RATES

**REQUEST FOR PROPOSALS (RFP) # FY 2024-2025-14  
CONSULTANT COMPETITIVE NEGOTIATION ACT (CCNA) CONTINUING PROFESSIONAL  
ARCHITECTURAL AND ENGINEERING SERVICES AND OTHER SERVICES**

- a. The Project Manager will contact the awarded Firm for the submittal of Exhibit B - Hourly Billing Rates, after the City Commission approves the award of Contract. The awarded Firm must submit Exhibit B – Hourly Billing Rates for Task Orders within five (5) business days of request.**
- b. There is a maximum rate cap of \$325 per hour per individual billing rate.**
- c. Exhibit B will be a part of the awarded Firm’s Agreement and will be utilized for the term of the Agreement by Project Managers when verifying Work Authorization costs and invoices.

Name of Proposing Firm: Hazen and Sawyer

Role/Position		Hourly Billing Rate for Initial 5 Year Term
<b>Architectural Design</b>		
1.1	Principal Architect	\$
1.2	Senior Project Architect	\$
1.3	Construction Cost Estimating	\$
1.4	Project Architect	\$
1.5	CADD Technician	\$
1.6	Administrative Staff	\$
<b>Civil Engineering</b>		
<del>2.1</del>	<del>Associate, Engineering</del>	\$
2.2	Director, Engineering	\$ 325
2.3	Project Manager	\$ 270
2.4	Project Engineer	\$ 240
2.5	Engineer	\$ 190
2.6	Junior Engineer	\$ 160
2.7	Senior CADD Tech Manager	\$ 180
2.8	CADD Technician	\$ 145
2.9	Permit Administrator	\$ 130
<b>Coastal/Marine Engineering</b>		
<del>3.1</del>	<del>Associate, Engineering</del>	\$
3.2	Director, Engineering	\$
3.3	Project Manager	\$
3.4	Project Engineer	\$
3.5	Engineer	\$
3.6	Junior Engineer	\$
3.7	Senior CADD Tech Manager	\$
3.8	CADD Technician	\$
3.9	Permit Administrator	\$
<b>Construction and Project Management / Construction Engineering and Inspection (CEI) Services</b>		
<del>4.1</del>	<del>Associate, Construction</del>	\$
<del>4.2</del>	<del>Construction Management Director</del>	\$
4.3	Construction Manager	\$ 240
4.4	Senior Inspector	\$ 140
4.5	Inspector /CADD Technician	\$ 125
4.6	Construction Coordinator	\$ 120

EXHIBIT B – HOURLY BILLING RATES

<b>Electrical Engineering</b>		
<del>5.1</del>	<del>Associate, Engineering</del>	\$
5.2	Director, Engineering	\$ 325
5.3	Project Manager	\$ 270
5.4	Project Engineer	\$ 240
5.5	Engineer	\$ 190
5.6	Junior Engineer	\$ 160
5.7	Senior CADD Tech Manager	\$ 180
5.8	CADD Technician	\$ 145
5.9	Permit Administrator	\$ 130

<b>Engineering Services</b>		
<del>6.1</del>	<del>Associate, Engineering</del>	\$
6.2	Director, Engineering	\$ 325
6.3	Project Manager	\$ 270
6.4	Project Engineer	\$ 240
6.5	Engineer	\$ 190
6.6	Junior Engineer	\$ 160
6.7	Senior CADD Tech Manager	\$ 180
6.8	CADD Technician	\$ 145
6.9	Permit Administrator	\$ 130

<b>Environmental Engineering</b>		
<del>7.1</del>	<del>Associate, Engineering</del>	\$
7.2	Director, Engineering	\$ 325
7.3	Project Manager	\$ 270
7.4	Project Engineer	\$ 240
7.5	Engineer	\$ 190
7.6	Junior Engineer	\$ 160
7.7	Senior CADD Tech Manager	\$ 180
7.8	CADD Technician	\$ 145
7.9	Permit Administrator	\$ 145

<b>Geotechnical</b>		
<del>8.1</del>	<del>Associate, Engineering</del>	\$
8.2	Engineer	\$
8.3	Driller	\$
8.4	Project Manager	\$
8.5	Project Engineer	\$
8.6	Junior Engineer	\$
8.7	Staff Geologist	\$
8.8	Permit Administrator	\$

<b>Landscape Architecture</b>		
9.1	Associate, Landscape Architect	\$
9.2	Senior, Landscape Architect	\$
9.3	Environmental Administrator	\$
9.4	Environmental Specialist	\$
9.5	Landscape CADD Technician	\$
9.6	Environmental Assistant	\$

EXHIBIT B – HOURLY BILLING RATES

9.7	Landscape Inspector/Arborist	\$
9.8	Landscape Designer	\$
9.9	Landscape Site Plan Reviewer	\$

<b>Material Testing</b>		
10.1	Senior Engineer	\$
10.2	Engineer	\$
10.3	CADD Technician	\$
10.4	Environmental Scientist	\$
10.5	Project Manager	\$
10.6	Testing Technician	\$
10.7	Survey Technician	\$

<b>Mechanical Engineering</b>		
<del>11.1</del>	<del>Associate, Engineering</del>	\$
11.2	Director, Engineering	\$
11.3	Project Manager	\$
11.4	Project Engineer	\$
11.5	Engineer	\$
11.6	Junior Engineer	\$
11.7	Senior CADD Tech Manager	\$
11.8	CADD Technician	\$
11.9	Permit Administrator	\$

<b>Plumbing Engineering</b>		
<del>12.1</del>	<del>Associate, Engineering</del>	\$
12.2	Director, Engineering	\$
12.3	Project Manager	\$
12.4	Project Engineer	\$
12.5	Engineer	\$
12.6	Junior Engineer	\$
12.7	Senior CADD Tech Manager	\$
12.8	CADD Technician	\$
12.9	Permit Administrator	\$

<b>Surveying</b>		
13.1	Associate, Surveying	\$
13.2	Senior Registered Surveyor	\$
13.3	Survey Crew	\$
13.4	Registered Surveyor	\$
13.5	Survey Coordinator	\$
13.6	CADD Technician	\$
13.7	3D Laser Scanner	\$
13.8	Hydrographic Survey Crew	\$
13.9	G.P.S. Survey Crew	\$
13.10	Sub-meter G.P.S.	\$
13.11	Soft Dig (per hole)	\$
13.12	Utility Locates (per hour)	\$

EXHIBIT B – HOURLY BILLING RATES

Transportation / Transit / Traffic Engineering		
14.1	Engineer	\$
14.2	Project Engineer	\$
14.3	Project Manager	\$
14.4	Field Services Technician	\$
14.5	Environmental Specialist	\$
14.6	CADD Technician	\$
14.7	GIS Technician	\$
14.8	Environmental Assistant	\$
14.9	Surveyor	\$
14.10	Construction Manager	\$
14.11	Inspector	\$
14.12	Graphic Designer	\$

Water / Wastewater / Stormwater Engineering		
15.1	Senior Engineer	\$ 270
<del>15.2</del>	<del>Associate Engineer</del>	\$
15.3	Director, Engineer	\$ 325
15.4	Project Manager	\$ 270
15.5	Project Engineer	\$ 240
15.6	Engineer	\$ 190
15.7	Junior Engineer	\$ 160
15.8	Support Specialist	\$ 130
15.9	Permit Administrator	\$ 130
15.10	Inspector	\$ 130

Name of Firm as it appears on Sunbiz: Hazen and Sawyer

Firm's FEI#/EIN#: 13-2904652

Print Name of Authorized Officer of the Firm per Sunbiz: Janeen Wietgreffe, PE, PMP

Print Title of Authorized Officer of the Firm per Sunbiz: Vice President

Signature of Authorized Officer of the Firm per Sunbiz: 

Date: 1/6/2026