



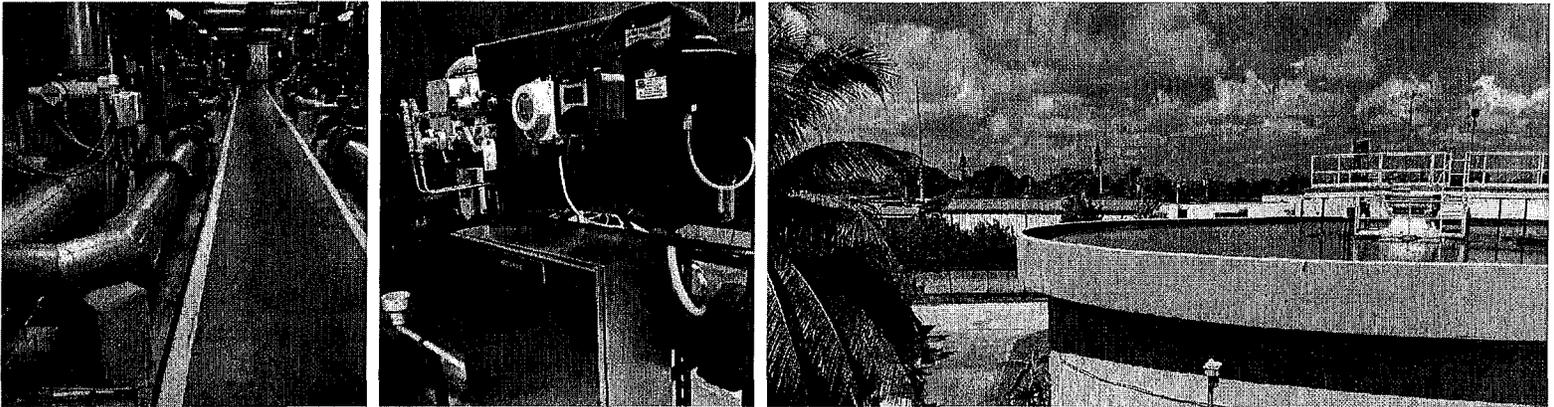
City of Fort Lauderdale

**COPY**

# Granular Activated Carbon Pilot and Plant Evaluation at the Fiveash Water Plant

Solicitation 12191-996 | October 2018

## QUALIFICATIONS



**CDM  
Smith**

CAM 19-0080  
EXHIBIT 5  
Page 1 of 138



621 NW 53<sup>rd</sup> Street, Suite 265  
 Boca Raton, FL 33487  
 tel: 561.571.3800

October 5, 2018

City of Fort Lauderdale, Procurement Services Division  
 Attn: James Hemphill – Asst. Manager Procurement and Contracts  
 100 N. Andrews Avenue, 6<sup>th</sup> Floor  
 Fort Lauderdale, FL 33301

**Subject: Granular Activated Carbon Pilot and Plant Evaluation at the Fiveash Water Plant – Solicitation 12191-996**

Dear Mr. Hemphill and Members of the Selection Committee:

As a trusted service provider, **CDM Smith Inc.** is proud to have served the City of Fort Lauderdale for almost 44 years on a variety of relevant and pertinent infrastructure assignments. The City's decision in seeking professional services for a pilot study and an evaluation of improvement options for your largest water treatment plant, the Charles W. Fiveash Water Treatment Plant (Fiveash WTP), is fully aligned with your **Fast Forward Fort Lauderdale: Our City, Our Vision 2035** where a course has been charted for the future of the City. A structurally sustainable infrastructure is fundamental and essential to safe, efficient, and reliable potable water for current and future generations to come.

Our team is uniquely qualified and positioned to deliver the work effectively and with sound analysis, as evidenced by the following:

**Demonstrated Technical Expertise** – Our team is led by CDM Smith project manager, **Timoth J. O'Neil, PE, BCEE**, a 31-year veteran in the management of local municipal programs very much like this endeavor. Tim has delivered \$48M in Fort Lauderdale community investment plans and fosters a productive work environment and stakeholder engagement with City staff. Together with our leads for the Pilot Study and the Plant Evaluation, **Frank Brinson, PE** and **Jorge M. Arevalo, PhD, PE**, (respectively) they present a unified delivery unit with demonstrated and successful performance on very similar projects. The sheer depth of qualified, local resources offered by our team is an indispensable differentiator worth noting. With 400 professionals in Florida and a global staff network of 5,000, the CDM Smith team has in place the local project delivery horsepower to effectively undertake this notable assignment. Our team is further bolstered by the engagement of highly regarded small businesses partners **Keith and Associates, Nutting Engineers of Florida, Inc.** and, local to downtown Fort Lauderdale, **McCafferty Brinson Consulting, LLC** (MBE).

## Your Evaluation Criteria

### Qualifications



- ✓ We hold the **licenses, insurance, and qualifications** necessary to successfully deliver the work effectively and with honest analysis.

### Experience



- ✓ Leveraging lessons learned/best practices from **22 pilot tests** in Florida in the last 10 years.
- ✓ Project Manager **Tim O'Neil** understands and can best deliver your vision through his delivery of \$48M in Fort Lauderdale CIPs.
- ✓ Principal-in-Charge **Ignacio Lizama's** committal of the firm's resources ensures the pilot plant and study is appropriately staffed.
- ✓ South FL WTP expert, **Frank Brinson**, provides a strong foundation in the City's treatment processes to improve the Fiveash water quality.
- ✓ Pilot manager **Jorge Arevalo** brings to the City expertise from seven similar WTP bench/pilot studies that were led to successful completion.
- ✓ Handpicked, specialized **subconsultants** bring local knowledge and expertise to the City.

### History and Past Performance



- ✓ South FL and Southeast US **references** best attest to our proven ability to deliver.
- ✓ 50+ Florida **lime softening** WTPs means we know your plant processes better than anyone.
- ✓ 40+ years of **Biscayne** and **Floridan** raw water supply experience in South Florida.
- ✓ Design of four of the largest **membrane** WTPs in the World – located in Palm Beach County.
- ✓ Hundreds of drinking water **corrosion control studies** performed by core team members.

### Approach to Scope of Work



- ✓ Identifying solutions based on **44 years** of local, relevant, and pertinent infrastructure assignments with the City.
- ✓ Our approach proactively strengthens existing infrastructure while weaving resilience into new plans/designs to **future-proof** the City.
- ✓ With **local MBE staff** serving in key task and management roles, the City's MBE goals will be met through meaningful project engagement.
- ✓ Value-added, innovative approach strengthens results to provide defensible recommendations and right solutions **the City can trust.**

**100%** Ready + Reliable = **CDM Smith**



WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

**Verifiable Pilot Study Experience** – Our past record of water system pilot studies and water treatment process evaluations for national and Florida clients is noteworthy and relevant to this project. No pilot study or process evaluation is expected to be an exact copy of the previous one. As such, we emphasize reliability, flexibility, and scalability as essential features on all pilot systems. Our team will deliver a study that is locally focused and specifically crafted for the Fiveash WTP project site. We have value-added propositions and bright ideas we share in detail in our submittal. Our team has led similar assignments in Miami-Dade County or the South Miami Heights WTP and Palm Beach County for Water Treatment Plant No. 3 and most recently for JEA in Jacksonville, making us best suited to evaluate the efficacy and efficiency of the GAC process for color removal and the process evaluations at the Fiveash WTP for the City.

**Accuracy in Cost Estimating and Lifecycle Cost Management** – We fully recognize that the City will rely on the opinions of probable cost for each recommended treatment option as an important criterion in charting the future course of the Fiveash WTP. CDM Smith offers an exceptional advantage in that our opinions are prepared by certified cost estimators from our construction group—a certified general contractor. By using certified cost estimators that focus on estimating water and wastewater projects in Florida, the City will benefit by our ability to prepare detailed and accurate cost estimates. Similarly, we maintain an updated database of lifecycle costs where we offer to perform “cradle to grave” analysis summarizing the economics of the treatment options based on the pilot study and process evaluation, construction cost, and O&M information for the service life of the asset.

**Authentic Value-Added Solutions** – Simply stated: CDM Smith has no preconceived notions that bind us to previous studies or past recommendations. We pledge to conducting thorough analysis and giving you our bright and creative ideas. We offer a 360 degree approach with the engagement of key stakeholders in the City such as your operators, management, and leadership to propose defensible recommendations and the right solutions you can trust. Our recommendations will be valid with sound analysis by our experts. Our firm’s motto **listen.think.deliver** fittingly encompasses our approach to this notable assignment.

The City will be best served in your selection of CDM Smith as your trusted partner in delineating the future course of the Fiveash WTP. We encourage the selection committee to contact our client references to confirm the timeliness and quality of our work. Per the RFQ requirements, we have included a Certificate of Authority as evidence that I have the authority to bind our firm. We look forward to your favorable evaluation of our qualifications, stand ready to serve the City, and ask for the opportunity to do so. Thank you for your kind consideration.

Very truly yours,



Ignacio L. Lizama, PE, ENV SP  
Vice President  
CDM Smith Inc.



75 State Street, Suite 701  
 Boston, Massachusetts 02109  
 tel: 617 452-6000

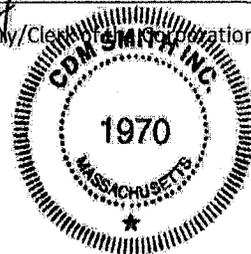
**CERTIFICATE**

I, Paul T. Milligan, Secretary/Clerk of CDM Smith Inc., a Massachusetts corporation, do hereby certify that Ignacio Lizama holds the position of Client Service Leader, which entitles Mr. Lizama to execute and deliver proposals, contracts and agreements for the performance of professional services in the name and on behalf of CDM Smith Inc. with a value of up to \$1 million. Further, Mr. Lizama has been delegated authority to execute and deliver proposals, contracts and agreements for the performance of professional services specifically for the Granular Activated Carbon Pilot and Plant Evaluation at the Charles W. Fiveash Water Plant, Fort Lauderdale, Florida.

I further certify that the foregoing is consistent with the Contract Signing Authority Policy and with the By-laws of the said corporation.

IN WITNESS WHEREOF, I have executed this certificate and have caused the corporate seal of CDM Smith Inc. to be hereunder affixed on this 28<sup>th</sup> day of September 28, 2018.

*Paul Milligan*  
 Paul T. Milligan- Secretary/Clerk of Corporation



Lizama, Ignacio-September 2018

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES



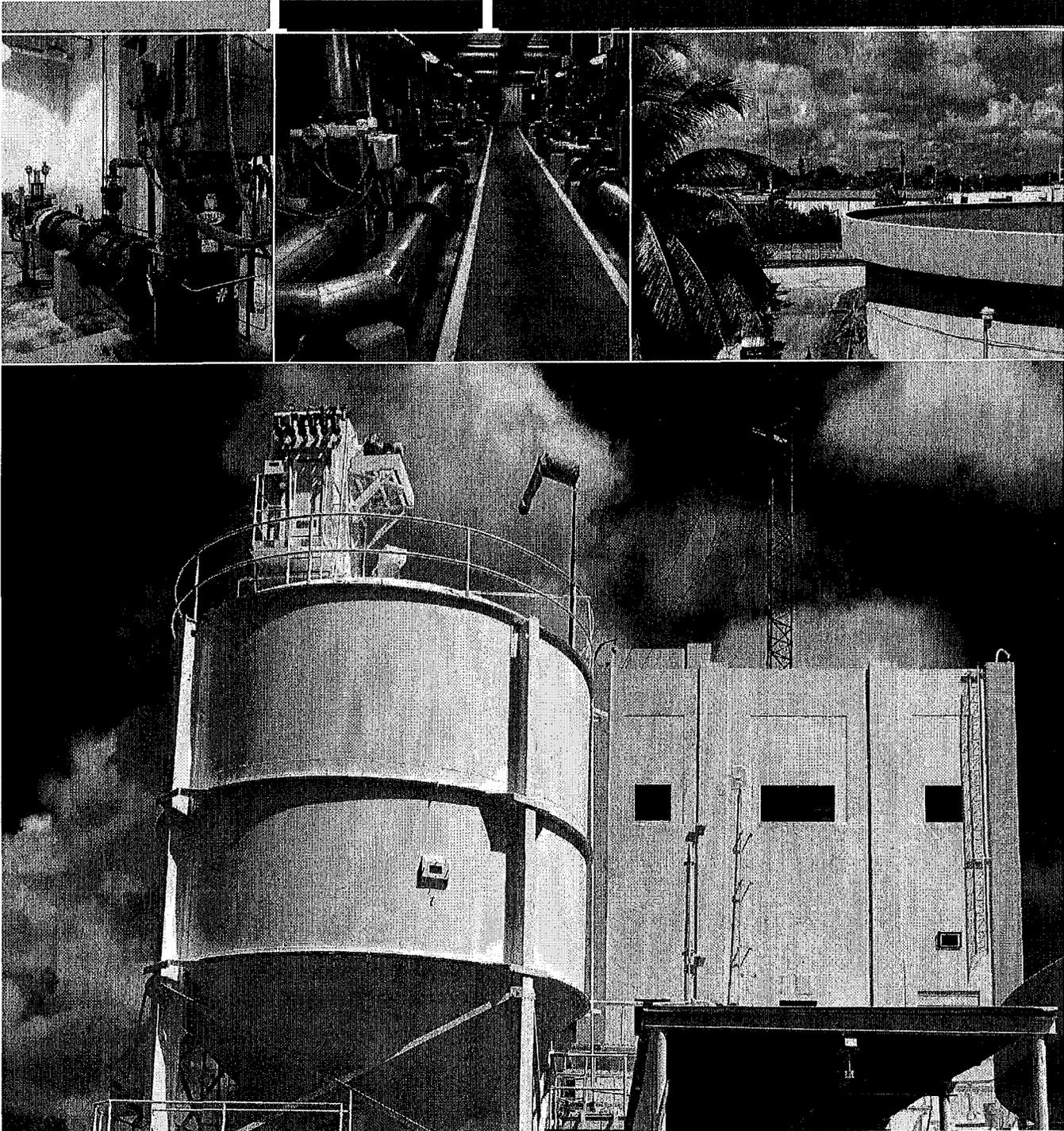
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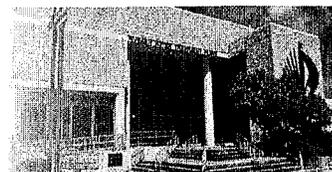
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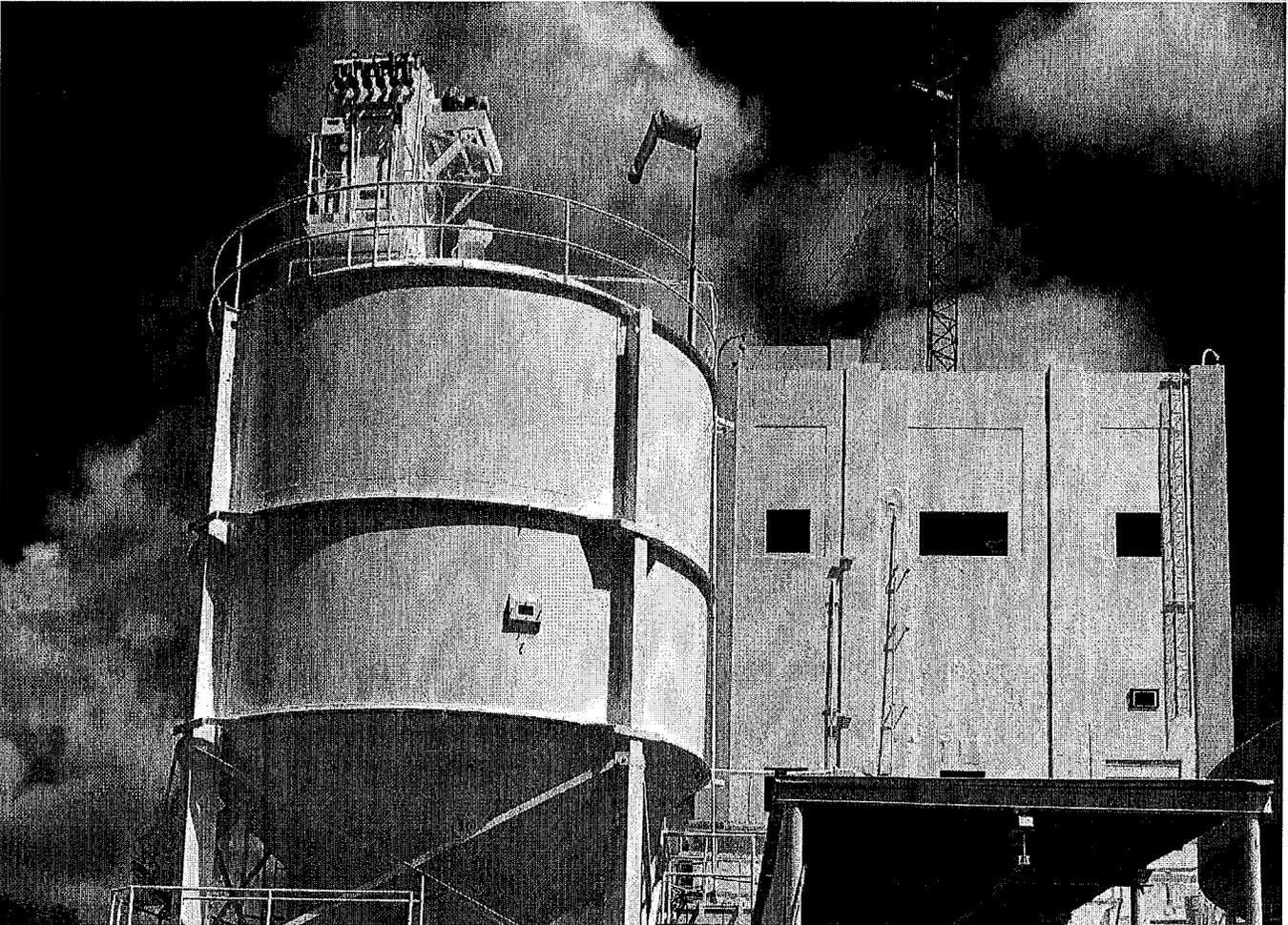
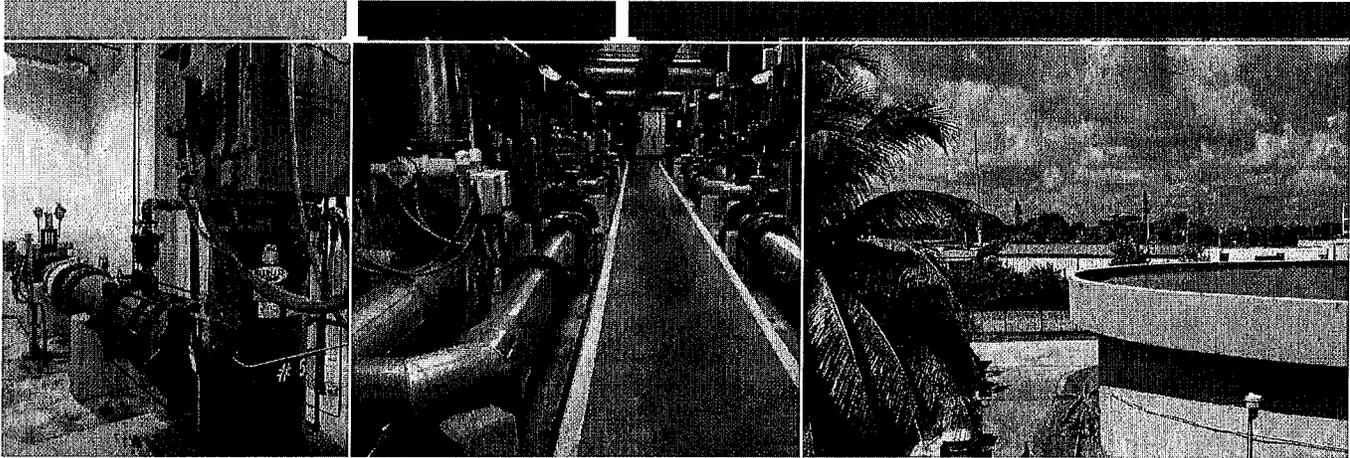
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SECTION

2

Executive Summary



Section 2:  
Executive Summary

CDM Smith's Executive Summary Responds to the City's Selection Criteria

**A 71-YEAR HISTORY OF EXCELLENCE IN THE WATER INDUSTRY**

CDM Smith has been supporting clients in Florida, the US and across the globe for decades now. As with all of them, our goal is to be a credible and high-performance partner who backs the City all the way with a specialized team that combines all disciplines and technologies of the water sector.

- Employee-owned corporation with more than \$1.2B in annual revenues, headquartered in Boston and serving Fort Lauderdale from our local Boca Raton office to deliver exceptional client service, quality results, and enduring value across the entire project life cycle.
- Partnered with the City on dozens of projects continuously for almost 45 years, bringing a profound understanding of the issues the City faces, as well as value through our application of institutional knowledge.
- CDM Smith is at the forefront of water quality research, leading more than \$17M in water research projects funded by the Water Research Foundation and Federally sponsored research programs such as SERDP, ESTCP, AFCECs, and managing hundreds of water supply projects across the US.
- Best-in-class experience designing lime softening and membrane facilities—more than 50 lime treatment systems and eight successfully operating membrane facilities in South Florida—will guide our pilot testing and process analyses.
- Strong technical capability and consistent ranking as a top drinking water firm by Engineering News Record (ENR), the American Council of Engineering Companies (ACEC), and the American Academy of Environmental Engineers (AAEE).
- Work on the project will be managed from our local office to facilitate coordination and collaboration with City staff. Our staff is a short 20-minute ride away from the Fiveash WTP site.



**OUR LOCAL PROJECT TEAM IS SUPPORTED BY A DIVERSE TEAM OF EXPERTS - ALL WITH A VERIFIABLE HISTORY OF PERFORMANCE**

The City of Fort Lauderdale can take confidence in our leadership. Ignacio, Tim, Frank, and Bill have worked together for years to support South Florida utilities with consistent, successful project delivery. We encourage **YOU** to contact our client references to confirm the timeliness and quality of our work.



**Ignacio Lizama, PE, ENV SP | Principal-in-Charge | Office - Miami**

- Established 25-year track record in the management, planning, design, and construction of significant engineering and infrastructure projects in South Florida
- Vice president of the firm with ability to commit resources to your project
- Professional experience spans every facet of the project cycle, including feasibility studies, design basis reports, master plans, detailed design, construction management, and client interaction



**Timothy O'Neil, PE, BCEE | Project Manager | Office - Boca Raton**

- Highly recognized and respected project manager; Has delivered \$48M in Fort Lauderdale community investment plans; Brings perfect combination of commitment, integrity and technical capability, which will help drive our team to deliver high-quality results
- Ability to manage projects within schedule and budget makes Tim one of CDM Smith's most sought-after project managers
- More than 28 years of Florida design experience includes having delivered more than \$150M in constructed costs



**Frank Brinson, PE | Evaluation and Options – Task Manager; Granular Activated Carbon Pilot Study – Pilot Plant Coordination/Design | Office - Fort Lauderdale**

- Environmental engineer with 26 years' specializing in master planning, water treatment and distribution
- Projects include Broward County Retail Potable Water and Wastewater Master Plan and Alternative Water Supply Master Plan; Extensive experience with lime softening facilities including Boca Raton and several Palm Beach County WTPs
- Evaluated treatment process and implemented appropriate process improvements, and obtained four-log virus treatment "certifications" for BCWWS WTP 1A, WTP 2A, and WTP 3A



**William B. Dowbiggin, PE, BCEE | Granular Activated Carbon Pilot Study – Pilot Technical Director; Process Engineering Expertise – MIEX | Office - Raleigh**

- Environmental engineer with 30+ years of experience which has involved 50+ WTP design projects and 12 water treatment bench/pilot plant projects
- Bench/pilot testing experience includes jar tests, corrosion control tests, conventional treatment, tube and plate settlers, superchargers, direct filtration, filter media optimization, air-water backwash, GAC, PAC, membranes, and chemical comparisons
- Proven and recent MIEX expertise includes pilot testing of MIEX for the Cobb County-Marietta Water Authority in Georgia and for Brunswick County in North Carolina



**UNMATCHED FLORIDA LIME SOFTENING EXPERIENCE**



**PROVEN EXPERTISE IN MEMBRANE DESIGN**

**PARTNERS BRING KNOWLEDGE AND VALUE TO THE CITY AND THE PROJECT**



CDM Smith has assembled our team to exceed your goals and objectives identified in the City's Solicitation. To this end, our team is proud to bring the local engineering firms of Keith and Associates and Nutting Engineers to this project. Our team also meets the City's desire to include capable MBE participation through the inclusion of the local Fort Lauderdale firm, McCafferty Brinson. Our history of including local MBE firms has introduced new companies into the available pool of engineers and increased South FL's available resources for future projects.



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In response to external factors, water treatment methods have needed to evolve and expand over the years and CDM Smith has always risen to the challenge. Our experts look for ways to stay one step ahead of the curve—to not only manage current water issues but also to evaluate current treatment practices to gain a better understanding of how they will work with today's water. We have risen the bar on water quality and use new technologies to improve and refine our methods in order to take quality water to even higher levels.

 <b>Ozone; UV/AOP</b> Specialist in advanced disinfection and oxidant treatment processes	 <b>Regulatory Coordination</b> Regulatory expert who has completed multiple regulatory compliance projects for South Florida WTPs	 <b>Water Quality</b> Process engineer and nationally recognized expert in water quality and AWT	 <b>Lime Softening</b> Lime softening process expert with who has conducted numerous process evaluations and studies	 <b>Water Supply</b> South Florida water supply expert with in-depth understanding of hydrogeological conditions	 <b>GAC; NF/RO/Desalination</b> Conducts research on water quality modeling in drinking water systems	 <b>Data Engineering Staff</b> Experience includes process design and improvements	 <b>MF/UF</b> Nationally-recognized expert in design of membranes for WTPs
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With a focus on water treatment since our founding, CDM Smith pioneered many of the technologies in use and has been at the forefront of the industry's work on treatment processes. Our experience, gained at hundreds of WTPs, including many in Florida, has established our reputation as experts in water treatment system piloting, planning, design, construction, and O&M.

1. Granular activated carbon pilot studies for potable water treatment
2. Unit operation and process evaluations for lime softening WTPs
3. Biscayne and Floridan raw water supply for WTPs
4. Membrane filtration plant design
5. Corrosion analysis and engineering for potable water distribution systems
6. Value engineering and lifecycle cost studies
7. Water use master planning and permitting

Our Team Has Worked at Many Similar WTPs in Florida and the Southeast and We Will Bring Lessons Learned to You from Our Work Evaluating and Optimizing Those Facilities.

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### Fiveash WTP – Evaluation and Options

With 70+ years of serving and solving our clients pressing water issues, the City will be best served by unmatched expertise applied to the Fiveash WTP project through the filter of CDM Smith's team of water professionals and their locally-based solutions.

- Our team will provide the City with authentic value-added solutions by applying the following steps:
- Select proven processes, equipment, and design criteria based on industry experience
  - Apply data collected from the bench-, pilot-, and plant-scale studies to improve plant performance and/or reduce costs
  - Prepare conceptual designs with appropriate detail to address requirements and/or constraints that include, but are not limited to, site, plant and system hydraulics, power, permitting, staffing, residuals disposal, and other items
  - Conduct permitting and constructability/operability reviews to develop schedules that account for permitting, design, construction, maintenance of plant operations, commissioning, optimization, and future upgrades/expansions
  - Develop customized cost models for capital and operating costs; and document all assumptions, for quantities, unit costs, and allowances for unidentified items and other uncertainties
  - Collaborate with the City and project stakeholders to advance and modify the alternatives to meet the project objectives

Through this process, our team will provide the City with the information to compare the alternatives, select the preferred alternative, and develop an implementation plan for the preferred Fiveash WTP improvements program as detailed in Section 5.



### Granular Activated Carbon Pilot Study

CDM Smith's approach to the GAC Pilot Study begins with our comprehensive understanding of WTP pilot testing, which includes:

- 71 years as an industry-leader in water with 2,500+ WTP projects
- 43 years of relevant Florida WTP experience
- 250+ pilot plant projects with 22 pilot tests completed in Florida in the past 20 years alone

By leveraging our expertise, CDM Smith will custom-design the pilot test unit around the City's project objectives and water quality goals so that it is configured to be truly representative of the proposed full-scale process, will provide data that will be useful in developing the final design, and includes the instrumentation necessary to collect the data needed to complete the evaluations and cost estimations that the City wishes to conduct.

Our custom design allows the GAC columns to operate in parallel and series, which facilitates the concurrent evaluation of multiple types of GAC, multiple empty bed contact times, and/or multiple loading rates, as well as facilitates the evaluation of multi-stage GAC treatment and maximizes the efficiency of the GAC media. To identify the most cost-effective full-scale GAC system design parameters, we recommend the GAC Pilot Study evaluate both parallel and series configurations.

Based upon the City's needs and goals, our vision for the GAC Pilot Study would also be enhanced by the addition of a bench-scale component. This additional component would effectively screen various types of GAC media at a bench-scale level to identify the most promising type(s) of GAC for testing at the pilot-scale, streamlining the pilot-scale schedule and enhance the overall quality of the GAC Pilot Study.

Our team has presented these value-added ideas for pilot testing and more in our project approach, located in Section 5 of our submittal, to maximize the use of the City's dollars to achieve water color enhancement.

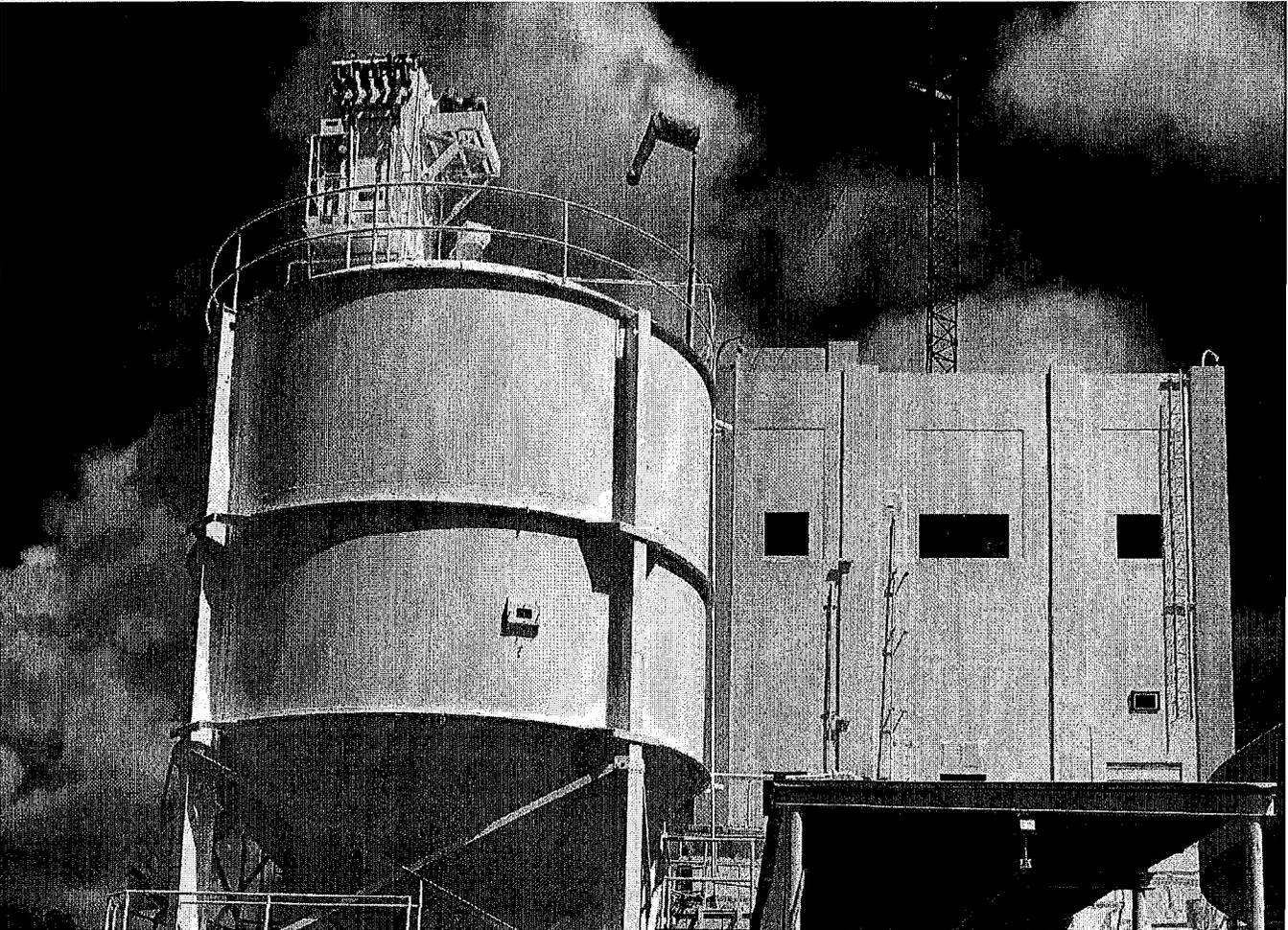
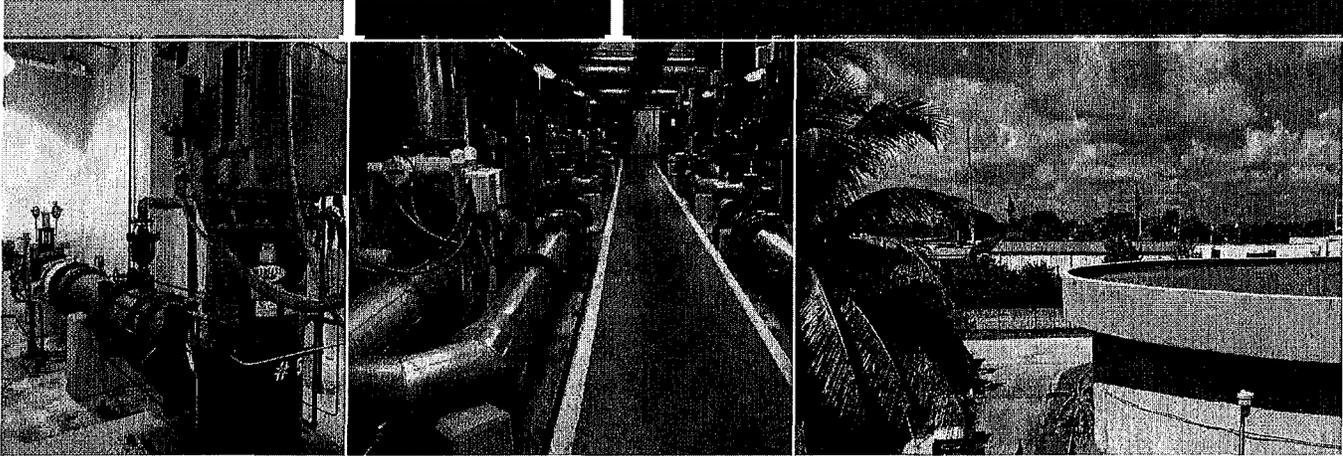


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SECTION

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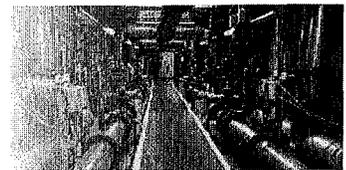
Firm Qualifications  
and Experience



Section 3:  
Firm Qualifications  
and Experience

# Section 3

## Firm Qualifications and Experience



### Standard Form 330

To respect the City's request for a concise submittal we have included the Standard Form (SF) 330, in the following tabs to comply with the City's Request for Qualifications (RFQ).

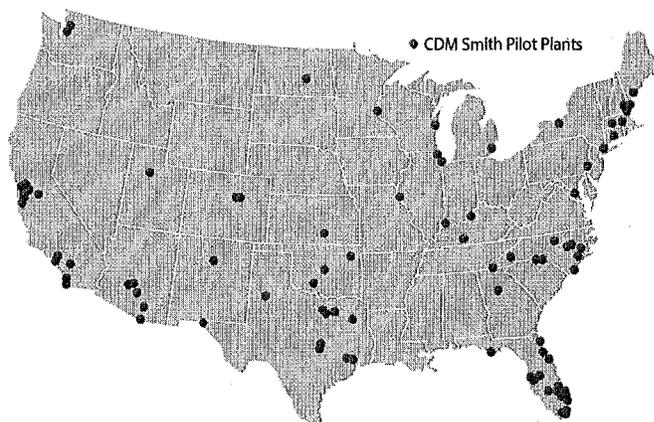
- SF 330 A-C – Section 3
- SF 330 D – Section 4
- SF 330 E – Section 4
- SF 330 F – Section 6
- SF 330 G – Section 6
- SF 330 H – Section 6
- SF 330 Part II – Section 6

### Firm's Experience Providing Similar Professional Services

Established in 1947, CDM Smith has been successfully assisting clients nationally for more than 71 years, and locally in Florida for 43 years. Notably, we have served the City for more than 45 years. Below are a few relevant firm qualifications additional qualifications can be found in the **SF 330 H** located in **Section 6**.

### Pilot Plant Expertise

CDM Smith's experience includes 71 years as an industry leader in all things water, including more than 2,500 WTP projects as a firm, as well as 43 years of relevant Florida WTP experience. More specifically, we have completed 250+ pilot plant projects, and in the past 20 years, we have completed 22 pilot studies in Florida alone. These projects encompass testing an extensive range of alternative treatment processes including Membrane Softening (MS), granular Activated Carbon (GAC), Ozone-Biologically Activated Filtration (Ozone-BAF), Microfiltration (MF), Reverse Osmosis (RO), Ultraviolet/Advanced Oxidation Processes (AOP), and more. CDM Smith's complete nationwide pilot testing experience is illustrated in the map to the right. ***Our lessons learned and insight gained from these similar projects are directly applicable to the City's project, assuring the City of our ability to address your water quality concerns.*** We have included a table in Section H of the SF 330 with additional details on our relevant experience.



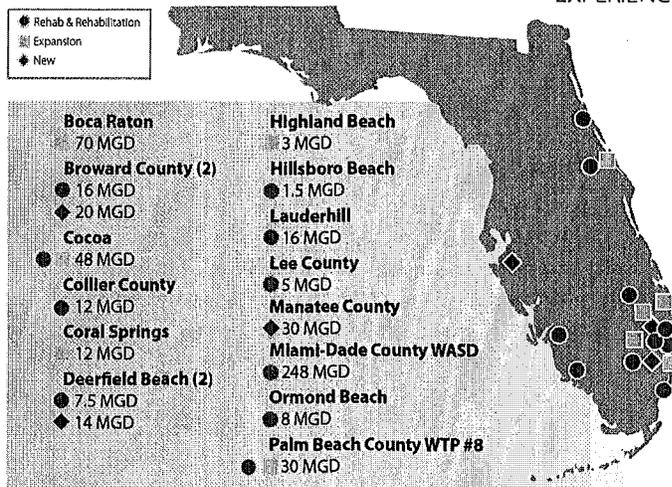
Our pilot plants offer a versatile and cost-effective way to monitor, analyze, and modify proposed treatment systems prior to full-scale design and implementation.

### Lime Softening Expertise

We offer extensive relevant and local experience designing lime softening facilities similar to Fiveash WTP—more than 50 lime treatment systems to date. In Florida, our experience covers plants with treatment capacities of 1 to 248 mgd, shown in the figure to the right.

Most noteworthy to this project is that CDM Smith provided design and engineering services for the 10-mgd lime softening capacity expansion at **Palm Beach County WTP No. 8**. The new facilities included a 10-mgd ACCELATOR™ solids contact clarifier, a 10-mgd post-treatment anionic exchange resin system, and three new multi-media filters. In addition, we upgraded existing chemical storage/feed systems and residuals handling

### CDM SMITH'S FLORIDA LIME SOFTENING WATER TREATMENT PLANT EXPERIENCE



systems. **Our work on WTP No. 8 gives the City the advantage of an experienced team that will know exactly what has to get done.**

Our lime softening experience also includes the design and startup of the largest diameter (at the time) upflow clarifier lime softening treatment units at the award-winning 70 mgd Boca Raton WTP (very similar to Fiveash WTP).

On a national level, we provided design and construction services for the expansion of the **City of Austin Ullrich WTP** from 100 mgd to 160 mgd, a project with a construction cost of \$73M. The expansion included a new lime handling building; new off-loading facilities and control panel; lime fill blower; six new lime storage silos equipped with target boxes, dust collection boxes, and load cells; new fully-automated lime slakers and aging tanks; flow-paced peristaltic feed pumps; and delivery piping to convey the lime slurry to each reactor clarifier basin.

### Past Project for Agencies of Similar Size and Scope and Ability to Meet Time and Budget

The City's staff is familiar with our commitment to maintaining schedule and budget. We have consistently delivered projects for the City that meet schedule expectations. We have also completed a number of significant projects throughout South Florida within budget and schedule constraints, several examples of which are shown below.

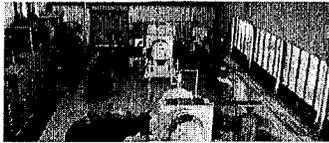
	<p><b>Waterworks 2011 Program Pump Station Rehabilitation, City of Fort Lauderdale, FL</b>  <b>\$ Budget:</b> Original Budget: \$10M, Actual Cost: \$8.3M (Engineering)  <b>Schedule:</b> Completed on schedule.</p>
	<p><b>City-wide Wastewater System Improvements, City of Fort Lauderdale, FL</b>  <b>\$ Budget:</b> \$98M—Completed on budget (Construction)  <b>Schedule:</b> Completed on schedule.</p>
	<p><b>George T. Lohmeyer Regional WWTP – Emergency Generator and 4,160V Switchgear Upgrade, City of Fort Lauderdale, FL</b>  <b>\$ Budget:</b> \$425,164—Completed on budget (Engineering)  <b>Schedule:</b> Completed on schedule.</p>
	<p><b>Ion Exchange Resin Plant and East WTP Improvements, City of Boynton Beach, FL</b>  <b>\$ Budget:</b> \$25.5M—Completed on budget (Construction)  <b>Schedule:</b> Completed on schedule.</p>
	<p><b>WTP No. 9 Nanofiltration Membrane Treatment Plant, Palm Beach County, FL</b>  <b>\$ Budget:</b> \$32M—Completed on budget (Construction)  <b>Schedule:</b> Completed on schedule.</p>
	<p><b>10 mgd WTP No. 8 Expansion, Palm Beach County, FL</b>  <b>\$ Budget:</b> \$18.6M—Completed on budget (Construction)  <b>Schedule:</b> Completed on schedule.</p>
	<p><b>Nanofiltration Water Treatment Plant Design-Build, Dania Beach, FL</b>  <b>\$ Budget:</b> \$8.9M —Completed on budget (Construction)  <b>Schedule:</b> Completed on schedule.</p>



**Alexander Orr Jr. WTP Continuing Engineering Services, Miami-Dade County, FL**

**\$ Budget:** \$651,000—Completed on budget (Engineering)

**📅 Schedule:** Completed on schedule.



**Water and Wastewater Master Plan, Broward County, FL**

**\$ Budget:** \$968,000—Completed on budget (Engineering)

**📅 Schedule:** Completed on schedule.

## Sustainable Business Practices

CDM Smith continually strives for better sustainability and environmental stewardship for our clients and us. We engineer our designs with sustainability in mind, and we practice it as a firm. Sustainability is guided by our internal sustainability leader and corporate sustainability team, and implemented throughout all offices by our office leadership network and local sustainability teams. Our local Southeast Florida offices are no exception, practicing waste minimization through trash recycling, paper/plastic reduction, and procurement of environmentally friendly products; energy efficiency through LED lighting, motion-activated light switches, Energy Star compliant devices, and utilization of natural lighting; and, most importantly, water conservation through the use of low-flow or ultra-low-flow water fixtures and high efficiency drip irrigation systems. Additionally, bottled water is not purchased for use in offices, and employees are encouraged to drink from the tap.



We are committed to continually improving sustainability—encompassing the integrated environmental, social, and economic dimensions—for our firm, our clients, and the communities in which we live and work. We maintain active partnerships with organizations like the International Council for Local Environmental Initiatives (ICLEI) – Local Governments for Sustainability, the leading association collaborating with local governments to address issues related to climate change and sustainability. In addition, we assist organizations worldwide in addressing the full spectrum of sustainability performance improvement, including resource management and recycling, and incorporating sustainability principles into our engineering and construction projects.

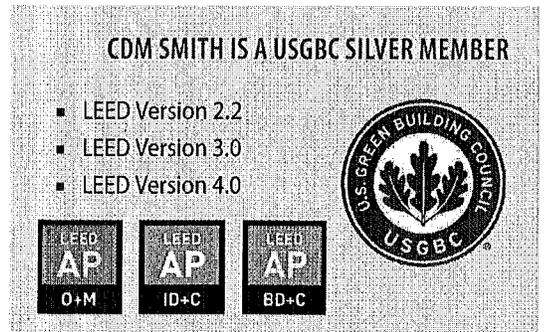
The Leadership in Energy and Environmental Design (LEED®) green building rating system has been instrumental in transforming the way buildings and communities are designed, built, and operated. Yet LEED doesn't address water and wastewater treatment; horizontal infrastructure that is integral to every community in this country. That's where Envision takes over. Envision is a sustainability rating system for civil infrastructure. CDM Smith holds a Charter Membership in the Institute for Sustainable Infrastructure (ISI), which has provided us with unique insight into the needs of our industry and our clients.

We offer the City 135 professionals certified in LEED and/or Envision who are experienced in applying best practices for sustainability and achieving project certification. We can support the City in achieving its sustainability goals across your entire operation.

### Delivering Excellence with LEED

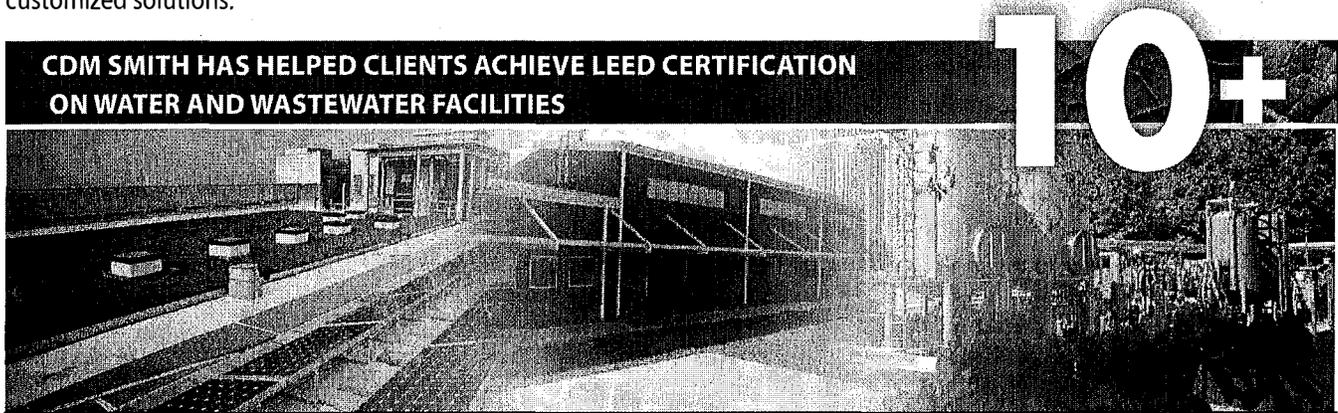
Sustainable design encompasses a broad range of design aspects—from the siting of new construction to the selection of finish materials and systems. It extends beyond the parameters of building design to include ecological impact to the surrounding environmental and occupant health and safety.

We have pursued LEED certifications in all market sectors, applying all LEED rating systems on more than **40 projects in 15 states**. CDM Smith LEED-certified projects include the Stockton WWTP – Delta Water Supply



WTP, in Lodi, CA, and closer to home the Solid Waste Authority of Palm Beach County Platinum-certified Education Center; the Nanofiltration WTP addition for the City of Dania Beach, FL; and the Babcock Ranch Community, W/WWTP operations building in Charlotte and Lee Counties, FL.

Our staff includes LEED Accredited Professionals (AP) in multiple disciplines throughout the firm. This allows us to bring a knowledgeable, integrated design team to each City project. We are capable of addressing the triple bottom line of sustainability: environmental stewardship, social responsibility, and economic growth through innovative, customized solutions.



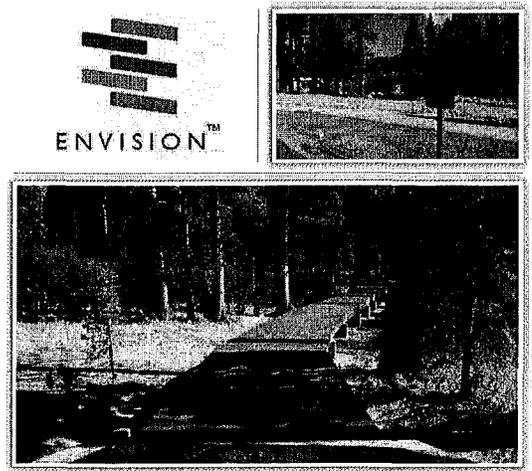
### The Value of Envision™

CDM Smith embraces the Envision™ infrastructure sustainability rating system tools to serve as guides for project teams in assessing the sustainability of projects. We played a critical role in the creation of the Envision Rating System and we continue to be a proponent of the strategies and methods that it entails.

Unlike LEED, Envision was developed to evaluate infrastructure. This comprehensive tool provides a holistic framework for evaluating and rating the community, environmental, and economic benefits of all types and sizes of infrastructure projects. Envision evaluates, grades, and gives recognition to infrastructure projects that use transformational, collaborative approaches to assess the sustainability indicators over the course of the project's lifecycle.

CDM Smith's award-winning Envision projects include the City of Boynton Beach Ion Exchange Resin Plant and East Water Treatment Plant Improvements in Boynton Beach, FL, which is received a Bronze rating in 2017. The Snow Creek Stream Environment Zone Restoration Project in North Lake Tahoe, CA, which earned the Envision Platinum award for sustainable infrastructure—the highest level attainable and the first platinum rating awarded by ISI.

With the use of Envision, we can assist the City in meeting project goals and identifying the sustainability, environmental, social, and economic benefits of a project. The tool can also help you assess options for investment of scarce resources, and address community concerns and environmental priorities.



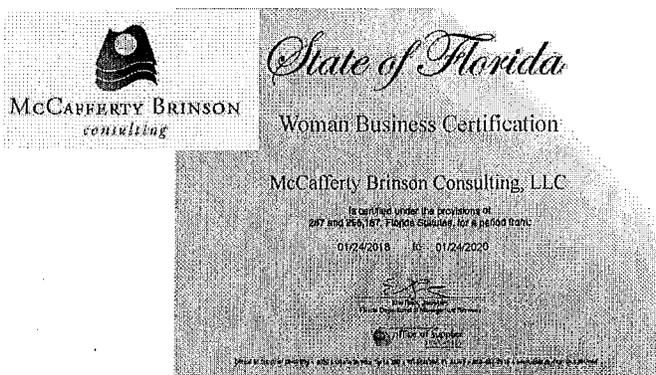
CDM Smith is a pioneer in the Envision rating system. Our work on the Snow Creek project earned the first ever **Envision Platinum Award for Sustainable Infrastructure.**

## Business Structure

CDM Smith Inc. is an employee-owned corporation incorporated in the State of Massachusetts and licensed to conduct business in the State of Florida.

## Minority or Woman Owned Business

CDM Smith is not a minority or woman-owned business; although, we maintain an excellent record of including these business' on our team and meeting clients' MBE/DBE/SBE goals. Such as local firm MBE firm **McCafferty Brinson Consulting, LLC** (MBC) registered in the State of Florida who will provide Evaluation and Options - Task Manager, Evaluation and Options - Regulatory Coordination, Granular Activated Carbon Pilot Study - Pilot Plant Coordination/ Design, and Process Engineering Expertise - Ion Exchange. For more information, please refer to **Tab 7: Minority (MBE) Participation.**



## Company Address, Phone Number, Fax Number, Email Address, Website, Contact Person, Etc.



### Headquarters

75 State Street, Suite 701  
Boston, MA 02109

### Boca Raton Office

621 NW 53<sup>rd</sup> Street, Suite 265  
Boca Raton, FL 33487

### Miami Office

800 Brickell Avenue, Suite 500  
Miami, FL 33131

**Ignacio L. Lizama, PE, ENV SP**  
Principal-in-Charge

Tel: 305.372.7171  
Fax: 305.372.9167  
lizamail@cdmsmith.com  
cdmsmith.com

## Relative Size of Firm

An employee-owned corporation with more than \$1.2B in annual revenues and a multi-disciplinary staff of nearly 5,000 in almost 150 offices worldwide, CDM Smith maintains the size, stability, and resources required to successfully undertake a diverse range of projects, while providing personalized, local client service. In Florida, we offer more than 400 employees including more than 125 Florida registered professional engineers.

## Licenses

We have included firm and personnel license information in the table below.

Name	Role	License Number
<b>CDM Smith</b>		FL – PE 20; FL – PG GB422; FL – AIA AA0002781
Timothy J. O'Neil, PE, BCEE	Project Manager	FL – PE 48897
Ignacio L. Lizama, PE, ENV SP	Principal-in-Charge	FL – PE 53868
Michael A. Zafer, PE	Technical Review Committee/QA/QC	CA – PE 51956
Susan L. Crawford, PE, BCEE	Technical Review Committee/QA/QC; Process Engineering Expertise – Enhanced Line Softening	TX – PE 80390
Layla L. Llewelyn, PE	Evaluation and Options – Data Engineering Staff	FL – PE 64082
Craig A. Gadberry, PE	Evaluation and Options – Cost Estimation; Support Services – Lifecycle Costing	FL – PE 55988
Daniel R. Maher, PE	Evaluation and Options – Facilities Planning; GAC Pilot Study Pilot Study – Pilot Developer/ Contractor; GAC Pilot Study – Pilot Operations Lead	FL – PE 62969
Jorge M. Arevalo, PhD, PE	GAC Pilot Study – Pilot Manager; GAC Pilot Study – Pilot Plant Design; Process Engineering Expertise – GAC; Process Engineering Expertise – Nanofiltration/Reverse Osmosis/ Desalination; Process Engineering Expertise – Microfiltration/Ultrafiltration; Support Services – Lifecycle Costing	FL – PE
William B. Dowbiggin, PE, BCEE	GAC Pilot Study – Pilot Technical Director; Process Engineering Expertise – MIEX	NC – PE 015394
Jennifer L. Hooper, PE	GAC Pilot Study – Laboratory Testing	WA – PE 47132
Christopher R. Schulz, PE, BCEE	Process Engineering Expertise – Ozone; Process Engineering Expertise – UV/AOP	CO – PE 0037966

Name	Role	License Number
Stewart J. Magenheimer, PG	Process Engineering Expertise – Water Supply and Reject Disposal	FL – PG1168
Mark C. White, PE, BCEE	Process Engineering – Microfiltration/Ultrafiltration	NC – PE 025886
Jonathan Z. Goldman, PE, BCEE	Process Engineering – Pipelines and Transmission	FL – PE 48925
Joshua H. Meinig, PE	Support Services – Mechanical Engineering/HVAC	FL – PE 72454
William R. Maples, PE	Support Services – Structural Engineering	FL – PE 49311
Clay M. Tappan, PE, BCEE	Support Services – Piping Engineering	FL – PE 42772
Emilio H. Gacharich, PE	Support Services – Electrical Engineering/Industrial Electrical Power Engineering	FL – PE 57455
Michael T. Alford, AIA, LEED® AP BD+C	Support Services – Architecture	AIA – AR92055
Valerie P. O'Hara, PE, BCEE	Support Services – Grant Coordination, Preparation of Grant Applications and Deliverables	FL – PE
<b>McCafferty Brinson Consulting, LLC</b>		26952
Frank Brinson, PE	Evaluation and Options – Task Manager; Granulated Activated Carbon Pilot Study – Pilot Plant Coordination/Design; Process Engineering Expertise – Ion Exchange	FL – PE 51313
Audra McCafferty, PE	Evaluation and Options – Regulatory Coordination	FL – PE 54737
<b>Keith and Associates</b>	<b>Survey; Landscape</b>	Survey – LB6860 Landscape – LC26000457
<b>Nutting Engineers of Florida, Inc.</b>	<b>Geotechnical</b>	FL – 606

### Other Pertinent Information

When it comes to outstanding performance, CDM Smith is at the forefront. Recognized for our award-winning work, we are an industry leader and maintain a presence as the "Firm of Choice" by consistently ranking among the nation's top consulting firms. Being recognized as a leader in the engineering field is evidenced by our numerous awards in engineering competitions. Projects and programs entering into competitions at the local, state, and national levels have helped to propel CDM Smith into the ranks of industry leadership. Our projects are precedent setting and have helped to advance the state of the engineering profession.

**450** ranging from 1 MGD to **WTPs 1,260 MGD**

**200** **PUMPING PROJECTS**  
up to capacity **6,300 MGD**  
up to horsepower **15,000 HP**

**27 BILLION**  
GALLONS PER DAY

**SEVEN DECADES**  
*of experience providing water treatment to municipal clients*



planning design construction  
assessment and rehabilitation  
**intake structures**  
pumping and storage facilities  
distribution and transmission mains  
collection and large interceptors

**NATIONAL DRINKING WATER AWARDS**

from ACEC and AAEEs

SINCE **1947**

**3 AWARDS IN 2018**  
for AAEEs Excellence in Environmental Engineering and Science



- #6 2016 ENR RANKINGS | THE TOP 500 DESIGN FIRMS WATER TREATMENT / DESALINATION
- #5 2018 ENR RANKINGS | THE TOP 500 DESIGN FIRMS ENGINEERING-ARCHITECT FIRM

SOURCES: ENR, MAY 2016; ENR, JULY 2018

A. CONTRACT INFORMATION		
1. TITLE AND LOCATION (City and State)		
Granular Activated Carbon Pilot and Plant Evaluation at the Fiveash Water Plant, Fort Lauderdale, FL		
2. PUBLIC NOTICE DATE	3. SOLICITATION OR PROJECT NUMBER:	
September 10, 2018	12191-996	
B. ARCHITECT-ENGINEER POINT OF CONTACT		
4. NAME AND TITLE		
Ignacio L. Lizama, PE, ENV SP; Vice President		
5. NAME OF FIRM		
CDM Smith Inc.		
6. TELEPHONE NUMBER	7. FAX NUMBER	8. E-MAIL ADDRESS
305.372.7171	305.372.9167	lizamail@cdmsmith.com

C. PROPOSED TEAM (Complete this section for the prime contractor and all key subcontractors.)						
	PRIME	JOINT PARTNER	SUBCONTRACTOR	9. FIRM NAME	10. ADDRESS	11. ROLE IN THIS CONTRACT
a.	<input checked="" type="checkbox"/>			CDM Smith – Boca Raton, FL <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	621 N.W. 53 <sup>rd</sup> Street, Suite 265 Boca Raton, FL 33487	Prime
b.	<input checked="" type="checkbox"/>			CDM Smith – Miami, FL <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	800 Brickell Avenue, Suite 500, Miami, FL 33131	Engineering Support
c.	<input checked="" type="checkbox"/>			CDM Smith – Maitland, FL <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	101 Southhall Lane, Suite 200 Maitland, FL 32751	Engineering Support
d.	<input checked="" type="checkbox"/>			CDM Smith – Jacksonville, FL <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	8381 Dix Ellis Trail, Suite 400 Jacksonville, FL 32256	Engineering Support
e.	<input checked="" type="checkbox"/>			CDM Smith – Raleigh, NC <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	5400 Glenwood Avenue, Suite 400 Raleigh, NC 27612	Engineering Support
f.	<input checked="" type="checkbox"/>			CDM Smith – Fort Worth, TX <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	801 Cherry Street – Unit 33, Suite 1820 Fort Worth, TX 76102	Engineering Support
g.	<input checked="" type="checkbox"/>			CDM Smith – Dallas, TX <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	12400 Coit Road, Suite 400 Dallas, TX 75251	Engineering Support
h.	<input checked="" type="checkbox"/>			CDM Smith – Boston, MA <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	75 State Street, Suite 701 Boston, MA 02109	Engineering Support
i.	<input checked="" type="checkbox"/>			CDM Smith – Chicago, IL <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	125 South Wacker Drive, Suite 700 Chicago, IL 60606	Engineering Support
j.	<input checked="" type="checkbox"/>			CDM Smith – Denver, CO <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	555 17 <sup>th</sup> Street, Suite 500 Denver, CO 80202	Engineering Support
k.	<input checked="" type="checkbox"/>			CDM Smith – Bellevue, WA <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	14432 SE Eastgate Way, Suite 100 Bellevue, WA 98007	Engineering Support
l.	<input checked="" type="checkbox"/>			CDM Smith – Concord, CA <small><input type="checkbox"/> CHECK IF BRANCH OFFICE</small>	2300 Clayton Road, Suite 950 Concord, CA 94520	Engineering Support

# Architect-Engineer Qualifications

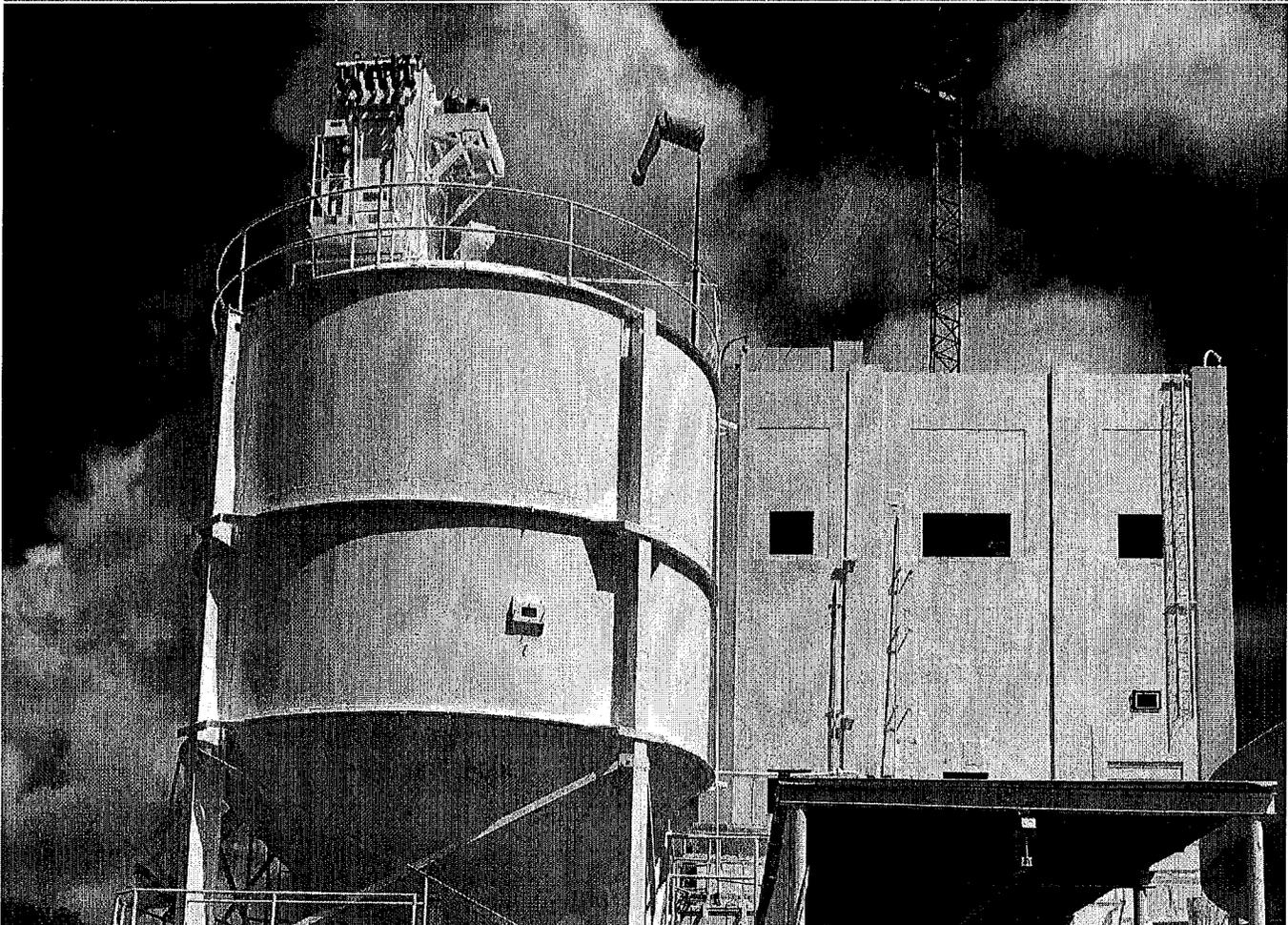
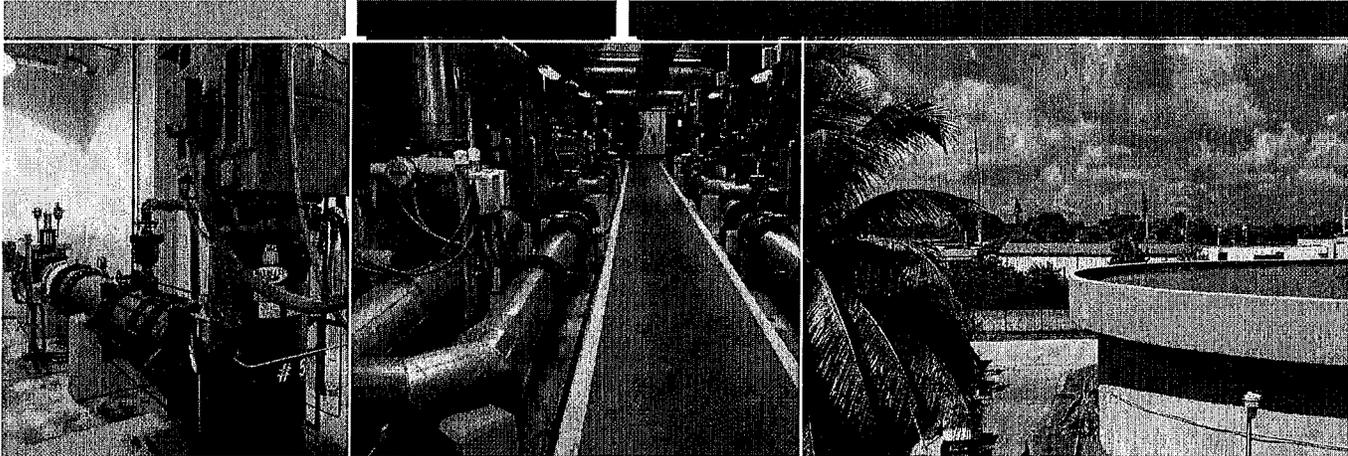
## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

C. PROPOSED TEAM (Complete this section for the prime contractor and all key subcontractors.)						
	PRIME	PARTNER	SUB-CONTRACTOR	9. FIRM NAME	10. ADDRESS	11. ROLE IN THIS CONTRACT
m.	✓			CDM Smith – Santiago, Chile	Edificio Huidobro Avenida Presidente Riesco 5711, Oficina 1201, Las Condes Santiago, Chile 7561114	Engineering Support
<small>☐ CHECK IF BRANCH OFFICE</small>						

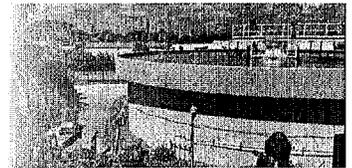
SECTION

4

Organizational Profile  
and Project Team



Section 4:  
Organizational Profile  
and Project Team



### CDM Smith Profile

Ever since CDM Smith was founded in 1947 by three civil engineering professors at MIT, the planning, investigation, and design of water and wastewater treatment facilities have been the cornerstone of our firm. From building small-scale pilot projects that employ the latest technologies to delivering world-class facilities that serve major industries, CDM Smith's water and wastewater experience is as diverse as our clientele. We offer a full-range of environmental services and are consistently ranked among the top drinking water firms in the country by Engineering News Record (ENR), the American Council of Engineering Companies (ACEC), and the American Academy of Environmental Engineers (AAEE).

Over the years, we have worked on virtually every aspect of water quality investigations, treatment technologies, and approaches to treatment plant design. We have completed over 2,500 water treatment plant (WTP) projects; designed over 1,500 new or expanded WTPs ranging from 1 million gallons per day (mgd) to 2,020-mgd; and provided expansion and improvement services for thousands of facilities across the globe. Additionally, many industry-standard water-treatment technologies, such as rapid-rate filtration, airwater backwash, and laminar-flow sedimentation, were pioneered by CDM Smith.

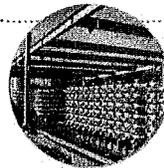
### Project Team and Subconsultants

Our team will be led by project manager **Timothy J. O'Neil, PE, BCEE**—one of CDM Smith's most senior project managers in South Florida. Local and regional professionals specializing in evaluation and options, granulated activated carbon pilot study, process engineering expertise, and support services have been carefully chosen to work closely with the City, regulators, and other stakeholders to meet all the project objectives. Local to the City, **McCafferty Brinson Consulting, LLC** will partner with CDM Smith's experts to help the City identify the most effective, affordable, and lasting solutions for the Fiveash WTP. **Keith and Associates** will provide survey and geotechnical services and **Nutting Engineers of Florida, Inc.** will provide geotechnical services to support the project.

# INDUSTRY LEADER

CDM Smith has maintained a continuous presence in Florida for

**44 YEARS**



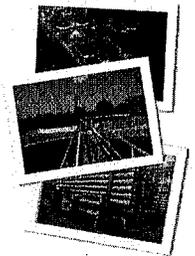
**650 mgd** of membrane treatment capacity throughout the US and internationally

**35+**

national drinking water awards for engineering excellence since 1990 from the American Consulting Engineers Council (ACEC) and the American Academy of Environmental Engineers (AAEE)

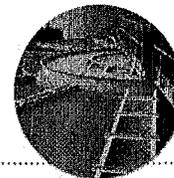
**250+**

The number of pilot projects CDM Smith has performed



**2,500+**

WTP projects with plants ranging from 1 mgd to 2,020 mgd



**18** The number of AWWA manuals of Practice CDM Smith has contributed to, helping write the industry standards



In 2017 and 2018, CDM Smith has published more than **27** 11 articles in leading water industry trade journals

### Team Member Capacity and Level of Involvement

We recognize the importance of balancing workload and staffing commitments to meeting the service expectations of our clients. With the majority of our work coming in the form of repeat business with which we have long-term working relationships, we recognize the value of maintaining the highest level of performance on the work that we receive. We have continuously maintained a presence in Florida since 1974 and continue to work with many of the same clients that we started with years ago, including the City of Fort Lauderdale. Our success is built on continually providing service and work products that meet or exceed our clients' expectations for accuracy, quality, cost, and schedule.

In considering the project team we present to the City, we have assessed their involvement in past relevant projects and their availability to perform the work that may be assigned. In the following table, we have detailed our individual team member's overall availability for the City's contract.

Team Member	Contract Role	Contract Availability
Ignacio Lizama	Principal-in-Charge	30% ■■■■■■■■
Tim O'Neil	Project Manager	100% ■■■■■■■■
Michael Zafer	Technical Review Committee/QA/QC	30% ■■■■■■■■
Susan Crawford	Technical Review Committee/QA/QC; Process Engineering Expertise – Enhanced Line Softening	30% ■■■■■■■■
Frank Brinson	Evaluation and Options – Task Manager; GAC Pilot Study – Pilot Plant Coordination/Design; Process Engineering Expertise – Ion Exchange	70% ■■■■■■■■
Layla Llewelyn	Evaluation and Options – Data Engineering Staff	85% ■■■■■■■■
Craig Gadberry	Evaluation and Options – Cost Estimation; Support Services – Lifecycle Costing	45% ■■■■■■■■
Audra McCafferty	Evaluation and Options – Regulatory Coordination	55% ■■■■■■■■
Lauren Miller	Evaluation and Options – Sustainability and Resiliency	45% ■■■■■■■■
Robert Gilbert	Evaluation and Options – Constructability	35% ■■■■■■■■
Dan Maher	Evaluation and Options – Facilities Planning; Granular Activated Carbon (GAC) Pilot Study – Pilot Developer/Contractor; GAC Pilot Study – Pilot Operations Lead	85% ■■■■■■■■
Angela Ortiz-Diaz	Evaluation and Options – Permitting	100% ■■■■■■■■
Jorge Arevalo	GAC Pilot Study – Pilot Manager; GAC Pilot Study – Pilot Plant Design; Process Engineering Expertise – GAC; Process Engineering Expertise – Nanofiltration/Reverse Osmosis/Desalination; Process Engineering Expertise – Microfiltration/Ultrafiltration; Support Services – Lifecycle Costing	90% ■■■■■■■■
Bill Dowbiggin	GAC Pilot Study – Pilot Technical Director; Process Engineering Expertise – MIEX	65% ■■■■■■■■
Jennifer Hooper	GAC Pilot Study – Laboratory Testing	60% ■■■■■■■■
Alysse Ness	GAC Pilot Study – Laboratory Coordination/Sampling/Testing	60% ■■■■■■■■
Rick Newberg	GAC Pilot Study – Operations Coordination/Training	90% ■■■■■■■■
Chris Schulz	Process Engineering Expertise – Ozone; Process Engineering Expertise – UV/AOP	30% ■■■■■■■■
Philip Singer	Process Engineering Expertise – Water Quality and Disinfection By-Product	30% ■■■■■■■■
Danny Shannon	Process Engineering Expertise – Enhanced Line Softening	35% ■■■■■■■■
Stew Magenheimer	Process Engineering Expertise – Water Supply and Reject Disposal	75% ■■■■■■■■
Mark White	Process Engineering – Microfiltration/Ultrafiltration	40% ■■■■■■■■
Beatriz Garcia	Process Engineering – Multistage Flash Distillation	30% ■■■■■■■■
Jon Goldman	Process Engineering – Pipelines and Transmission	35% ■■■■■■■■

# Proven Champion for Project Success

Tim has extensive local experience managing large water and wastewater utility projects with similar needs and complex water resources challenges. With more than **31 years of experience** covering the full spectrum of water projects he is the project manager the City needs on its team to deliver on-schedule, on-budget projects of the highest quality.



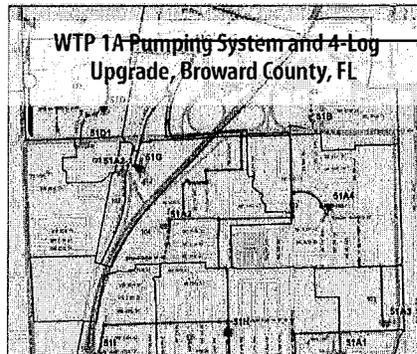
“ Responsiveness to the City and working hand-in-hand with your staff will be my main focus. From start to finish, you can be assured that the your projects will remain my #1 priority.”

*Timothy J. O'Neil*

## Timothy J. O'Neil, PE, BCEE – Project Manager

Education: BS – Mechanical Engineering, University of Florida

Registration(s): Professional Engineer – FL; Board Certified Environmental Engineer (BCEE), American Academy of Environmental Engineers and Scientists



15+ years of project management experience with \$48M of City of Fort Lauderdale projects including design, permitting, bidding, and services during construction

## THE RIGHT LEADER FOR YOUR PROJECT

### Decisive Leadership

Known for sound judgment, diplomacy, and collaborative and transparent communications; Decision maker with proven ability to anticipate and resolve potential conflicts before they become challenges.

### Experienced Manager

With more than 31 years of experience including each aspect of water design, permitting, and construction and an ability to manage projects within schedule and budget makes Tim one of our most sought-after project managers.

### Responsiveness

Tim will manage our staff and will remain responsive, available, and engaged throughout every project under the City's contract. He is a Broward County resident conveniently accessible to the WTP and City Hall.

### Effective Decision-Making

Through a collaborative approach, Tim will help build consensus among stakeholders and guide the decision-making process, which will be vital for staying on schedule and within budget.

D. ORGANIZATIONAL CHART OF PROPOSED TEAM

ATTACHED



City of Fort Lauderdale

**PRINCIPAL-IN-CHARGE**

Ignacio L. Lizama, PE, ENV SP

**TECHNICAL REVIEW COMMITTEE/QA/QC**

Michael A. Zafer, PE\*  
Susan L. Crawford, PE\*, BCEE

**PROJECT MANAGER**

Timothy J. O'Neil, PE, BCEE

**EVALUATION AND OPTIONS**

**Task Manager**  
Frank Brinson, PE

<b>Data Engineering Staff</b> Layla L. Llewelyn, PE	<b>Constructability</b> Robert J. Gilbert, DBIA
<b>Cost Estimation</b> Craig A. Gadberry, PE	<b>Facilities Planning</b> Daniel R. Maher, PE
<b>Regulatory Coordination</b> Audra McCafferty, PE	<b>Permitting</b> Angela P. Ortiz-Diaz
<b>Sustainability and Resiliency</b> Lauren M. Miller	

**GRANULAR ACTIVATED CARBON PILOT STUDY**

**Pilot Manager**  
Jorge M. Arevalo, PhD, PE

**Pilot Technical Director**  
William B. Dowbiggin, PE\*, BCEE

<b>Pilot Plant Design</b> Jorge M. Arevalo, PhD, PE	<b>Laboratory Testing</b> Jennifer L. Hooper, PE
<b>Pilot Plant Coordination/Design</b> Frank Brinson, PE	<b>Laboratory Coordination/Sampling/Testing</b> Anna Alyse Ness
<b>Pilot Developer/Contractor</b> Daniel R. Maher, PE	<b>Operations Coordination/Training</b> Richard K. Newberg
<b>Pilot Operations Lead</b> Daniel R. Maher, PE	

**PROCESS ENGINEERING EXPERTISE**

<b>Ozone</b> Christopher R. Schulz, PE*, BCEE	<b>Enhanced Lime Softening</b> Danny Shannon, PE*, BCEE Susan L. Crawford, PE*, BCEE	<b>Water Supply and Reject Disposal</b> Stewart J. Magenheimer, PG	<b>Multistage Flash Distillation</b> Beatriz Garcia Fernando
<b>Granular Activated Carbon</b> Jorge M. Arevalo, PhD, PE	<b>MIEX</b> William B. Dowbiggin, PE*, BCEE	<b>Nanofiltration/Reverse Osmosis/Desalination</b> Jorge M. Arevalo, PhD, PE	<b>Corrosion Analysis</b> Philip C. Singer, PhD, BCEE
<b>UV/AOP</b> Christopher R. Schulz, PE*, BCEE	<b>Ion Exchange</b> Frank Brinson, PE	<b>Microfiltration/Ultrafiltration</b> Mark C. White, PE*, BCEE Jorge M. Arevalo, PhD, PE	<b>Pipelines and Transmission</b> Jonathan Z. Goldman, PE, BCEE
<b>Water Quality and Disinfection By-Product</b> Philip C. Singer, PhD, BCEE			

**SUPPORT SERVICES**

<b>Mechanical Engineering/HVAC</b> Joshua H. Meinig, PE	<b>Utilities Engineering (Subsurface Engineering)</b> Keith and Associates	<b>Grant Coordination, Preparation of Grant Applications and Deliverables</b> Valerie P. O'Hara, PE, BCEE	<b>Lifecycle Costing</b> Craig A. Gadberry, PE Jorge M. Arevalo, PhD, PE
<b>Structural Engineering</b> William R. Maples, PE	<b>Electrical Engineering/Industrial Electrical Power Engineering</b> Emilio H. Gacharich, PE	<b>Constructability</b> John S. Chandler	<b>Survey</b> Keith and Associates
<b>Piping Engineering</b> Clay M. Tappan, PE, BCEE	<b>Architecture</b> Michael T. Alford, AIA, LEED* AP BD+C	<b>Value Engineering</b> John S. Chandler	<b>Landscape</b> Keith and Associates
<b>Environmental Engineering</b> Brendan V. Brown, PWS		<b>Cost Controls</b> John S. Chandler	<b>Geotechnical</b> Nutting Engineers of Florida, Inc.
<b>Instrumentation and Controls</b> Adrian Streng			

**SUBCONSULTANTS**

- Keith and Associates
- McCafferty Brinson Consulting, LLC
- Nutting Engineers of Florida, Inc.

\* PE in State other than Florida  
Key Staff

# E SECTION

## Resumes of Key Personnel Proposed for this Contract PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME		13. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE	
Timothy J. O'Neil, PE, BCEE		Project Manager		a. TOTAL	31
15. FIRM NAME AND LOCATION (City and State)		b. WITH CURRENT FIRM			
CDM Smith – Boca Raton, FL		22			
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)		
BS – Mechanical Engineering			PE – FL (Mechanical)		
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):					
Board Certified Environmental Engineer; Florida Engineering Society; American Society of Mechanical Engineers; American WaterWorks Association; Florida Water Environmental Association					
19. RELEVANT PROJECTS					
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
a.	<p><b>Engineer-of-Record, South Miami Heights WTP Deep Injection Well Permit and Design, Miami-Dade Water and Sewer Department (WASD), Miami-Dade County, FL, Ongoing.</b> Mr. O'Neil is the engineer-of-record for the <b>deep injection well</b> for the future \$100M South Miami Heights WTP. Mr. O'Neil's services included coordination with the client's professional geologist group to apply for a Class V construction permit with a proposed injection within the Boulder Zone approximately 2,500 feet below land surface.</p>				
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
b.	<p><b>Design Project Manager, Design-Build Services for the 2.0-MGD Nanofiltration WTP, City of Dania Beach, FL, 2011.</b> Mr. O'Neil provided design and permitting services for the new <b>2.0-mgd Nanofiltration Design-Build</b> project at the City's existing <b>lime softening WTP</b>. Mr. O'Neil completed the design in 12-weeks and obtained the six regulatory permits in the subsequent 12-weeks. The project involved surveying, site plan approval, on-site piping, pretreatment, two 1-mgd nanofiltration skids/frames/treatment system, 6,000 square feet (150 feet by 40 feet) with 20 foot eave height building, chemicals, chemical storage, cleaning system, post treatment, HVAC, electrical connections, parking improvements, connections to the wet well, and other ancillary items. The improvements integrate the new nanofiltration WTP facilities with the current lime softening facilities and coordinated construction to minimize disruption to current activities. The project included an innovative membrane system design entailing a two stage NF membrane system with convertible third stage RO units was developed to meet the project technical challenges including providing the operational flexibility to treat variable quality raw water sources. The NF/RO system utilizes the existing sewer collection system, for concentrate disposal. <i>The project won an Honor Award from the Florida Design-Build Institute of America (DBIA) and the FICE Engineering Excellence Grand Award in 2012.</i></p>				
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
c.	<p><b>Senior Project Manager, WTP 1A Pumping System and 4-Log Upgrade, Construction Management Services, Broward County, FL, 2013.</b> Mr. O'Neil provided construction management services for the structural baffling modifications to the east clearwell to provide disinfection of the finished water. Modifications to the existing chemical application points to disinfect the east and west blended clearwell water. Installation of four new transfer pumps in the east pump room drawing from the east clearwell. Installation of new transfer piping to route the discharge of the new transfer pumps to existing on-site finished water ground storage tanks. Replacement and relocation of existing high service pumps 1, 3, and 5 from the existing east pump room to the concrete pad and canopy located south of the existing high service pumps 2, 4 and 6. The project modifications meet the 4-log virus removal/inactivation requirement under the Federal Groundwater Rule, by achieving the CT value required to show <b>4-log inactivation with free chlorine</b> in the existing east clearwell. A CT value is the product of the concentration of the disinfectant, free chlorine at WTP 1A, and the contact time with the product water. The CT value required at WTP 1A to provide 4-log virus treatment is 3.4 mg-min/L, which equals a target free chlorine residual of 1.8 mg/L. Primary disinfection of the treatment process flow takes place in the baffled disinfectant contact zone located within the existing east clearwell. New piping routes filtered, lime softened water from the Filters 5 thru 8 (west) to the east clearwell to be blended with the filtered water from Filters 1 thru 4. Free chlorine residual, pH, and temperature are monitored at the end of the free chlorine contact zone in the east clearwell, upstream of the ammonia application point. Also a second, "intermediate", monitoring and ammonia application point at approximately half of the total disinfection contact volume. This feature was included as a contingency for operational flexibility. Mr. O'Neil attended monthly progress meetings, reviewed shop drawings, replied to technical questions, closed the health department permit, and demonstrated 4-log compliance with the health department</p>				

# E SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

1. NAME		3. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE		
Ignacio L. Lizama, PE, ENV SP		Principal-in-Charge		a. TOTAL	25	
				b. WITH CURRENT FIRM	12	
15. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Miami, FL						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
BS – Civil Engineering			PE – FL (Civil)			
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Envision Sustainable Professional; Member, American Water Works Association; Member, Water Environment Federation; Member, Florida Engineering Society; Member, American Public Works Association; Member, National Society of Professional Engineers						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<p><b>Principal-in-Charge, Alexander Orr Jr. WTP Professional Services Agreement, Miami-Dade Water and Sewer Department (WASD), Miami-Dade County, FL, 2013.</b> Mr. Lizama was responsible for the implementation of comprehensive engineering services on the Alexander Orr Jr. WTP with a treatment capacity of 248 mgd, for the largest WTP in Miami-Dade. Services have included design of plant upgrades and expansions, including renewal and replacement (R&amp;R) projects. Among the projects conducted under this contract are a chloramine evaluation and nitrification study, construction management services for the <b>aquifer storage and recovery (ASR) ultraviolet (UV) disinfection system</b> at the South and Southwest Wellfields, a <b>lime softening</b> and sodium hexametaphosphate evaluation, and design of improvements to the in-house plant water use accounting. A recent assignment is the conversion from gas disinfection to onsite disinfection using an onsite generation system (OSG). The project includes preliminary site investigations, preliminary design reports, preparation of design and contract specifications, permitting and procurement services, bidding assistance, and services during construction.</p>					
b.	<p><b>Principal-in-Charge, South Miami Heights WTP, WASD, Miami-Dade County, FL, Ongoing.</b> As the officer-in-charge for the South Miami Heights WTP, Mr. Lizama is leading a multi-discipline team in the preparation of a design criteria package for the WASD procurement of design, construction, and operation services for a 20-mgd WTP as a design-build-operate and finance project. The design criteria will include criteria for finished water quality, criteria for a WTP capable of treating water from two sources (<b>Biscayne Aquifer and the Upper Floridan Aquifer</b>), criteria for Leadership in Energy and Environmental Design (LEED®) Silver Certification, criteria for the production wells and transmission mains, and criteria for operations of the future plant.</p>					
c.	<p><b>Principal-in-Charge, South Miami Heights (SMH) Water Treatment Plant Injection Well System and Upper Floridan Aquifer Test Production Well Program, Miami Dade Water and Sewer Department (WASD), Miami-Dade County, FL, 2017.</b> Mr. Lizama oversaw the hydrogeological services for the construction of three <b>Upper Floridan Aquifer (UFA) test production wells</b> and one continuous core well for the evaluation of potential yield and quality of groundwater from the UFA at the proposed South Miami Heights wellfield. The project also included the construction of a Class V deep exploratory well with an associated dual zone monitoring well, which is intended to be converted to a Class I Industrial injection well for the disposal of <b>reverse osmosis concentrate</b>.</p>					
d.	<p><b>Principal-in-Charge, Alexander Orr Jr. WTP Lime Slaker Upgrades, Miami-Dade County, FL, 2012.</b> Mr. Lizama oversaw the team that designed the replacement of the existing <b>lime slaker</b> units at the 248-mgd Alexander Orr Jr. WTP. WASD elected to switch slaking technology from the existing batch slakers to paste slakers, include customized improvements. As part of this renewal and replacement, CDM Smith facilitated the fitment of these customized improvements using 3D laser scanning and 3D design. The project included the design of six replacement slakers and transfer tanks and pumps, three new aging/mixing tanks, and a dedicated lime slurry pump/feed system. Services also included permitting, cost estimating, and bidding assistance.</p>					
e.	<p><b>Principal-in-Charge, Alexander Orr Jr. Water Treatment Plant Chloramine Evaluation and Nitrification Control Study, Miami-Dade County, FL, 2008.</b> Mr. Lizama oversaw the development and preparation of a <b>chloramine dosage and nitrification evaluation</b> for the 248 mgd Alexander Orr Jr. Water Treatment Plant. This project includes evaluating the existing plant chlorine and ammonia dosing operations, chloramines residuals, equipment operations, and the distribution system monitoring. Based on the findings of this evaluation a preliminary design nitrification control report and a preliminary design for instrumentation and control of the ammonia/free chlorine feed system were prepared.</p>					

# E SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME		13. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE	
Michael A. Zafer, PE		Technical Review Committee/ QA/QC		a. TOTAL	31
				b. WITH CURRENT FIRM	31
15. FIRM NAME AND LOCATION (City and State)					
CDM Smith – Concord, CA					
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)		
MS – Civil Engineering; BS – Civil Engineering			PE – CA, NV, NM (Civil)		
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):					
Certified Drinking Water Treatment Operator – CA, NM; Member, American Water Works Association; Member, Research Committee for the CA-NV AWWA Section					
19. RELEVANT PROJECTS					
a.	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				
	<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH				
	<b>Technical Advisor, Buckman Regional Water Treatment Plant, City of Santa Fe, NM, 2011.</b> Mr. Zafer served as technical director for the <b>pilot testing</b> to select the treatment process for a new 15 mgd surface water treatment plant for the City and County of Santa Fe on the Rio Grande River. He served as technical advisor throughout preliminary design and assisted throughout the <b>design, startup, and optimization phases</b> of the new facility.				
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				
	<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH				
b.	<b>Project Engineer, Water Quality Regulations Compliance Project, Santa Clara Valley Water District, San Jose, CA, 1991.</b> For the Santa Clara Valley Water District, Mr. Zafer led several activities associated with the implementation of process upgrades at the District's three plants (42, 100, and 100 mgd). Recent tasks included focused <b>pilot testing</b> to optimize disinfection, bromate control, and taste and odor removal with settled water ozonation and <b>biologically active GAC/sand filters</b> . Major facilities improvements now being implemented at the three plants include a new 25-mgd contact clarifier, settled water ozone, GAC/sand filters with filter-to-waste, and washwater clarification.				
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				
c.	<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH				
	<b>Project Engineer, Allen WTP Upgrade, City of Englewood, CO, 2000.</b> Mr. Zafer served as process engineer during predesign for the upgrade of the Allen WTP 28 mgd for the Englewood. Intake and pump station improvements, pretreatment facilities, chemical systems improvements, filter modifications, and solids handling improvements will be implemented at the existing direct filtration plant to help the City meet proposed and future drinking water regulations and to minimize taste and odor problems. As part of the predesign study, Mr. Zafer developed <b>pilot testing</b> protocols for pretreatment and filtration investigations and helped train City staff (intern) in the operation of the pilot filter columns.				
d.	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				
	<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH				
e.	<b>Design Manager, scwd2 Regional Desalination Plant Design, Santa Cruz Water Department and Soquel Creek Water District, Santa Cruz, CA, 2012.</b> Mr. Zafer managed the design of a new 2.5 mgd seawater <b>reverse osmosis desalination</b> plant to treat water from an open-ocean intake in Northern California. The plant was design to provide drinking water for drought protection for the City and an alternative, sustainable supply for the District. Preliminary design was completed in 2012; however the project has been deferred to assess alternative supplies. Mr. Zafer also served as technical reviewer for the <b>comprehensive 12-month pilot study</b> to determine the optimal pretreatment process for treating seawater from Monterey Bay. The project received a \$1.9M grant from the State to advance the science and technology for implementing seawater as a viable drinking water supply in California. <i>The project received a 2011 ACEC California Merit award.</i>				
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				
	<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH				
	<b>Design Manager and Commissioning Manager, Monterey Peninsula Water Supply Project Desalination Infrastructure Design-Build, California American Water, Pacific Grove, CA, Ongoing.</b> Mr. Zafer is managing the design and will serve as commissioning manager for a new seawater <b>reverse osmosis desalination</b> plant for an \$87M design-build project led by CDM Smith. The plant will treat water from the first large-scale beach wells in Northern California and produce 9.6 mgd of drinking water to provide drought protection and an alternative, sustainable supply to replace surface water from the Carmel River. The project is currently in the NEPA/CEQA permitting phase, and is scheduled to deliver desalinated drinking water in 2019.				

# E SECTION

## Resumes of Key Personnel Proposed for this Contract PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME		13. ROLE WITH THIS CONTRACT		14. TOTAL YEARS EXPERIENCE		
Susan L. Crawford, PE, BCEE		Technical Review Committee/QA/QC; Process Engineering Expertise – Enhanced Line Softening		a. TOTAL	29	
				b. WITH CURRENT FIRM	29	
15. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Dallas, TX						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
BS – Civil Engineering			PE – AR, CO, MS, TX (Civil)			
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Board Certified Environmental Engineer; Member: AWWA, WEF, WaterReuse Association, AMTA, IOA, IUVA; AWWA Water Reuse Committee (current)						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<p><b>Project Director, Brazos River Authority, Texas, 2007.</b> For the Brazos River Authority surface water treatment plant that treats water from Lake Granbury, CDM Smith provided design and construction phase services to expand the existing 6-mgd reverse osmosis (RO) system to 7.5 mgd. In addition to the RO system expansion, CDM Smith performed RO pilot-scale testing to evaluate various biofouling control options as pretreatment ahead of the RO system. CDM Smith ultimately recommended the implementation of intermittent chloramination.</p>					
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
b.	<p><b>Project Manager, Membrane Pilot Study and Preliminary Design, Dallas County Park Cities Municipal Utilities District (DCPCMUD) Dallas, TX, 2012.</b> Ms. Crawford served as project manager for a six-month <b>low pressure membrane pilot study</b> that also assessed ultraviolet (UV)/peroxide for taste and odor control. Due to project site constraints and to limit the number of pilot plants being operated, CDM Smith developed a pilot testing RFQ that was sent to all low-pressure membrane suppliers. The qualifications submittals were reviewed and ranked by CDM Smith and DCPCMUD, based on established criteria listed in the RFQ, and the three highest ranking manufacturers were invited to pilot test. CDM Smith <b>performed all pilot testing services</b> during this treatability study. Following the pilot tests, CDM Smith prepared a Pilot Study Report that summarized all testing results and prepared a Pre-Design Report evaluating the plant upgrades required to implement the various alternatives.</p>					
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
c.	<p><b>Project Director, Membrane Pilot Study, City of Weatherford, TX, 2004.</b> Ms. Crawford served as project director for a 4 ½ -month <b>microfiltration/ultrafiltration membrane pilot study</b> that evaluated three membrane manufacturers for future implementation at the city's existing water treatment plant. Membrane technologies being evaluated include pressure and submerged for treatment of the city's two surface water sources—Lake Weatherford and Lake Benbrook.</p>					
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
d.	<p><b>Technical Review Committee, New 9-mgd Surface Water Treatment Plant, Sugar Land, TX, 2014.</b> Ms. Crawford served as process technical reviewer during the <b>piloting</b>, preliminary design, and final design phases of this project that evaluated chlorine dioxide, ozone, and UV disinfection as well as <b>advanced oxidation</b> with hydrogen peroxide, high rate setting, PAC, and <b>GAC adsorption, and low pressure membranes</b>. The new plant process includes pre-oxidation with chlorine dioxide, pretreatment consisting of rapid mix, flocculation and sedimentation, GAC contactors, and MF pressure membrane filters. In addition to chlorine dioxide, the chemical facilities at the plant include polyaluminum chloride, bulk sodium hypochlorite, liquid ammonium sulfate, and sodium hydroxide. The project used the construction manager at risk form of alternative project delivery and cost \$69M. <i>Additionally, this project was a 2014 ACEC of Texas Gold Medal winner.</i></p>					
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
e.	<p><b>Project Engineer, Lime Softening Water Treatment Plant Upgrade, City of Wichita, KS, 1993.</b> Ms. Crawford was project engineer for the upgrade of a 120-mgd <b>lime softening plant</b> to 160 mgd for Wichita. She was responsible for the process/mechanical upgrades to the rapid mix, flocculation, and sedimentation basins at the plant, including hydraulic modifications. Prior to design of the Wichita WTP improvements, Ms. Crawford played a key role in conducting the overall evaluation of the Wichita plant. This evaluation included bench-scale studies to assess alternative coagulants, rapid mix and flocculation mixing times and intensities, and trihalomethane formation kinetic studies for Safe Drinking Water Act (SDWA) compliance. Ms. Crawford also conducted a <b>filter pilot study</b> to evaluate the performance of various media at filtration rates up to 10 gpm/sf. The results of the filter pilot study convinced the Kansas Department of Health and Environment to upgrade the plant's capacity without the addition of new filters—thus saving the City of Wichita approximately \$6M.</p>					

12. NAME		13. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE		
Layla L. Llewelyn, PE		Evaluation and Options – Data Engineering Staff		a. TOTAL	18	
				b. WITH CURRENT FIRM	11	
15. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Miami, FL						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
MS – Environmental Engineering; BS – Civil Engineering			PE – FL (Environmental)			
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Member, Water Environment Federation; Member, Florida Water Environmental Association; CDM Smith Florida Representative for WateReuse Association						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<p><b>Task Manager, South Miami Heights WTP, Miami-Dade Water and Sewer Department (WASD), Miami-Dade County, FL, Ongoing.</b> As the task manager for the South Miami Heights WTP, Ms. Llewelyn is leading a multi-discipline team in the preparation of a design criteria package for the WASD procurement of design, construction, and operation services for a 20-mgd WTP as a design/build/operate/finance project. The design criteria will include criteria for finished water quality, criteria for a WTP capable of treating water from two sources (<b>Biscayne Aquifer and the Upper Floridan Aquifer</b>), criteria for Leadership in Energy and Environmental Design (LEED®) Silver Certification, criteria for the production wells and transmission mains, and criteria for operations of the future plant.</p>					
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
b.	<p><b>Project Manager, Alexander Orr Jr. WTP Conversion of Chlorine Disinfection System from Chlorine Gas to Sodium Hypochlorite Solution: Preliminary Engineering Report, WASD, Miami-Dade County, FL, 2012.</b> Ms. Llewelyn was the project manager for the preliminary engineering report identifying major process, civil, mechanical, structural, electrical, and instrumentation and control needs and changes for the implementation of a <b>sodium hypochlorite disinfection</b> at the 248-mgd Alexander Orr Jr. WTP. The proposed disinfections system replaced the existing chlorine gas disinfection. This task included identification of regulatory requirements, identification of required process modifications, site planning, equipment selection, mechanical/process/instrumentation design, electrical system design, and cost estimating.</p>					
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
c.	<p><b>Task Manager, Alexander Orr Jr. WTP Lime Slaker Upgrades, Miami-Dade County, FL, 2012.</b> Ms. Llewelyn served as the task manager leading the team that designed the replacement of the existing <b>lime slaker</b> units at the 248-mgd Alexander Orr Jr WTP. WASD elected to switch slaking technology from the existing batch slakers to paste slakers, include customized improvements. As part of this renewal and replacement, CDM Smith facilitated the fitment of these customized improvements using 3D laser scanning and 3D design. The project included the design of six replacement slakers and transfer tanks and pumps, three new aging/mixing tanks, and a dedicated lime slurry pump/feed system. Services also included permitting, cost estimating, and bidding assistance.</p>					
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
d.	<p><b>Project Engineer, Alexander Orr Jr. Water Treatment Plant Chloramine Evaluation and Nitrification Control Study, Miami-Dade County, FL, 2008.</b> Ms. Llewelyn was the project engineer responsible for the development and preparation of a <b>chloramine dosage and nitrification evaluation</b> for the 248 mgd Alexander Orr Jr. Water Treatment Plant. This project includes evaluating the existing plant chlorine and ammonia dosing operations, chloramines residuals, equipment operations, and the distribution system monitoring. Based on the findings of this evaluation a preliminary design report nitrification control report and a preliminary design for instrumentation and control of the ammonia/free chlorine feed system were prepared.</p>					
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
e.	<p><b>Task Manager, Alternative Route Analysis for Area N 48-inch and 36-inch Diameter Water Transmission, Miami-Dade County, FL, 2013.</b> As the task manager for the completion of <b>alternative analysis</b> for the Area N improvements for the MDWASD, as originally recommended in the Department's Water Facilities Master Plan Update, Ms. Llewelyn lead and coordinated the field visits, the initial environmental investigations, and the analysis and assessments of route alternatives of approximate 9 miles of proposed 48-inch diameter and 36-inch diameter water transmission main needed to improve water delivery to southern portions of Miami-Dade County.</p>					

# E

## SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME		13. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE		
Craig A. Gadberry, PE		Evaluation and Options – Cost Estimation; Support Services – Lifecycle Costing		a. TOTAL	25	
				b. WITH CURRENT FIRM	16	
15. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Maitland, FL						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
BS – Civil Engineering			PE – FL (Civil)			
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Member, Florida Engineering Society; Member, National Society of Professional Engineers; Member, American Society of Professional Estimators; Member, Association for the Advancement of Cost Engineering International						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<p><b>Chief Estimator, South Miami Heights (SMH) Water Treatment Plant Injection Well System and Upper Floridan Aquifer Test Production Well Program, Miami Dade Water and Sewer Department (WASD), Miami-Dade County, FL, 2017.</b> CDM Smith provided hydrogeological services and construction oversight (RPR) associated with the construction of three <b>Upper Floridan Aquifer (UFA) test production wells</b> and one continuous core well for the evaluation of potential yield and quality of groundwater from the UFA at the proposed South Miami Heights wellfield. The project also included the construction of a Class V deep exploratory well with an associated dual zone monitoring well, which is intended to be converted to a Class I Industrial injection well for the disposal of <b>reverse osmosis</b> concentrate. Mr. Gadberry served as the chief estimator for the project.</p>				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
b.	<p><b>Chief Estimator, Progressive Design-Build for Ion Exchange Resin Plant and East WTP Improvements, City of Boynton Beach, FL, 2017.</b> Mr. Gadberry was the chief estimator for the \$25.5M design-build of new ion exchange resin facility and upgrading/capacity expansion of the existing <b>lime softening</b>, filtration, and residuals handling systems at the East Water Treatment Plant to a capacity of 24 mgd. Additionally, this project incorporates replacement of the existing high services pumps and new re-pump station located onsite with a 3.0-MG ground storage tank.</p>				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
c.	<p><b>Chief Cost Estimator, Retail Potable Water and Wastewater Master Plan, Broward County, FL, 2016.</b> CDM Smith was responsible for developing a Retail Potable <b>Water and Wastewater Master Plan</b> for a future forecast year of 2040 to address retail facilities within the County's four service areas (known as Districts 1, 2, 3A, and 3BC). As part of this effort, our team developed the hydraulic model of the County's retail potable water, water, and wastewater systems, utilizing ESRI ArcGIS, InfoWater, and InfoSWMM, respectively, to develop a detailed and accurate model. In addition, our team was also responsible for data collection and cataloging. Mr. Gadberry served as the chief estimator for the project.</p>				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
d.	<p><b>Chief Cost Estimator, Alternative Water Supply Project, City of Tarpon Springs, FL, 2015.</b> CDM Smith was responsible for the design of the new \$60M, 6.4-mgd Tarpon Springs Membrane Treatment Plant (MTP). The project included raw water characterization, <b>membrane pilot plant testing studies</b>, and <b>membrane system design</b> and performance projections, as well as the design of chemical storage and feed systems, post-treatment, and hydraulic analysis for transfer and high service pumps.</p>				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
e.	<p><b>Chief Estimator, West Wellfield Expansion and Raw Water Transmission Mains, City of Deerfield Beach, FL, 2007.</b> CDM Smith was retained to perform <b>injection well</b> and pump station design and construction services projects in several contracts at the City of Deerfield Beach's West WTP. The construction of the concentrate pump station, injection well, and dual zone monitor well was managed by CDM Smith. In addition to providing on-site resident engineering services, we provided general construction services, including shop drawing review, construction coordination and scheduling, instrumentation programming, and O&amp;M start-up and training services. Mr. Gadberry provided oversight, review, and QA/QC of the engineer's opinion of probable cost of construction.</p>				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	

12. NAME		13. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE		
Lauren M. Miller		Evaluation and Options – Sustainability and Resiliency		a. TOTAL	b. WITH CURRENT FIRM	
				14	11	
15. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Boston, MA						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
MA - Energy and Environmental Analysis; BS - Environmental Studies						
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Steering Committee Member, Climate Adaptation Forum: a collaboration of Environmental Business Council of New England (EBC) and the Sustainable Solutions Lab at the University of Massachusetts Boston; Member and Former Chair, City of Cambridge Climate Protection Action Committee						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<p><b>Task Manager, ACRP Project 02-30, Enhancing the Airport-Industry SAGA Website, Transportation Research Board, 2012.</b> The basis of this Transportation Research Board (TRB) project is to update the Sustainable Aviation Guidance Alliance’s (SAGA) website and associated database of <b>sustainability measures</b> for airports. Ms. Miller served as task manager for the enhancements to the SAGA website and database resource that focus on creating a customizable format, improved search functions, easier navigation, a user’s guide for the database, and a more streamlined list of <b>sustainability practices and projects</b>.</p>					
b.	<p><b>Project Manager and Sustainability Research Analyst, Sustainability Rating Systems Evaluation, Massachusetts Port Authority, MA, 2017.</b> Massport tasked CDM Smith with <b>researching sustainability rating systems (SRS)</b> that would be applicable and more meaningful for Massport’s airport and port non-building facilities to replace existing Sustainable Design Guidelines (SDG). To accomplish this, Ms. Miller researched 20 possible SRS, based on the Massport’s agreed-upon needs. The research included: Envision, BREEAM (Building Research Establishment’s Environmental Assessment), CEEQUAL (Civil Engineering Environmental Quality Assessment and Award Scheme), and SuRe® – the <b>Standard for Sustainable and Resilient Infrastructure</b>, along with three project-type-specific SRS: Greenroads, Parksmart, and PEER (Performance Excellence in Electricity Renewal).</p>					
c.	<p><b>Sustainability Research Analyst, Municipal Environmental Department Analysis, City of Arlington, TX, 2007.</b> For the City of Arlington to become a leader in sustainability, it is important for the City to understand how other US cities with similar populations <b>organize themselves to be more sustainable</b>. Ms. Miller provided Arlington City leaders with information on how some of the most sustainable cities run their departments. In addition, she analyzed the recycling programs and budgets of the top recycling cities in the US.</p>					
d.	<p><b>Project Director and Resilience Expert; Passaic River Basin Climate Resilience Plan, North Jersey Transportation Planning Authority NJTPA, Newark, NJ, Ongoing.</b> The NJTPA selected CDM Smith to assess the current and future <b>vulnerability of the transportation assets</b> to extreme heat events, extreme precipitation events, and <b>sea level rise</b> and storm surge in the Passaic River Basin, NJ. This project will identify adaptation strategies for a more resilient transportation system. As project director, Ms. Miller is responsible for shaping the direction of the project and leading the cross-disciplinary team of water resource engineers, hydraulic and hydrologic (H&amp;H) modelers, transportation planners, asset management specialists, and GIS experts.</p>					
e.	<p><b>Project Manager and Technical Lead, Salem Vulnerability Assessment and Adaptation Plan, Salem, MA, 2015.</b> CDM Smith partnered with Salem for a CDM Smith-sponsored Research and Development project to conduct a Climate Change Vulnerability Assessment and Adaptation Plan. The project established the top three <b>climate change impacts</b> based on downscaled Global Climate Models (GCMs), research from the National Oceanic and Atmosphere Administration (NOAA), and other sources. Ms. Miller led the vulnerability assessment using the ICLEI approach to determine the sensitivity and the adaptive capacity of assets within the City. The adaptation plan outlined specific strategies for the City to make their <b>climate vulnerable areas into climate resilient areas</b>. The sectors included in this work were: water systems, stormwater, transportation, energy, <b>critical infrastructure</b>, and vulnerable populations.</p>					

# E

## SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

1. NAME		3. ROLE IN THIS CONTRACT		4. TOTAL YEARS EXPERIENCE		
Robert J. Gilbert, DBIA		Evaluation and Options – Constructability		a. TOTAL	38	
				b. WITH CURRENT FIRM	7	
15. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Maitland, FL						
16. EDUCATION (degree and specialization)				17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)		
				Licensed General Contractor – NM, AZ		
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Design-Build Designated Professional; Member, American Society of Civil Engineers; Member, Design-Build Institute of America; Member, American Water Works Association; Member, Construction Management Association of America						
19. RELEVANT PROJECTS						
a.	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
	<p><b>Constructability Expert, Ion Exchange Resin Plant and East WTP Improvements, City of Boynton Beach, FL, 2017.</b> Mr. Gilbert was the constructability expert for the \$25.5M progressive DB method, to install an <b>Ion Exchange Resin Plant</b> at the West WTP site for pretreatment of the water supply to the East WTP from the western <b>wellfield</b> while upgrading of the WTP from 19.2-mgd to a capacity of 24-mgd. The project scope includes surveying, geotechnical services, preliminary engineering and design, final design, all permitting, equipment procurement, demolition, site restoration, site improvements, and construction of the WTP additions and improvements including but not limited to civil, mechanical, structural, electrical, instrumentation and control, telemetry disciplines, quality control, safety, start-up, performance testing, operator training, operations and maintenance (O&amp;M) manuals, and record drawings.</p>					
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
	<p><b>Constructability Expert, \$63.5M CMAR Modification and Upgrade of 60-mgd Highland Avenue WTP, City of Augusta, GA, 2009.</b> The Highland Avenue WTP was permitted to treat 60 mgd, but could only produce a continuous 45 mgd. The City wanted to upgrade its facility to meet its permitted capacity. Mr. Gilbert was responsible for the project and oversaw the construction of a multipurpose building to house a new plant control room, seven new deep-bed filters, all chemical facilities, administrative offices, O&amp;M areas, laboratories, and ancillary pumping systems. The team ensured <b>continuous water production</b> while transitioning from the existing facilities to the new facilities. The project was completed \$1.8M under budget. The total CMAR contracted value was \$63.5M.</p>					
b.	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
	<p><b>Constructability Expert, DB of Variable Frequency Drive (VFD) Replacement and Control Modifications at the Morris Bridge Pump Station, Tampa, FL, 2013.</b> This \$4.8M DB project consists of converting an existing <b>water treatment plant</b> to a storage pump station for the City. The project included mechanical, structural, HVAC, plumbing, electrical and I&amp;C demolition and removal, including sequenced removal of MCC-1, existing VFDs 1 through 6, removal of harmonic filters, existing compressors, mechanical piping, 8-ton hoist, equipment pads, washwater reclaim pumps etc. followed by additions/improvements that include a new air compressor, new electrical room, new HVAC, condensing units and duct work, new thermostats, lighting modifications with occupancy sensors, new doors, motorized louvers, switchboard modifications, new MCC, new VFDs for pumps 1 through 6, new PLC, integration of existing pumps I/O, control and wiring modification etc.</p>					
c.	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
	<p><b>Constructability Expert, Solid Waste Authority (SWA) Mass Burn Waste-to-Energy (WTE) Facility Design-Build-Operation (DBO), Palm Beach County, FL, 2015.</b> Mr. Gilbert served as the team <b>constructability</b> expert for the design and construction of the CDM Smith \$120M portion of the \$672M, new 3,000-tpd mass burn WTE facility's on-site roadways, drainage, utilities, landscaping, grading, and fencing. Work also included design and construction of the tipping floor building, as well as the building for air pollution control, ash handling, maintenance/warehouse, and all services and utilities therein. Additionally, the siding and roofing on the refuse pit, boiler water treatment, and turbine generator buildings. The scope items included the design and construction of a Platinum LEED®-certified administration/visitors center; oversight of subcontractors conducting geotechnical investigations, topographic surveys, and tree surveys; and preparing final dewatering modeling and engineering of the recharge trenches for the installation foundations and facilities below the groundwater table. He oversaw all aspects of design and worked with the construction management team to complete construction of the facility.</p>					
d.	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
	<p><b>Constructability Expert, Solid Waste Authority (SWA) Mass Burn Waste-to-Energy (WTE) Facility Design-Build-Operation (DBO), Palm Beach County, FL, 2015.</b> Mr. Gilbert served as the team <b>constructability</b> expert for the design and construction of the CDM Smith \$120M portion of the \$672M, new 3,000-tpd mass burn WTE facility's on-site roadways, drainage, utilities, landscaping, grading, and fencing. Work also included design and construction of the tipping floor building, as well as the building for air pollution control, ash handling, maintenance/warehouse, and all services and utilities therein. Additionally, the siding and roofing on the refuse pit, boiler water treatment, and turbine generator buildings. The scope items included the design and construction of a Platinum LEED®-certified administration/visitors center; oversight of subcontractors conducting geotechnical investigations, topographic surveys, and tree surveys; and preparing final dewatering modeling and engineering of the recharge trenches for the installation foundations and facilities below the groundwater table. He oversaw all aspects of design and worked with the construction management team to complete construction of the facility.</p>					

# E SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

2. NAME		3. ROLE IN THIS CONTRACT		4. TOTAL YEARS EXPERIENCE		
Daniel R. Maher, PE		Evaluation and Options – Facilities Planning; GAC Pilot Study – Pilot Developer/Contractor; GAC Pilot Study – Pilot Operations Lead		a. TOTAL	20	
				b. WITH CURRENT FIRM	11	
5. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Miami, FL						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
BS – Civil Engineering			PE – FL (Civil)			
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
40-hour OSHA Personnel Protection and Safety Course; Member, American Society of Civil Engineers						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<p><b>Project Manager, South Miami Heights WTP, Injection Well System and Upper Floridan Aquifer (UFA) Test Production Well Program, Contract W-930, WASD, Miami-Dade County, FL, 2017.</b> CDM Smith's scope of services included providing professional engineering services for the design, permitting, and implementation of a hydrogeologic test plan in preparation for the proposed ultralow pressure <b>reverse osmosis WTP and UFA wellfield</b> for Miami-Dade County. The test plan program included the installation and testing of three UFA test production wells, and a new Class V injection well to the Boulder Zone. Mr. Maher's duties for this project included overseeing the preparation of the hydrogeologic test plan, drawing and specifications development, and preparation of permit documents and guiding the project through the FDEP permitting process. Mr. Maher also managed the construction phase services for installation of the wells, completion of aquifer performance testing and development of hydrogeologic test report. His responsibilities also included preparing monthly invoices and status reports; conducting project meetings; as well as coordination with the client's construction management and hydrogeology staff, and coordinating resource management for full-time project representation.</p>				<input checked="" type="checkbox"/>	
b.	<p><b>Project Manager, South Miami Heights WTP, Design-Build Operate Finance and Maintain (DBFOM), WASD, Miami-Dade County, FL, 2018.</b> CDM Smith's scope of services included providing professional engineering services for development of a design build criteria package that will serve as the basis for preparing the final design for a new <b>raw water supply and membrane water treatment facility</b> with an initial capacity of 20 mgd, and preparation of procurement documents for a design-build alternative delivery, including operation and financing, for Miami-Dade County. The program includes <b>Upper Floridan aquifer and Biscayne aquifer wellfields</b>, deep injection well system for concentrate disposal and the membrane treatment process. Mr. Maher is responsible for overseeing the preparation of design criteria documents, probable construction cost estimates, request for qualifications and request for proposals procurement documents and supporting the project through the Miami-Dade County procurement process. In addition, Mr. Maher is responsible for preparing monthly invoices, status reports, and schedule updates, conducting project coordination meetings, as well as day-to-day project management activities.</p>				<input checked="" type="checkbox"/>	
c.	<p><b>Project Manager, Alexander Orr Jr. WTP Distribution System, 20-inch and 24-inch Diameter Water Transmission Mains, WASD, Miami-Dade County, FL, 2017.</b> Mr. Maher managed the design, permitting, and construction phase services of nearly 4.5 miles of new 20 through 24-inch diameter ductile iron <b>water transmission main</b> in south Miami-Dade County. The project included connections to existing water mains and new fire hydrants. Mr. Maher was responsible for overseeing the preparation of design criteria documents, probable construction cost estimates, request for design-build services procurement documents and supporting the County during the procurement process. In addition, Mr. Maher was responsible for preparing monthly invoices, status reports, and schedule updates, conducting project coordination meetings.</p>				<input checked="" type="checkbox"/>	

# E SECTION

# Resumes of Key Personnel Proposed for this Contract PART I – CONTRACT-SPECIFIC QUALIFICATIONS

2. NAME Angela P. Ortiz-Diaz		3. ROLE IN THIS CONTRACT Evaluation and Options – Permitting		4. TOTAL YEARS EXPERIENCE	
		a. TOTAL	4	b. WITH CURRENT FIRM	3
5. FIRM NAME AND LOCATION (City and State) CDM Smith – Miami, FL					
16. EDUCATION (degree and specialization) MSCE – Environmental Engineering; BS – Civil Engineering			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)		
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.): Member, Florida Water Environment Association					
19. RELEVANT PROJECTS					
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
a.	<p><b>Project Engineer, CD 1.09 Fats, Oil, and Grease (FOG) Removal Facility South District Wastewater Treatment Plant (WWTP), WASD, Miami-Dade County, FL, 2018.</b> The project consisted of improving the existing FOG and septage receiving facility process, in order to ease operations and improve flow efficiency. In this project Ms. Ortiz coordinates design efforts among the various design disciplines by checking work at every design phase, and facilitates communication to avoid design conflicts. Under the guidance of the design manager, Ms. Ortiz identified yard piping conflicts with the proposed foundation of the bridge crane. She was also in charge of writing sections of the technical memos and BODR. She also has performed site visits with the design team members to verify site characteristics for design. Ms. Ortiz actively participating in checking efforts of plans and specifications at every design phase before each client submittal. Finally, Ms. Ortiz <b>led the permitting application process</b>, and kept written record of client review workshops and other meetings, as well as internal technical review meetings.</p>				
b.	<p><b>Project Engineer, CD 2.19(2) Co-Gen Facility Detailed Design Central District WWTP, WASD, Miami-Dade County, Florida, 2018.</b> This project entailed the addition of a biological Hydrogen Sulfide (H2S) system and new associated biogas pipeline, and construction of a new switchgear building for the existing Co-Generation building. Ms. Ortiz participated in design activities, such as BODR write-up, preliminary specification identification, and coordination among design disciplines. Ms. Ortiz performed a site visit with the design team and the client to identify alternative pipe routing. Ms. Ortiz <b>led the permitting application process</b>. Ms. Ortiz was also responsible of keeping written record of client review workshops and other meetings, as well as internal technical review meetings.</p>				
c.	<p><b>Junior Engineer, CD 2.27 Oxygen Production Facility Central District WWTP, WASD, Miami-Dade County, FL, 2018.</b> This project consists of the design and construction of a new Vacuum Pressure Swing Adsorption (VPSA) oxygen production facility to replace the aging cryogenic oxygen production facilities. Ms. Ortiz participated in technical memo and BODR write up, performed several site visits with the design team and the client, and kept photographic record as necessary for engineers in other locations. Ms. Ortiz facilitated communication between the design manager and the client in order to obtain answers to critical questions for the design. Ms. Ortiz anticipates to undertake a design task and drive it to completion during the detailed design phase. Finally, Ms. Ortiz has kept written record of client review workshops and other meetings, as well as internal technical review meetings.</p>				
d.	<p><b>Engineer, Water Supply in Developing Countries, Las Canas, Dominican Republic, 2014.</b> Ms. Ortiz was part of the multidisciplinary team that developed the design and implementation strategy of a community size drinking water treatment system. The system comprised of two sand filters and two <b>membrane filters</b> that treats water for 300 families. The design was developed based on information obtained of the water source, waterborne diseases experienced by the community, and water practices. The project also addressed the need to educate people on the importance on safe water practices, as well as necessary technical training for the operation and maintenance of the system. Further, surveys were planned to document and monitor the efficacy of the project.</p>				

# E

## SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME		13. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE			
Jorge M. Arevalo, PhD, PE		GAC Pilot Study – Pilot Manager; GAC Pilot Study – Pilot Plant Design; Process Engineering Expertise – GAC; Process Engineering Expertise – Nanofiltration/Reverse Osmosis/Desalination; Process Engineering Expertise – Microfiltration/Ultrafiltration; Support Services – Lifecycle Costing		a. TOTAL	14	b. WITH CURRENT FIRM	9
15. FIRM NAME AND LOCATION (City and State)							
CDM Smith – Maitland, FL							
16. EDUCATION (degree and specialization)				17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
PhD – Environmental Engineering; MS – Environmental Engineering; BS – Chemical Engineering				PE – FL (Environmental)			
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):							
Member, American Water Works Association							
19. RELEVANT PROJECTS							
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)							PERFORMED WITH CDM SMITH
a.	<p><b>Project Engineer, Northwest Water Treatment Plant Expansion and Upgrades, Brunswick County, NC, Ongoing.</b> The Cape Fear River, source water for the Northwest WTP, has been found to contain a variety of contaminants of public health concern, including perfluorinated compounds or PFCs (GENX, PFOS, PFOA, etc.), 1,4-dioxane, hexavalent chromium, NDMA, endocrine disruptors (EDCs), pesticides, and Pharmaceuticals and Personal Care Products (PPCPs), among others. CDM Smith evaluated different treatment alternatives and recommended <b>pilot testing</b> the use of <b>reverse osmosis membranes</b> to remove the contaminants. As such, a membrane pilot unit was installed on February 2018 to treat the effluent from the existing media filters and has been in operation for six months. Dr. Arevalo was responsible for the selection and procurement of the pilot equipment, the development of the testing protocol, installation and commissioning of the pilot unit, training of local staff in the proper operation and maintenance of the pilot equipment, the development of data collection templates, and the development of master spreadsheets for data reporting and analysis. Currently, Dr. Arevalo is leading the preparation of the final pilot report and he will lead the design of the 36-mgd capacity full-scale membrane treatment system.</p>						<input checked="" type="checkbox"/>
b.	<p><b>Process Engineer, Water Purification Technology Evaluation Project, JEA, Jacksonville, FL, Ongoing.</b> To advance sustainable water supply, responsible growth, and the betterment of the St. Johns River, JEA initiated its Water Purification Technology Program. CDM Smith was selected to complete the first phase of this program, the Research and Development Phase, which focuses on the evaluation of various water purification technologies through both literature reviews and field testing. To complete the objectives of this project, CDM Smith just completed field tests of two alternative process trains at both the Southwest Wastewater Treatment Plant and the Buckman Wastewater Treatment Plant. Data collected throughout the field testing will be utilized to compare treatment alternatives and develop capital and operational and maintenance cost estimates to select a single treatment process for subsequent testing at a 1.0 mgd capacity scale. The two treatment processes <b>field tested</b> at the Southwest Wastewater Treatment Plant were: coagulation, flocculation, sedimentation, <b>ozone</b>, biological filtration, and <b>advanced oxidation; and ultrafiltration, reverse osmosis, and advanced oxidation</b>. Dr. Arevalo helped with the selection and procurement of the field equipment, the design of treatment systems and the development of the testing protocol.</p>						<input checked="" type="checkbox"/>
c.	<p><b>Project Engineer, Hood Road WTP Membrane Treatment Conversion, Seacoast Utility Authority, West Palm Beach, FL, 2014.</b> The project included the design and construction of a \$50M, 30.5-mgd finished water treatment capacity membrane treatment facility at the Hood Road WTP site to replace the two <b>existing lime softening</b> facilities. Dr. Arevalo assisted with the <b>pilot plant operation</b>, troubleshooting, data analysis, and final pilot report preparation. He also assisted with drawings, specifications, and cost estimating. He reviewed shop drawings and responded to Contractor requests for information during the construction of this project.</p>						<input checked="" type="checkbox"/>
d.	<p><b>Project Engineer, Alternative Water Supply Project, City of Tarpon Springs, FL, 2015.</b> Dr. Arevalo served as an engineer for the design of the new \$60M, 6.4-mgd Tarpon Springs Membrane Treatment Plant (MTP). He assisted with raw water characterization, <b>membrane pilot plant testing studies</b>, and <b>membrane system design</b> and performance projections, as well as the design of chemical storage and feed systems, post-treatment, and hydraulic analysis for transfer and high service pumps. Dr. Arevalo also helped prepare the final pilot report, the preliminary design report for the new MTP, and the design criteria package for the design-build contractor.</p>						<input checked="" type="checkbox"/>

# E

## SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME William B. Dowbiggin, PE, BCEE		13. ROLE IN THIS CONTRACT GAC Pilot Study – Pilot Technical Director; Process Engineering Expertise – MIEX		14. TOTAL YEARS EXPERIENCE a. TOTAL 34		b. WITH CURRENT FIRM 32		
15. FIRM NAME AND LOCATION (City and State) CDM Smith – Raleigh, NC								
16. EDUCATION (degree and specialization) MS – Environmental Engineering; BS – Civil Engineering				17. CURRENT PROFESSIONAL REGISTRATION (state and discipline) PE – GA, NC, SC, TN, VA				
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.): Board Certified Environmental Engineer; Member, 5 S Society; Member American Water Works Association								
19. RELEVANT PROJECTS								
a.	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)						<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
	<p><b>Project Engineer/Review Demonstration of High Quality Drinking Water Production Using Multi-Stage Ozone-Biological Filtration: A Comparison of DPR With Existing IPR Practice, Gwinnett County Department of Water Resources, Gwinnett County, GA, 2017.</b> This work supports WRF project 4555 and WRRF 15-11. CDM Smith is supporting Gwinnett County in <b>performing pilot-scale tests</b> in this side-by-side study of IPR and DPR to evaluate the efficacy of <b>ozone-BAF</b>. The DPR pilot will evaluate various ratios of blended F. Wayne Hills WRC effluent in combination with Lake Lanier as a <b>raw water source</b>. CDM Smith is also providing professional consulting services to support DWR with the design and procurement of pilot testing facilities, design of the experimental approach, operations plan development and operations support, data analysis, and recommendations for full-scale implementation requirements related to the two pilot studies at the Shoal Creek Filter Plant. Mr. Dowbiggin provided support of project deliverables, such as the pilot design and testing and monitoring plan.</p>							
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)						<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
	<p><b>Project Manager and Engineer, North Fork and Mills River Water Supply Program, City of Asheville, NC, 2017.</b> The program required fast-track design and construction of major facility improvements, as well as implementation of a multi-faceted program to conserve the Authority's <b>high quality water supply</b>. The four components of Phase I included the North Fork WTP upgrade and expansion from 25-to 31-mgd, design of a new 36-mgd East Asheville Booster Pump Station, design of five miles of new 24-inch diameter water transmission pipeline, and a new SCADA system. Mr. Dowbiggin was project engineer for the <b>evaluation of water supply alternatives</b>, led the <b>water quality bench-scale and pilot testing efforts</b>, and was involved in the preliminary design of dam diversion structures and intakes. Phase II involved the design of the new Mills River Regional 7.5-mgd WTP, which is a completely new 5-mgd WTP, designed for readily expanding to 30 mgd. This plant includes a new intake, raw water storage reservoir, raw and finished water pumps, ozonation, rapid mixing/ flocculation, sedimentation, filtration, maintenance, administration and laboratory facilities, chemical storage and feed, and residuals facilities</p>							
c.	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)						<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
	<p><b>Project Manager, Water Treatment Evaluation and Preliminary Engineering for 36-mgd Expansion and Advanced Treatment, Brunswick County, NC, Ongoing.</b> In early 2018, CDM Smith completed a treatment evaluation and water supply engineering alternatives study for Brunswick County. The County wanted to evaluate feasible alternatives to 1) expand capacity of their existing Northwest WTP, 2) utilize alternative sources of raw water, and 3) remove emerging contaminants, such as 1,4 Dioxane and PFAS, found in the Cape Fear River Basin. The project included <b>evaluating each alternative</b>, identifying permitting and environmental issues, <b>piloting of advanced treatment technology at the WTP, a life-cycle cost analysis</b>, and three presentations to the County Board of Commissioners. The Water Treatment Evaluation has been completed and CDM Smith is now working on preliminary engineering, permitting, and funding applications for the selected alternative, which includes expansion of the Northwest WTP to 36 mgd and the addition of advanced treatment technology to remove emerging contaminants found in the Cape Fear River Basin.</p>							
d.	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)						<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
	<p><b>Technical Manager/Lead Design Engineer, Cary-Apex WTP Pilot Study and Evaluation of Improvements, Town of Cary, NC.</b> CDM Smith is conducting a <b>pilot study</b> to determine the effectiveness of biofiltration in improving water quality and consistency. <b>Ozone, GAC, and advanced oxidation</b> have already been tested. The pilot facilities include five pilot columns for testing alternate advanced treatment. Potential future testing includes <b>ion exchange, reverse osmosis, and nanofiltration</b>.</p>							

# E

## SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

2. NAME		3. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE	
Jennifer L. Hooper, PE		GAC Pilot Study – Laboratory Testing		a. TOTAL	11
				b. WITH CURRENT FIRM	9
15. FIRM NAME AND LOCATION (City and State)					
CDM Smith – Bellevue, WA					
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)		
MS – Environmental Engineering; BS – Biological Systems Engineering			PE – WA (Environmental)		
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):					
40-hour Hazardous Waste Operations Safety Training; Member, American Water Works Association (AWWA); Subcommittee Chair for AWWA's Biological Treatment Committee, Monitoring and Operations Subcommittee; Project Advisory Committee member for Water Research Foundation project 4496: Converting from Conventional Filtration to Biological Filtration					
19. RELEVANT PROJECTS					
TITLE AND LOCATION (CITY & STATE) - YEAR COMPLETED (ENG./CONST.) - ROLE - BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
a.	<p><b>Co-Principal Investigator, Pilot and Study of High Quality Drinking Water Projection Using Advanced Treatment Options, Gwinnett County Department of Water Resources, Gwinnett County, GA, 2017.</b> The project is intended to evaluate alternative treatment trains to the full advanced treatment (FAT) model for IRP and DPR which includes <b>microfiltration/ultrafiltration (MF/UF), reverse osmosis (RO), and advanced oxidation (AOP)</b>. Implementation of FAT has been difficult due to high energy, capital, and operations and maintenance costs, and use is particularly difficult for inland facilities where RO concentrate disposal is not practical. This pilot-scale demonstration study of ozone-biofiltration as an alternative and more economical treatment train for DPR. Two side-by-side pilots as either IPR or DPR will be evaluated to assess treatment efficacy when F. Wayne Hill WRC treated water is blended at various ratios and used alone as a raw water source. Performance data will incorporate results from a Hazard Analysis and Critical Control Points (HACCP) evaluation including primary and secondary drinking water standards as well as unregulated microbial contaminants and chemical compounds. This research will demonstrate whether ozone-BAF can provide water of equal or higher quality than current drinking water supplies without the use of membranes. Ms. Hooper lead design of the <b>pilot treatment facilities and design of the pilot test plan</b>. CDM Smith coordinated testing over the duration of one year and compiled findings and recommendations to utilities into a research report.</p>				

2. NAME		3. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE	
Anna Alysse Ness		GAC Pilot Study – Laboratory Coordination/Sampling/Testing		a. TOTAL	2
				b. WITH CURRENT FIRM	<1
15. FIRM NAME AND LOCATION (City and State)					
CDM Smith – Jacksonville, FL					
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)		
MS-Environmental Engineering Sciences; BS-Biosystems Engineering					
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):					
Member, American Water Works Association (AWWA); Member, Florida Section AWWA Young Professional Committee Chair (2018) and Co-Chair (2017); Member, Florida Water Environment Association (FWEA)					
19. RELEVANT PROJECTS					
TITLE AND LOCATION (CITY & STATE) - YEAR COMPLETED (ENG./CONST.) - ROLE - BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
a.	<p><b>Project Engineer, Water Purification Technology, JEA, Jacksonville, FL, Ongoing.</b> To advance sustainable water supply, responsible growth, and the betterment of the St. Johns River, JEA initiated its Water Purification Technology Program. CDM Smith was selected to complete the first phase of this program, the Research and Development Phase, which focuses on the evaluation of various water purification technologies through both literature reviews and <b>field testing</b>. To complete the objectives of this project, CDM Smith will field test two alternative process trains at both the Southwest and Buckman WWTPs. Data collected throughout the field testing will be utilized to <b>compare treatment alternatives</b> and develop capital and operational and maintenance cost estimates to select a single treatment process for subsequent testing at a 1.0 mgd capacity scale. The two treatment processes field tested include coagulation, flocculation, sedimentation, ozone, biological filtration, and advanced oxidation; and <b>ultrafiltration, reverse osmosis, and advanced oxidation</b>. Ms. Ness' responsibilities include daily water quality field tests, chemical handling, sample collection, troubleshooting equipment, analytical data compilation and reporting, field safety, and daily operations reporting. Throughout the duration of the project, she served as the lead operator and typically provided daily on-site support.</p>				

# E SECTION

# Resumes of Key Personnel Proposed for this Contract PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME Richard K. Newberg		13. ROLE IN THIS CONTRACT GAC Pilot Study – Operations Coordination/Training		14. TOTAL YEARS EXPERIENCE	
		a. TOTAL 40	b. WITH CURRENT FIRM 10		
15. FIRM NAME AND LOCATION (City and State) CDM Smith – Maitland, FL					
16. EDUCATION (degree and specialization) BS – Business Science; AA – Computer Science			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)		
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.): Class A Drinking Water Treatment Plant Operator – FL; Class A Wastewater Treatment Plant Operator – FL, SC; NASSCO – PACP, LACP, and MACP Certified; EPA – “Asset Management” CUPSS Certified Trainer; Member, Florida Water Pollution Control Operations Association; Member, American Water Works Association					
19. RELEVANT PROJECTS					
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
a. <b>Senior Operations Specialist, Tampa Bay Surface Water Treatment Facility, Tampa Bay Water, Tampa, FL, 2010.</b> Mr. Newberg was an integral member of the team that developed the startup plan, transition plan, and operation and maintenance (O&M) manual for the 120-mgd Tampa Bay Surface Water Treatment Facility. Mr. Newberg provided onsite support for the <b>startup and commissioning of the new treatment systems</b> at the surface water treatment plant.					
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
b. <b>Senior Operations Specialist, Carrabelle and Lanark WTPs, City of Carrabelle, FL, 2010.</b> Mr. Newberg provided <b>startup and commissioning services</b> , and coordinated the efforts of the construction team at the Carrabelle and Lanark WTPs. The two water treatment facilities were upgraded with a <b>MIEX system</b> to remove MCLs from the ground water wells, new SCADA system, and <b>GAC filtration</b> that included the <b>training the staff</b> in its proper operation.					
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
c. <b>Senior Operations Specialist, Anastasia Island WWTP, City of St. Augustine, FL, 2015.</b> Mr. Newberg created the <b>O&amp;M manual</b> for upgrades to the Anastasia Island WWTP that was expanded to 5.0-mgd. He also reviewed all equipment manuals to verify that they meet project specifications.					
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
d. <b>Senior Operations Specialist, Mud Creek Water Pollution Control Plant, City of Valdosta, GA, 2012.</b> Mr. Newberg provided O&M services that included developing a <b>startup and commissioning</b> , electronic O&M manual, training the staff on system operations, optimizing the integration of automation with the facilities systems, and CMMS for the Mud Creek Water Pollution Control Plant.					
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
e. <b>Senior Operations Specialist, South Water Reclamation Facility (SWRF), Orange County, FL, 2008.</b> Mr. Newberg developed the <b>O&amp;M Manual</b> for the 12.47-kVA generator system and provided technical training on the standby power system. The standby power system uses diesel and natural gas as their fuel sources. The system is designed to start on diesel fuel and then run on a natural gas/diesel fuel mix when the load capacity reaches 20 percent until it reaches 80 percent; then the system switches automatically back to diesel.					
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
f. <b>Senior Operations Specialist, South Water Reclamation Facility (SWRF), Orange County, FL, 2008.</b> Mr. Newberg developed the <b>O&amp;M Manual</b> for the 12.47-kVA generator system and provided technical training on the standby power system. The standby power system uses diesel and natural gas as their fuel sources. The system is designed to start on diesel fuel and then run on a natural gas/diesel fuel mix when the load capacity reaches 20 percent until it reaches 80 percent; then the system switches automatically back to diesel.					
TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)					<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
g. <b>Senior Operations Specialist, Richard A. Heyman Environmental Protection Facility (RAHEPF) Operation and Performance Report, City of Key West, FL, 2009.</b> Mr. Newberg conducted an <b>Operations and Maintenance Performance Report (OMPR)</b> for the RAHEPF. The report was based on documentation and data provided by the City of Key West RAHEPF staff along with onsite inspections conducted in conjunction with the preparation of this report. An evaluation was conducted to identify the physical condition of each treatment unit, each process area, and the overall treatment efficiency in conjunction with the plant's operating permit. The report included performance trends based on hydraulic and organic loading rates, along with a comprehensive description of the O&M program as implemented by the O&M staff of the City's RAHEPF.					

# E SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

A. NAME		B. ROLE IN THIS CONTRACT		C. TOTAL YEARS EXPERIENCE		
Christopher R. Schulz, PE, BCEE		Process Engineering Expertise – Ozone; Process Engineering Expertise – UV/AOP		a. TOTAL	36	
				b. WITH CURRENT FIRM	32	
D. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Denver, CO						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
MS – Environmental Engineering; BS – Civil Engineering			PE – CO (Civil)			
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Board Certified Environmental Engineer; Member, American Water Works Association, International Ozone Association, International Ultraviolet Light Association; Member, AWWA UV Disinfection Standards Committee; Member, Board of Directors, International Ozone Association; Member, Board of Directors, Pan-American Group, International Ozone Association; Member, Board of Directors, International Ultraviolet Light Association						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) - YEAR COMPLETED (ENG./CONST.) - ROLE - BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<b>Ozone Process Designer, Ozone Facility Design, Gwinnett County, GA, Ongoing.</b> Mr. Schulz provided design and construction services for <b>150-mgd preozone</b> facility with an installed ozone generation capacity of 1,500 pounds per day. The ozone design included high-concentration, oxygen-fed ozone generation system and sidestream venturi injection-downflow tube (SVI DT) ozone contacting system, developed by Mr. Schulz.				<input checked="" type="checkbox"/>	
b.	<b>Ozone Process Designer, Ozone Facility Design, City of Raleigh, NC, 2018.</b> Mr. Schulz provided design services for <b>78-mgd, 2-stage ozone</b> facility for Raleigh. This facility produces high-concentration ozone using liquid oxygen feed gas with an installed ozone generator capacity of 6,400 pounds per day. The first stage (preozone) uses the <b>SVI-DT contactor ozone injection technology</b> developed by Mr. Schulz. The second (intermediate ozone) uses fine-bubble diffusers and is designed for 99 percent (2-log) inactivation of Cryptosporidium.				<input checked="" type="checkbox"/>	
c.	<b>Ozone Design Lead, Ozone System Upgrade and Expansion, Fairfax County, VA, 2018.</b> Mr. Schulz provided study, design and construction services for upgrade and expansion of 150-mgd ozone system to 225-mgd. The existing <b>ozone generation and contacting systems</b> will be upgraded to provide up to 3-log Giardia inactivation using an automated CT monitoring program. Computational fluid dynamic (CFD) was used to optimize the baffling configuration of the contractors to improve gas-liquid mixing and ozone residual stability.				<input checked="" type="checkbox"/>	
d.	<b>WTP Expansion, Valdosta, GA, 2008, Senior Process Advisor.</b> Mr. Schulz is the ozone process advisor for the upgrade and expansion of a 15-mgd ozone facility to 22.5 mgd. <b>Alternative ozone contacting systems were evaluated</b> for oxidation of hydrogen sulfide, including a vertical in-line diffusion pipeline contacting system developed by Mr. Schulz. In addition, alternative deoxygenation systems were evaluated to reduce dissolved oxygen levels in the finished water, including air stripping and nitrogen-assisted air stripping processes.				<input checked="" type="checkbox"/>	
e.	<b>Ozone Design Lead, Ozone Disinfection Facility, City of Houston, TX, Ongoing.</b> Mr. Schulz is currently serving as the ozone design lead for a new 320-mgd WTP for Houston. The ozone facility will include six <b>ozone generators</b> with a capacity of 17,400 ppd, a chilled cooling water system, and four settled water ozone contactors with fine-bubble diffusers and a contact time of 10 minutes at design flow. A new hybrid constant concentration control strategy will be designed for the ozone system to rapidly respond to changing plant flow and water quality conditions.				<input checked="" type="checkbox"/>	
f.	<b>Ozone Process Lead, Ozone System Upgrading Project, Orlando Utilities Commission, Orlando, FL, Ongoing.</b> Mr. Schulz is providing study, design and construction services for the phased upgrading of seven <b>ozone systems</b> for groundwater treatment plants for hydrogen sulfide oxidation. The plants have design capacities ranging from 10 to 44 mgd. The upgrades include replacement of ozone generation equipment, conversion from fine-bubble diffusion to sidestream injection ozone dissolution system, and new ozone dose control strategies. The first plant, rated at 44-mgd, is completed and upgrades for the second plant are under design.				<input checked="" type="checkbox"/>	

# E

## SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME		13. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE		
Philip C. Singer, PhD, BCEE		Process Engineering Expertise – Water Quality and Disinfection By-Product; Process Engineering Expertise – Corrosion Analysis		a. TOTAL	45	
				b. WITH CURRENT FIRM	7	
15. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Raleigh, NC						
16. EDUCATION (degree and specialization)				17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)		
PhD – Harvard University; MS – Sanitary Engineering; BS – Civil Engineering						
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Board Certified Environmental Engineer; Member, American Society of Civil Engineers; Member, Association of Environmental Engineering and Science Professors; Member, National Academy of Engineering; Member, American Academy of Environmental Engineers; Member, International Ozone Association; Member, Water Environment Federation						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) - YEAR COMPLETED (ENG./CONST.) - ROLE - BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<b>Principal Investigator, Occurrence of Selected Pharmaceutically-Active Compounds and Personal Care Products in Gwinnett County Wastewater and Drinking Water, Gwinnett County (GA) Department of Public Utilities, Ongoing.</b> The presence of 18 pharmaceutically active compounds (PhACs) and personal care products (PCPs) and one endocrine disrupting compound (EDC) was followed monthly after various stages of treatment in an advanced WWTP in the US. Twenty-four hour composite samples were collected after primary clarification, biological treatment and <b>membrane filtration, granular activated carbon (GAC)</b> adsorption, and <b>ozonation</b> . Compounds were identified using high performance liquid chromatography/tandem mass spectrometry (LC-MS/MS) and gas chromatography/mass spectrometry (GC-MS) after solid-phase extraction. Standard addition methods were applied to overcome matrix effects. The extent of PPCP removal by the various processes was related to the physical-chemical properties of the compounds.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
b.	<b>Project Advisor, Cary/Apex Water Treatment Facility, Town of Cary, NC, Ongoing.</b> The Town retained CDM Smith to provide engineering services to expand the <b>Cary/Apex Water Treatment Facility (CAWTF)</b> from 16 mgd capacity to 40 mgd. Dr. Singer served as a project advisor on the technical review committee for this project.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
c.	<b>Principal Investigator, Ozonation and Enhanced Coagulation for Control of DBPs, US Environmental Protection Agency, Various Locations, Various Dates.</b> Dr. Singer and his group evaluated the effectiveness of ozonation, coagulation, and biofiltration in controlling halogenated <b>DBPs in drinking water</b> . Ozonation preceding coagulation and clarification and ozonation following coagulation and clarification were investigated. Biofiltration following coagulation and ozonation was also examined. Both bench and pilot-scale studies were employed. Variables examined included ozone and coagulant dose, pH, type of organic material, bromide concentration, and type of biologically-active filter media. Performance was assessed based on the measurement of TOC, DOC, UV absorbance, THM formation potential, HAA formation potential, bromate, and biodegradable organic carbon. All nine bromine- and chlorine-containing HAAs were measured. The study was performed in two distinct phases: one involving both bench-scale and pilot-plant investigations, and one involving only bench-scale investigations.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
d.	<b>Co-Principal Investigator, Formation and Decay of Disinfection Byproducts (DBP) in the Distribution System, Professional Engineering Firm and AWWA Research Foundation, Various Locations, Various Dates.</b> Dr. Singer and his team examined the formation and decay of selected <b>DBPs in distribution systems</b> focusing on the four THMs and the nine HAAs as well as individual THM and HAA species. The project objectives included evaluation of the critical factors that affect THM and HAA behavior in distribution systems, examination of the effect of storage reservoirs/tanks and booster chlorination stations on THM and HAA concentration and speciation, evaluation of the changes in DBP concentrations and speciation during seasonal changes from chloramines to free chlorine to avoid potential nitrification episodes, and determination of methods of identifying the distribution system locations and times of maximum THM and HAA concentrations in order to address Stage 2 DBPR requirements.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	

# E SECTION

# Resumes of Key Personnel Proposed for this Contract

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME		13. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE		
Danny J. Shannon, PE, BCEE		Process Engineering Expertise – Enhanced Line Softening		a. TOTAL	36	
				b. WITH CURRENT FIRM	36	
15. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Fort Worth, TX						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
MS - Civil Engineering; BS - Civil Engineering			PE – TX (Civil)			
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Board Certified Environmental Engineer; Member, American Water Works Association; Member, International Ozone Association						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) - YEAR COMPLETED (ENG./CONST.) - ROLE - BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<p><b>Project Manager, Surface Water Plant Preliminary Engineering, City of Pearland, TX, Ongoing.</b> Mr. Shannon is project manager for the preliminary engineering phase for a new 10-mgd surface water plant for the City of Pearland. This project includes a process selection phase that <b>evaluates alternative treatment processes</b> to meet the City water quality goals and regulatory requirements. Conventional processes, <b>membrane technologies, ozonation, and carbon adsorption</b> are being evaluated in both <b>bench-scale and pilot plant studies</b>. The final selection of processes will lead to the development of a preliminary engineering report. This report will be the basis for final design of the new facilities.</p>					
b.	<p><b>Project Manager, Stillhouse Water Treatment Plant Design, Bell County Water Control and Improvement District No. 1, TX, 2018.</b> Mr. Shannon served as project manager for the design of the new 17-mgd Stillhouse <b>Water Treatment Plant</b> that is currently under construction, with a completion date in 2020. This multi-discipline project is being designed using 3D modeling out of five CDM Smith offices.</p>					
c.	<p><b>Project Manager, Water Treatment Rehabilitation, Improvements and Optimization Master Plan, City of Arlington, TX, 2017.</b> Mr. Shannon served as project manager for the <b>evaluation of the existing ozone system</b> facilities at both the Pierce Burch and John Kubala WTPs. As part of this project, a fast-track procurement, design and construction project was developed for immediate needs at the Pierce Burch WTP. These Phase I facilities upgrades have been completed and placed into operation. Phase II facility improvements at both plants, include modifications to the LOX storage and feed facilities, ozone generation, diffusion, off-gas destruction, and process controls, were completed in the summer of 2017.</p>					
d.	<p><b>Project Manager, Water Treatment Plant Process Evaluation and Design, City of Fort Worth, TX, 2012.</b> Mr. Shannon served as project manager for the process evaluation and design for the new 12-mgd Westside Water Treatment Plant. The plant, was constructed on a Greenfield site, and includes <b>ozonation, flocculation, high-rate sedimentation with plate settlers, biological contactors, and low pressure membrane filtration</b>. The plant infrastructure, including basins, buildings, major piping, chemical facilities, ozone generators, and electrical facilities have been designed for 35-mgd capacity. This will enable incremental expansion of the plant in future years by equipment addition to meet demands. Plant startup occurred in April 2012.</p>					
e.	<p><b>Project Manager, Eagle Mountain Water Treatment Plant Expansion, City of Fort Worth, TX, 2007.</b> Mr. Shannon was project manager, senior design engineer, and technical director for the \$43M Eagle Mountain WTP – Phase III Expansion that increased plant capacity from 70 mgd to 105 mgd. Mr. Shannon was responsible for process selection, preliminary design development, and design oversight for all engineering disciplines. The design included new and modified <b>ozonation</b> facilities, conventional treatment unit processes, new chemical storage and feed facilities, expanded instrumentation and control, and new clearwell and high service pump station. Subsequent to the Phase III expansion, Mr. Shannon was project engineer and design engineer for the original 30 mgd Eagle Mountain WTP project that was placed into operation in 1992 and project manager and senior design engineer for the Phase II expansion that was placed into operation in 2000.</p>					

Resumes of Key Personnel Proposed for this Contract  
PART I – CONTRACT-SPECIFIC QUALIFICATIONS

13. NAME		14. TOTAL YEARS EXPERIENCE	
Stewart J. Magenheimer, PG		a. TOTAL	b. WITH CURRENT FIRM
15. ROLE IN THIS CONTRACT		32	29
Process Engineering Expertise – Water Supply and Reject Disposal			
15. FIRM NAME AND LOCATION (City and State)			
CDM Smith – Boca Raton, FL			
16. EDUCATION (degree and specialization)		17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)	
MSc – Geology; MBA – Business Administration; BSc – Geology		PG – FL	
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):			
Former Member, Florida Water Environment Association, Past Chair of the Southeast Chapter; Former Member, Florida Association of Environmental Professionals, Past President of South Florida Chapter; Former Member, Florida Association of Professional Geologists, Past Officer			
19. RELEVANT PROJECTS			
	TITLE AND LOCATION (CITY & STATE) - YEAR COMPLETED (ENG./CONST.) - ROLE - BRIEF DESCRIPTION (Scope, Size, Cost, etc.)		<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH
a.	<p><b>Technical Reviewer, South Miami Heights (SMH) Water Treatment Plant Injection Well System and Upper Floridan Aquifer Test Production Well Program, Miami Dade Water and Sewer Department (WASD), Miami-Dade County, FL, 2017.</b> Mr. Magenheimer provided hydrogeological review services associated with the construction of three <b>Upper Floridan Aquifer (UFA) test production wells</b> and one continuous core well for the evaluation of potential yield and quality of groundwater from the UFA at the proposed South Miami Heights wellfield. The project also included the construction of a Class V deep exploratory well with an associated dual zone monitoring well, which is intended to be converted to a Class I Industrial injection well for the disposal of <b>reverse osmosis</b> concentrate.</p>		
b.	<p><b>Project Manager, West Wellfield Improvements, City of Deerfield Beach, Broward County, FL, 2012.</b> As part of a 4 million gallon per day (mgd) water treatment plant expansion, Mr. Magenheimer provided project management and hydrogeological support services related to the development of two <b>karst Biscayne aquifer</b> and one 1,400-foot deep <b>Floridan aquifer</b> municipal production wells. Services provided included evaluation of lithologic, geophysical, and well test data and the selection of final production intervals.</p>		
c.	<p><b>Technical Reviewer, Retail Potable Water and Wastewater Master Plan, Broward County, FL, 2016.</b> Mr. Magenheimer served as technical reviewer for the development of a Retail Potable <b>Water and Wastewater Master Plan</b> for a future forecast year of 2040 to address retail facilities within the County's four service areas (known as Districts 1, 2, 3A, and 3BC). As part of this effort, our team developed the hydraulic model of the County's retail potable water, water, and wastewater systems, utilizing ESRI ArcGIS, InfoWater, and InfoSWMM, and developed a <b>detailed and accurate model</b>. In addition, our team was also responsible for data collection and cataloging.</p>		
d.	<p><b>Resident Project Manager and Lead Hydrologist, Water Supply Wells 28W, 31W, and 33W, City of Boca Raton, FL, 2014.</b> Mr. Magenheimer served as the resident project manager for design and bidding phases and served as lead hydrologist for the final design of the three new <b>Biscayne Aquifer raw water production wells</b>; and approximately 9,000 linear feet of 12-, 14-, and 18-inch raw water piping, including associated electrical, instrumentation, and site improvements for the City. This project was completed on-time and on-budget.</p>		
e.	<p><b>Technical Lead, Continuing Wellfield Rehabilitation Services, City of Boca Raton, FL, Ongoing.</b> CDM Smith has assisted the City with ongoing maintenance, rehabilitation, and optimization efforts at the City's <b>production wellfields</b>. Serving as the technical lead, Mr. Magenheimer has led quarterly data review and evaluation reports, as well as as-needed technical expert services. Projects under this contract have been completed on-time and on-budget.</p>		
f.	<p><b>Project Manager, Alternative Water Resources Feasibility Study, City of Fort Lauderdale, FL, 2012.</b> Mr. Magenheimer managed two feasibility analyses of implementing selected reclaimed water projects that could offset potable water deliveries from the regional water management system within the City of Fort Lauderdale. These studies investigated the potential to use <b>desalination</b> and <b>reclaimed water technologies</b> to offset fresh water withdrawals from the water management system. In addition to managing the project, Mr. Magenheimer provided hydrogeologic conceptualization.</p>		

# E SECTION

## Resumes of Key Personnel Proposed for this Contract PART I – CONTRACT-SPECIFIC QUALIFICATIONS

14. NAME		15. ROLE IN THIS CONTRACT		16. TOTAL YEARS EXPERIENCE		
Mark C. White, PE, BCEE		Process Engineering – Microfiltration/Ultrafiltration		a. TOTAL	21	
				b. WITH CURRENT FIRM	21	
17. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Chicago, IL						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
MSEE – Water Resources Engineering; BS – Civil Engineering; BS – Architecture			PE – IL, NC, NM, WI			
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Board Certified Environmental Engineer; Chair, American Water Works Association, Membrane Systems Subcommittee; Member, American Water Works Association; Member, American Water Works Association Membrane Process Committee; Member, American Water Works Association, Water Treatment Facilities Design and Construction Committee						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<b>Design Engineer, Water Treatment Plant Improvements, Town of Cary, NC, Ongoing.</b> Mr. White served as a design engineer for the Cary/Apex water treatment facility improvements and expansion project. This project involved the design of a 24-mgd expansion of the treatment capacity for the system along with an upgrade of the chemical storage and <b>disinfection systems</b> and installation of new <b>ozone</b> facilities. Mr. White developed detailed design of treatment, pumping and chemical feed facilities as well as coordinated design work for the civil, mechanical, structural, electrical, architectural, and HVAC disciplines. As part of a predesign study, he designed and conducted a <b>pilot testing program</b> to evaluate the performance of intermediate ozonation and alternative filter media on the effects of <b>ozone and granular activated carbon (GAC)</b> filter absorbers on the control of taste and odor compounds, turbidity, manganese, and disinfection byproducts.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
b.	<b>Membrane Specialist, East Canyon Water Plant Evaluation, Weber Basin Water Conservancy District Summit, UT, 2012.</b> Mr. White served as membrane specialist during a <b>condition assessment</b> of an existing <b>microfiltration</b> plant that has been off-line for 10 years. This project included multiple site visits and a one-week operational assessment period to evaluate the condition of the facilities and to identify improvements required to restore facility operation, upgrade to current regulatory requirements and expand treatment capacity.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
c.	<b>Project Manager and Treatment Process Design Lead, Ultrafiltration Membrane Improvements, Racine, WI, 2006.</b> Mr. White served as the project manager and treatment process lead for the design, construction and start-up of a new <b>50-mgd ultrafiltration membrane</b> system for the Racine WTP. This is currently one of the largest membrane facilities within the US. Following commissioning, Mr. White worked with Racine staff to optimize operational performance of the installed membrane system to increase capacity, improve redundancy, and lower operational costs.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
d.	<b>Process Design Lead, Design-Build of the Pojoaque Basin Regional Water Treatment Plant, Santa Fe County, NM, Ongoing.</b> Mark is currently serving as the process design lead for the design-build of a new 6.23 mgd WTP utilizing <b>high-recovery ultrafiltration and nanofiltration membrane</b> systems. This project is being implemented for the United States Department of the Interior, Bureau of Reclamation to develop a new potable water supply for the pueblos of Nambé, Pojoaque, San Ildefonso, and Tesuque; and unincorporated areas of Santa Fe County.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
e.	<b>Membrane Specialist, Pilot Testing and Design, United Water New York, Haverstraw, NY, 2013.</b> Mr. White served as <b>MF/UF membrane specialist</b> for a year-long <b>pilot investigation</b> and design for a new water treatment system. The proposed drinking water plant will treat water from the Hudson River using coagulation, sedimentation, <b>ultrafiltration membranes, low-pressure reverse osmosis membranes</b> , and chlorine contact. Mr. White prepared pilot testing protocols, evaluated testing data, and developed procurement documents and design for the UF membrane system.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
f.	<b>Project Manager, Membrane Treatment Cold Water Capacity Project, Appleton, WI, 2008.</b> Mr. White served as the project manager for an engineering assessment to improve the operation of an 18-mgd <b>ultrafiltration system</b> . We evaluated the causes of excessive fouling of the ultrafiltration system. We recommended improvements to reduce membrane fouling and successfully demonstrated the performance of these improvements during <b>pilot-scale and full-scale testing</b> . CDM Smith developed recommendations and preliminary evaluation of a series of improvements.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	

# E SECTION

## Resumes of Key Personnel Proposed for this Contract PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME		13. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE		
Beatriz García Fernández		Process Engineering – Multistage Flash Distillation		a. TOTAL	15	
				b. WITH CURRENT FIRM	<1	
15. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Santiago, Chile						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
MS – Chemical Engineer; BS – Chemical Engineer						
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.)						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) • YEAR COMPLETED (ENG./CONST.) • ROLE • BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<b>Technical Advisor, Codelco Water Supply Project, Radomiro Tomic, Santiago, Chile, Ongoing.</b> Ms. Fernández serves as technical advisor for the bidding phase of the Codelco Water Supply Project. The project consists of supplying <b>desalinated water</b> by means of the design, financing, construction, 20-year operation and maintenance under a BOOT scheme of a <b>reverse osmosis desalination plant</b> with a design capacity of 840 l/s and with a potential expansion of 1956 l/s. The project also includes, among others, marine works, a conveyance pipeline system, which includes approximately 160 km of pipeline, a reservoir, and the associated power supply infrastructure.					
b.	<b>Technical Advisor, Desalination Plant, Santiago, Chile, Ongoing.</b> Ms. Fernández is serving as technical advisor for the development of the documentation required by the environmental agencies in Chile (EIA & PAS) of a <b>desalination plant</b> and marine works for 1050 l/s.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
c.	<b>Technical Advisor, Escondida Water Supply Expansion, Antofagasta, Chile, Ongoing.</b> Ms. Fernández is responsible of leading the pre-commissioning and commissioning of the owner support team, working together with the installation team, the purchasing department and the Owner, BHP.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
d.	<b>Design Project Manager, GS Inima, Djerba, Tunisia, 2018.</b> Ms. Fernández was responsible for the engineering of a <b>reverse osmosis desalination</b> plant during the construction of 50.000 m3/day with its associated marine works. After the construction she was also part of the commissioning team until the completion of the plant (TND 160M).				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
e.	<b>Design Project Manager, Radomiro, Tomic, Chile, 2018.</b> Ms. Fernández was responsible for the engineering of a <b>reverse osmosis desalination</b> plant during the design of 72.500 m3/day with its associated marine works (USD 200M).				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
f.	<b>Sales Support Senior Engineer, Pentair Water Process Technology, Nederland, 2015.</b> Ms. Fernández was responsible for the design and cost estimation of ultrafiltration systems for seawater (SW), drinking water (DW) and wastewater (WW) plants. She was responsible of turnkey projects of SW, WW, and DW plants. Ms. Fernández was responsible of the R&D of <b>ultrafiltration systems</b> to be installed in floating production storage and offloading units (FPSO).				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
g.	<b>Design Project Manager, Previous Employer, Caribbean, Saudi Arabia, Australia, 2013.</b> Ms. Fernández was responsible of the engineering of a <b>reverse osmosis desalination</b> plant during the design and construction of 24.000 m3/day with its associated beach wells and discharge marine works (USD 43,1M) in Aruba. For a client in Ras Az Zawr, Saudi Arabia, she was responsible of the engineering of a <b>reverse osmosis desalination</b> plant during the bid of 189.000 m3/day (USD 450M). Ms. Fernández was responsible of the engineering of a <b>reverse osmosis desalination</b> plant during the bid of 150.000 m3/day (AUD 1,34M) for a client in Adelaide, Australia.				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
h.	<b>Senior Engineer, Previous Employer, Fujairah, United Arab Emirates (UAE), 2009.</b> Ms. Fernández served as senior engineer and was responsible of the reverse osmosis part of the <b>desalination</b> plant during the design and construction of 137.500 m3/day (USD 130M).				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	

# E SECTION

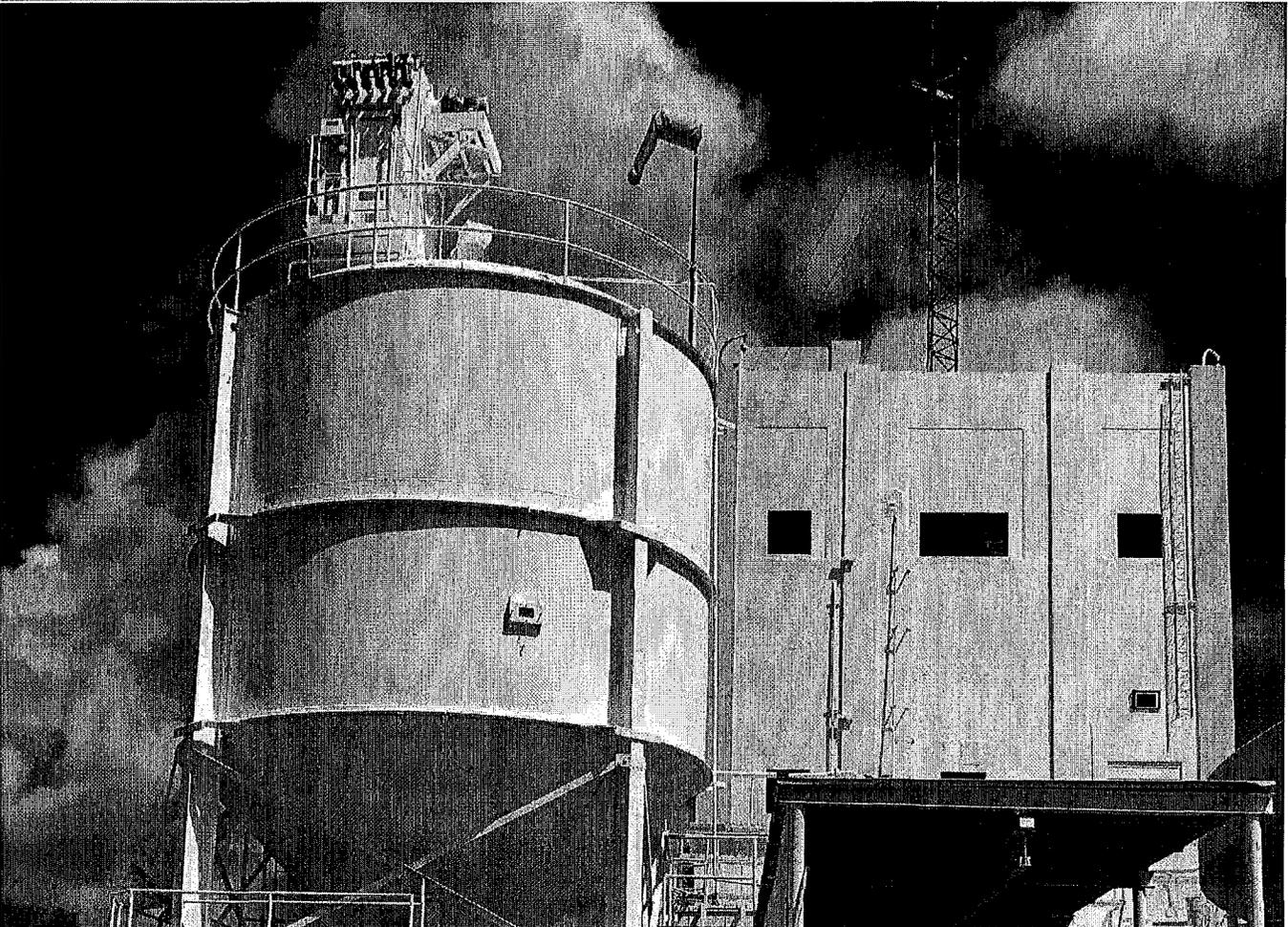
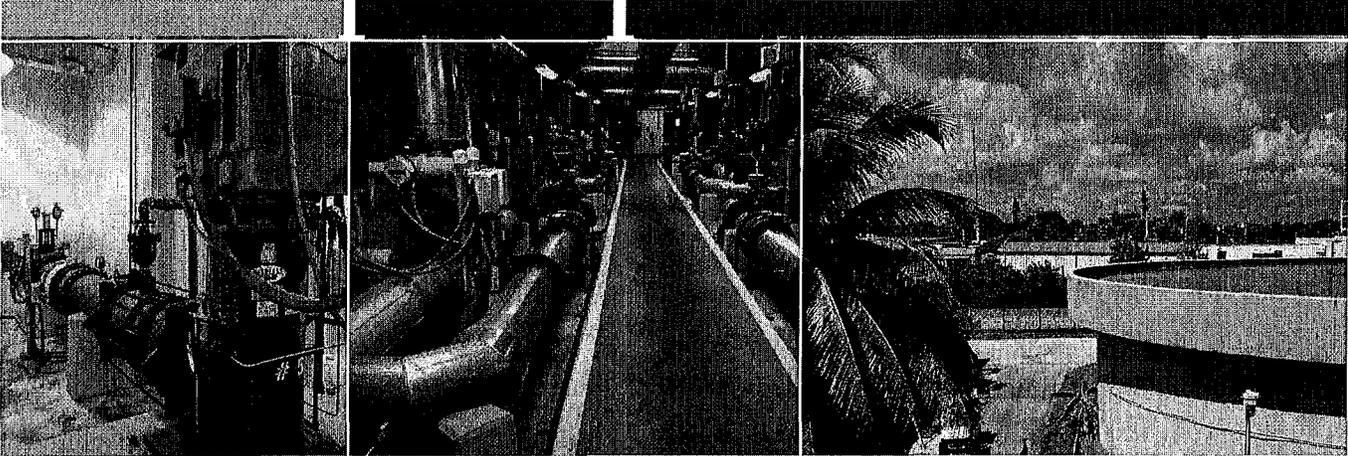
# Resumes of Key Personnel Proposed for this Contract PART I – CONTRACT-SPECIFIC QUALIFICATIONS

12. NAME		13. ROLE IN THIS CONTRACT		14. TOTAL YEARS EXPERIENCE		
Jonathan Z. Goldman, PE, BCEE		Process Engineering Expertise – Pipelines and Transmission		a. TOTAL	31	
				b. WITH CURRENT FIRM	31	
15. FIRM NAME AND LOCATION (City and State)						
CDM Smith – Boca Raton, FL						
16. EDUCATION (degree and specialization)			17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)			
ME – Environmental Engineering; BS – Environmental Engineering			PE – FL (Environmental)			
18. OTHER PROFESSIONAL QUALIFICATIONS (PUBLICATIONS, ORGANIZATIONS, TRAINING, AWARDS, ETC.):						
Board Certified Environmental Engineer; Member, Society of Environmental Engineers; Member American Society of Civil Engineers; Member, American Water Works Association; Member, Water Environment Federation; Member, Florida Engineering Society						
19. RELEVANT PROJECTS						
	TITLE AND LOCATION (CITY & STATE) - YEAR COMPLETED (ENG./CONST.) - ROLE - BRIEF DESCRIPTION (Scope, Size, Cost, etc.)				<input checked="" type="checkbox"/> PERFORMED WITH CDM SMITH	
a.	<p><b>Project Manager/Engineer-of-Record, Retail Potable Water and Wastewater Master Plan, Broward County, FL, 2016.</b> Mr. Goldman was responsible for developing a Retail Potable Water and Wastewater Master Plan for a future forecast year of 2040 to address retail facilities within the County's four service areas (known as Districts 1, 2, 3A, and 3BC). As part of this effort, our team developed the hydraulic model of the County's retail potable water, water, and wastewater systems, utilizing ESRI ArcGIS, InfoWater, and InfoSWMM, and we developed a <b>detailed and accurate model</b>. In addition, our team was also responsible for data collection and cataloging.</p>					
b.	<p><b>Program Manager and Client Service Manager, Water System Improvements, City of Deerfield Beach, FL, 2009.</b> Mr. Goldman and his engineering team identified and implemented several major water supply and treatment capital improvements projects for the City, which met changing regulatory requirements, provided renewal of aging infrastructure with award-winning state-of-the-art facilities, added efficiency to operations, and helped ensure the viable sustainable supply of fresh drinking water to the service area customers of Deerfield Beach. Projects included water treatment plant improvements, <b>wellfield improvements, new Floridan wells</b> and <b>reverse osmosis</b> treatment plant, concentrate disposal wells, water use permitting, and energy efficiency upgrades.</p>					
c.	<p><b>Technical Review, South Miami Heights WTP, WASD Miami-Dade County, FL, 2017.</b> Mr. Goldman provided technical review for the design criteria package for WASD's procurement of design, construction, and operation services for a 23.3-mgd WTP as a DBOF project. The design criteria will include criteria for finished water quality, criteria for a WTP capable of treating water from two sources (<b>Biscayne Aquifer and the Upper Floridan Aquifer</b>), criteria for LEED® Silver, criteria for the production wells and transmission mains, and criteria for operations of the future plant.</p>					
d.	<p><b>Program Director, Design-Build Services for the 2.0-mgd Nanofiltration WTP, City of Dania Beach, FL, 2011.</b> Mr. Goldman oversaw design and permitting services for the new <b>2.0-mgd nanofiltration</b> DB process at the City's existing <b>lime softening</b> WTP. The project involved surveying, site plan approval, on-site piping, pretreatment, two 1-mgd nanofiltration skids/frames/treatment system, 6,000 sf (150 feet by 40 feet) with 20 foot eave height building, chemicals, chemical storage, cleaning system, post treatment, HVAC, electrical connections, parking improvements, connections to the wet well, and other ancillary items. The improvements integrated the new nanofiltration water treatment plant facilities with the then current lime softening facilities and coordinated construction to minimize disruption to current activities. The new building obtained LEED® Gold. <i>The project won an Honor Award from the Florida Design-Build Institute of America (DBIA) and the FICE Engineering Excellence Grand Award in 2012.</i></p>					
e.	<p><b>Project Manager/Engineer-of-Record, Watermain and Forcemain Criticality and Risk Assessment, City of Boca Raton, FL, 2017.</b> Mr. Goldman was responsible for delivering the asset risk and prioritization analysis for the City's <b>underground utility pressure pipelines for both water and wastewater</b>. The analysis consisted of determining and prioritizing the risk for pipeline failures in the City's system and prioritize them in both the short term and long term, for renewal and/or replacement needs. The project employed state-of-the-art software and the City's GIS to assist in processing the large amounts of data, which are inherent in a system of this size. The City is integrating the information from this project into its existing CIP and is working towards the goal of meeting the needs identified by the long-term analysis. This is to be accomplished by inspecting, replacing, or rehabilitating pipeline assets as appropriate, and utilizing the digital results for total risk, total consequence, and total probability to organize and prioritize the renewal plan.</p>					

SECTION

5

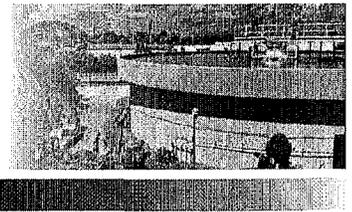
Approach to  
Scope of Work



Section 5:  
Approach to Scope of Work

# Section 5

## Approach to Scope of Work



CDM Smith has discussed the Granular Activated Carbon (GAC) Pilot and Plant Evaluation Project with the City's staff, toured the plant, reviewed the April 2017 Comprehensive Utility Strategic Master Plan (CUSMP), and enlisted our drinking water experts to develop an approach that builds upon the City's work to date. We will collaborate with you on goal setting and comparing options to meet the City's needs, goals, and objectives are to perform a GAC pilot study for color enhancement and evaluate treatment and water supply scenarios for these planning level options:

- Repair and replace the current plant (without GAC)
- Implement color removal process (GAC or other) to the current plant
- Implement a new WTP at Fiveash

We understand that your water quality goals for color removal (CUSMP recommends maximum of 8 Pt-Co CUs) secondary limite is 15 PT-CO color units and virus inactivation (minimum 4 logs removal/inactivation) are the primary objectives, but the project must also address organics removal, disinfection by-products (regulated and unregulated), disinfectant residual stability, corrosion control, contaminants of emerging concern, softening, residuals, and other considerations.

We will leverage our expertise with testing, designing, estimating, permitting, constructing, and operating not only for GAC, but for lime softening, nanofiltration/ reverse osmosis, ozone, UV, and all the treatment technologies and facilities considered. We will collaborate with the City to provide accurate, insightful, and timely information to develop and compare the alternatives to assist the City in the selection of the process that best meets the long-term goals for water quality, cost effectiveness, resiliency, climate change, sea level rise, and sustainability at the Fiveash WTP.

To meet the project objectives most effectively and efficiently, we propose a six-step approach that includes all the activities listed in the RFQ, and a

task structure that the CDM Smith team has used to deliver pilot studies and complex alternatives analysis projects for drinking water clients in Florida, across the US, and around the world and establish critical success factors.

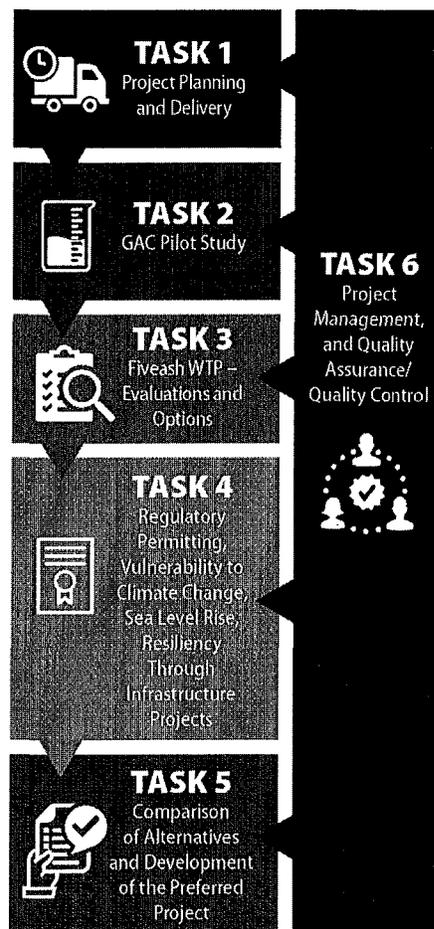
In Task 1, the City and CDM Smith will collaborate to: 1) confirm the project objectives; 2) define the specific goals for water quality, production, operations, resiliency, sustainability, cost, and other considerations; 3) identify the candidate treatment options; and 4) set expectations for communications, management, and quality control activities throughout the project.

For Task 2 - GAC Pilot and Task 3 - Plant Evaluation, we propose to advance the two studies on parallel tracks. The City will benefit from this approach because it will provide reliable performance, sizing, site planning, and cost information early in the project. Our approach will also allow the team to focus on bench, pilot, and possibly plant-scale testing to fill data gaps, and to refine design and operating

criteria for the most promising alternatives. We will work closely with the City to scale up the data and develop initial design concepts, operating strategies, and comparative capital and operating costs.

While the initial design concepts are being developed, Task 4 will assess the permitting and vulnerability aspects for the alternatives. The assessment will consider current and potential future regulations, resiliency, climate change, sea level rise, and sustainability aspects.

After the information from Tasks 1 through 4 have been compiled and presented to the City, CDM Smith will facilitate a series of collaborative workshops in Task 5. The project team will compare the alternatives, discuss technical issues for each alternative, develop evaluation criteria, and collaborate with the City as a recommendation of the preferred alternative is finalized. After the preferred alternative is selected, the City and CDM Smith will refine the elements into the preferred project and present the updated conceptual



design, implementation schedule, and planning level costs for capital and operating expenditures in a summary report.

Task 6 provides for the CDM team’s project management efforts, and QA/QC activities needed to maintain the project on schedule, budget and scope while meeting or exceeding the City’s service expectations.

The following pages present detailed descriptions for each of the six tasks. For convenience and clarity, we have organized each task to include:

- Objectives and Approach
- Insight and Innovation
- Activities and Deliverables

The proposed schedule for the six tasks, and the associated project activities, meetings, workshops, and deliverables are presented at the end of this section.

## Task 1 – Project Planning and Delivery



### Objectives and Approach:

One of the first and most critical steps toward a highly successful project will be to work with the City to develop a clear, definitive, and detailed set of project objectives, including defined finished water quality goals, as well as operational goals for the treatment process. The RFQ and the CUSMP provide the basis for the project objectives, and the production and quality goals, respectively.

We believe the more challenging aspects of Task 1 will include:

- Developing a manageable list of candidate treatment alternatives from the comprehensive list of technologies listed in the RFQ
- Aligning the data needs for Task 2 – GAC pilot study and with Task 3- Evaluation and Options

Developing this information will enable the team to design and customize the pilot test unit(s) and testing program to efficiently collect the data necessary to evaluate and design the proposed GAC process relative to those goals and objectives. In addition, this defined set of goals and objectives will provide a framework and criteria for evaluation of other potential treatment technologies and process design options, effectively providing a “roadmap” for the remainder of the project. Once the project objectives and goals are completely developed and defined, CDM Smith will have the information necessary to commit the appropriate resources

to each project task and collaborate with the City to develop a detailed project plan and schedule. We will strive for “buy-in” from the City and project stakeholders identified by the City at the outset of the project. Our goal is to develop a common understanding of the project objectives, plan, and schedule, and to develop clear lines of communication. As your project manager, **Timothy J. O’Neil, PE, BCEE** will monitor progress of the project and make adjustments as necessary during execution, so that the end results meet the City’s expectations.

### Insight and Innovation:

Our team proposes to develop a preliminary comprehensive list of candidate treatment alternatives based on the RFQ and present it to the City at the kickoff meeting. We will work with the City to conduct an initial feasibility assessment and fatal-flaw analysis to reduce the candidate treatment alternatives to a manageable short-list based on the City’s objectives and goals, and the City’s and CDM Smith’s collective water treatment experience.

### Activities and Deliverables:

- Conduct Kickoff Meeting (Presentation and Minutes)
- Conduct Project Objectives and Goals Workshop (TM-1; draft and final)
- Conduct Candidate Treatment Alternatives Workshop (TM-2; draft and final)
- Communicate with City to meet expectations and manage project team, scope, schedule, and budget (Project Work Plan, includes communications plan and quality management plan)

## Task 2 – GAC Pilot Study



### Objectives and Approach:

Our team will custom-design the GAC pilot equipment and testing program around the City’s project objectives and water quality goals so it is configured to be truly representative of the proposed full-scale process, provide data that will be useful in developing the final design, and include the instrumentation necessary to collect the data needed to complete the evaluations, and cost estimations that the City wishes to conduct. Reliability, flexibility, and scalability are features all pilot systems must possess. Reliability consists of the pilot system operating when required. For pilot studies, downtime equals lost time, lost money, and lost data. Flexibility consists of the pilot system

possessing not only the ability to operate over the range of testing conditions, but also sufficient instrumentation and sample points to facilitate the collection of a complete and comprehensive data set. Pilot systems with limited flexibility unnecessarily restrict the range of potential operating conditions, and associated data collection efforts, which can lead to the formation of inaccurate conclusions and recommendations. Scalability consists of the data collected throughout the pilot study will translate to full-scale systems. Data collected from non-standard or unproven pilot systems may not accurately represent the expected performance of a full-scale system. Working together **William B. Dowbiggin, PE\*, BCEE** and **Jorge M. Arevalo, PhD, PE** will utilize their respective experiences to design a system for the City's GAC Pilot Study that will be reliable, flexible, and scalable, so that the City's goals are achieved.

### Insight and Innovation:

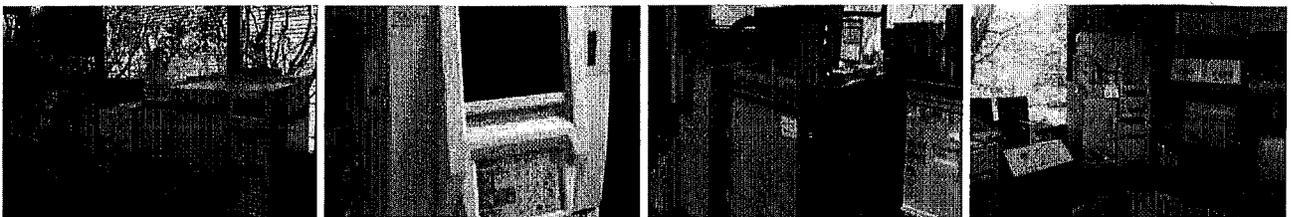
For more than 30 years, CDM Smith has been implementing GAC to meet a variety of water quality goals. The GAC systems at large drinking water facilities are typically configured as filter adsorbers or post-filter contactors, and they support populations of naturally occurring bacteria that promote biologic filtration and the removal of organic matter, oxidation byproducts, and other constituents. Our team's extensive design and operating experience, and industry leading research provides the understanding and tools to quickly and confidently evaluate GAC for the most important design criteria: GAC material specifications, filter loading rates, empty bed contact time, bed life (i.e., regeneration or replacement frequency), and backwashing requirements.

**Parallel and Series Configuration** – Because of the organic content in the Biscayne Aquifer, we propose to configure and operate the pilot system to allow the GAC columns to operate in parallel and series. Operation of the system in a parallel configuration facilitates the concurrent evaluation of multiple types of GAC, multiple empty bed contact times, and/or multiple loading rates. Operation of

the system in a series configuration facilitates the evaluation of multi-stage GAC treatment and maximizes the efficiency of the GAC media. To identify the most cost-effective full-scale GAC system design parameters, CDM Smith recommends the GAC Pilot Study evaluate both parallel and series configurations.

**Lease or Lease/Purchase Options** – Based on CDM Smith's experience, we anticipate the cost-effective and efficient procurement strategy will involve the purchase/rental of one or more multi-column pilot units from a company which specializes in the design and fabrication of pilot-scale equipment. Intuitech, Inc. is one such company and CDM Smith has recently and successfully utilized Intuitech's multi-column pilot units on the Water Purification Technology Project (JEA, Florida) and the Pilot and Study of High Quality Drinking Water Production Using Advanced Treatment Options (Gwinnett County, GA). Dr. Arevalo was directly involved in both of these projects, his familiarity with the equipment will allow for a smooth startup for the Fiveash WTP pilot plant. **As added value, CDM Smith owns and operates mobile trailer-mounted and skid mounted pilot systems. These systems represent a valuable resource to City for the investigation of viable technologies as desired.** We currently have available two filter absorbers and two post filter contactors that could be used to save time and money for this project.

**Supplemental Bench-Scale Testing for GAC, Ozone, UV, AOP, and Other Processes** – Based upon the City's needs and goals, CDM Smith's vision for the GAC Pilot Study would be enhanced by the addition of a bench-scale component. We envision this additional component would effectively screen various types of GAC media at a bench-scale level to identify the most promising type(s) of GAC for testing at the pilot-scale. Our own and full-service Environmental Treatability Laboratory in Bellevue, WA specializes in treatability studies, process optimization studies, and adsorptive column studies; and has the experience and



CDM Smith's own and full-service Environmental Treatability Laboratory in Bellevue, WA specializes in treatability studies, process optimization studies, and adsorptive column studies; and has the experience and expertise necessary to complete this work.

expertise necessary to complete this work. By leveraging our resources, CDM Smith can streamline the pilot-scale schedule and enhance the overall quality of the GAC Pilot Study to include the separate or synergistic effects of alternative processes. We are equipped and staff to conduct treatability studies for GAC, ion exchange, ozone, ozone/hydrogen peroxide, UV, and UV-hydrogen peroxide, chemical coagulation, DBP formation kinetics with free chlorine or chloramines, and other processes at the City's request.

### **Activities and Deliverables:**

**Develop Pilot Testing Protocol** – The development of a detailed Pilot Testing Protocol is critical to the success of a pilot study. This protocol serves as the roadmap for the pilot study and defines the test objectives; identifies the operating conditions and schedule for each test phase; identifies the parameters which will be monitored throughout the study; delineates the responsibilities of the owner, engineer, and vendor; defines the operational and analytical criteria by which the system's performance will be evaluated; and identifies specific data collection requirements for the study. While CDM Smith acknowledges that modifications to the Pilot Testing Protocol will be made during the operational phase of the study, failure to develop a logical roadmap would adversely impact the overall quality and integrity of the pilot study. (Pilot Testing Protocol; draft and final)

**Pilot System Operations** – Operation of the pilot system is the heart and soul of every pilot study. As such, the operational phase of the pilot study is critical to its success and we intend to support this phase of the study with both local (41-person Boca Raton office and CDM Smith's 15-person Miami office) and remote (216-person Orlando office) resources. Local resources will primarily be responsible for day-to-day operations of the pilot system such as ensuring the system operates at the desired conditions, data collection, sample collection and analysis, minor troubleshooting efforts, and minor repairs. Remote resources will primarily be responsible for initial training, general oversight, process decisions, major troubleshooting efforts, and major repairs. CDM Smith will also leverage standard features of the Intuitech multi-column pilot unit (in other words, automatic mode of operation, feedback controls, on-line instrumentation and data logging systems, an alarm notification system, and remote monitoring and control) to minimize downtime, improve the consistency of operations, and enhance the quality of data obtained throughout the pilot study.

The operational phase of a pilot study provides an opportunity for City's operational staff to gain practical, hands-on experience with new treatment processes. We welcome the opportunity to work with the City's operational

staff throughout the operational phase of the GAC Pilot Study, should the City be interested in participating.

**Collect Data and Report Results** – The collection and reporting of data, including both physical operational parameters and water quality parameters, is critical to the evaluation of the GAC process. These data will be collected through a variety of means including online instruments, field analyses, and outside laboratory analyses. These data will be collected and entered into a master data collection spreadsheet for review and analysis. Pre-prepared tables and graphs of critical parameters (in other words, color, UV-254, total organic carbon, pH, alkalinity, headloss, bed volume throughput, and so forth) will expedite the data review process as well as highlight any anomalies in operation such that remedial actions can be implemented immediately. Upon the successful completion of the operational phase of the GAC Pilot Study, CDM Smith will compile the data collected throughout the course of the study into a logical, concise, and easily understandable weekly reports.

In CDM Smith's experience, all pilot studies benefit from weekly conference calls. Often less than 30 minutes, these calls allow CDM Smith to quickly bring the City up to speed on the operation and performance of the pilot system. These weekly calls also give the project team the opportunity to discuss potential modifications to the Pilot Testing Protocol.

**Develop Conceptual Design and Cost Estimates for GAC Options** – CDM Smith will utilize the data collected throughout the operational step of the GAC Pilot Study to develop basic design parameters for a full-scale GAC system (i.e. blend rates, loading rates, headloss, backwash frequency, GAC replacement frequency, etc.) and these parameters will form the basis of the capital and O&M cost estimates. A unique advantage of the CDM Smith team, as it relates to the development of cost estimates, is that we have the support of our construction group, a certified general contractor. By using construction cost estimators who focus on estimating construction costs for water utility projects in the southeast region, the City will benefit by our ability to deliver more detailed and more accurate cost estimates. Furthermore, CDM Smith's cost estimators continually support active construction projects. As a result, our estimators have access to an up-to-date database of actual bid estimates from contractors, vendors, and equipment manufacturers, all of which enhances the quality and accuracy of our estimates. CDM Smith will also incorporate construction trend analyses and escalation rates/indices in our estimates. (Pilot Study Report; draft and final).

## Task 3 – Fiveash WTP – Evaluations and Options

### Objectives and Approach:



The objective of the Task 3 – Evaluations and Options is to evaluate the three options identified to improve the Fiveash WTP in the CUSMP:

#### **Option 1 – Repair/Replace the Current Fiveash WTP:**

This option will maintain the existing unit processes and will not significantly reduce the color below existing levels (approximately 15 Pt-Co color units); continue the five-year repair and replacement (R&R) to address aging equipment; implement 4 log virus inactivation treatment; and upgrade the plant controls and monitoring.

**Option 2 – Implement Color Removal Process to Existing Fiveash WTP:** This option will reduce color below 10 Pt-Co with a GAC process, advanced lime softening process, ion exchange, ozone, UV-AOP, NF/RO, or potentially other processes or combinations of processes; implement 4 log virus inactivation treatment; provide a spare lime softening capacity for routine maintenance of existing lime softening units; continue the five-year R&R to address aging equipment; and upgrade the plant controls and monitoring.

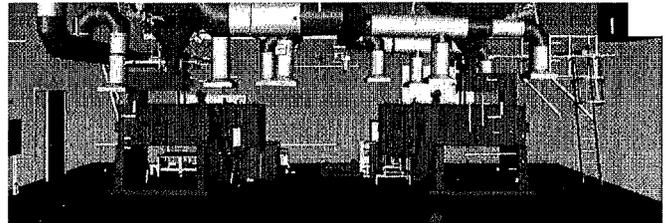
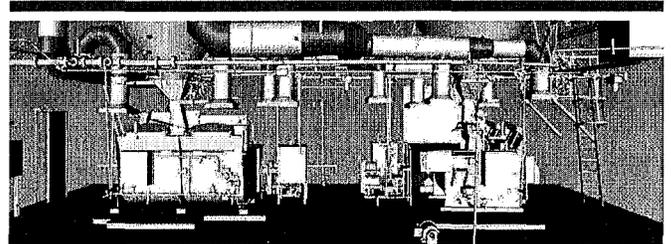
**Option 3 – Implement New WTP at Fiveash:** This option will replace the existing Fiveash WTP with a new facility that would feature advanced treatment process to reduce color to less than 10 Pt-Co color units; provide 4-log virus removal/inactivation; and meet additional water quality, production, water supply, reliability, resiliency, sustainability, O&M, safety, economic, and other goals. The potential treatment of alternative raw water supplies (including the Biscayne Aquifer, Floridan Aquifer, and seawater), and the potential to locate the new plant at an alternate site, (possibly in conjunction with a power plant), will present a wide range of variables for Option 3.

Although the three options present many potential alternatives, and seemingly infinite variations to the alternatives, the CDM Smith team has successfully completed similar analyses by applying the following steps:

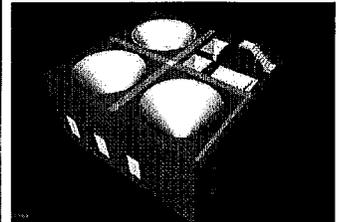
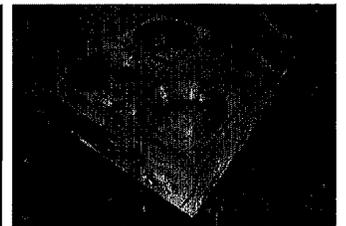
- Select proven processes, equipment, and design criteria based on industry experience
- Apply data collected from the bench-, pilot-, and plant-scale studies to improve plant performance and/or reduce costs
- Prepare conceptual designs with appropriate detail to address requirements and/or constraints that include, but

are not limited to site, plant and system hydraulics, power, permitting, staffing, residuals disposal, and other items

- Conduct permitting, constructability and operability reviews to develop schedules that account for permitting, design, construction, maintenance of plant operations, commissioning, optimization, and future upgrades and/or expansions
- Develop customized cost models for capital and operating costs; and document all assumptions for quantities, unit costs, and allowances for unidentified items and other uncertainties
- Collaborate with the City and project stakeholders to advance and modify the alternatives to meet the project objectives



As part of our Lime, SHM, and Tank Drainage Systems Upgrades project at the Miami-Dade WSD Alexander Orr Jr. we used laser scanning, point cloud technologies, and 3-dimensional modeling.



Through this process, our team will provide the City with the information to compare the alternatives, select the preferred alternative, and develop an implementation plan for the preferred project.

### **Insight and Innovation:**

In addition to the CDM Smith team of water treatment experts, regulatory and permitting specialists, facilities design engineers, constructors, estimators, operators, financial specialists, and outreach professionals, we will draw upon a variety of in-house resources, tools and technologies should the City choose to further enhance the project through:

- Laser scanning
- Point cloud technologies
- 3-dimensional modeling
- Hydraulic and computational fluid dynamics modeling
- Drone flight photography and surveying
- Multi-criteria decision analysis (MCDA) software

### **Activities and Deliverables:**

**Assess Condition and Performance of the Fiveash WTP** – Evaluate the existing plant with respect to the general condition of the equipment and facilities, water quality and production, and ability to meet current and future codes and regulations. (Section in Summary Report; draft and final).

**Characterize Existing and Potential Future Raw Water Supplies** – Compare key water quality parameters to assess appropriate treatment technologies for Options 1, 2, and 3; include existing and potential future supplies – Biscayne Aquifer, Floridan Aquifer (upper and lower), and Atlantic Ocean (seawater). (Section in Summary Report; draft and final).

**Conduct Desktop Analyses for Disinfection, DBP Formation, Corrosion Control, and Blending** – Perform a desktop analyses for develop approaches and criteria for 4-log virus inactivation, compliance with DBP standards, optimized corrosion control, and blending to estimate the capacity of alternative treatment unit processes (such as nanofiltration, reverse osmosis, ion exchange, lime softening, etc.) to meet the City's finished water quality goals after blending. (Section in Summary Report; draft and final).

**Advance Conceptual Designs for Options 1, 2, and 3** – Prepare conceptual designs for alternatives, including preliminary site plans, hydraulic profiles, design criteria, and descriptions of anticipated operations. (Section in Summary Report; draft and final)

**Prepare Conceptual Cost Estimates for Capital and Operating Costs for Options 1, 2, and 3** – A unique advantage of the CDM Smith team, as it relates to developing cost estimates, is that we have the support of our construction group, a certified general contractor. By using construction cost estimators who focus almost solely on estimating construction costs for water/wastewater utility projects in the southeast region, the City will benefit by our ability to deliver a more detailed and accurate estimate. Most of our competitors do not have access to these in-house resources and therefore they rely on their design engineers to develop their cost estimates. Our cost estimators will use the Association for the Advancement of Cost Engineering (AACE) Class 4, or "Study or Feasibility," methodology. To accurately estimate the construction costs to this Class, the evaluated treatment options for the Fiveash WTP will have a project level definition of 15-percent as recommended by AACE. Our estimate will also incorporate applicable construction trend analyses, based upon our experience with recent projects and/or similar as constructed jobs. The appropriate escalation rates or indices will be included in the estimate.

Operating cost estimates will also be prepared that will include at a minimum the following items:

- Equipment maintenance (e.g., membrane replacement)
- Facility maintenance (e.g., HVAC, house-keeping)
- Chemicals (e.g., pre-treatment, disinfection, cleaning, calibration)
- Water quality analyses
- Special considerations for the residuals disposal
- Electrical/power
- Operations staff/personnel
- Communications (e.g., telemetry, phone)

The estimates for operations and maintenance (O&M) will be concisely presented to the City with back-up documentation (e.g., bulk chemical costs and disposal rates, as appropriate. If beneficial to the City, we could also prepare life cycle costs in the analysis, CDM Smith can perform a "cradle-to-grave"-type life cycle cost analysis to summarize the economics of the project based upon the equipment performance, as well as the construction and O&M cost information prepared for an estimated 50-year project life.

## Task 4 – Regulatory Permitting, Vulnerability to Climate Change, Sea Level Rise, Resiliency Through Infrastructure Projects



### TASK 4

#### Objectives and Approach:

Task 4 addresses topics identified in the RFQ as critical to the successful implementation of the project:

- Regulatory permitting
- Water supply and reject disposal planning
- Vulnerability to climate change and sea level rise
- Goal to address resiliency through infrastructure projects

These topics will be investigated concurrent with Task 3 Evaluations and Options, and incorporated in the comparison of alternatives, selection of the preferred alternative, and development of an implementation plan for the preferred project (Task 5).

#### Insight and Innovation:

We offer recent and credible insight and innovation valuable to the City during the implementation of this assignment. We have served our clients in find solutions to their challenges no matter how small, large, straightforward, or complex. We will leverage our multidisciplinary team of professionals with a common focus and goal.

#### Activities and Deliverables:

**Permitting Considerations** – It is of the utmost importance to consider the impact of regulations when developing a plan to significantly modify a water treatment process. Changes to water treatment facilities are regulated by Florida Department of Environmental Protection.

Broward County's Environmental Protection group locally regulates asbestos removal, lead based paint removal, diesel fuel storage, sodium hypochlorite storage, site drainage, site air quality, tree removal, and building drains.

City site development approval and building department have jurisdiction over building setbacks, how the front of buildings looks, which street the front of the buildings faces, floor elevation, perimeter fencing material, landscaping, tree removal, sidewalks, bike paths, bike racks, and so forth.

Fortunately, each of the treatment processes that are being considered by the City for application at the Charles W. Fiveash WTP has been permitted in the State of Florida previously, except for multistage flash distillation which is typically used at power plant for cooling water with lower power costs.

If the City were to make significant changes to the treatment processes at the Charles W. Fiveash WTP, Florida Department of Environmental Protection would require at least the following items to approve a permit:

- Site plan for the process changes
- Pilot study demonstrating the changes will comply with state standards
- Modeling for NPDES discharge
- Approval of new waste discharge permit

In addition to permitting of new construction, it is critical that the evaluation of treatment technologies consider potential impacts on continued compliance with specific regulatory requirements, competing treatment objectives, and potential synergies between process upgrades aimed at different objectives. For example, providing four-log virus treatment through chemical disinfection has the potential to increase the production of disinfection by-products, potentially compromising compliance with the D/DBP Rule if this contingency is not taken into consideration in the overall process design. Enhanced organics removal treatment technologies can generally be expected to provide more efficient removal of DBP precursors than the existing conventional lime softening process at the Charles W. Fiveash WTP. Therefore, there is a synergy in that the organics removal upgrade will provide greater flexibility in alternatives available for four-log virus treatment, as well as establishing a "safety margin" in the compliance conditions for four-log virus treatment. This presents the City with an opportunity for optimization of the two processes to achieve both treatment objectives at the lowest cost to the City. Pilot testing provides a powerful tool to identify, under real-world conditions, the most important factors to necessary to achieve this optimization. This is one of the reasons that custom design of the pilot test unit and testing protocol to achieve the City's defined objectives, is critical to obtaining the greatest value from the pilot testing program.

Permitting a new waste stream discharge is of particular importance for LPRO/NF, since the waste stream is significantly different than a conventional plant waste stream. The Prospect Wellfield that the Charles W. Fiveash WTP currently discharges its process waste to would likely not be a permissible location for the concentration from the membranes. The typical location for discharging the concentrate would be back into the Charles W. Fiveash WTP, down new deep injection wells which are typically 3000-feet deep.

**Water supply and reject disposal planning** – Our water supply and reject planning activities, led by **Stewart J. Magenheimer, PG**, follow a process that develops long-term, sustainable water supply and reject disposal strategies based on the development of system models and decision support tools and recent experience with incorporating climate change into decision-making efforts. Increased population growth in the City of Fort Lauderdale, particularly in the downtown areas, continues to place increased demand on the City's primary source of drinking water, the Biscayne Aquifer. The City's water treatment process is designed specifically to treat the water quality characteristics of the Biscayne Aquifer and process it into finished water. Additional Biscayne Aquifer allocations are restricted by the state's Regional Water Availability Rule. To meet this future demand, alternative water supply solutions that can provide a sustainable water supply for the City and meet the rule requirement require investigation. Possible solutions include using an increased groundwater allocation secured by recharge of the Biscayne Aquifer from either the regional C-51 Reservoir project or selected reclaimed water within the City or drawing water from the deeper Floridan Aquifer. This latter option requires desalination treatment to process into drinking water. Based on our experience, CDM Smith takes a holistic approach to this evaluation, identifying the technical feasibility, cost effectiveness, and economics of implementing selected water supply alternative projects that could potentially offset water deliveries from the regional water management system. We will analyze demand studies and population estimates; estimate water resources sustainability and reliability; and quantify reject disposal flows based on the different new plant processes. We will take a long-term view (30-50 years) for water supply alternatives such as Biscayne Aquifer, Floridan Aquifer, ocean water, C-51, C-11, C-12; and deep injection of reject disposal as industrial waste.

**Vulnerability to the effect of Climate Change or Sea Level Rise** – The effect of Climate Change or Sea Level Rise threatens the City's infrastructure and assets making them vulnerable to damage. Broward County along with the City and many other local municipalities hold a proactive and robust Technical Advisory Committee to the Water Advisory Board. The City's climate change and sea level rise are dynamic and ongoing agenda items for the stakeholders and the most current understanding will be included in the draft and final Report deliverable of this project. **We have developed more than 35 coastal facility and stormwater management plants across the United States for flood control and water supply protection.** We prepared the City's Stormwater Master Plan (2009), recently updated in 2018, and are currently preparing the City of Miami's Comprehensive Stormwater Master Plan. We consider a

combination of armoring (green, gray, and blue), raising and relocating at-risk facilities to tailor the program to your needs.

CDM Smith's recent experience on our contract for Design Services for the Ocean Outfall Legislation (OOL) related projects with Miami-Dade Water and Sewer is most relevant. We propose sharing how climate change and sea level rise was approached and will vet it with the City. We conducted site evaluations and summarized recommendations. Our evaluation was a risk based approach on how the treatment facility should be protected and hardened to withstand and be resilient in the face of storm surge and extreme rainfall and sea level rise.

**Resiliency through Infrastructure Projects** – CDM Smith is leading the way in the planning and delivery of resilient infrastructure for today and for the future of coastal sea level rise, storm events, and inland flooding. CDM Smith can assist the City to proactively address environmental changes by strengthening what is already in place and weaving resilience into new plans and designs. From conducting vulnerability and risk assessments, to advising on capital planning, to protecting valuable assets throughout their useful life, we are well-prepared to advise on floods, droughts, hurricanes and tropical storms, climate change and other threats that may strike an area, as well as suggest what can be done to cost-effectively protect citizens and infrastructure. Through consideration of interdependent systems and the threats posed against them, CDM Smith can guide the City's organization and assets toward stronger, more adaptable functions that allow life and business to carry on with less interruption and increased reliability.

## Task 5 – Comparison of Alternatives and Development of the Preferred Project



### TASK 5

#### Objectives and Approach:

After the information from Tasks 1 through 4 have been compiled and presented to the City, CDM Smith will facilitate a series of collaborative workshops in Task 5. The project team will compare the alternatives, discuss technical issues for each alternative, develop evaluation criteria, and the City will select the preferred alternative. After the preferred alternative is selected, the City and CDM Smith will refine the elements into the preferred project and present the updated conceptual design, implementation schedule, and planning level costs for capital and operating expenditures in a Summary Report.

## Insight and Innovation:

CDM Smith understands that key to the success of our effort will be our ability to effectively communicate and collaborate. Our past proven experience and depth of our assigned professionals enhance our offering to the City as the comparison of alternatives to the Fiveash WTP and development of the preferred alternative is prepared. Our team has the insight to involve key stakeholders in the City such as your operators, management, and leadership to propose defensible recommendations and the right solutions you can trust.

## Activities and Deliverables:

**Conduct Alternatives Comparison Workshop** – After conceptual designs and costs have been prepared, the project team will meet with the City and project stakeholders to evaluate and compare the alternatives in an open, collaborative forum. The first activity of the workshop will discuss and compare the alternatives; and identify changes critical to the evaluations and comparisons. The final portion workshop will establish evaluation criteria to rank the alternatives and select the preferred option. (Workshop Presentation; Minutes; and Section in the Summary Report, draft and final)

**Facilitate Workshop to Select the Preferred Alternative** – After making the requested changes to the alternatives, the project team will participate in a second workshop to apply the evaluation criteria to the alternatives. The City and project stakeholders will select the preferred option. (Workshop Presentation; Minutes; and Section in the Summary Report, draft and final)

**Develop an Implementation Plan for the Preferred Project** – The City and CDM Smith will further advance the details of the selected option and develop an implementation plan for the preferred project. The implementation plan will include a project description, conceptual design information (e.g., site plan, hydraulic profile, design criteria, etc.), implementation schedule, and conceptual capital and operating cost estimates. (Summary Report, draft, and final)

## Task 6 – Project Management, and Quality Assurance/Quality Control



This task will provide for project management efforts, QA/QC activities, and routine communications for the Fiveash WTP Project. Our team understands the expectations that the City has and we have established the following project

management factors to fulfill our responsibilities to carry out this contract successfully:

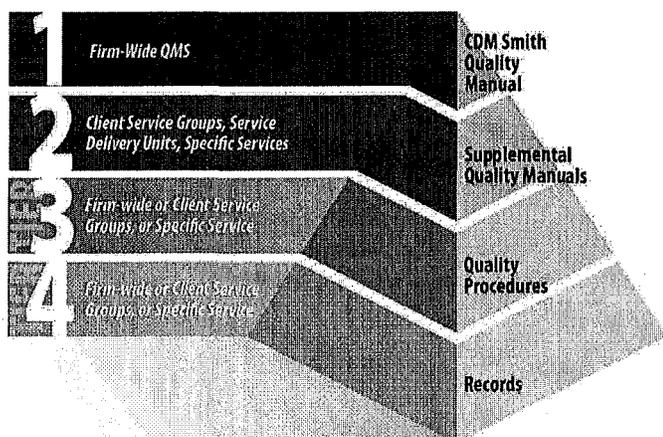
- **Responsiveness** – The CDM Smith team maintains that responsiveness is a key tenant of superior client service and goes together with quality and communications. We commit to being there to meet this need through our project manager, Tim O’Neil, a 31-year veteran with a verifiable record of service to the City of Fort Lauderdale.
- **Communication** – Our entire project team will establish and maintain effective working relationships with your staff and affected stakeholders to promote frequent, open, and effective communication.
- **Quality** – We will confirm that deliverables meet the City’s and our team’s quality expectations.
- **Schedule** – CDM Smith will monitor and adjust production and task schedules to make certain that all deliverables meet or exceed schedule requirements.
- **Budget Management and Control** – CDM Smith will also manage project tasks and meet budget expectations by utilizing efficient scheduling, financial monitoring, and quality control procedures and employing our Oracle Project Accounting system to improve efficiency.

At CDM Smith, quality is defined as “meeting or exceeding the City’s expectations.” We will implement Quality Management Plans (QMPs) to address quality control (QC) and quality assurance (QA) procedures throughout design and construction phases of the Fiveash WTP Project. These procedures will outline our team’s effort to verify, check, and review all documents developed for this contract.

Key to this basic tenet is the CDM Smith Project Quality Management (PQM) process. As part of the Kickoff Workshop/ Meeting, we will clearly define the roles and responsibilities of the key stakeholders in the project, review and discuss the scope of work, budget, and schedule constraints, and identify factors that will have an impact on the outcome of the project. As a team, we will resolve the ranking of the influencing factors to agree upon a clear understanding among all parties including:

- City’s expectations which may not be explicitly described in the contract.
- A definition of the conditions or facilities that are fixed and cannot change.
- A definition of the conditions or facilities that are flexible and can change. This will lead to a discussion of value engineering (VE) ideas—alternative approaches to the basic concepts that may result in more flexible operations and/or less capital or life-cycle cost reductions.
- The scope of the project and responsible parties.

Finally, as a team, we will define and agree to the mission statement as well as define and agree to the critical success factors of the Fiveash WTP project. Typically, eight to ten critical success factors are defined. Over the past 71 years, we have found that when all the key stakeholders can agree to the mission and the critical success factors, the project has a much greater probability of success.



We will implement QMPs to address QA and QC procedures throughout the project.

The following highlights the specific QA/QC activities that will take place during the project.

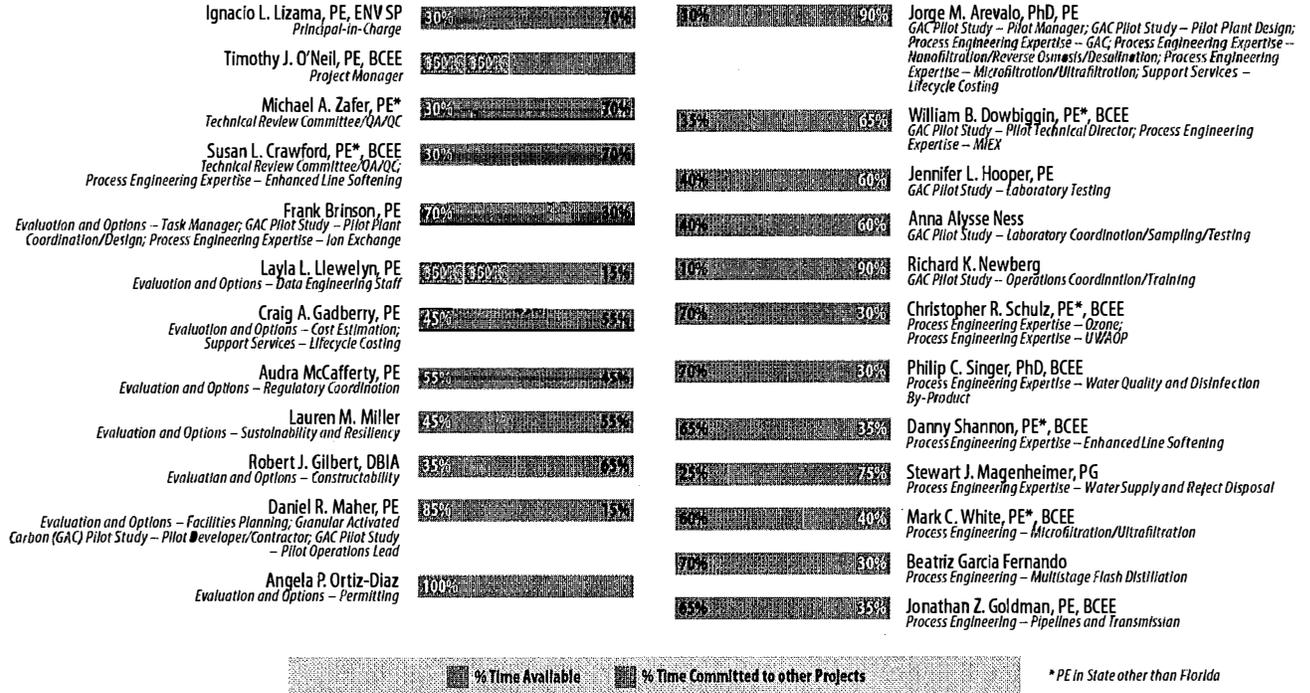
- **Technical Review Committee (TRC) Meeting** – We will conduct a peer review called a TRC meeting as the project progresses. At TRCs, the processes and pilot plant operations/data are reviewed by subject expert senior reviewers who are not directly involved in the project development. For this project, we will combine our TRC with the planned intermittent progress reviews. The goal will be to get appropriate stakeholder, project team members, and senior peers to review and critique the project and confirm we are moving ahead consistent with the City’s expectations, confirm that the selected processes and supplied pilot plants technically sound, and redirect pilot plant operations as necessary. The TRC will provide an open forum to review the technical approaches taken by the project team.
- **Document Checking** – A document checking process will be conducted throughout the project. Assumptions, calculations, and process criteria development files are independently crosschecked throughout for accuracy, clarity, and technical quality. All of our process and equipment decisions are reviewed on a number of levels for completeness and applicability. Calculations, performance specifications, and pilot plant procurement drawings undergo technical, completeness, and operability reviews.

- **Value Engineering Review** – A value engineering review may be conducted during the development of the pilot plant design and procurement documents. The objective of this review is to reduce project risk, suggest improvements and alternatives, expedite the schedule, and maximize the value, reliability, and performance of the pilot plant testing at the lowest life-cycle cost.
- **Agency Reviews** – Applicable codes and permit conditions will be identified for use during the conceptual pilot plant design phase of the project.

### Workload and How this Project will Fit into our Workload

CDM Smith’s team that is presented in this proposal was assembled for its strengths related to Pilot Study with Evaluations and Options of Charles W. Fiveash WTP. We have detailed our local expertise, experience with City staff, and familiarity with our subconsultant partners to optimize resource allocation. Our deep bench of professionals is available and locally committed to successfully completing this notable assignment on schedule and within your budgetary requirements. We are confident of our team’s ability to deliver high quality service to the City. Our staff had the availability to serve and this project fits very well into our workload as represented in the graphic on the following page.

# FORT LAUDERDALE WORKLOAD COMMITMENT



## Project Scheduling Methodology for Optimum Time

CDM Smith proposes a preliminary schedule is shown on the following page and is based on recent success for other similar high profile pilot studies and treatment process evaluations including JEA, FL and for Brunswick County, NC. Pilot duration is difficult to estimate and depends on how soon we reach breakthrough and depends on operation of columns in parallel or in series. Breakthrough is reached when the GAC adsorption capacity for organics of concern is exhausted, so we will ultimately need to operate until we reach breakthrough.

CDM Smith's own's Bellevue laboratory will perform the GAC screening activity in two to three months (including a report). Laboratory work would be completed before we start operations of pilot as we would use the laboratory results to select the type of GAC for pilot operations. We will perform laboratory work concurrent with pilot equipment procurement and installation. We recommend including an allowance of one to two months to get the pilot equipment procured and installed, a month to prepare the testing protocol document, and a month to prepare the final report. As added value, CDM Smith owns and operates mobile trailer-mounted and skid mounted pilot systems. These systems represent a valuable resource to City for the investigation of viable technologies as desired. We are open to discussing this option with the City that could result in time savings on the project.

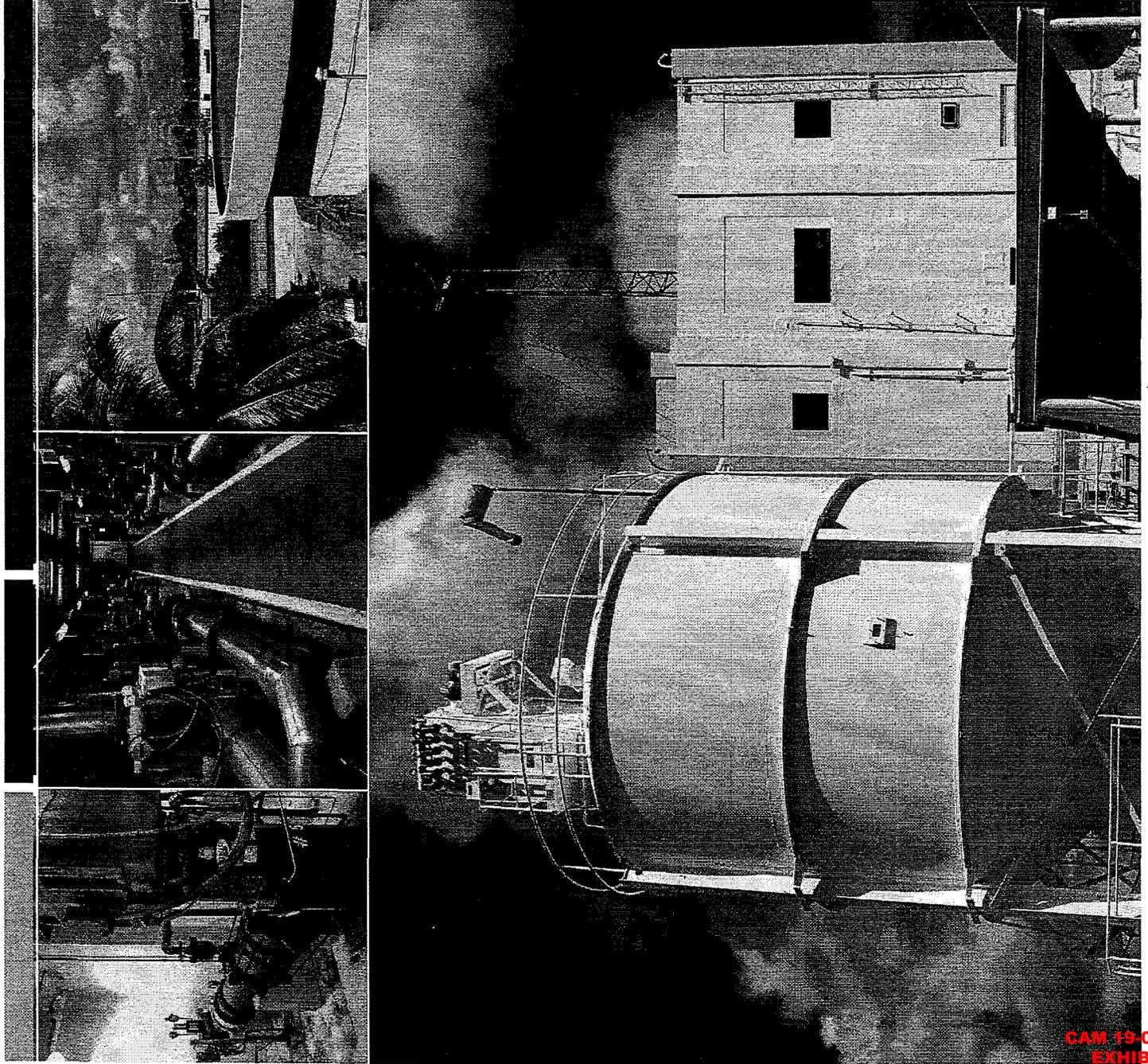
ACTIVITY NAME	MONTHS								
	1	2	3	4	5	6	7	8	9
<b>Notice to Proceed</b>	◆								
<b>Task 1 – Project Planning and Delivery</b>									
Conduct Kickoff Meeting & Project Objectives and Goals Workshop	Ⓜ								
<b>Task 2 – Granular Activated Carbon Pilot Study<sup>1</sup></b>									
Develop Pilot Testing Protocol		▲	★						
Pilot Equipment Procurement									
Pilot Equipment Installation and Startup									
Pilot System Operations									
Collect Data and Report Results								▲	★
Develop Conceptual Design and Cost Estimates for GAC Options									
City Review of Report									
<b>Task 3 – Fiveash WTP – Evaluations and Options</b>									
Assess Condition and Performance of the Fiveash WTP									
Characterize Existing and Potential Future Raw Water Supplies									
Conduct Desktop Analyses for Disinfection, DBP Formation, Corrosion Control, and Blending									
Advance Conceptual Designs for Fiveash WTP Options									
Prepare Conceptual Cost Estimates for Capital and Operating Costs									
Preparation and City Review of Report								▲	★
<b>Task 4 – Regulatory Permitting, Vulnerability to Climate Change, Sea Level Rise, Resiliency Through Infrastructure Projects</b>									
Permitting Considerations									
Water Supply and Reject Disposal Planning									
Vulnerability to the Effect of Climate Change or Sea Level Rise									
Resiliency Through Infrastructure Projects									
<b>Task 5 – Comparison of Alternatives and Development of the Preferred Project</b>									
Conduct Alternatives Comparison Workshop									★
Facilitate Workshop to Select the Preferred Alternative									★
Develop an Implementation Plan for the Preferred Project								▲	★
<b>Task 6 – Project Management and QA/QC</b>									

<sup>1</sup> Pilot operations of GAC systems are site specific and may exceed the estimated duration if beds are not exhausted and/or biologic activity continues to remove color after beds are exhausted.

◆ Notice to Proceed    Ⓜ Meeting    ▲ Draft    ★ Final

SECTION  
**6**

References



# F

## SECTION

### Example Projects Which Best Illustrate Proposed Team's Qualifications for this Contract

#### 20. EXAMPLE PROJECT KEY NUMBER | I

20. TITLE AND LOCATION (City and State) Water Purification Technology Evaluation and Research and Development Testing Project, Jacksonville, FL		21. YEAR COMPLETED PROFESSIONAL SERVICES Ongoing		CONSTRUCTION (If applicable) N/A
21. PROJECT OWNER'S INFORMATION				
a. PROJECT OWNER JEA 21 West Church Street, Tower 4 Jacksonville, FL 32202		b. POINT OF CONTACT NAME Ryan Popko, PE, Project Manager		c. POINT OF CONTACT TELEPHONE NUMBER Tel: 904.665.8516 Email: popkrr@jea.com
24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and cost)			PROJECT COST:	\$2.4M

JEA implemented the water purification technology (WPT) program to continue to expand their reclaimed water customer base. The final goal of the program is to develop a water purification facility that can produce water that is suitable for either indirect potable reuse via deep well injection, or direct potable reuse. JEA designated the Southwest and Buckman Water Reclamation Facilities (WRFs) as test sites, utilizing effluent from each facility, to evaluate a variety of available and implementable water purification technologies to produce IPR or DPR quality water.

The primary objective of this phase is to evaluate and compare WPT options for the purification of secondary clarified effluent by concurrently operating two process trains at the Southwest and Buckman WRFs. Data collected throughout the R&D phase will be utilized to compare the performance of each process train, to identify appropriate design criteria and operational parameters for use in subsequent phases, and to develop estimated capital and O&M costs for each process train. This information will also facilitate the selection of an optimized water purification process train for subsequent demonstration-scale testing efforts and a potential full scale facility.

The two process trains to be evaluated include:

- The UF/LPRO process, which consists of membrane filtration using ultrafiltration (UF) followed by low pressure reverse osmosis (LPRO). The relatively low total dissolved solids content (salinity) of the WPT source water could provide an opportunity for an alternative water purification process that presents a potentially lower capital and O&M cost and does not require the disposal of LPRO concentrate.
- The second train utilizes ozone and biologically active filtration (BAF). Ozone injection followed by BAF offers several advantages over the UF/LPRO approach; however, potential challenges will need to be evaluated and addressed during the R&D testing before the most appropriate water purification process train for this application can be determined.

The product water from both the UF/LPRO and ozone/BAF process trains will be disinfected through an advanced oxidation process (AOP). The AOP process utilized throughout the R&D testing period offered a variety of disinfection alternatives including: ozone, ozone with hydrogen peroxide, UV light, UV light with hydrogen peroxide, or UV light with ozone. CDM Smith is also investigating the potential to disinfect the product water with sodium hypochlorite as an alternative to hydrogen peroxide.



#### CITY SCOPE ITEMS INVOLVED

- **Scope Item #1:** GAC pilot studies for potable water treatment

#### ABILITY TO MEET BUDGET AND SCHEDULE REQUIREMENTS

- Operation of the R&D equipment at the Southwest WRF concluded in March 2018 and operation of the R&D equipment is currently in progress at the Buckman WRF. Project is currently on schedule and within budget.

#### PILOT PLANT TECHNOLOGY

- UF/LPRO
- Ozone BAF

#### KEY STAFF

- Ness, Schulz

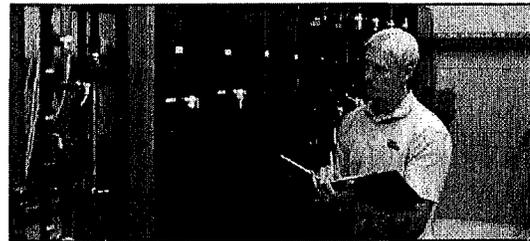
29. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Jacksonville, FL	(3) ROLE Prime
b.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Denver, CO	(3) ROLE Support Services

21. TITLE AND LOCATION (City and State)		22. YEAR COMPLETED	
Pilot and Study of High Quality Drinking Water Production Using Advanced Treatment Options, Gwinnett County, GA		PROFESSIONAL SERVICES Ongoing	CONSTRUCTION (if applicable) N/A
23. PROJECT OWNERS INFORMATION			
a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER	
Gwinnett County Department of Water Resources (GCDWR) 684 Winder Highway, Lawrenceville, GA 30045	Denise Funk, PE, BCEE, Division Director, Research and Development	Tel: 678.376.6908 Email: denise.funk@gwinnettcountry.com	
24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and cost)		PROJECT COST:	\$800K

The primary objectives of this multi-award-winning project were to demonstrate that ozone-biofiltration can be used to achieve potable quality water in a DPR scenario and evaluate which blending ratios could be used to meet primary and secondary drinking water standards. An additional objective was to evaluate the potential of the F. Wayne Hill Water Resources Center (FWH WRC) blended water to stabilize water quality and operations during challenges with Lake Sidney Lanier raw water quality at the SCFP.

Two independent, side-by-side, pilot treatment trains were constructed and operated in parallel for 9-months. The pilot plants simulated the full-scale treatment train at the SCFP. One pilot plant, the DPR pilot, tested four blending ratios (15%, 25%, 50%, and 100%) of highly treated reclaimed water from the FWH WRC combined with the raw water from Lake Lanier. The second pilot plant, the IPR pilot, operated in the SCFP's planned IPR scenario, with 100% of influent water from Lake Lanier. Performance of unit processes including ozone, biological filtration, and chlorine disinfection were assessed. Results from the DPR pilot were benchmarked against a parallel pilot that operated as the current IPR scenario (e.g., 100% Lake Lanier water) and compared against the SCFP. The chlorinated filter effluent from the DPR pilot at the 15% FWH effluent blend (85% Lake Lanier water) met all primary and secondary MCLs evaluated during the study. Higher blends had some exceedances of MCLs for cyanide, nitrate, bromate and di(2-ethylhexyl) phthalate. Higher blends would be possible with further nitrate and bromate control at the FWH WRC. Operational benefits with DPR included reduced ozone demand, lower filter headloss accumulation rates, and the ability to mitigate source water quality excursions.

CDM Smith assisted with the piloting facility design (e.g. blending requirements, treatment processes, and sizes of components) and start-up/commissioning, operations and troubleshooting of the pilot facilities, development of the research work plan, sampling, data management and analysis, and summarizing findings in the Water and Environment Reuse Foundation (WE&RF) interim and draft reports. In addition, we managed five third-party laboratories who performed analytical testing services.



**CITY SCOPE ITEMS INVOLVED**

- **Scope Item #1:** GAC pilot studies for potable water treatment

**ABILITY TO MEET BUDGET AND SCHEDULE REQUIREMENTS**

- Final report submitted to WE&RF on May 2018; Project awaiting closeout.

**PILOT PLANT TECHNOLOGY**

- Two-stage ozone-biological filtration

**AWARD-WINNING**

- 2018 Excellence in Environmental Engineering and Science™ Awards Competition Winner
- 2018 Water Reuse Association Transformational Innovation Award

**KEY STAFF**

- Dowbiggin, Hooper, Schulz, Singer

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Raleigh, NC	(3) ROLE Support Services
b.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Bellevue, WA	(3) ROLE Support Services
c.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Denver, CO	(3) ROLE Support Services

# F

## SECTION

### Example Projects Which Best Illustrate Proposed Team's Qualifications for this Contract

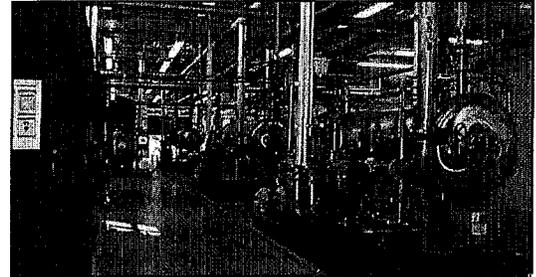
#### 20. EXAMPLE PROJECT KEY NUMBER | 3

21. TITLE AND LOCATION (City and State)		22. YEAR COMPLETED	
Cary-Apex WTP Pilot Study and Evaluation of Improvements, Cary, NC		PROFESSIONAL SERVICES Ongoing	CONSTRUCTION (If applicable) N/A
23. PROJECT OWNER'S INFORMATION			
a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER	
Town of Cary, NC 400 James Jackson Ave, Cary, NC 27513	Alexandra Jones, Water System Manager	Tel: 919.362.5504 Email: alexandra.jones@townofcary.org	
24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)		PROJECT COST:	\$1.29M

CDM Smith has been supporting the Cary-Apex WTP since the late 1990s, when we were selected to implement residuals handling facilities and subsequently to expand the WTP from 16-mgd to 40-mgd.

The Town and CDM Smith are performing a project to evaluate conversion of existing filters to biofiltration through pilot testing with ozone, GAC, and anthracite biofilters. This project includes evaluating emerging contaminant issues such as 1,4-dioxane, PFAS, algal toxins, algal taste and odor compounds, and disinfection byproduct control. The overall Phase 3A improvements project also includes clearwell additions, rehabilitation of existing structures, chemical feed system upgrades, and removal of unnecessary piping in the filter pipe gallery.

As part of this project, CDM Smith is conducting a pilot study to determine the effectiveness of biofiltration in improving water quality and consistency. Ozone, GAC, and advanced oxidation have already been tested. The pilot facilities include five pilot columns for testing alternate advanced treatment. Potential future testing includes ion exchange, reverse osmosis, and nanofiltration.



#### CITY SCOPE ITEMS INVOLVED

- **Scope Item #1:** GAC pilot studies for potable water treatment

#### ABILITY TO MEET BUDGET AND SCHEDULE REQUIREMENTS

- Project is anticipated to be completed in October 2018, and is currently on schedule and within budget

#### PILOT PLANT TECHNOLOGY

- Pilot testing of biofiltration for a one-year period

#### KEY STAFF

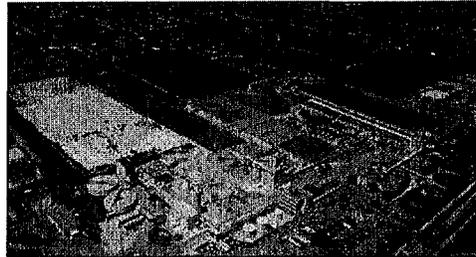
- Dowbiggin, White

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Raleigh, NC	(3) ROLE Prime
b.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Chicago, IL	(3) ROLE Support Services

21. TITLE AND LOCATION (City and State)		22. YEAR COMPLETED	
Alexander Orr Jr. WTP Continuing Engineering Services, Miami-Dade County, FL		PROFESSIONAL SERVICES Varies (See Below)	CONSTRUCTION (if applicable) Varies (See Below)
23. PROJECT OWNER'S INFORMATION			
a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER	
Miami-Dade Water and Sewer Department (WASD) 6800 SW 87 <sup>th</sup> Avenue, Miami, FL 33173	Brian Trujillo, Project Manager	Tel: 786.552.4406 Email: btruj01@miamidade.gov	
24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and cost)		PROJECT COST:	Varies (See Below)

CDM Smith is responsible for the implementation of comprehensive unit operation and process evaluation services for the lime softening treatment process at the 248-mgd Alexander Orr Jr. WTP owned and operated by WASD.

- **Conversion to Commercial Liquid Sodium Hypochlorite Solution (2012; \$63K):** Our team was responsible for evaluating the feasibility and effectiveness of converting the facility's disinfection chemical source to commercial liquid sodium hypochlorite instead of chlorine gas. We reviewed and evaluated the WTP's water quality data and current operations, researched the regulatory requirements needed for the conversion, and prepared the hydraulic calculations for the chemical metering pumps used to convey sodium hypochlorite to the injection points upstream of the filters.
- **Lime, SHM, and Tank Drainage Systems Upgrades (2009; \$113K):** In order to provide conceptual design for recommended upgrades to the WTP's lime and tank drainage systems, our team evaluated the facility's existing conditions and recommended improvements, which included replacing the existing lime slakers, providing new slurry tanks near Chemical Buildings 1 and 2 to increase slurry storage and allow the lime slaking process additional contact time and providing dedicated metering pumps for feeding lime slurry from the chemical buildings to the hydrotreaters.
- **Development of a Lime Sludge Residuals Management Plan (2009; \$238K):** WASD retained CDM Smith to address immediate and long-term lime sludge disposal needs at the WTP, as well as the overall water treatment system. As part of this work, our team also assisted in the development of a RMP for the WTP. The overall goal of the RMP was to incorporate 5-, 10- and 20-year recommendations to be used by WASD for the 2030 planning horizon.
- **Chloramine Evaluation and Nitrification Control Study (2008; \$237K):** The Alexander Orr Jr WTP was experiencing operational issues related to its chloramine feed system, including space limitations for lime sludge facilities and storage capabilities of chemical facilities, specifically, the short seven-day supply capabilities for ammonia. Our team evaluated the existing plant chlorine and ammonia dosing operations, chloramines residuals, equipment operations, and the distribution system monitoring. Based on the findings of this evaluation, we prepared a preliminary design report for improved chlorine and ammonia feed system, injection points and monitoring points, including associated electrical and instrumentation improvements, as well as recommendations for operational and monitoring improvements to control nitrification in the distribution system.



**CITY SCOPE ITEMS INVOLVED**

- **Scope Item #2:** Unit operation and process evaluations for lime-softening WTPs

**ABILITY TO MEET BUDGET AND SCHEDULE REQUIREMENTS**

- Projects were completed on schedule and within budget.

**UNIT PROCESSES EVALUATED**

- Lime softening

**KEY STAFF**

- O'Neil, Lizama, Maher, Llewelyn, Arevalo, Gadberry, Magenheimer

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Miami, FL	(3) ROLE Prime
b.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Boca Raton, FL	(3) ROLE Support Services
c.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Maitland, FL	(3) ROLE Support Services

21. TITLE AND LOCATION (City and State)		22. YEAR COMPLETED	
Water Treatment Facilities Unit Operation and Process Services, Deerfield Beach, FL		PROFESSIONAL SERVICES 2014	CONSTRUCTION (If applicable) 2014
23. PROJECT OWNER'S INFORMATION			
a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER	
City of Deerfield Beach 290 Goolsby Boulevard, Deerfield Beach, FL 33442	Chad Grecsek, Director of Sustainable Management	Tel: 954.420.5562 Email: cgrecsek@deerfield-beach.com	
24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)		PROJECT COST:	\$26.7M

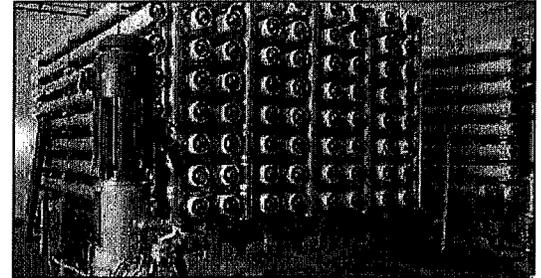
The City of Deerfield Beach owns and operates the 18.0 mgd West Water Treatment Plant (WTP) which was expanded by an additional 10.5 mgd of nanofiltration membrane softening and 3.0 mgd of reverse osmosis treatment capacity.

CDM Smith has been involved in numerous projects related to these improvements, including several unit operation and process evaluations for this lime-softening WTP.

**Lime Softening Plant Rerating:** We evaluated two softening treatment processes. The existing lime softening treatment process was evaluated in terms of the process equipment expansion required to meet future water demands and quality requirements. In addition, a membrane softening treatment process alternative was evaluated in combination with increasing the rating on the existing lime softening process to 7.5 mgd.

**Nanofiltration Expansion:** CDM Smith identified two membrane plant pre-design related studies/projects to be undertaken to accomplish the desired design and construction schedules. We worked with the City and completed a membrane pilot testing program and concentrate disposal facility study. The pilot test evaluated and confirmed the membrane process assumptions identified in the preliminary design report prior to undertaking the final design of the WTP Phase II expansion. Another important conclusion of the pilot testing program was that the existing wellfield and raw water piping needed rehabilitation to render them suitable for the membrane process.

**Low Pressure Reverse Osmosis Expansion:** Due to water supply restrictions, the City had to reduce its use of Biscayne Aquifer feed water. To address this problem, the City planned the construction of a new 3-mgd LPRO treatment plant. CDM Smith conducted the LPRO pilot plant testing in conjunction with the design of the new facility. The source water for the pilot testing and the future LPRO facility was an on-site Upper Floridan aquifer test/production well. An innovative feature of the LPRO system design is that it will allow for the recycling of the nanofiltration concentrate. The nanofiltration concentrate is filtered through the LPRO process allowing for an increase in water production by this recycling process.



**CITY SCOPE ITEMS INVOLVED**

- **Scope Item #2:** Unit operation and process evaluations for lime-softening WTPs

**ABILITY TO MEET BUDGET AND SCHEDULE REQUIREMENTS**

- CDM Smith met all budget and schedule requirements for projects performed under these improvements, including the unit process evaluations.

**UNIT OPERATION/PROCESS EVALUATIONS**

- Lime softening, membrane softening, and LPRO

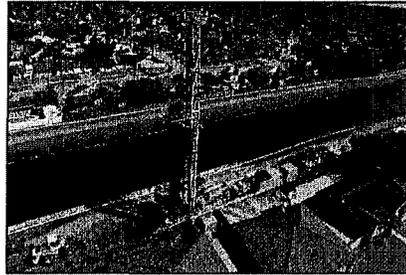
**KEY STAFF**

- O'Neil, Gadberry, Arevalo, Magenheimer, Goldman

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Boca Raton, FL	(3) ROLE Prime
b.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Maitland, FL	(3) ROLE Support Services

21. TITLE AND LOCATION (City and State)		22. YEAR COMPLETED	
South Miami Heights WTP Raw Water Supply Program (Floridan and Biscayne), Miami-Dade County, FL		PROFESSIONAL SERVICES 2017	CONSTRUCTION (if applicable) 2017
23. PROJECT OWNER'S INFORMATION:			
a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER	
Miami-Dade WASD 11800 SW 208th Street, Miami, FL 33177	Maria Idia Macfarlane, MS, PG, Professional Geologist	Tel: 786.552.8469 Email: maria.macfarlane@miamidade.gov	
24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)		PROJECT COST:	\$16M

A systematic and comprehensive hydrogeologic test program was developed to evaluate potential yield and quality of groundwater from the UFA at the proposed SMH wellfield site. Three spatially representative locations of the 14 UFA sites were selected to install UFA test production wells for hydrogeological assessment. In addition to investigating the UFA through a test production well program, a Underground Injection Control (UIC) Class V deep exploratory well located at the SMH WTP site was designed and permitted as part of the hydrogeologic test program to explore suitability of disposal of RO brine into the Boulder Zone (2,500-3,500 feet below land surface [bls]), and to collect geologic and hydrogeologic data beneath the UFA on the SMH WTP site.



The hydrogeologic data collected will provide critical design criteria for the SMH WTP. A common risk associated with brackish water quality UFA production wells is the upconing of saline water at underlying formations. Although some level of salinity increase is expected, actual operating data from various UFA wellfields in South Florida have shown that the salinity in groundwater from some UFA production wells degraded sooner than anticipated. The hydrogeologic test program includes desktop hydrogeologic data review of existing nearby UFA or Lower Floridan Aquifer wells, formation testing (packer testing, video and geophysical logging, and water quality sampling) during the construction of three UFA test/production wells, a seismic survey targeting imaging to 4,000 feet bls, a continuous core down to 1,640 feet bls, long-duration (30 days) aquifer performance tests (APTs), and specific capacity testing. This innovative test program was designed to optimize production well locations and wellfield operations.

After collecting and analyzing the lithologic, geophysical, water quality, and aquifer hydraulic data, a variable density groundwater flow and transport model will be developed with the site-specific data collected as part of this test program. Flow and transport simulations for various pumping scenarios will be conducted to evaluate aquifer water levels and water quality changes over time, as well as to evaluate the wellfield design scenarios.

**CITY SCOPE ITEMS INVOLVED**

- **Scope Item #3:** Biscayne and Floridan raw water supply for WTPs

**ABILITY TO MEET BUDGET AND SCHEDULE REQUIREMENTS**

- Design documents were drafted in April 2014. Field activities began in August 2015 and completed in April 2017. Project met schedule and budget requirements.

**RAW WATER SUPPLY**

- WASD withdraws approximately 304 mgd from the Biscayne Aquifer, which is part of the surficial aquifer system. As part of an alternative water supply initiative, WASD obtained from SFWMD in their 20-year WUP in 2012 an allocation of 23.3 mgd of brackish water from the UFA to supply a planned new LPRO WTP.

**AWARD-WINNING**

- NGWA Outstanding Groundwater Supply Project Award for 2017

**KEY STAFF**

- O'Neil, Lizama, Llewelyn, Gadberry, Maher, Ortiz-Diaz, Arevalo, Magenheimer, Goldman

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
	CDM Smith	Miami, FL	Prime
b.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
	CDM Smith	Boca Raton, FL	Support Services
c.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
	CDM Smith	Maitland, FL	Support Services

# F

## SECTION

### Example Projects Which Best Illustrate Proposed Team's Qualifications for this Contract

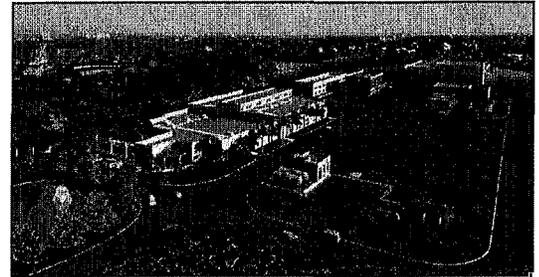
#### 20. EXAMPLE PROJECT KEY NUMBER | 7

21. TITLE AND LOCATION (City and State)		22. YEAR COMPLETED	
South Miami Heights Membrane WTP and Wellfield Improvements, Miami-Dade County, FL		PROFESSIONAL SERVICES 2018	CONSTRUCTION (if applicable) N/A
23. PROJECT OWNER'S INFORMATION			
a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER	
Miami-Dade WASD 3501 NW 46 Street Miami, FL 33142	Brian Trujillo, PE; Project Manager	Tel: 786.552.4406 Email: btruj01@miamidadegov	
24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)		PROJECT COST:	TBD

In response to a desire for improved water quality and due to continued growth, WASD retained CDM Smith services for the design and permitting of the 20-mgd South Miami Heights WTP, wellfield, and associated improvements.

Concurrently, CDM Smith also undertook a two-phase pilot testing program to confirm PDR design criteria and pre-approve membrane element manufacturers through side-by-side testing. WASD elected to use membrane treatment technology for the dual treatment objectives of softening and nitrate reduction for the South Miami Heights WTP. In addition, this facility was designed to use an integrated membrane approach using parallel treatment trains of membrane softening (NF) membranes and UF membranes to provide a multiple barrier approach for disinfection for this shallow aquifer water supply source.

The subsequent regulatory environment shifted interest for additional or supplemental water supply to the deeper Floridan aquifer. CDM Smith developed preliminary design for a combination of NF softening for Biscayne aquifer and LPRO for the Floridan aquifer supply. From 2014 to 2017, CDM Smith developed a hydrogeologic program and field testing of water quantity and quality for both the Biscayne aquifer and Floridan aquifer as potential supplies to the proposed South Miami Heights WTP. This program included a deep injection well for potential concentrate disposal.



#### CITY SCOPE ITEMS INVOLVED

- **Scope Item #4:** Membrane filtration plant design

#### ABILITY TO MEET BUDGET AND SCHEDULE REQUIREMENTS

- WASD gave CDM Smith a "Superior Performance" rating for schedule and budget for this project.

#### PILOT PLANT TECHNOLOGY

- Membrane softening (MF), Ultrafiltration (UF), and Low pressure reverse osmosis (LPRO)

#### KEY STAFF

- O'Neil, Lizama, Llewelyn, Gadberry, Maher, Ortiz-Diaz, Arevalo, Magenheimer, Goldman

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Miami, FL	(3) ROLE Prime
b.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Boca Raton, FL	(3) ROLE Support Services
c.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Maitland, FL	(3) ROLE Support Services

# SECTION

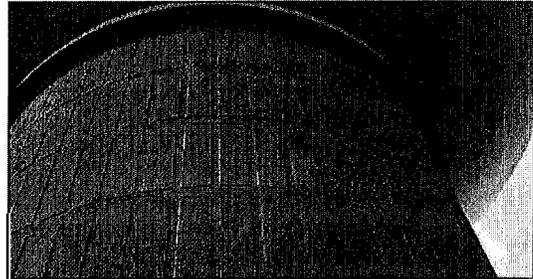
## Example Projects Which Best Illustrate Proposed Team's Qualifications for this Contract

### 20. EXAMPLE PROJECT KEY NUMBER | 8

21. TITLE AND LOCATION (City and State)		22. YEAR COMPLETED	
Corrosion Control Treatment Study, Raleigh, NC		PROFESSIONAL SERVICES Ongoing	CONSTRUCTION (If applicable) N/A
23. PROJECT OWNER'S INFORMATION			
a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER	
City of Raleigh, NC 222 W. Hargett Street Raleigh, NC 27601	Whit Wheeler, PE; Assistant Director of Water Operations	Tel: 919.996.4582 Email: whit.wheeler@raleighnc.gov	
24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)			PROJECT COST: \$245,000

CDM Smith managed a drinking water corrosion control study related to lead, copper, and iron corrosion (2011). The study evaluated the City's existing corrosion control treatment strategies and future water quality requirements and provided recommendations for overall water quality compliance and continued corrosion control optimization. The systemwide investigation included a review of current industry research, review of the City's current and historical treatment plant and distribution system data, a one-year special distribution system water quality sampling program for lead and copper at susceptible locations that are not covered by lead and copper rule compliance sampling requirements, and bench-scale testing to evaluate potential treatment changes.

CDM Smith and the City recently initiated a follow-up study to proactively evaluate if the current corrosion control treatment is effective in controlling corrosion of lead goosenecks, lead solder, and other sources of lead in its drinking water distribution system. The study will address the changes discussed in the 2016 USEPA *Guidance Manual for Optimized Corrosion Control Treatment*. The project involves a six-month testing phase with pipe rigs and weekly monitoring of the water quality. The effectiveness of existing corrosion inhibitor dosage along with potential switch to an alternative inhibitor will be evaluated at varying target pH values.



#### CITY SCOPE ITEMS INVOLVED

- **Scope Item #5:** Corrosion analysis and engineering for potable water distribution systems

#### ABILITY TO MEET BUDGET AND SCHEDULE REQUIREMENTS

- This project is currently on schedule and on budget. The six-month testing ends in Mid-October.

#### CORROSION ANALYSIS

- Lead, copper, and iron

#### KEY STAFF

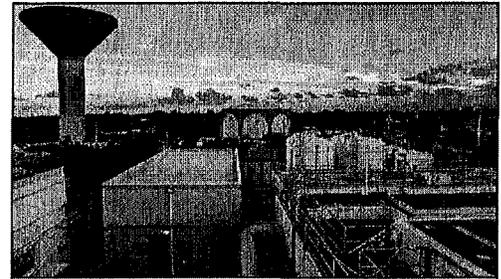
- Dowbiggin

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
	CDM Smith	Raleigh, NC	Prime

21. TITLE AND LOCATION (City and State)		22. YEAR COMPLETED	
Ion Exchange Resin Plant and East WTP Improvements, Boynton Beach, FL		PROFESSIONAL SERVICES 2017	CONSTRUCTION (if applicable) 2017
23. PROJECT OWNER'S INFORMATION			
a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER	
City of Boynton Beach 124 Woolbright Road, Boynton Beach, FL 33435	Michael Low, Manager Technical Services	Tel: 561.742.6403 Email: lowm@bbfl.us	
24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and cost)		PROJECT COST:	\$25.5M

CDM Smith delivered a progressive design-build installation of an Ion Exchange Resin Plant at the West WTP site for pretreatment of the water supply to the East WTP from the western wellfield while upgrading the WTP to a capacity of 24 mgd. When CDM Smith was engaged, our initial cost estimate of all components was \$48M. As this price was 50% over the City's budget, we worked with the City to perform cost assessments and value engineering as design continued and provided target estimates at the 10%, 30%, and 60% levels. The final guaranteed maximum price was signed for \$30.8M. Using a progressive design-build approach, the team was able to deliver the baseline scope below the initial budget. Approximately \$2.5M in savings from value engineering allowed the City to proceed with several other value-added items, including:

- Modified parking layouts, fencing, and security systems to provide separation between employee parking areas and plant operations, and to allow employees to park near the administration building.
- Installed a new programmable LED lighting system to provide colored aesthetics to both the City's iconic water tower and ground storage tank.
- Constructed a new medical clinic on the site which provides basic services to City employees and reduces the City's costs for employee medical insurance. Our original contract only included construction of new stud walls but with the savings, we were able to complete the full build out of the clinic.
- Performed significant structural repairs of the existing finished water clearwell.
- Added design improvements to the base MIEX system with inclined stainless-steel resin settling plates (instead of tubes) to separate the resin from the treated water, allowing for easier maintenance and resilience in the system.
- Performed testing to evaluate structural integrity of the existing silos as the original scope included complete replacement of the existing lime silos. Based on the results of the testing, we recommended that the existing silos be retained (with repairs). The resulting savings allowed funding of other needed improvements.
- Provided self-performance of selected work packages including yard piping. By self-performing the yard piping, we were able to address several utility conflicts in real-time with our in-house designers and construction professionals working to develop work-arounds and minimize cost and schedule impacts.



**CITY SCOPE ITEMS INVOLVED**

- **Scope Item #6:** Value engineering

**ABILITY TO MEET BUDGET AND SCHEDULE REQUIREMENTS**

- The project met schedule and budget requirements.

**IDENTIFIED BUDGET SAVINGS**

- **Contract Price:** \$30.8M
- **Final Cost:** \$25.5M
- Approximately \$2.5M in savings from project buyout, value engineering, and sales tax on owner direct purchases allowed the City to proceed with several other value-added items related to site enhancements, long-term safety, unforeseen conditions, and community outreach projects.

**KEY STAFF**

- Gadberry, Gilbert, Arevalo

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Boca Raton, FL	(3) ROLE Prime
b.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Maitland, FL	(3) ROLE Support Services

20. EXAMPLE PROJECT KEY NUMBER | 10

21. TITLE AND LOCATION (City and State)		22. YEAR COMPLETED	
Water and Wastewater Master Plan, Broward County, FL		PROFESSIONAL SERVICES 2016	CONSTRUCTION (if applicable) N/A
23. PROJECT OWNER'S INFORMATION			
a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER	
Broward County Water and Wastewater Services 2555 West Copans Road, Pompano Beach, FL, 33069	Rolando Nigaglioni, PE, Manager of the Planning, Development, and GIS Section, Construction Management Supervisor	Tel: 954.831.0882 Email: rnigaglioni@broward.org	
24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)		PROJECT COST:	\$968K

CDM Smith was retained by Broward County to develop a Retail Potable Water and Wastewater Master Plan for a future forecast year of 2040 to address retail facilities within the County's four service areas (known as Districts 1, 2, 3A, and 3BC). As part of this effort, our team developed a hydraulic model of the County's retail potable water, water, and wastewater systems, utilizing ESRI ArcGIS, InfoWater, and InfoSWMM, respectively, to develop a detailed and accurate model. In addition, our team is also responsible for data collection and cataloging.

For the Retail Potable Water and Water Master Plan, CDM Smith utilized InfoWater to develop a hydraulic model of the County's water system. Our team utilized 2015 meter billing data geocoded to parcels, then assigned them to the nearest pipes/nodes in the model. For system flow testing, pressure and flow monitors were distributed throughout the system, time-coordinated readings were conducted for each of the flow tests, and specific conditions were recorded. System demands were adjusted in the model to reflect the field data collected from the WTP meters, and flow and pressure data was applied to each test hydrant, pump station, and interconnect. As a result, our team identified the need for future pipe improvements and replacements.

For the Retail Wastewater Master Plan, InfoSWMM was used as the hydraulic modeling software of choice to combine open channel (gravity system) and pressure flow (pumps and force mains) into one model, and GIS was used for geometric data and connectivity. Our team divided the County's retail wastewater system into 22 separate InfoSWMM models to each represent a retail collection area. We then obtained pump station information from the County's Maximo asset database, as well as extracted flow information to provide statistics for each County-owned pump station. Existing average flow conditions were calibrated to annual average pump run times based on the availability of flow and pump run time data for all 22 models. As a result, 11 of the models were selected by the County for near term five-year Capital Improvement Program (CIP) analysis. CDM Smith developed the final Master Plan for presentation to the Board of County Commissioners.



**CITY SCOPE ITEMS INVOLVED**

- **Scope Item #7:** Water use master planning and permitting

**ABILITY TO MEET BUDGET AND SCHEDULE REQUIREMENTS**

- The project met schedule and budget requirements.

**SIZE OF MUNICIPALITY**

- **Drinking Water Customers:** 59,000
- **Wastewater Services:** 600,000
- **Treatment Plants:** 2 WTPs and 1 WWTP
- Six water storage and pumping stations

**KEY STAFF**

- O'Neil, Gadberry, Magenheimer, Goldman

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Boca Raton, FL	(3) ROLE Prime
b.	(1) FIRM NAME CDM Smith	(2) FIRM LOCATION (City and State) Maitland, FL	(3) ROLE Support Services

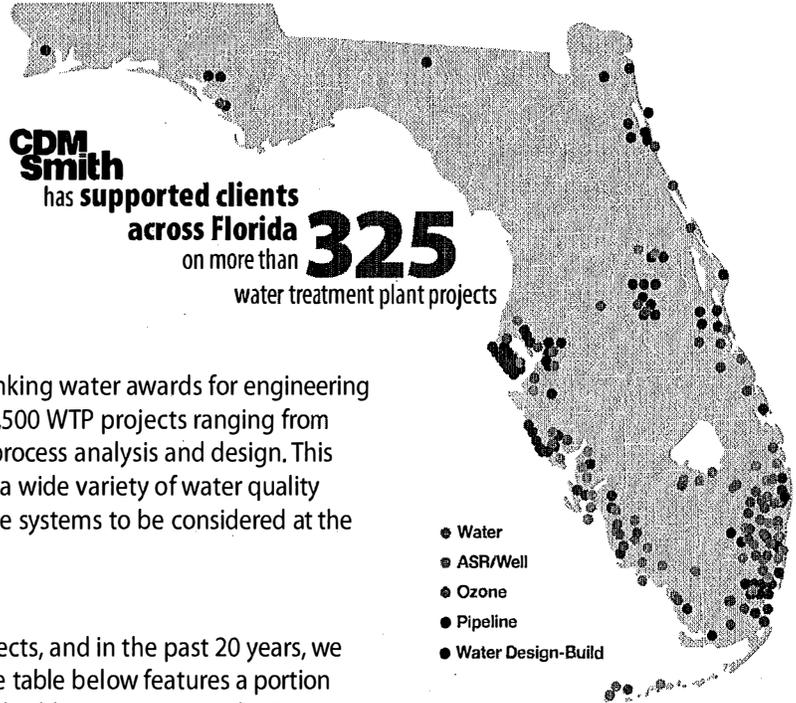


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### Water Treatment Experience

CDM Smith's FL offices have been leading the way in WTP projects for 44+ years with more than 325 WTP projects across Florida. CDM Smith is unquestionably among the leading WTP designers today, with one-third of our nearly 5,000 worldwide staff dedicated to the drinking water field. These experts work on water treatment projects day in and day out and can be called upon at any time to respond to technical requests or to satisfy short-term staffing demands. We have earned numerous peer awards, including more than 35 national drinking water awards for engineering excellence since 1990. We have completed over 2,500 WTP projects ranging from 1 to 2,020 mgd and are a national leader in WTP process analysis and design. This includes extensive domestic experience covering a wide variety of water quality challenges. We have extensive experience with the systems to be considered at the Fiveash WTP.



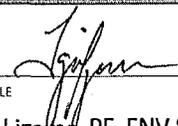
### Pilot Plant

CDM Smith's has completed 250+ pilot plant projects, and in the past 20 years, we have completed 22 pilot tests in Florida alone. The table below features a portion of CDM Smith's relevant projects with directly applicable experience to the City's project and include testing for an extensive range of alternative treatment processes.

Client/Location	Project Name/Facility	Bench/Pilot Study of Treatment	Ozone	Activated Carbon (GAC/PAC)	UV	AOP	Ozone-Bio-filtration (OBF)	Bio-filtration w/o Ozone	Membranes MF/UF/NF/RO	Lime Softening	Ion Exchange	Corrosion Control	Disinfection By-Products
Various Locations	Optimizing Biofiltration for Various Source Water Qualities, Water Research Foundation	•	•	•		•	•	•					•
Various Locations	Practical Monitoring Tools for Biological Processes in Biofiltration Water Research Foundation	•	•	•		•	•	•					•
Long Beach, CA	Leo J. Vander Lans WTP Pilot Tests (8 mgd)	•				•			•				
San Jose, CA	Rinconada and Santa Teresa WTPs	•	•	•	•	•	•	•			•	•	•
San Diego, CA	Miramar Water Treatment Plant Pilot Study (140 mgd)	•	•	•		•	•	•				•	•
San Francisco, CA	Harry Tracy WTP (180 mgd)	•	•	•		•	•	•				•	•
Santa Clara Valley, CA	Santa Teresa WTP Upgrades (100 mgd)	•	•	•			•					•	•
Santa Cruz, CA	Graham Hill WTP (24 mgd)	•	•	•	•	•	•	•	•		•	•	•
Englewood, CO	Allen WTP UV Disinfection (28 mgd)	•		•	•			•				•	•
Clearwater, FL	Reverse Osmosis Water Treatment Plant (ROWTP) No. 1 Expansion (4.5 mgd)	•		•					•				
Dania Beach, FL	Nanofiltration Water Treatment Plant Design-Build									•			
Deerfield Beach, FL	West Water Treatment Plant Expansion	•	•						•	•			•
Miami-Dade County FL	Preston NF Pilot Testing Miami-Dade Water & Sewer Dept.	•	•	•						•			•

Client/Location	Project Name/Facility	Bench/Pilot Study of Treatment	Ozone	Activated Carbon (GAC/PAC)	UV	AOP	Ozone Bio-filtration (OBF)	Bio-filtration w/o Ozone	Membranes MF/UF/NF/RO	Lime Softening	Ion Exchange	Corrosion Control	Disinfection By-Products
Miami-Dade County, FL	South Miami Heights WTP Miami-Dade Water & Sewer Dept.	•	•							•		•	•
Miami-Dade County, FL	Hialeah DBP/ICR NF Pilot Testing Miami-Dade Water & Sewer Dept.												
Boca Raton, FL	Glades Road Water Treatment Plant	•	•						•	•			•
Palm Beach County, FL	Water Treatment Plant No. 3	•							•				•
Palm Beach County, FL	Lake Region Water Treatment Plant	•							•				•
JEA, Jacksonville, FL	Advanced Treatment Pilot Study for Potable Reuse	•	•	•	•	•	•	•	•				•
Ormond Beach, FL	Water Treatment Plant Expansion and Improvements	•							•				•
Seacoast Utility Authority, Clewiston, FL	Hood Road Water Treatment Plant (WTP) Membrane Conversion	•							•				•
St. Augustine, FL	Water Treatment Plant Membrane Facility Addition	•							•				•
Tampa, FL	Tampa Bay Water Regional Surface Water Treatment	•	•	•			•					•	•
Tarpon Springs, FL	Alternative Water Supply Project	•							•				•
Gwinnett County, GA	Demonstration of High Quality Drinking Water Production	•	•	•			•						•
Gwinnett County, GA	Lanier Filter Plant Expansion and Upgrades	•	•	•		•	•	•	•				
Gwinnett County, GA	Shoal Creek Filter Plant	•	•	•		•	•	•	•				
Chicago, IL	Jardine WPP	•	•	•	•	•	•	•				•	•
Lake Bluff, IL	Neal WTP	•	•	•	•		•						•
Louisville, KY	Crescent Hill WTP Advanced Treatment Technologies Pilot Study	•	•	•	•	•	•	•					•
St. Paul, MN	McCarrons WTP	•	•	•			•	•		•			•
Boston, MA	John J. Carroll WTP	•	•	•	•	•	•	•					•
Asheville, NC	Mills River WTP	•	•	•			•						
Brunswick County, NC	Northwest WTP Advanced Treatment Study	•	•	•	•	•	•	•	•		•	•	•
Bladen County, NC	Bladen Bluffs WTP	•		•									
Cary, NC	Cary-Apex WTP Biofiltration Pilot Testing	•	•	•		•	•						
Charlotte, NC	Franklin WTP Expansion	•		•									
Greenville, NC	Charles Horne WTP	•	•	•		•	•	•					
Raleigh, NC	E.M. Johnson WTP	•	•	•		•	•	•					
Kinston, NC	Neuse Regional WTP	•	•	•	•	•	•	•			•		
Wilmington, NC	Sweeney WTP Upgrade and Expansion	•	•	•		•	•	•					
Santa Fe, NM	Buckman WTP	•	•	•			•	•			•	•	•
New York, NY	Catskills-Delaware Supplies	•	•	•	•	•	•	•				•	•
Cincinnati, OH	Richard Miller WTP UV and UV/AOP Pilot Study	•		•	•	•						•	•

Client/Location	Project Name/Facility	Bench/Pilot Study of Treatment	Ozone	Activated Carbon (GAC/PAC)	UV	AOP	Ozone-Bio-filtration (OBF)	Bio-filtration w/o Ozone	Membranes MF/UF/NF/RO	Lime Softening	Ion Exchange	Corrosion Control	Disinfection By-Products
Oklahoma City, OK	Hefner WTP	•	•	•			•	•		•		•	•
Philadelphia, PA	Baxter WTP Optimization and Advanced Treatment Pilot Studies	•	•	•			•	•				•	•
Philadelphia, PA	Belmont WTP Optimization and Advanced Treatment Pilot Studies	•	•	•			•	•				•	•
Florence, SC	Pee Dee Regional WTP	•						•					
El Paso, TX	Kay Bailey Hutchison Desalination Plant	•							•			•	•
Dallas, TX	Bachman WTP	•	•	•			•	•					•
Dallas, TX	Eastside WTP	•	•	•			•	•					•
Dallas, TX	Elm Fork WTP	•	•	•		•	•	•		•		•	•
Fort Worth, TX	Eagle Mountain WTP	•	•	•		•	•	•				•	•
Houston, TX	Southeast Water Purification Facility Pilot	•	•	•	•	•	•	•				•	•
Austin, TX	Ullrich WTP	•	•	•			•	•	•	•			•
Fairfax County, VA	Corbalis WTP Stage III Expansion	•	•	•			•						
Gloucester County, VA	Gloucester RO WTP	•							•				
Henrico County, VA	Henrico County WTP Expansion	•	•	•		•	•						
Newport News Water Works, VA	Lee Hall Water Treatment Plant Biofiltration Pilot Study	•	•										
Loudoun County, VA	Trap Rock WTP	•	•	•	•		•	•				•	•
Seattle, WA	Tolt WTP	•	•	•			•	•				•	•

AUTHORIZED REPRESENTATIVE		THE FOREGOING IS A STATEMENT OF FACTS	
31. SIGNATURE		32. DATE	October 5, 2018
33. NAME AND TITLE	Ignacio L. Lizama, PE, ENV SP; Vice President		

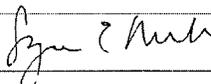
# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

If a firm has branch offices, complete for each specific branch office seeking work				1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME				12191-996	
CDM Smith Inc.				3. YEAR ESTABLISHED:	4. DUNS NUMBER:
2b. STREET				1947	05-599-0261
621 NW 53 <sup>rd</sup> Street, Suite 265				5. OWNERSHIP:	
2c. CITY	2d. STATE	2e. ZIP	a. TYPE	b. SMALL BUSINESS STATUS:	
Boca Raton	FL	33487	Corporation	Large Business	
6a. POINT OF CONTACT NAME AND TITLE				7. NAME OF FIRM (if block 2a is a branch office)	
Suzanne E. Mechler, PE, BCEE; Principal				CDM Smith Inc.	
6b. TELEPHONE NUMBER:		6c. E-MAIL ADDRESS:		8b. YR. ESTABLISHED:	8c. DUNS NUMBER:
561.571.3800		mechlerse@cdmsmith.com		1947	05-599-0261
8. FORMER FIRM NAME(S) (if any)					
Camp Dresser & McKee; Camp Dresser & McKee Inc.					

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	-	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	1	C15	Construction Management	10
12	Civil Engineer	426	-	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	2	E03	Electrical Studies and Design	8
16	Construction Manager	198	8	E09	Environmental Impact Studies	8
18	Cost Estimator	54	-	E12	Environmental Remediation	10
21	Electrical Engineer	126	4	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	7	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	-	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	1	P07	Plumbing & Piping Design	9
30	Geologist	176	1	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	-	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	1	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	4	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	-	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	1	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	1	S11	Sustainable Design	8
57	Structural Engineer	132	1	S13	Storm Water Handling & Facilities	9
58	Technician	432	-	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	-	U04	Utility Design/Coordination/Inspection	9
	Other	851	9	W02	Water Resources; Hydrology; Groundwater	10
	<b>TOTAL</b>	<b>4,674</b>	<b>41</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. FEDERAL WORK	10	1. Less than \$100,000	6. \$2 million to less than \$5 million		
b. NON-FEDERAL WORK	10	2. \$100,000 to less than \$250,000	7. \$5 million to less than \$10 million		
c. TOTAL WORK	10	3. \$250,000 to less than \$500,000	8. \$10 million to less than \$25 million		
		4. \$500,000 to less than \$1 million	9. \$25 million to less than \$50 million		
		5. \$1 million to less than \$2 million	10. \$50 million or greater		

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE	b. DATE	c. NAME AND TITLE
	October 5, 2018	Suzanne E. Mechler, PE, BCEE; Principal

# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)			1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME <b>CDM Smith Inc.</b>			12191-996	
2b. STREET <b>800 Brickell Avenue, Suite 500</b>			3. YEAR ESTABLISHED <b>1947</b>	4. DUNS NUMBER <b>05-599-0261</b>
2c. CITY <b>Miami</b>	2d. STATE <b>FL</b>	2e. ZIP <b>33131</b>	5. OWNERSHIP	
			a. TYPE <b>Corporation</b>	b. SMALL BUSINESS STATUS: <b>Large Business</b>
6a. POINT OF CONTACT NAME AND TITLE <b>Ignacio L. Lizama, PE, ENV SP; Vice President</b>			7. NAME OF FIRM (if block 2a is a branch office) <b>CDM Smith Inc.</b>	
6b. TELEPHONE NUMBER <b>305.372.7171</b>		6c. E-MAIL ADDRESS: <b>lizamail@cdmsmith.com</b>		8c. DUNS NUMBER <b>05-599-0261</b>
8. FORMER FIRM NAME(S) (if any) <b>Camp Dresser &amp; McKee; Camp Dresser &amp; McKee Inc.</b>				

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	-	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	-	C15	Construction Management	10
12	Civil Engineer	426	2	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	-	E03	Electrical Studies and Design	8
16	Construction Manager	198	-	E09	Environmental Impact Studies	8
18	Cost Estimator	54	-	E12	Environmental Remediation	10
21	Electrical Engineer	126	-	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	6	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	-	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	-	P07	Plumbing & Piping Design	9
30	Geologist	176	1	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	-	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	-	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	-	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	-	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	2	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	2	S11	Sustainable Design	8
57	Structural Engineer	132	-	S13	Storm Water Handling & Facilities	9
58	Technician	432	-	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	-	U04	Utility Design/Coordination/Inspection	9
	Other	851	2	W02	Water Resources; Hydrology; Groundwater	10
<b>TOTAL</b>		<b>4,674</b>	<b>15</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (Insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER	
a. FEDERAL WORK	10	1. Less than \$100,000	6. \$2 million to less than \$5 million
b. NON-FEDERAL WORK	10	2. \$100,000 to less than \$250,000	7. \$5 million to less than \$10 million
c. TOTAL WORK	10	3. \$250,000 to less than \$500,000	8. \$10 million to less than \$25 million
		4. \$500,000 to less than \$1 million	9. \$25 million to less than \$50 million
		5. \$1 million to less than \$2 million	10. \$50 million or greater

12. AUTHORIZED REPRESENTATIVE The foregoing is a statement of facts.		
a. SIGNATURE 	b. DATE <b>October 5, 2018</b>	c. NAME AND TITLE <b>Ignacio L. Lizama, PE, ENV SP; Vice President</b>

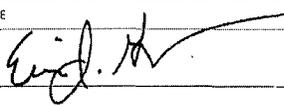
# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work)			1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME <b>CDM Smith Inc.</b>			12191-996	
2b. STREET <b>101 Southhall Lane, Suite 200</b>			3. YEAR ESTABLISHED <b>1947</b>	4. DUNS NUMBER <b>05-599-0261</b>
2c. CITY <b>Maitland</b>	2d. STATE <b>FL</b>	2e. ZIP <b>32751</b>	5. OWNERSHIP	
			a. TYPE <b>Corporation</b>	b. SMALL BUSINESS STATUS: <b>Large Business</b>
6a. POINT OF CONTACT NAME AND TITLE <b>Eric J. Grotke, PE, BCEE; Vice President</b>			7. NAME OF FIRM (if block 2a is a branch office) <b>CDM Smith Inc.</b>	
6b. TELEPHONE NUMBER <b>407.660.2552</b>	6c. E-MAIL ADDRESS: <b>grotkeej@cdmsmith.com</b>		8b. YR. ESTABLISHED <b>1947</b>	8c. DUNS NUMBER <b>05-599-0261</b>
8. FORMER FIRM NAME(S) (if any) <b>Camp Dresser &amp; McKee; Camp Dresser &amp; McKee Inc.</b>				

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	6	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	17	C15	Construction Management	10
12	Civil Engineer	426	15	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	33	E03	Electrical Studies and Design	8
16	Construction Manager	198	17	E09	Environmental Impact Studies	8
18	Cost Estimator	54	7	E12	Environmental Remediation	10
21	Electrical Engineer	126	10	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	6	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	5	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	1	P07	Plumbing & Piping Design	9
30	Geologist	176	3	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	1	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	2	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	7	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	3	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	19	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	3	S11	Sustainable Design	8
57	Structural Engineer	132	7	S13	Storm Water Handling & Facilities	9
58	Technician	432	21	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	4	U04	Utility Design/Coordination/Inspection	9
	Other	851	29	W02	Water Resources; Hydrology; Groundwater	10
	<b>TOTAL</b>	<b>4,674</b>	<b>216</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. FEDERAL WORK	10	1. Less than \$100,000	6. \$2 million to less than \$5 million		
b. NON-FEDERAL WORK	10	2. \$100,000 to less than \$250,000	7. \$5 million to less than \$10 million		
c. TOTAL WORK	10	3. \$250,000 to less than \$500,000	8. \$10 million to less than \$25 million		
		4. \$500,000 to less than \$1 million	9. \$25 million to less than \$50 million		
		5. \$1 million to less than \$2 million	10. \$50 million or greater		

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE 	b. DATE <b>October 5, 2018</b>	c. NAME AND TITLE <b>Eric J. Grotke, PE, BCEE; Vice President</b>

# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

If a firm has branch offices, complete for each specific branch office seeking work.)			1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME			12191-996	
CDM Smith Inc.			3. YEAR ESTABLISHED	4. DUNS NUMBER
2b. STREET			1947	05-599-0261
8381 Dix Ellis Trail, Suite 400			5. OWNERSHIP	
2c. CITY	2d. STATE	2e. ZIP	a. TYPE	b. SMALL BUSINESS STATUS:
Jacksonville	FL	32256	Corporation	Large Business
6a. POINT OF CONTACT NAME AND TITLE			7. NAME OF FIRM (if block 2a is a branch office)	
Patrick R. Victor, PE, DWRE; Vice President			CDM Smith Inc.	
6b. TELEPHONE NUMBER:		6c. E-MAIL ADDRESS:	8b. YR. ESTABLISHED	8c. DUNS NUMBER
904.731.7109		victorpr@cdmsmith.com	1947	05-599-0261
8. FORMER FIRM NAME(S) (if any)				
Camp Dresser & McKee; Camp Dresser & McKee Inc.				

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	-	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	-	C15	Construction Management	10
12	Civil Engineer	426	1	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	-	E03	Electrical Studies and Design	8
16	Construction Manager	198	1	E09	Environmental Impact Studies	8
18	Cost Estimator	54	-	E12	Environmental Remediation	10
21	Electrical Engineer	126	-	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	8	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	-	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	-	P07	Plumbing & Piping Design	9
30	Geologist	176	-	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	1	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	2	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	4	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	-	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	1	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	2	S11	Sustainable Design	8
57	Structural Engineer	132	-	S13	Storm Water Handling & Facilities	9
58	Technician	432	-	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	-	U04	Utility Design/Coordination/Inspection	9
	Other	851	2	W02	Water Resources; Hydrology; Groundwater	10
<b>TOTAL</b>		<b>4,674</b>	<b>22</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (Insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. FEDERAL WORK	10	1. Less than \$100,000 2. \$100,000 to less than \$250,000 3. \$250,000 to less than \$500,000 4. \$500,000 to less than \$1 million 5. \$1 million to less than \$2 million	6. \$2 million to less than \$5 million 7. \$5 million to less than \$10 million 8. \$10 million to less than \$25 million 9. \$25 million to less than \$50 million 10. \$50 million or greater		
b. NON-FEDERAL WORK	10				
c. TOTAL WORK	10				

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE	b. DATE	c. NAME AND TITLE
	October 5, 2018	Patrick R. Victor, PE, DWRE; Vice President

# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work)				1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME <b>CDM Smith Inc.</b>				12191-996	
2b. STREET <b>5400 Glenwood Avenue, Suite 400</b>				3. YEAR ESTABLISHED <b>1947</b>	4. DUNS NUMBER <b>05-599-0261</b>
2c. CITY <b>Raleigh</b>	2d. STATE <b>NC</b>	2e. ZIP <b>27612</b>	5. OWNERSHIP		
			a. TYPE <b>Corporation</b>	b. SMALL BUSINESS STATUS: <b>Large Business</b>	
6a. POINT OF CONTACT NAME AND TITLE <b>David L. Collins, PE, BCEE; Vice President</b>				7. NAME OF FIRM (if block 2a is a branch office) <b>CDM Smith Inc.</b>	
6b. TELEPHONE NUMBER <b>919.325.3500</b>		6c. E-MAIL ADDRESS <b>collinsdl@cdmsmith.com</b>		8b. YR. ESTABLISHED <b>1947</b>	8c. DUNS NUMBER <b>05-599-0261</b>
8. FORMER FIRM NAME(S) (if any) <b>Camp Dresser &amp; McKee; Camp Dresser &amp; McKee Inc.</b>					

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	-	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	5	C15	Construction Management	10
12	Civil Engineer	426	12	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	1	E03	Electrical Studies and Design	8
16	Construction Manager	198	1	E09	Environmental Impact Studies	8
18	Cost Estimator	54	2	E17	Environmental Remediation	10
21	Electrical Engineer	126	5	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	18	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	1	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	2	P07	Plumbing & Piping Design	9
30	Geologist	176	3	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	7	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	4	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	4	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	-	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	1	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	3	S11	Sustainable Design	8
57	Structural Engineer	132	7	S13	Storm Water Handling & Facilities	9
58	Technician	432	2	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	2	U04	Utility Design/Coordination/Inspection	9
	Other	851	7	W02	Water Resources; Hydrology; Groundwater	10
<b>TOTAL</b>		<b>4,674</b>	<b>87</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (Insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. FEDERAL WORK	10	1. Less than \$100,000	2. \$100,000 to less than \$250,000	3. \$250,000 to less than \$500,000	4. \$500,000 to less than \$1 million
b. NON-FEDERAL WORK	10	5. \$1 million to less than \$2 million	6. \$2 million to less than \$5 million	7. \$5 million to less than \$10 million	8. \$10 million to less than \$25 million
c. TOTAL WORK	10	9. \$25 million to less than \$50 million	10. \$50 million or greater		

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE 	b. DATE October 5, 20 08	c. NAME AND TITLE David L. Collins, PE, BCEE; Vice President

# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work)			1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME			12191-996	
CDM Smith Inc.			3. YEAR ESTABLISHED	4. DUNS NUMBER
2b. STREET			1947	05-599-0261
801 Cherry Street – Unit 33, Suite 1820			5. OWNERSHIP	
2c. CITY	2d. STATE	2e. ZIP	a. TYPE	b. SMALL BUSINESS STATUS:
Fort Worth	TX	76102	Corporation	Large Business
6a. POINT OF CONTACT NAME AND TITLE			7. NAME OF FIRM (if block 2a is a branch office)	
David L. Collins, PE, BCEE; Vice President			CDM Smith Inc.	
6b. TELEPHONE NUMBER:		6c. E-MAIL ADDRESS:		8b. YR. ESTABLISHED
817.332.8727		collinsdl@cdmsmith.com		8c. DUNS NUMBER
				1947
				05-599-0261
8. FORMER FIRM NAME(S) (if any)				
Camp Dresser & McKee; Camp Dresser & McKee Inc.				

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	-	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	1	C15	Construction Management	10
12	Civil Engineer	426	4	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	-	E03	Electrical Studies and Design	8
16	Construction Manager	198	-	E09	Environmental Impact Studies	8
18	Cost Estimator	54	-	E12	Environmental Remediation	10
21	Electrical Engineer	126	-	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	4	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	-	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	-	P07	Plumbing & Piping Design	9
30	Geologist	176	1	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	-	R11	rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	2	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	2	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	-	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	-	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	-	S11	Sustainable Design	8
57	Structural Engineer	132	-	S13	Storm Water Handling & Facilities	9
58	Technician	432	-	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	-	U04	Utility Design/Coordination/Inspection	9
	Other	851	1	W02	Water Resources; Hydrology; Groundwater	10
	<b>TOTAL</b>	<b>4,674</b>	<b>15</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER	
a. FEDERAL WORK	10	1. Less than \$100,000	6. \$2 million to less than \$5 million
b. NON-FEDERAL WORK	10	2. \$100,000 to less than \$250,000	7. \$5 million to less than \$10 million
c. TOTAL WORK	10	3. \$250,000 to less than \$500,000	8. \$10 million to less than \$25 million
		4. \$500,000 to less than \$1 million	9. \$25 million to less than \$50 million
		5. \$1 million to less than \$2 million	10. \$50 million or greater

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE	b. DATE	c. NAME AND TITLE
	October 5, 2018	David L. Collins, PE, BCEE; Vice President

# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

(if a firm has branch offices, complete for each specific branch office seeking work.)			1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME			12191-996	
CDM Smith Inc.			3. YEAR ESTABLISHED	4. DUNS NUMBER
2b. STREET			1947	05-599-0261
12400 Coit Road, Suite 400			5. OWNERSHIP	
2c. CITY	2d. STATE	2e. ZIP	a. TYPE	b. SMALL BUSINESS STATUS:
Dallas	TX	75251	Corporation	Large Business
6a. POINT OF CONTACT NAME AND TITLE			7. NAME OF FIRM (if block 2a is a branch office)	
David L. Collins, PE, BCEE; Vice President			CDM Smith Inc.	
6b. TELEPHONE NUMBER:		6c. E-MAIL ADDRESS:	8b. YR. ESTABLISHED	8c. DUNS NUMBER
214.346.2800		collinsdl@cdmsmith.com	1947	05-599-0261
8. FORMER FIRM NAME(S) (if any)				
Camp Dresser & McKee; Camp Dresser & McKee Inc.				

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	1	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	5	C15	Construction Management	10
12	Civil Engineer	426	4	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	-	E03	Electrical Studies and Design	8
16	Construction Manager	198	5	E09	Environmental Impact Studies	8
18	Cost Estimator	54	-	E12	Environmental Remediation	10
21	Electrical Engineer	126	11	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	6	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	1	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	5	P07	Plumbing & Piping Design	9
30	Geologist	176	-	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	2	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hvdraulic Engineer	109	-	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	3	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	5	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	7	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	2	S11	Sustainable Design	8
57	Structural Engineer	132	5	S13	Storm Water Handling & Facilities	9
58	Technician	432	6	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	2	U04	Utility Design/Coordination/Inspection	9
	Other	851	8	W02	Water Resources; Hydrology; Groundwater	10
<b>TOTAL</b>		<b>4,674</b>	<b>80</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. FEDERAL WORK	10	1. Less than \$100,000		6. \$2 million to less than \$5 million	
b. NON-FEDERAL WORK	10	2. \$100,000 to less than \$250,000		7. \$5 million to less than \$10 million	
c. TOTAL WORK	10	3. \$250,000 to less than \$500,000		8. \$10 million to less than \$25 million	
		4. \$500,000 to less than \$1 million		9. \$25 million to less than \$50 million	
		5. \$1 million to less than \$2 million		10. \$50 million or greater	

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE	b. DATE	c. NAME AND TITLE
	October 5, 2018	David L. Collins, PE, BCEE; Vice President

# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)			1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME <b>CDM Smith Inc.</b>			12191-996	
2b. STREET <b>75 State Street, Suite 701</b>			3. YEAR ESTABLISHED <b>1947</b>	4. DUNS NUMBER <b>05-599-0261</b>
2c. CITY <b>Boston</b>	2d. STATE <b>MA</b>	2e. ZIP <b>02109</b>	5. OWNERSHIP	
6a. POINT OF CONTACT NAME AND TITLE <b>David L. Collins, PE, BCEE; Vice President</b>			a. TYPE <b>Corporation</b>	b. SMALL BUSINESS STATUS: <b>Large Business</b>
6b. TELEPHONE NUMBER: <b>312.346.5000</b>			7. NAME OF FIRM (if block 2a is a branch office) <b>CDM Smith Inc.</b>	
6c. E-MAIL ADDRESS: <b>collinsdl@cdmsmith.com</b>			8b. YR. ESTABLISHED <b>1947</b>	8c. DUNS NUMBER <b>05-599-0261</b>
B. FORMER FIRM NAME(S) (if any) <b>Camp Dresser &amp; McKee; Camp Dresser &amp; McKee Inc.</b>				

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	5	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	15	C15	Construction Management	10
12	Civil Engineer	426	21	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	24	E03	Electrical Studies and Design	8
16	Construction Manager	198	5	E09	Environmental Impact Studies	8
18	Cost Estimator	54	4	E12	Environmental Remediation	10
21	Electrical Engineer	126	17	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	45	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	14	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	19	P07	Plumbing & Piping Design	9
30	Geologist	176	9	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	14	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	13	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	24	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	7	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	9	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	5	S11	Sustainable Design	8
57	Structural Engineer	132	14	S13	Storm Water Handling & Facilities	9
58	Technician	432	52	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	1	U04	Utility Design/Coordination/Inspection	9
	Other	851	163	W02	Water Resources; Hydrology; Groundwater	10
	<b>TOTAL</b>	<b>4,674</b>	<b>480</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (Insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER	
a. FEDERAL WORK	10	1. Less than \$100,000 2. \$100,000 to less than \$250,000 3. \$250,000 to less than \$500,000 4. \$500,000 to less than \$1 million 5. \$1 million to less than \$2 million	6. \$2 million to less than \$5 million 7. \$5 million to less than \$10 million 8. \$10 million to less than \$25 million 9. \$25 million to less than \$50 million 10. \$50 million or greater
b. NON-FEDERAL WORK	10		
c. TOTAL WORK	10		

12. AUTHORIZED REPRESENTATIVE: The foregoing is a statement of facts.		
a. SIGNATURE	b. DATE	c. NAME AND TITLE
	October 5, 2018	David L. Collins, PE, BCEE; Vice President

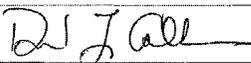
# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)			1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME			12191-996	
CDM Smith Inc.			3. YEAR ESTABLISHED	4. DUNS NUMBER
2b. STREET			1947	05-599-0261
125 South Wacker Drive, Suite 700			5. OWNERSHIP	
2c. CITY	2d. STATE	2e. ZIP	a. TYPE	b. SMALL BUSINESS STATUS:
Chicago	IL	60606	Corporation	Large Business
6a. POINT OF CONTACT NAME AND TITLE			7. NAME OF FIRM (if block 2a is a branch office)	
David L. Collins, PE, BCEE; Vice President			CDM Smith Inc.	
6b. TELEPHONE NUMBER:		6c. E-MAIL ADDRESS:	8b. YR. ESTABLISHED	8c. DUNS NUMBER
312.346.5000		collinsdl@cdmsmith.com	1947	05-599-0261
8. FORMER FIRM NAME(S) (if any)				
Camp Dresser & McKee; Camp Dresser & McKee Inc.				

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	4	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	1	C15	Construction Management	10
12	Civil Engineer	426	7	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	2	E03	Electrical Studies and Design	8
16	Construction Manager	198	3	E09	Environmental Impact Studies	8
18	Cost Estimator	54	-	E12	Environmental Remediation	10
21	Electrical Engineer	126	3	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	11	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	3	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	7	P07	Plumbing & Piping Design	9
30	Geologist	176	2	R06	Rehabilitation (Buildings; Structures; Facilities)	10
	Geotechnical Engineer	108		R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	3	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	5	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	3	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	5	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	-	S11	Sustainable Design	8
57	Structural Engineer	132	5	S13	Storm Water Handling & Facilities	9
58	Technician	432	1	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	2	U04	Utility Design/Coordination/Inspection	9
	Other	851	12	W02	Water Resources; Hydrology; Groundwater	10
<b>TOTAL</b>		<b>4,674</b>	<b>79</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (Insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. FEDERAL WORK	10	1. Less than \$100,000		6. \$2 million to less than \$5 million	
b. NON-FEDERAL WORK	10	2. \$100,000 to less than \$250,000		7. \$5 million to less than \$10 million	
c. TOTAL WORK	10	3. \$250,000 to less than \$500,000		8. \$10 million to less than \$25 million	
		4. \$500,000 to less than \$1 million		9. \$25 million to less than \$50 million	
		5. \$1 million to less than \$2 million		10. \$50 million or greater	

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE	b. DATE	c. NAME AND TITLE
	October 5, 2018	David L. Collins, PE, BCEE; Vice President

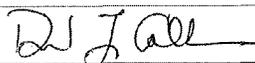
# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)			1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME			12191-996	
CDM Smith Inc.			3. YEAR ESTABLISHED	4. DUNS NUMBER
2b. STREET			1947	05-599-0261
555 17th Street, Suite 500			5. OWNERSHIP	
2c. CITY	2d. STATE	2e. ZIP	a. TYPE	b. SMALL BUSINESS STATUS:
Denver	CO	80202	Corporation	Large Business
6a. POINT OF CONTACT NAME AND TITLE			7. NAME OF FIRM (if block 2a is a branch office)	
David L. Collins, PE, BCEE; Vice President			CDM Smith Inc.	
6b. TELEPHONE NUMBER:		6c. E-MAIL ADDRESS:	8b. YR. ESTABLISHED	8c. DUNS NUMBER
303.383.2300		collinsdl@cdmsmith.com	1947	05-599-0261
8. FORMER FIRM NAME(S) (if any)				
Camp Dresser & McKee; Camp Dresser & McKee Inc.				

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	-	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	-	C15	Construction Management	10
12	Civil Engineer	426	7	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	-	E03	Electrical Studies and Design	8
16	Construction Manager	198	8	E09	Environmental Impact Studies	8
18	Cost Estimator	54	1	E12	Environmental Remediation	10
21	Electrical Engineer	126	-	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	25	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	22	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	6	P07	Plumbing & Piping Design	9
30	Geologist	176	6	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	2	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	12	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	13	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	-	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	4	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	3	S11	Sustainable Design	8
57	Structural Engineer	132	3	S13	Storm Water Handling & Facilities	9
58	Technician	432	8	T03	Traffic & Transportation Engineering	8
00	Transportation Engineer	98	-	U04	Utility Design/Coordination/Inspection	9
	Other	851	27	W02	Water Resources; Hydrology; Groundwater	10
	<b>TOTAL</b>	<b>4,674</b>	<b>147</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (Insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER	
a. FEDERAL WORK	10	1. Less than \$100,000	6. \$2 million to less than \$5 million
b. NON-FEDERAL WORK	10	2. \$100,000 to less than \$250,000	7. \$5 million to less than \$10 million
c. TOTAL WORK	10	3. \$250,000 to less than \$500,000	8. \$10 million to less than \$25 million
		4. \$500,000 to less than \$1 million	9. \$25 million to less than \$50 million
		5. \$1 million to less than \$2 million	10. \$50 million or greater

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE	b. DATE	c. NAME AND TITLE
	October 5, 2018	David L. Collins, PE, BCEE; Vice President

# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)			1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME			12191-996	
CDM Smith Inc.			3. YEAR ESTABLISHED	4. DUNS NUMBER
2b. STREET			1947	05-599-0261
14432 SE Eastgate Way, Suite 100			5. OWNERSHIP	
2c. CITY	2d. STATE	2e. ZIP	a. TYPE	b. SMALL BUSINESS STATUS:
Bellevue	WA	98007	Corporation	Large Business
6a. POINT OF CONTACT NAME AND TITLE			7. NAME OF FIRM (if block 2a is a branch office)	
David L. Collins, PE, BCEE; Vice President			CDM Smith Inc.	
6b. TELEPHONE NUMBER:		6c. E-MAIL ADDRESS:	8b. YR. ESTABLISHED	8c. DUNS NUMBER
425.519.8300		collinsdl@cdmsmith.com	1947	05-599-0261
8. FORMER FIRM NAME(S) (if any)				
Camp Dresser & McKee; Camp Dresser & McKee Inc.				

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	-	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	-	C15	Construction Management	10
12	Civil Engineer	426	3	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	-	E03	Electrical Studies and Design	8
16	Construction Manager	198	6	E09	Environmental Impact Studies	8
18	Cost Estimator	54	-	E12	Environmental Remediation	10
21	Electrical Engineer	126	-	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	12	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	6	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	1	P07	Plumbing & Piping Design	9
30	Geologist	176	9	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	3	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	2	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	1	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	-	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	6	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	-	S11	Sustainable Design	8
57	Structural Engineer	132	-	S13	Storm Water Handling & Facilities	9
58	Technician	432	8	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	2	U04	Utility Design/Coordination/Inspection	9
	Other	851	5	W02	Water Resources; Hydrology; Ground Water	10
	<b>TOTAL</b>	<b>4,674</b>	<b>64</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. FEDERAL WORK	10	1. Less than \$100,000		6. \$2 million to less than \$5 million	
b. NON-FEDERAL WORK	10	2. \$100,000 to less than \$250,000		7. \$5 million to less than \$10 million	
c. TOTAL WORK	10	3. \$250,000 to less than \$500,000		8. \$10 million to less than \$25 million	
		4. \$500,000 to less than \$1 million		9. \$25 million to less than \$50 million	
		5. \$1 million to less than \$2 million		10. \$50 million or greater	

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE	b. DATE	c. NAME AND TITLE
	October 5, 2018	David L. Collins, PE, BCEE; Vice President

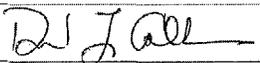
# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

If a firm has branch offices, complete for each specific branch office seeking work.)				1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME <b>CDM Smith Inc.</b>				12191-996	
2b. STREET <b>2300 Clayton Road, Suite 950</b>				3. YEAR ESTABLISHED <b>1947</b>	4. DUNS NUMBER <b>05-599-0261</b>
2c. CITY <b>Concord</b>		2d. STATE <b>CA</b>	2e. ZIP <b>94520</b>	5. OWNERSHIP a. TYPE <b>Corporation</b> b. SMALL BUSINESS STATUS: <b>Large Business</b>	
6a. POINT OF CONTACT NAME AND TITLE <b>David L. Collins, PE, BCEE; Vice President</b>				7. NAME OF FIRM (if block 2a is a branch office) <b>CDM Smith Inc.</b>	
6b. TELEPHONE NUMBER <b>925.933.2900</b>		6c. E-MAIL ADDRESS <b>collinsdl@cdmsmith.com</b>		8b. YR. ESTABLISHED <b>1947</b>	8c. DUNS NUMBER <b>05-599-0261</b>
8. FORMER FIRM NAME(S) (if any) <b>Camp Dresser &amp; McKee; Camp Dresser &amp; McKee Inc.</b>					

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	-	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	3	C15	Construction Management	10
12	Civil Engineer	426	4	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	-	E03	Electrical Studies and Design	8
16	Construction Manager	198	1	E09	Environmental Impact Studies	8
18	Cost Estimator	54	-	E12	Environmental Remediation	10
21	Electrical Engineer	126	1	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	14	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	-	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	-	P07	Plumbing & Piping Design	9
30	Geologist	176	2	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	-	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	3	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	-	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	3	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	2	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	3	S11	Sustainable Design	8
57	Structural Engineer	132	3	S13	Storm Water Handling & Facilities	9
58	Technician	432	-	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	-	U04	Utility Design/Coordination/Inspection	9
	Other	851	4	W02	Water Resources; Hydrology; Groundwater	10
	<b>TOTAL</b>	<b>4,674</b>	<b>43</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (Insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. FEDERAL WORK	10	1. Less than \$100,000		6. \$2 million to less than \$5 million	
b. NON-FEDERAL WORK	10	2. \$100,000 to less than \$250,000		7. \$5 million to less than \$10 million	
c. TOTAL WORK	10	3. \$250,000 to less than \$500,000		8. \$10 million to less than \$25 million	
		4. \$500,000 to less than \$1 million		9. \$25 million to less than \$50 million	
		5. \$1 million to less than \$2 million		10. \$50 million or greater	

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE	b. DATE	c. NAME AND TITLE
	October 5, 2018	David L. Collins, PE, BCEE; Vice President

# Architect-Engineer Qualifications

## PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work)			1. SOLICITATION NUMBER (if any):	
2a. FIRM (OR BRANCH OFFICE) NAME <b>CDM Smith Inc.</b>			12191-996	
2b. STREET <b>Edificio Huidobro, Avenida Presidente Riesco 5711, Oficina 1201</b>			3. YEAR ESTABLISHED 1947	4. DUNS NUMBER 05-599-0261
2c. CITY <b>Las Condes (Santiago)</b>			5. OWNERSHIP	
2d. STATE <b>Chile</b>	2e. ZIP <b>7561114</b>	a. TYPE <b>Corporation</b>	b. SMALL BUSINESS STATUS: <b>Large Business</b>	
6a. POINT OF CONTACT NAME AND TITLE <b>David L. Collins, PE, BCEE; Vice President</b>			7. NAME OF FIRM (if block 2a is a branch office) <b>CDM Smith Inc.</b>	
6b. TELEPHONE NUMBER <b>425.519.8300</b>	6c. E-MAIL ADDRESS <b>collinsdl@cdmsmith.com</b>	8b. YR. ESTABLISHED 1947	8c. DUNS NUMBER 05-599-0261	
B. FORMER FIRM NAME(S) (if any) <b>Camp Dresser &amp; McKee; Camp Dresser &amp; McKee Inc.</b>				

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRMS EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. FUNCTION CODE	b. DISCIPLINE	c. NO. OF EMPLOYEES		a. PROFILE CODE	b. EXPERIENCE	c. REVENUE INDEX NUMBER (see below)
		(1) FIRM	(2) BRANCH			
06	Architect	32	-	A12	Automation; Controls; Instrumentation	8
08	CADD Technician	202	1	C15	Construction Management	10
12	Civil Engineer	426	7	C18	Cost Estimating; Cost Engineering	6
15	Construction Inspector	285	-	E03	Electrical Studies and Design	8
16	Construction Manager	198	-	E09	Environmental Impact Studies	8
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21	Electrical Engineer	126	-	E13	Environmental Testing and Analysis	8
23	Environmental Engineer	592	2	H07	Highways; Streets; Airfield Paving; Parking Lots	9
24	Environmental Scientist	240	-	P06	Planning (Site, Installation, and Project)	9
29	Geographic Information System Specialist	91	-	P07	Plumbing & Piping Design	9
30	Geologist	176	-	R06	Rehabilitation (Buildings; Structures; Facilities)	10
27	Geotechnical Engineer	108	-	R11	Rivers; Canals; Waterways; Flood Control	7
32	Hydraulic Engineer	109	-	S04	Sewage Collection, Treatment and Disposal	10
34	Hydrologist	168	1	S05	Soils & Geologic Studies; Foundations	9
42	Mechanical Engineer	65	-	S07	Solid Wastes; Incineration; Landfill	8
47	Planner	222	-	S09	Structural Design; Special Structures	8
52	Sanitary Engineer	67	-	S11	Sustainable Design	8
57	Structural Engineer	132	-	S13	Storm Water Handling & Facilities	9
58	Technician	432	-	T03	Traffic & Transportation Engineering	8
60	Transportation Engineer	98	-	U04	Utility Design/Coordination/Inspection	9
	Other	851	3	W02	Water Resources; Hydrology; Groundwater	10
	<b>TOTAL</b>	<b>4,674</b>	<b>14</b>	<b>W03</b>	<b>Water Supply; Treatment and Distribution</b>	<b>10</b>

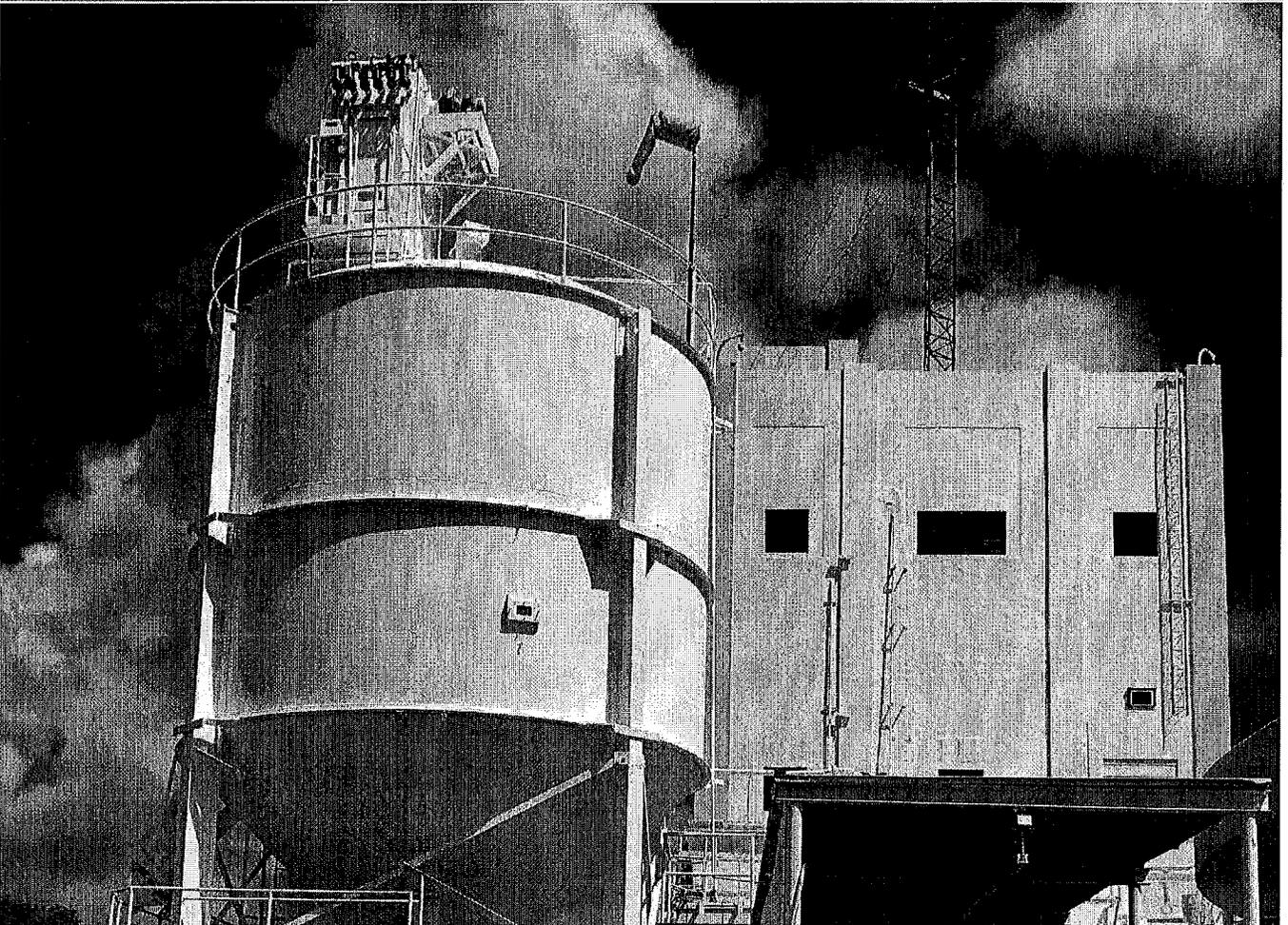
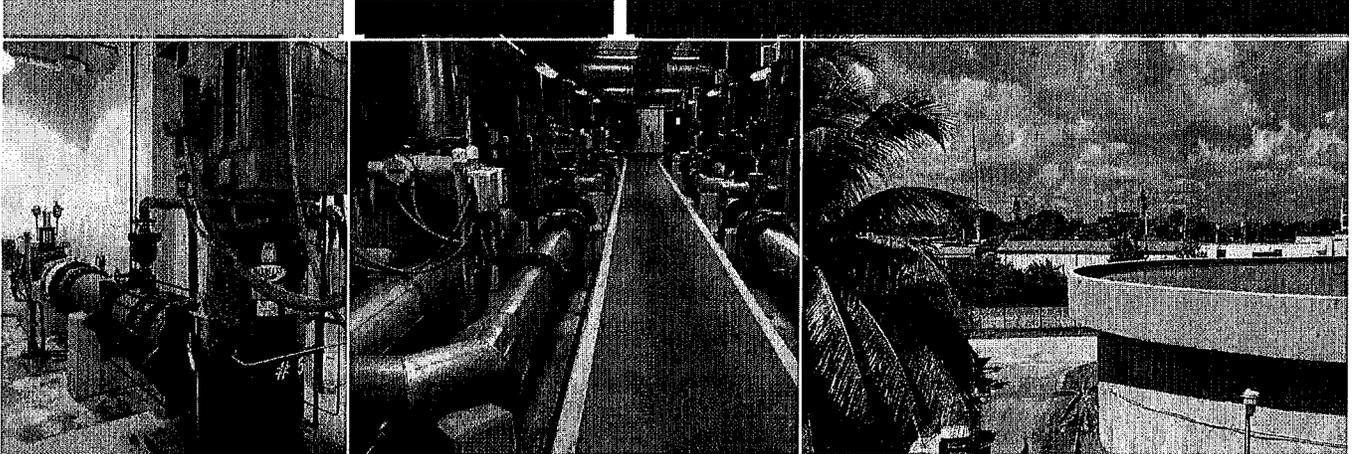
11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. FEDERAL WORK	10	1. Less than \$100,000	2. \$100,000 to less than \$250,000	3. \$250,000 to less than \$500,000	6. \$2 million to less than \$5 million
b. NON-FEDERAL WORK	10	4. \$500,000 to less than \$1 million	5. \$1 million to less than \$2 million	7. \$5 million to less than \$10 million	8. \$10 million to less than \$25 million
c. TOTAL WORK	10	9. \$25 million to less than \$50 million			
10. \$50 million or greater					

12. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.		
a. SIGNATURE	b. DATE	c. NAME AND TITLE
	October 5, 2018	David L. Collins, PE, BCEE; Vice President

SECTION

7

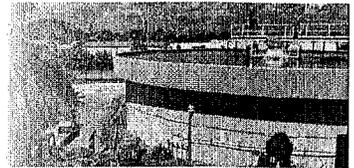
Minority (MBE)  
Participation



Section 7:  
Minority (MBE)  
Participation

# Section 7

## Minority (MBE) Participation



### Firm's Previous Efforts

CDM Smith is not a minority business enterprise (MBE) firm; however, we are committed to utilizing MBE/small business enterprises (SBE)/disadvantage business enterprise (DBE) firms in meaningful roles on our projects. This way, we enhance the opportunities for DBE/SBE/MBE firms to gain the experience that ensures long-term business viability. On each assignment we are the lead firm, we seek either to complement our in-house skills in specialized engineering areas, or supplement and extend our in-house capabilities with additional resources and local knowledge.

We have a strong history of successfully achieving DBE/SBE/MBE participation on projects. We also have a strong record of partnering across the State of Florida, and successful examples of CDM Smith's DBE/SBE/MBE utilization on projects are showcased in on this page.

### Firm's Planned Efforts

Our team includes **McCafferty Brinson Consulting, LLC** (MBC) for Evaluation and Options - Task Manager; Evaluation and Options - Regulatory Coordination; Granular Activated Carbon Pilot Study - Pilot Plant Coordination/Design; and Process Engineering Expertise - Ion Exchange. MBC is a MBE firm and further information on the firms capabilities is included in **Tab 8 Subconsultants**. Below is a copy of MBC's WBE certificate.



CDM Smith consistently meets or exceeds established contract goals for DBE/SBE/MBE participation for our projects throughout Florida. Here are some of our South Florida Examples.

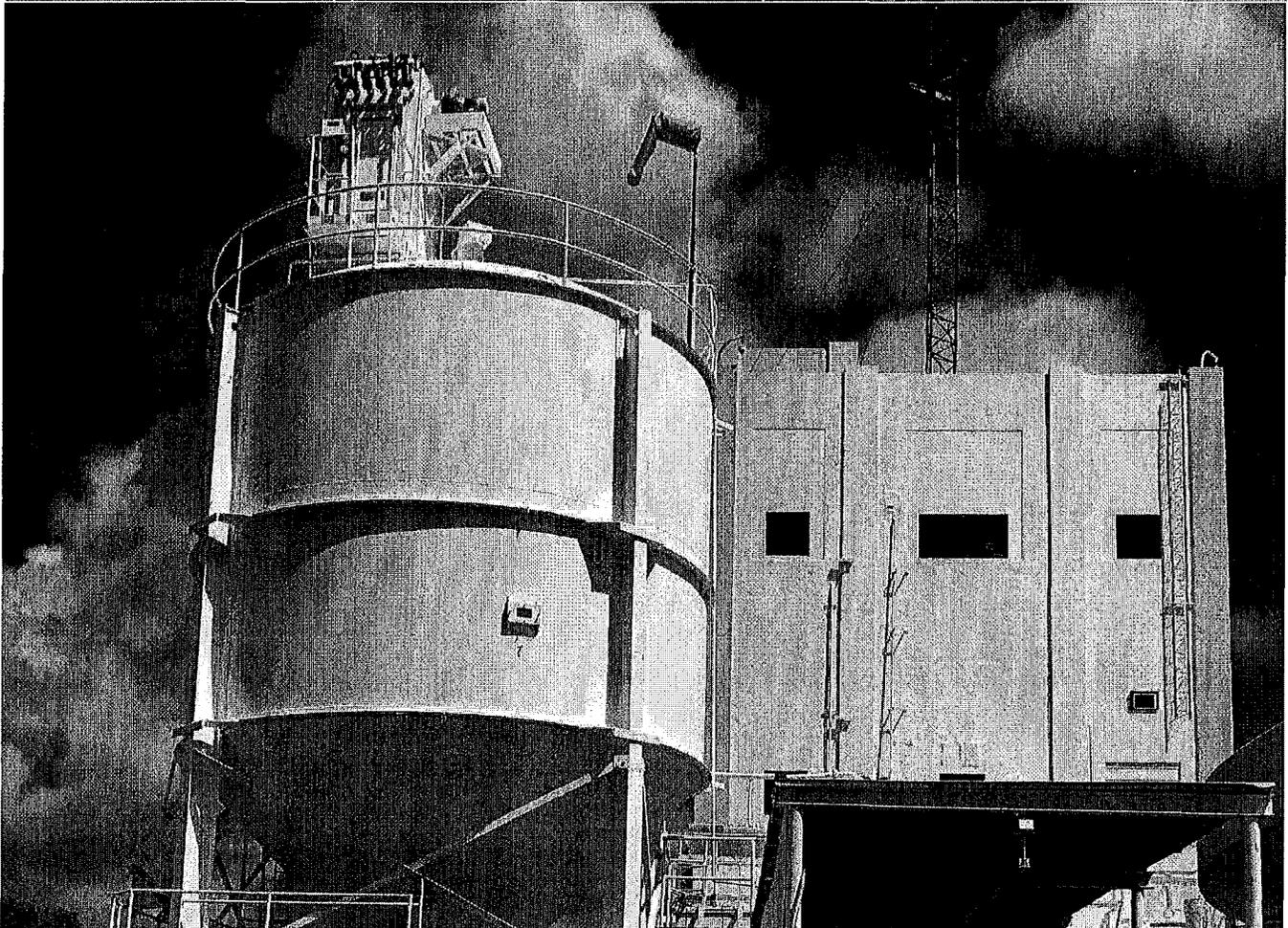
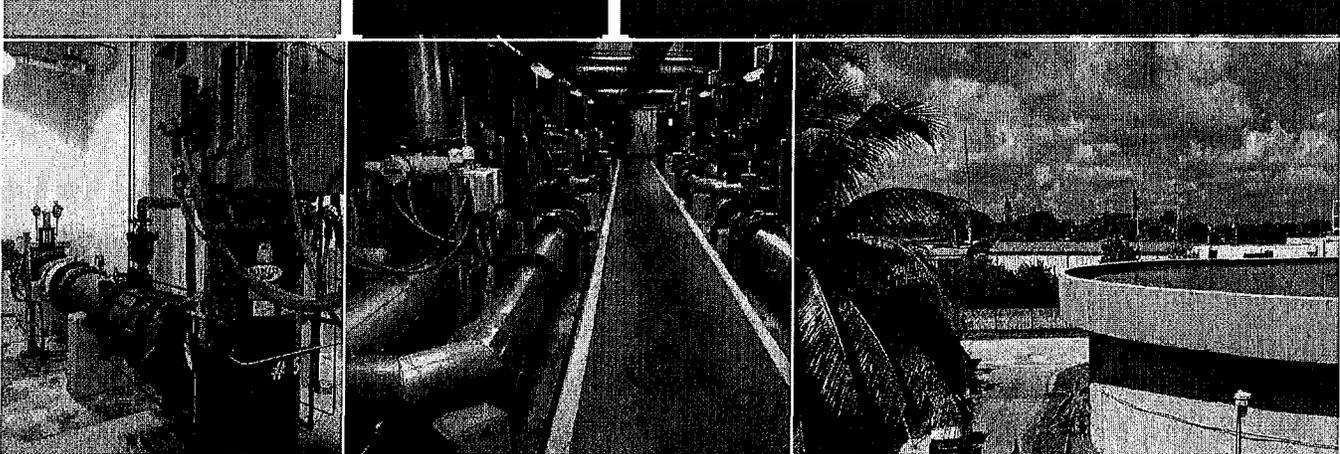
PROJECT	GOAL	ACHIEVED
3A Facility Lime Process Demolition, Broward County, FL	13%	13%
3B and 3C 4-log Inactivation Hydraulic Modeling Report, Broward County, FL	25%	40%
2A Water Treatment Plant Corrosion Control Update, Broward County, FL	25%	30%
1A Anion Exchange Treatment Update, Broward County, FL	25%	35%
3B Facility Chlorination System Improvements, Broward County, FL	25%	49%
North Regional Wastewater Treatment Pumping System/Septage Receiving Facility, Broward County, FL	13%	17%
NRWWTP Electrical Load Center and Motor Control Centers Rehabilitation, Broward County, FL	25%	25%
MDWASD OOL WWTP Design Services, Miami-Dade County, FL	24%	33%
South District Water Reclamation Project, Miami-Dade County, FL	20%	28%
South Miami Heights WTP, Miami-Dade County, FL	10%	12%
Stormwater Master Plan, Miami-Dade County, FL	5%	15%
Seaport Environmental Services, Miami-Dade County, FL	30%	40%
Class I Landfill Cells 15 & 16 Services During Construction, SWA, FL	15%	27%
Process Engineering for ECR Board, West Palm Beach, FL	9%	26%
General Hydrogeological Services, Palm Beach County, FL	15%	22%
Modeling Services, SFWMD, FL	25%	79%

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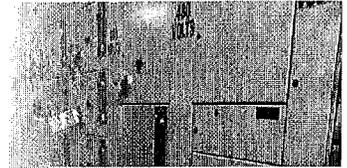
SECTION

8

Subconsultants



Section 8:  
Subconsultants



### Subconsultants

The CDM Smith team is supported by highly qualified and knowledgeable specialty subconsultants making our team comprehensive, yet manageable and efficient. Below is a brief introduction of our subconsultants with additional details on the firms qualifications and experience included in the firms SF 330's at the end of this section.

#### **McCafferty Brinson Consulting, LLC (MBC)**



##### **Evaluation and Options - Task Manager; Evaluation and Options - Regulatory Coordination; Granular Activated Carbon Pilot Study - Pilot Plant Coordination Design; and Process Engineering Expertise - Ion Exchange**

Located in the City of Fort Lauderdale, MBC is an engineering consulting firm founded in South Florida in 2006. MBC offers environmental consulting, engineering design, and construction administration services related to potable water, reclaimed water, and wastewater treatment systems, pumping and transmission systems, and utility infrastructure, as well as permitting and regulatory compliance consulting. MBC is certified as a State of Florida Minority, Women and Service-Disabled Veteran Business Enterprise (MBE) and as a County Business Enterprise (CBE) in Broward County.

#### **Keith and Associates, Inc. (KEITH)**



##### **Utilities Engineering (Subsurface Engineering); Survey; Landscape**

KEITH is a multi-disciplined consulting engineering firm headquartered in Pompano Beach, FL with additional offices in Broward, Miami-Dade, Palm Beach, St. Lucie, and Orlando. They provide civil engineering, traffic engineering, comprehensive planning, surveying and mapping, subsurface utility engineering (SUE), landscape architecture, BIM/VDC and construction management services. The firm was founded on the principle of achieving success by combining client oriented business practices with the latest technology and a staff of experienced and talented professionals. They have provided construction services for projects ranging from roadways, water mains, sanitary sewers, storm sewers, lakes, retention areas, driveways, and other civil engineered facilities.

#### **Nutting Engineers of Florida, Inc.**



##### **Geotechnical**

Nutting has been one of the premier geotechnical engineering firms in South Florida since its inception in 1967. Their comprehensive range of services include geotechnical exploration and engineering including soil borings and groundwater well drilling, monitoring of pile installation, groundwork modification and chemical grouting procedures, quality control/ quality assurance testing of construction materials, and structural inspections (special/threshold) of structures.

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**PART I - CONTRACT-SPECIFIC QUALIFICATIONS**

**A. CONTRACT INFORMATION**

1. TITLE AND LOCATION *(City and State)*

Granular Activated Carbon Pilot and Plant Evaluation at Fiveash Water Plant

2. PUBLIC NOTICE DATE

September 10, 2018

3. SOLICITATION OR PROJECT NUMBER

12191-996

**B. ARCHITECT-ENGINEER POINT OF CONTACT**

4. NAME AND TITLE

Frank A. Brinson, P.E., Vice President

5. NAME OF FIRM

McCafferty Brinson Consulting, LLC.

6. TELEPHONE NUMBER

(954) 797-7100

7. FAX NUMBER

(954) 467-9870

8. E-MAIL ADDRESS

fbrinson@mccaffertybrinson.com

**C. PROPOSED TEAM**

*(Complete this section for the prime contractor and all key subcontractors.)*

	(Check)			9. FIRM NAME	10. ADDRESS	11. ROLE IN THIS CONTRACT
	PRIME	J-V PARTNER	SUBCONTRACTOR			
a.			✓	McCafferty Brinson Consulting, LLC <input type="checkbox"/> CHECK IF BRANCH OFFICE	633 S. Andrews Ave, Suite 402 Fort Lauderdale, FL 33301	Subconsultant
b.				<input type="checkbox"/> CHECK IF BRANCH OFFICE		
c.				<input type="checkbox"/> CHECK IF BRANCH OFFICE		
d.				<input type="checkbox"/> CHECK IF BRANCH OFFICE		
e.				<input type="checkbox"/> CHECK IF BRANCH OFFICE		
f.				<input type="checkbox"/> CHECK IF BRANCH OFFICE		

**D. ORGANIZATIONAL CHART OF PROPOSED TEAM**

□ (Attached)

**E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT**

(Complete one Section E for each key person.)

12. NAME Frank A. Brinson, P.E., BCEE	13. ROLE IN THIS CONTRACT Principal Engineer	14. YEARS EXPERIENCE	
		a. TOTAL 26	b. WITH CURRENT FIRM 12

15. FIRM NAME AND LOCATION (City and State)  
McCafferty Brinson Consulting, LLC, Fort Lauderdale, Florida

16. EDUCATION (DEGREE AND SPECIALIZATION) B.S.E, Environmental Engineering, University of Florida, 1991	17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) Professional Engineer, Florida License No. 51313
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18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)  
Mr. Brinson is an environmental engineer with twenty-six years of experience. He is experienced in both management and execution of projects with expertise in engineering analysis, pilot studies, modeling, utility master planning, design, permitting, preparation of bidding and construction documents, construction contract administration, and construction management. Specialties include water, wastewater, and reclaimed water treatment facilities, evaluation studies, pumping and hydraulic systems, and utility infrastructure.

**19. RELEVANT PROJECTS**

	(1) TITLE AND LOCATION (City and State)	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION (If applicable)
a.	40 mgd Nanofiltration Membrane Element Replacement and Pilot Study, Glades Road Water Treatment Plant, Boca Raton, Florida	2015	2015
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm		
Mr. Brinson served as the Project Manager and Engineer of Record for the design of a 2:1 array full-size element pilot plant, pilot-scale proof testing, development of technical specifications for the replacement membrane elements and membrane performance requirements, negotiations with the membrane element manufacturer, development of technical specifications and bidding documents for a separate membrane loading contract, and permitting and bidding services.			
b.	Anion Exchange Treatment Facility, Water Treatment Plant 1A, Broward County, Florida	2011	2011
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm		
Mr. Brinson served as the Project Manager and Design Engineer for membrane process pilot testing and preliminary design for a nanofiltration process addition to the District 1A Water Treatment Plant and preparing a treatment process alternative analysis which concluded that anion exchange was more cost-effective than nanofiltration. Mr. Brinson was involved in design of the recommended anion exchange process improvements.			
c.	Membrane Element Replacement and Pilot Testing Pompano Beach, Florida	Ongoing	Ongoing
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm		
Mr. Brinson is the Project Manager for the design of a 2:1 array full-size element pilot plant and he is assisting with pilot studies and data analysis, loading membrane elements and start-up of the plant for each test run, monitoring operating data, and providing a performance analysis following each test run. See example project number 3 (page 47) for additional information.			
d.	Four-Log Virus Treatment of Groundwater: Compliance Studies, Process Improvements, and Demonstration Submittals Multiple South Florida Utilities	2008	Ongoing
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm		
These projects include data collection and review, regulatory compliance review, development of compliance alternatives and recommendations, design, and services during construction. See example project number 4 (page 48) for additional information.			
e.	Holiday Park Lead and Copper Study Broward County, Florida	2016	2018
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm		
This project included performance of a desk-top study and in-situ testing to evaluate existing water quality, to recommend water quality goals and a corrosion inhibitor dosing rate, and the design and installation of corrosion inhibitor bulk storage and feed system.			

**E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT**

(Complete one Section E for each key person.)

12. NAME Audra McCafferty, P.E., LEED AP, ENV SP	13. ROLE IN THIS CONTRACT Principal Engineer	14. YEARS EXPERIENCE	
		a. TOTAL 26	b. WITH CURRENT FIRM 12

15. FIRM NAME AND LOCATION (City and State)  
McCafferty Brinson Consulting, LLC, Fort Lauderdale, Florida

16. EDUCATION (DEGREE AND SPECIALIZATION) B.S.E, Environmental Engineering, University of Florida, 1991	17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) Professional Engineer, Florida License No. 54737
--	--

18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)  
Ms. McCafferty is an environmental engineer with twenty-six years of experience. While Ms. McCafferty's technical experience is primarily focused in environmental services, she also has experience in building materials, asbestos surveying, geotechnical engineering, and construction materials testing. Ms. McCafferty has a broad range of professional experience, including work execution in the project engineer role, project management, permitting, funding assistance, cost estimating, scheduling, senior technical review, quality assurance/quality control (QA/QC) management, staffing and resource management, and business development.

**19. RELEVANT PROJECTS**

(1) TITLE AND LOCATION (City and State)	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (If applicable)
(1) TITLE AND LOCATION (City and State) Four-Log Virus Treatment of Groundwater: Compliance Studies, Process Improvements, and Demonstration Submittals Multiple South Florida Utilities	2008	Ongoing
a. (3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE These projects include data collection and review, regulatory compliance review, development of compliance alternatives and recommendations, design, and services during construction. See example project number 4 (page 48) for additional information. Ms. McCafferty assisted with the data review and regulatory compliance review.	<input checked="" type="checkbox"/> Check if project performed with current firm	
(1) TITLE AND LOCATION (City and State) Broward County Water and Wastewater Master Plan Broward County, Florida	2016	N/A
b. (3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE BCWWS updated its retail Master Plan. MBC services included analysis of potable water treatment source of supply, establishing operational goals, growth forecasts, water systems modeling, recommending improvements and submittal of the master plan. Ms. McCafferty performed water service area interconnection evaluations and regulatory compliance assistance.	<input checked="" type="checkbox"/> Check if project performed with current firm	
(1) TITLE AND LOCATION (City and State) Broward County North Regional Wastewater Treatment Plant Upgrade Broward County, Florida	2018	Ongoing
c. (3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Permitting and design services for the reclaimed water treatment plant expansion including filter feed pumping, filters, chlorine contact basins, distribution pumping, chemical storage and feed systems. Ms. McCafferty facilitated permitting efforts on the state and local levels associated with the additional reclaimed water treatment capacity.	<input checked="" type="checkbox"/> Check if project performed with current firm	
(1) TITLE AND LOCATION (City and State) 3A Facility Four-Log Virus Treatment Implementation BCWWS Broward County, Florida	2016	N/A
d. (3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Development of treatment process recommendations, desk-top laboratory treatability studies, design and construction administration of recommended process improvements, and preparation of Demonstration submittals to regulatory agencies. Ms. McCafferty supported data analysis related to tank sizing and permitting efforts on the state and local level	<input checked="" type="checkbox"/> Check if project performed with current firm	
(1) TITLE AND LOCATION (City and State) COPB Water Treatment Plant Regulatory Review Related to Bulk Chemical Storage, Pompano Beach, FL	2018	N/A
e. (3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Investigation of anhydrous ammonia storage tank registration on state and county level. Regulatory review for closure, demolition and removal out-of-service sulfuric acid AST with the FDEP and BC. Ms. McCafferty assisted the City with review of regulatory requirements associated with the bulk storage tanks and federal reporting requirements.	<input checked="" type="checkbox"/> Check if project performed with current firm	

<b>F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT</b> (Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)	20. EXAMPLE PROJECT KEY NUMBER 1
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<b>21. TITLE AND LOCATION (City and State)</b> 40 mgd Nanofiltration Membrane Element Pilot Study and Replacement, Glades Road Water Treatment Plant, Boca Raton, Florida	<b>22. YEAR COMPLETED</b> <b>PROFESSIONAL SERVICES</b> 2015	<b>CONSTRUCTION (If applicable)</b> 2015
--	---	---

23. PROJECT OWNER'S INFORMATION		
<b>a. PROJECT OWNER</b> City of Boca Raton, Florida	<b>b. POINT OF CONTACT NAME</b> Mr. Chris Helfrich	<b>c. POINT OF CONTACT TELEPHONE NUMBER</b> 561-338-7303 CHelfrich@ci.boca-raton.fl.us

**24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and cost.)**

**Background**

In 2004, the City of Boca Raton completed construction and commissioning of the 40 million gallon per day (mgd) nanofiltration (NF) membrane process addition to the City's 70 mgd Glades Road Water Treatment Plant. This plant is currently the largest NF facility in operation in the world, and is the largest NF facility in South Florida that operates without acid or antiscalant pretreatment. MBC principal Frank Brinson served as project manager and engineer of record for design and construction of this project while an employee of Camp Dresser & McKee Inc. (CDM).

The original membrane elements for the plant were specially developed for the 2004 project by the membrane manufacturer, Hydranautics. The membrane elements subsequently became the ESNA LF (low fouling) product line, the industry standard for South Florida nanofiltration facilities, installed at the Cities of Hollywood, Deerfield Beach, Pompano Beach, and Dania Beach.

**Project**

In 2014, the City of Boca Raton began planning for a routine replacement of NF elements, and retained MBC to assist with the replacement. MBC's scope of services for the pilot study and replacement project included the following:

- Pilot-scale design and proof testing of the latest offering in the membrane manufacturer's low-fouling NF product lines.
- Development of technical specifications and contract documents for the replacement membrane elements and performance requirements in addition to permitting and bidding services.
- Preparation of technical specifications and bidding documents for a separate membrane loading contract by qualified membrane systems contractors.
- Contract administration and inspection services during the membrane loading period.

The project was completed in 2015 after review and approval of membrane performance testing by MBC. The plant continues to operate successfully with no chemical pretreatment.

**Construction Cost:** \$4.5 million with no change orders.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
	McCafferty Brinson Consulting, LLC	Fort Lauderdale, Florida	Prime Engineering Consultant
b.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
c.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
d.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
e.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
f.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE

**F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT**  
 (Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER

2

21. TITLE AND LOCATION <i>(City and State)</i> Anion Exchange Treatment Facility Nanofiltration Process Addition and 4-log Study, Water Treatment Plant 1A, Broward County, Florida	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES 2011	CONSTRUCTION <i>(If applicable)</i> 2011

**23. PROJECT OWNER'S INFORMATION**

a. PROJECT OWNER Broward County Water and Wastewater Services	b. POINT OF CONTACT NAME Mr. Rolando Nigaglioni, P.E	c. POINT OF CONTACT TELEPHONE NUMBER 954.831.0882 rnigaglioni@broward.org
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**24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT** *(Include scope, size, and cost.)*

**Background**

In June 2002, Broward County contracted with CDM to provide design, bidding, and construction management services for a nanofiltration (NF) process addition to the County's District 1A water treatment plant (WTP 1A), a 16 million gallon per day (mgd) conventional lime softening facility. As part of the preliminary design phase, the County requested a treatment process alternative analysis that concluded an anion exchange process was more cost effective to achieve the County's goals. The primary objective of the project was to maintain continued compliance with the Disinfectant/Disinfection By-product (D/DBP) Rule and improve the aesthetic quality (color) of the finished water. CDM assigned Frank Brinson, P.E., as project manager.

**The Project**

Following completion of the preliminary design phase and treatment process alternative analysis, the County retained CDM for final design, bidding and construction management services for the anion exchange process and other improvements related to four-log virus treatment compliance. CDM retained MBC as a subconsultant to provide process/mechanical design support services. The scope of the project included the following:

- Performed a study and updated design to the anion exchange process including modifications to the finished water clearwell to provide disinfection to comply with the recently implemented Chapter 62-555 FAC 4-log virus inactivation/removal requirement.
- Design, permitting and construction administration of a 9 mgd capacity anion exchange process (six 1.5 mgd nominal capacity units) with feed pumps, backwash, regeneration, and cleaning systems, and regeneration waste disposal.
- Modifications to existing post-treatment chemical application points to provide a disinfected, stable blended finished water and four-log virus treatment of the finished water.
- Modifications to the existing transfer pumping and high-service pumping systems to maintain the existing plant capacity rating of 16 mgd while maintaining operational flexibility.

Design of the improvements was completed in February 2008. MBC provided construction administration services for the improvements under separate authorization. Substantial completion of construction was October 2011.  
**Construction Cost:** \$4.2 Million and 3% change orders.

**25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT**

	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
a.	McCafferty Brinson Consulting, LLC	Fort Lauderdale, Florida	Subconsultant
b.	CDM	Fort Lauderdale, Florida	Prime Engineering Consultant
c.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
d.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
e.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
f.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE

<b>F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT</b> (Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)	20. EXAMPLE PROJECT KEY NUMBER <b>3</b>
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<b>21. TITLE AND LOCATION (City and State)</b> 10 mgd Nanofiltration Membrane Element Pilot Study and Replacement, Water Treatment Plant Pompano Beach, Florida	<b>22. YEAR COMPLETED</b>	
	<b>PROFESSIONAL SERVICES</b> Ongoing	<b>CONSTRUCTION (If applicable)</b> N/A

<b>23. PROJECT OWNER'S INFORMATION</b>		
<b>a. PROJECT OWNER</b> City of Pompano Beach, Florida	<b>b. POINT OF CONTACT NAME</b> Mr. A. Randolph Brown	<b>c. POINT OF CONTACT TELEPHONE NUMBER</b> 954-545-7043 Randolph.Brown@copbfl.com

**24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT** (Include scope, size, and cost.)

**Background**

In 2002, the City of Pompano Beach installed a new 10 million gallon per day (mgd) capacity nanofiltration membrane treatment plant. The original membrane elements that were installed had a higher operating pressure than the manufacturer's projected performance. The City performed a pilot test and concluded that installation of new nanofiltration membranes in addition to "fine tuning" membrane selection would greatly improve performance and more cost-effective operation. In 2006, the City of Pompano Beach authorized a project team including CDM and MBC to provide services associated with the procurement and start-up of the plant with new membranes.

On April 5, 2016, the City of Pompano Beach authorized MBC under Work Authorization No. 1 to provide engineering services for the replacement of the 1,820 nanofiltration (NF) membrane elements at the City's water treatment plant. The existing NF membrane elements have performed satisfactorily since they were installed in 2008. The City's Capital Improvement Plan (CIP) has funds budgeted for replacement of the NF elements which have reached their useful life.

**The Project**

MBC's scope of services for the project includes the following:

- Preparation and submittal of an application for a public water system construction permit for the pilot test unit.
- Testing of each membrane element selection. Including 90 days of prequalification testing under current typical full-scale plant operating conditions.
- Advising and monitoring the loading of membrane elements and start-up of the pilot unit for each test run.
- Monitoring the pilot test unit operations during pilot testing.
- Analysis of performance and water quality during and at the conclusion of each test run. Preparation and submittal of a brief letter report summarizing the data and conclusions for each of the two test runs.

The design phase, technical specification development and plant permitting have been completed. Pilot testing of each membrane element section is currently being performed.

**Construction Cost:** \$1.1 million, estimated value.

<b>25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT</b>			
a.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
	McCafferty Brinson Consulting, LLC	Fort Lauderdale, Florida	Prime Engineering Consultant
b.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
c.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
d.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
e.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
f.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE

<b>F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT</b> (Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)	20. EXAMPLE PROJECT KEY NUMBER <b>4</b>
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<b>21. TITLE AND LOCATION</b> <i>(City and State)</i> Four-Log Virus Treatment of Groundwater: Compliance Studies, Process Improvements, and Demonstration Submittals, Multiple South Florida Utilities	<b>22. YEAR COMPLETED</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; padding: 5px;"> <b>PROFESSIONAL SERVICES</b> 2008         </td> <td style="width: 50%; text-align: center; padding: 5px;"> <b>CONSTRUCTION</b> <i>(If applicable)</i> Ongoing         </td> </tr> </table>	<b>PROFESSIONAL SERVICES</b> 2008	<b>CONSTRUCTION</b> <i>(If applicable)</i> Ongoing
<b>PROFESSIONAL SERVICES</b> 2008	<b>CONSTRUCTION</b> <i>(If applicable)</i> Ongoing		

23. PROJECT OWNER'S INFORMATION		
<b>a. PROJECT OWNER</b> City of Boca Raton City of Pompano Beach Broward County (BCWWS)	<b>b. POINT OF CONTACT NAME</b> <u>Boca Raton</u> , Mr. Chris Helfrich  <u>Pompano Beach</u> , Mr. A. Randolph Brown  <u>Broward County</u> , Mr. Rolando Nigaglioni, P.E.	<b>c. POINT OF CONTACT TELEPHONE NUMBER</b> 561.338.7303 CHelfrich@ci.boca-raton.fl.us  954.545.7043 Radolph.Brown@copbfl.com  954.831.0882 rnigaglioni@broward.org

**24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT** *(Include scope, size, and cost.)*

**Background**

Under the final Federal Ground Water Rule (GWR), published by the United States Environmental Protection Agency (USEPA) and Chapter 62-550.828, Florida Administrative Code (FAC), public water systems that use groundwater sources for their raw water supply shall provide four-log virus treatment of groundwater sources, or conduct additional microbial monitoring, effective December 2009. Many utilities have elected to implement four-log virus treatment within their treatment processes to avoid the additional monitoring requirements and potential public notices.

Since 2008, MBC has assisted several large South Florida utilities in evaluating their treatment processes, developing cost-effective four-log virus treatment process improvements. Through these improvements, city utilities have successfully obtained four-log virus treatment "certifications" of their facilities (letters of "Determination of Four-Log Virus Treatment of Groundwater") from the appropriate regulatory agencies.

**The Project**

MBC service associated with four-log virus treatment for the various utilities have included analysis of existing treatment processes, beach-scale treatability and jar testing studies, full-scale process testing, evaluation of disinfection by-product (DBP) formation (DBP formation potential curves), design and construction of treatment process modification and preparation and submittal of Demonstration of Four-Log Virus Treatment submittals to the FDEP. Frank Brinson served as Engineer of Record for four-log virus treatment "Determinations" at the following facilities:

1. Boca Raton 70 mgd Glades Road Water Treatment Plant (WTP),
2. City of Pompano Beach 50 mgd WTP,
3. Broward County Water and Wastewater Services (BCWWS) 16 mgd WTP 1A,
4. BCWWS 30 mgd WTP 2A,
5. BCWWS 5 mgd WTP 3A.

**25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT**

	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
a.	McCafferty Brinson Consulting, LLC	Fort Lauderdale, FL	Prime Consultant and Sub Consultant (project dependent)
b.	CDM Smith	Fort Lauderdale, FL	Prime Consultant
c.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
d.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
e.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
f.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE

**G. KEY PERSONNEL PARTICIPATION IN EXAMPLE PROJECTS**

26. NAMES OF KEY PERSONNEL (From Section E, Block 12)	27. ROLE IN THIS CONTRACT (From Section E, Block 13)	28. EXAMPLE PROJECTS LISTED IN SECTION F (Fill in "Example Projects Key" section below before completing table. Place "X" under project key number for project participation in same or similar role.)									
		1	2	3	4	5	6	7	8	9	10
Frank A. Brinson, P.E.	Principal Engineer	X	X	X	X						
Audra McCafferty, P.E.	Principal Engineer	X		X	X						

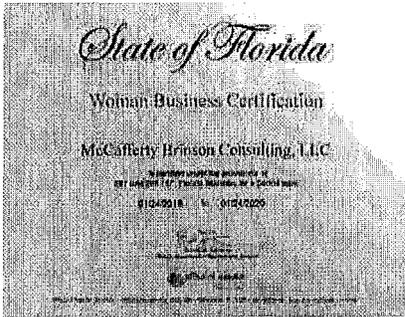
**29. EXAMPLE PROJECT KEY**

No.	TITLE OF EXAMPLE PROJECT (FROM SECTION F)	No.	TITLE OF EXAMPLE PROJECT (FROM SECTION F)
1.	40 mgd Nanofiltration Membrane Element Pilot Study and Replacement	6.	
2.	Anion Exchange Treatment Facility Nanofiltration Process Addition and 4-log Study	7.	
3.	10 mgd Nanofiltration Membrane Element Pilot Study and Replacement	8.	
4.	Four-Log Virus Treatment of Groundwater: Compliance Studies, Process Improvements, and Demonstration Submittals	9.	
5.		10.	

H. ADDITIONAL INFORMATION

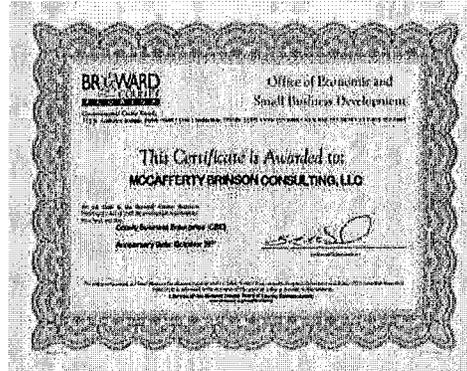
30. PROVIDE ANY ADDITIONAL INFORMATION REQUESTED BY THE AGENCY. ATTACH ADDITIONAL SHEETS AS NEEDED.

**Small Business Status:** MBC is a small woman-owned business that is certified as:



- State of Florida Minority, Women and Service-Disabled Veteran Business Enterprise (MBE), certification expires 01/24/20

- Broward County – County Business Enterprise (CBE) certification anniversary date 10/25



I. AUTHORIZED REPRESENTATIVE  
The foregoing is a statement of facts.

31. SIGNATURE

32. DATE

September 26, 2018

33. NAME AND TITLE

Frank A Brinson, P.E. Vice President/Principal Engineer



# ARCHITECT – ENGINEER QUALIFICATIONS

## PART I – CONTRACT-SPECIFIC QUALIFICATIONS

### A. CONTRACT INFORMATION

1. TITLE AND LOCATION *(City and State)*

Granular Activated Carbon Pilot and Plant Evaluation at the Fiveash Water Plant (Broward County, Florida)

2. PUBLIC NOTICE DATE

September 10, 2018

3. SOLICITATION OR PROJECT NUMBER

12191-996

### B. ARCHITECT-ENGINEER POINT OF CONTACT

4. NAME AND TITLE

Alex Lazowick, PE, Executive Vice President

5. NAME OF FIRM

KEITH (Keith and Associates, Inc.)

6. TELEPHONE NUMBER

954-788-3400

7. FAX NUMBER

N/A

8. E-MAIL ADDRESS

mail@KEITHteam.com

### C. PROPOSED TEAM

*(Complete this section for the prime contractor and all key subcontractors.)*

	<i>(Check)</i>			9. FIRM NAME	10. ADDRESS	11. ROLE IN THIS CONTRACT
	PRIME	J-V PARTNER	SUBCON-TRACTOR			
a.			X	KEITH <input type="checkbox"/> CHECK IF BRANCH OFFICE	301 East Atlantic Boulevard Pompano Beach, FL 33060	Subsurface Utility Engineering (SUE), Survey, Landscape Architecture
b.				<input type="checkbox"/> CHECK IF BRANCH OFFICE		
c.				<input type="checkbox"/> CHECK IF BRANCH OFFICE		
d.				<input type="checkbox"/> CHECK IF BRANCH OFFICE		
e.				<input type="checkbox"/> CHECK IF BRANCH OFFICE		

D. ORGANIZATIONAL CHART OF PROPOSED TEAM

*(Attached)*

**E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT**

<b>12. NAME</b> Daniel Checchia	<b>13. ROLE IN THIS CONTRACT</b> Subsurface Utility Engineering and Utility Coordination Manager	<b>14. YEARS EXPERIENCE</b>	
		a. TOTAL 21	b. WITH CURRENT FIRM 7
<b>15. FIRM NAME AND LOCATION</b> KEITH, Pompano Beach, Florida			
<b>16. EDUCATION</b> AS Applied Science in Construction Technology, Suffolk Community College, 2008		<b>17. CURRENT PROFESSIONAL REGISTRATION</b>	
<b>18. OTHER PROFESSIONAL QUALIFICATIONS</b> FDOT Maintenance of Traffic, Founding Board of Director - SUE Association			

**19. RELEVANT PROJECTS**

	(1) TITLE AND LOCATION	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION
a.	<b>North Regional Wastewater Treatment Plant (NRWWTP) Load Master Pump Station 454 Rehabilitation Design, Bid, Construction Management (Tamarac, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Broward County Water and Wastewater Services required improvements for Master Pump Station 454 as part of the Broward County Water and Wastewater Services Capital Improvements Program. Upgrades to Master Pump Station 454, located at 4201 West Commercial Blvd., are required to meet projected build out conditions of the station, to replace equipment that has reached the end of its useful life, and miscellaneous improvements aimed at decreasing operation and maintenance costs. Mr. Checchia is performing Subsurface Utility Engineering (SUE) services for this project.		
b.	<b>North Regional Wastewater Treatment Plant (NRWWTP) Septage Receiving Facility Updating (Pompano Beach, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Broward County Water and Wastewater Services required improvements for a Septage Receiving Facility as part of the Broward County Water and Wastewater Services Capital Improvements Program. Improvements are required to meet changes in space usage over the life of the complex consisting of new booster pumps, new backup power generator, new truck clean-out station, new building, and re-purpose the existing building aimed at decreasing costs. As a subconsultant to CDM Smith, KEITH provided Subsurface Utility Engineering (SUE), surveying, civil engineering, and landscape architectural services.		
c.	<b>North Regional Wastewater Treatment Plant (NRWWTP) Load Center and Motor Control Centers Rehabilitation (Pompano Beach, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm The scope of this project includes the design and engineering services during construction for the replacement of Load Centers 5 and 6 related Motor Control Centers (MCC), and replacement/rehabilitation of associated duct banks at the North Regional Wastewater Treatment Plant (NRWWTP). KEITH performed soft dig test holes to locate the depth of cover over the existing concrete duct banks. 29 total test holes will be performed.		
d.	<b>Broward County Water Reclaimed Water Plant Expansion (Sunrise, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm As a subconsultant to Brown and Caldwell, KEITH is performing a subsurface utility exploration at the proposed improvement sites within the plant and for proposed yard piping routing. Ground Penetrating Radar (GPR) will be used to designate, verify, and document location of existing underground facilities, including major piping, electrical conduits, and storm water facilities. Soft digs will also be conducted to verify the elevation of the designated underground facilities. KEITH will also assist with identifying potential conflicts and critical interconnects that require subsurface investigation.		
e.	<b>Broward County Water Treatment Plant Virus Removal (Pompano Beach, Florida)</b>	2016	2016
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm KEITH provided professional services to locate subsurface utilities at a portion of the Broward County Water Treatment Plant, located at NE 13th Way and 51st Street in Pompano Beach. Locations included water mains/services, sewer force mains, cable television, gas main/services, electrical, and telephone lines.		

**E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT**

12. NAME <b>Lee Powers, PSM</b>	13. ROLE IN THIS CONTRACT Project Surveyor/GIS Specialist	14. YEARS EXPERIENCE	
		a. TOTAL <b>13</b>	b. WITH CURRENT FIRM <b>9</b>
15. FIRM NAME AND LOCATION KEITH, Pompano Beach, Florida			
16. EDUCATION BS Land Surveying & Geomatics Engineering, Purdue University, 2005		17. CURRENT PROFESSIONAL REGISTRATION Florida Professional Surveyor & Mapper, #6805	
18. OTHER PROFESSIONAL QUALIFICATIONS Florida Society of Professional Surveyors & Mappers, BIM Smart Foundation, Member, BuildingSMART Foundation Member. <b>Certifications:</b> Transportation Worker Identification Credential (TWIC), FDOT Maintenance of Traffic			

**19. RELEVANT PROJECTS**

	(1) TITLE AND LOCATION	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION
b.	<b>North Regional Wastewater Treatment Plant (NRWWTP) Load Master Pump Station 454 Rehabilitation Design, Bid, Construction Management (Tamarac, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE Broward County Water and Wastewater Services required improvements for Master Pump Station 454 as part of the Broward County Water and Wastewater Services Capital Improvements Program. Upgrades to Master Pump Station 454, located at 4201 West Commercial Blvd., are required to meet projected build out conditions of the station, to replace equipment that has reached the end of its useful life, and miscellaneous improvements aimed at decreasing operation and maintenance costs. Mr. Powers performed surveying services for this project.	<input checked="" type="checkbox"/> Check if project performed with current firm	
c.	<b>North Regional Wastewater Treatment Plant (NRWWTP) Septage Receiving Facility Updating (Pompano Beach, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE Broward County Water and Wastewater Services required improvements for a Septage Receiving Facility as part of the Broward County Water and Wastewater Services Capital Improvements Program. Improvements are required to meet changes in space usage over the life of the complex consisting of new booster pumps, new backup power generator, new truck clean-out station, new building, and re-purpose the existing building aimed at decreasing costs. Mr. Powers performed surveying services and laser scanning for this project.	<input checked="" type="checkbox"/> Check if project performed with current firm	
d.	<b>North Regional Wastewater Treatment Plant (NRWWTP) Load Center and Motor Control Centers Rehabilitation (Pompano Beach, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE The scope of this project includes the design and engineering services during construction for the replacement of Load Centers 5 and 6 related Motor Control Centers (MCC), and replacement/rehabilitation of associated duct banks at the North Regional Wastewater Treatment Plan (NRWWTP). Mr. Powers performed surveying services for this project.	<input checked="" type="checkbox"/> Check if project performed with current firm	
e.	<b>Broward County Water Reclaimed Water Plant Expansion (Sunrise, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE As a subconsultant to Brown and Caldwell, KEITH is tasked with surveying activities to supplement the existing topographic survey provided by Broward County and verifying the elevation of select hydraulic process structures such as top of weir/wall/floor and overflow elements of existing structures.	<input checked="" type="checkbox"/> Check if project performed with current firm	
c.	<b>Broward County Water &amp; Wastewater Services (WWS) GPS/GIS Project (Broward County, Florida)</b>	2014	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE Mr. Powers served as the Project Surveyor for this utility location project. KEITH was the Prime Professional on this Broward County Water and Wastewater Services (BCWWS) contract, which included several hundred miles of water and sewer piping and appurtenances. The goal of this 18-month project was to obtain sub-meter accurate NAD83 HARN state plane coordinates for the WWS' surface visible features and to populate the BCWWS GIS shapefiles with the pertinent utility survey information.	<input checked="" type="checkbox"/> Check if project performed with current firm	

**E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT**

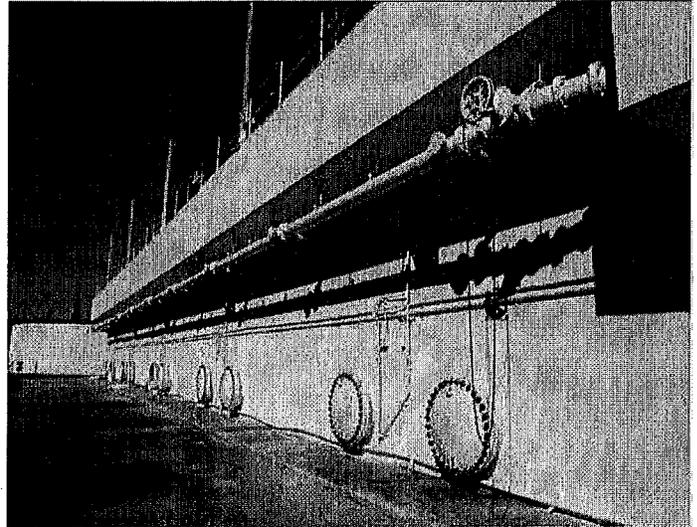
<b>12. NAME</b> Michael Phillips, P.L.A, ASLA	<b>13. ROLE IN THIS CONTRACT</b> Senior Landscape Architect	<b>14. YEARS EXPERIENCE</b>	
		a. TOTAL 32	b. WITH CURRENT FIRM 4
<b>15. FIRM NAME AND LOCATION</b> KEITH, Pompano Beach, Florida			
<b>16. EDUCATION</b> B.S., Interior Design, Florida State University, 1985		<b>17. CURRENT PROFESSIONAL REGISTRATION</b> State of Florida Registered Landscape Architect #LA0001540	
<b>18. OTHER PROFESSIONAL QUALIFICATIONS</b> United States Green Building Council – South Florida, American Society of Landscape Architects (ASLA)			

**19. RELEVANT PROJECTS**

	(1) TITLE AND LOCATION	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION
a.	<b>Broward County Water Reclaimed Water Plant Expansion (Sunrise, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	As a subconsultant to Brown and Caldwell, KEITH is tasked with landscape architectural services associated with the exterior design and construction of two buildings as part of the North Regional Wastewater Treatment Plant Reclaimed Water Expansion. For both North and South locations, KEITH will perform a tree inventory and appraisal, an existing tree disposition plan, landscape plans, and irrigation plans.		
b.	<b>North Regional Wastewater Treatment Plant (NRWWTP) Septage Receiving Facility Updating (Pompano Beach, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	Broward County Water and Wastewater Services required improvements for a Septage Receiving Facility as part of the Broward County Water and Wastewater Services Capital Improvements Program. Improvements are required to meet changes in space usage over the life of the complex consisting of new booster pumps, new backup power generator, new truck clean-out station, new building, and re-purpose the existing building aimed at decreasing costs. Landscape architectural finishes for the front of the pump station facing the road are requested to compliment the adjacent City of Lauderdale Lakes Municipal Building Complex.		
c.	<b>North Regional Wastewater Treatment Plant (NRWWTP) Load Center and Motor Control Centers Rehabilitation (Pompano Beach, Florida)</b>	On-going	N/A
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	The scope of this project includes the design and engineering services during construction for the replacement of Load Centers 5 and 6 related Motor Control Centers (MCC), and replacement/rehabilitation of associated duct banks at the North Regional Wastewater Treatment Plant (NRWWTP). KEITH performed soft dig test holes to locate the depth of cover over the existing concrete duct banks. 29 total test holes will be performed. Mr. Phillips is providing landscape architectural services for this project.		
d.	<b>Fire Station 7 and Emergency Management Facility (Hallandale Beach, Florida)</b>	On-going	CONSTRUCTION (If applicable) On-going
	(3) BRIEF DESCRIPTION AND SPECIFIC ROLE	<input checked="" type="checkbox"/> Check if project performed with current firm	
	The building program and design for the City's new main fire rescue headquarters and emergency management facility were developed to achieve LEED Silver Certification and include a 25,000 SF, two-story complex with four apparatus bays and living quarters for up to 16 firefighters. In addition to on-duty fire rescue staff, the building will house the City's Fire Prevention Bureau including office space for fire inspectors, plans review and public education. Keith and Associates is providing Civil Engineering, Landscape Architecture including arborist services and Subsurface Utility Engineering (SUE).		

<b>F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT</b> <i>(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete on Section F for each project)</i>		<b>20. EXAMPLE PROJECT KEY NUMBER</b>  <b>1</b>				
<b>21. TITLE AND LOCATION (City and State)</b>  <b>Broward County Reclaimed Water Plant Expansion (Sunrise, Florida)</b>		<b>22. YEAR COMPLETED</b> <table border="1"> <tr> <td>PROFESSIONAL SERVICES</td> <td>CONSTRUCTION (if applicable)</td> </tr> <tr> <td>On-going</td> <td>N/A</td> </tr> </table>	PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)	On-going	N/A
PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)					
On-going	N/A					
<b>23. PROJECT OWNER'S INFORMATION</b>						
<b>a. PROJECT OWNER</b> Broward County Water & Wastewater Engineering Division	<b>b. POINT OF CONTACT NAME</b> Jeffrey H. Greenfield, Ph.D, PE, BCEE	<b>c. POINT OF CONTACT TELEPHONE NUMBER</b> (954) 831-0923				
<b>24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size and cost)</b>						

The North Regional Wastewater Treatment Plant (NRWWTP) utilizes a 54-inch ocean outfall and Class I Injection Wells as the primary means of treated effluent disposal. Recent legislation by the State of Florida, generally known as the "Ocean Outfall Rule", eliminates the use of ocean outfalls for disposal after 2025. The Outfall Rule also mandates the implementation of a wastewater reclamation program with a minimum capacity of 60 percent of the facility's Baseline Flow above and beyond current reclaimed water application. This is a total reclaimed water production of approximately 26 mgd for the NRWWTP. Broward County has requested services pertaining to the expansion of the existing reclaimed facility to increase its firm rated capacity to approximately 26 mgd.



As a subconsultant to Brown and Caldwell, KEITH is performing a subsurface utility exploration at the proposed improvement sites within the plant and for proposed yard piping routing. Ground Penetrating Radar (GPR) will be used to designate, verify, and document location of existing underground facilities, including major piping, electrical conduits, and storm water facilities. Soft digs will also be conducted to verify the elevation of the designated underground facilities. KEITH will also assist with identifying potential conflicts and critical interconnects that require subsurface investigation

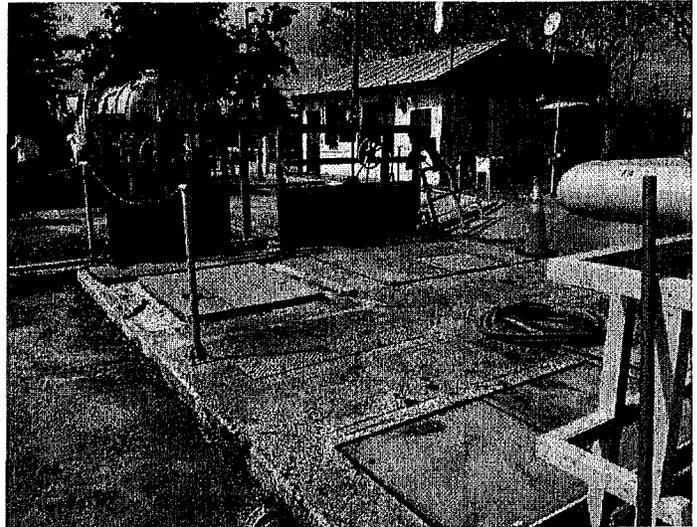
KEITH is tasked with surveying activities to supplement the existing topographic survey provided by the Broward County and verifying the elevation of select hydraulic process structures such as top of weir/wall/floor and overflow elements of existing structures. KEITH is also tasked with landscape architectural services associated with the exterior design and construction of two buildings as part of the North Regional Wastewater Treatment Plant Reclaimed Water Expansion. For both North and South locations, KEITH will perform a tree inventory and appraisal, an existing tree disposition plan, landscape plans, and irrigation plans.

Lastly, KEITH is assisting Brown and Caldwell with the detail design engineering services for the yard piping design. KEITH will prepare 30 percent design drawings, 50 percent design drawings, and 90 percent design.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
	KEITH	Pompano Beach, Florida	Civil Engineering, Subsurface Utility Engineering (SUE), Surveying, Landscape Architecture

<b>F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT</b> <i>(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete on Section F for each project.)</i>		<b>20. EXAMPLE PROJECT KEY NUMBER</b>  <b>2</b>				
<b>21. TITLE AND LOCATION (City and State)</b> <b>North Regional Wastewater Treatment Septage Receiving Facility Updating (Pompano Beach, Florida)</b>		<b>22. YEAR COMPLETED</b> <table border="1"> <tr> <td>PROFESSIONAL SERVICES</td> <td>CONSTRUCTION (if applicable)</td> </tr> <tr> <td>On-going</td> <td>N/A</td> </tr> </table>	PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)	On-going	N/A
PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)					
On-going	N/A					
<b>23. PROJECT OWNER'S INFORMATION</b>						
<b>a. PROJECT OWNER</b> Broward County Water & Wastewater Engineering Division	<b>b. POINT OF CONTACT NAME</b> Merle Medina, Construction Project Manager	<b>c. POINT OF CONTACT TELEPHONE NUMBER</b> (954) 831-0791				
<b>24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size and cost)</b>						

Broward County Water and Wastewater Services required improvements for a Septage Receiving Facility as part of the Broward County Water and Wastewater Services Capital Improvements Program. The Capital Improvements Program identified an update to this Facility as recommended in the Regional Wastewater Transmission System Expansion Report. Septage Receiving Facility Operations/ Administration Improvements is required to meet changes in space usage over the life of the complex consisting of new booster pumps, new backup power generator, new truck clean-out station, new building, and re-purpose the existing building aimed at decreasing operation and maintenance costs.



KEITH is tasked with surveying activities providing topographic survey of the subject parcel depicting all the above ground appurtenances and any identified interior and sub-surface accessible equipment that will be needed for the design of the station's upgrade. KEITH also provided horizontal designation and test hole services to locate all utilities in order to minimize any potential damage. KEITH's Civil Engineering team is preparing site plan drawings for the proposed updates, indicating the proposed building location and vehicular circulation, and will take into account required landscape areas/buffers, parking requirements, dumper location, fire access and issues required by City of Pompano Beach Land Development Code. In addition to the site plan drawings, KEITH is preparing on-site paving, grading and drainage plans that meet the requirements of the regulatory agencies, including stormwater pollution prevention plans. KEITH will also be responsible for engineering permitting processing as well as CEI services. Lastly, KEITH's Landscape Architecture team is performing a tree inventory and appraisal, an existing tree disposition plan, landscape plans, irrigation plans and landscape observation services.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a	KEITH	Pompano Beach, Florida	Civil Engineering, Subsurface Utility Engineering (SUE), Surveying, Landscape Architecture



# ARCHITECT – ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER (if any)  
Solicitation 12191-996

## PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (OR BRANCH OFFICE) NAME KEITH			3. YEARS ESTABLISHED 1998	4. DUNS NUMBER 618480219
2b. STREET 301 East Atlantic Boulevard			5. OWNERSHIP	
2c. CITY Pompano Beach		2d. STATE FL	2e. ZIP CODE 33060	a. TYPE Corporation
6a. POINT OF CONTACT NAME AND TITLE A. Dodie Keith-Lazowick, PLS, President			b. SMALL BUSINESS STATUS N/A	
6b. TELEPHONE NUMBER 954-788-3400		6c. E-MAIL ADDRESS mail@keithteam.com		7. NAME OF FIRM (if block 2a is a branch office) N/A
8a. FORMER FIRM NAME(S) (if any) N/A			8b. YR. ESTABLISHED N/A	8c. DUNS NUMBER N/A

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL REVENUE FOR LAST 5 YEARS		
a. Function Code	b. Discipline	c. No. of Employees		a. Profile Code	b. Experience	c. Revenue Index Number (see below)
		(1) Firm	(2) Branch			
02	Administrative	14		A06	Airports; Terminals and Hangars	6
12	Civil Engineering, PE	8	2	B02	Bridges	2
60	Transportation Engineering, PE	2	1	C07	Coastal Engineering	2
15	Construction Inspector	7		C10	Commercial Building (Low Rise)	6
16	Construction Manager	19		C11	Community Facilities	5
29	G.I.S. Specialist	1		C15	Construction Management	6
38	Land Surveyor, PSM	5		C16	Construction Surveying	4
39	Landscape Architect, RLA	3		E02	Educational Facilities	4
47	Planner: Urban/Regional	6		F02	Field Houses; Gyms; Stadiums	3
48	Project Manager	6	3	G04	G.I.S. Services; Development, Analysis	2
53	Scheduler	1		H07	Highways, Street, Airfield Paving	4
	Landscape Designer	5		H09	Hospitals & Medical Facilities	3
	Project Engineer	17	8	I06	Irrigation; Drainage	3
	Project Surveyor	5	1	L03	Landscape Architecture	5
	Survey Field Crew	14		P05	Planning (Community, Regional...)	3
	Subsurface Utility Engineer	4	1	R03	Railroad; Rapid Transit	3
	Subsurface Utility Field Crew	11		R04	Recreation Facilities (Parks, Marinas, etc.)	4
	Utility Coordinator	4	1	S10	Surveying; Platting; Mapping; Flood Study	3
	VDC/BIM/CIM	1		S13	Storm Water Handling & Facilities	3
				T04	Topographic Surveying & Mapping	4
				W03	Water Supply; Treatment & Distribution	2
				Z01	Zoning; Land Use Studies	2
TOTAL		133	17			

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (Insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. Federal Work	N/A	1. Less than \$100,000	6. \$2 million to less than \$5 million	7. \$5 million to less than \$10 million	8. \$10 million to less than \$25 million
b. Non-Federal Work	8	2. \$100,000 to less than \$250,000	9. \$25 million to less than \$50 million	10. \$50 million or greater	
c. Total Work	8	3. \$250,000 to less than \$500,000			
		4. \$500,000 to less than \$1 million			
		5. \$1 million to less than \$2 million			

### 12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE 	b. DATE October 1, 2018
c. NAME AND TITLE Alex Lazowick, Executive Vice President	

# ARCHITECT - ENGINEER QUALIFICATIONS

## PART 1 - CONTRACT-SPECIFIC QUALIFICATIONS

### A. CONTRACT INFORMATION

1. TITLE AND LOCATION <i>(City and State)</i> City of Fort Lauderdale - Granular Activated Carbon Pilot and Plant Evaluation at the Fiveash Water Plant		
2. PUBLIC NOTICE DATE September 10, 2018	3. SOLICITATION OR PROJECT NUMBER 12191-996	

### B. ARCHITECT-ENGINEER POINT OF CONTACT

4. NAME AND TITLE Richard Wohlfarth, P.E., B.N.. Principal/ Director of Engineering		
5. NAME OF FIRM Nutting Engineers of Florida, Inc.		
6. TELEPHONE NUMBER 561-736-4900	7. FAX NUMBER 561-737-9975	8. E-MAIL ADDRESS Rickw@nutting.biz

### C. PROPOSED TEAM

*(Complete this section for the prime contractor and all key subcontractors.)*

	(Check)			9. FIRM NAME	10. ADDRESS	11. ROLE IN THIS CONTRACT
	PRIME	J-V PARTNER	SUBCONTRACTOR			
a.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Nutting Engineers of Florida, Inc.  <input type="checkbox"/> CHECK IF BRANCH OFFICE	1310 Neptune Drive Boynton Beach, Florida 33426	Geological and Geophysical Studies
b.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	  <input type="checkbox"/> CHECK IF BRANCH OFFICE		
c.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	  <input type="checkbox"/> CHECK IF BRANCH OFFICE		
d.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	  <input type="checkbox"/> CHECK IF BRANCH OFFICE		
e.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	  <input type="checkbox"/> CHECK IF BRANCH OFFICE		
f.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	  <input type="checkbox"/> CHECK IF BRANCH OFFICE		

### D. ORGANIZATIONAL CHART OF PROPOSED TEAM

*(Attached)*

**E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT**

*(Complete one Section E for each key person.)*

12. NAME Richard Wohlfarth, P.E., B.N.		13. ROLE IN THIS CONTRACT Dir. of Engineering/ Principal-In-Charge		14. YEARS EXPERIENCE	
				a. TOTAL 30	b. WITH CURRENT FIRM 25
15. FIRM NAME AND LOCATION <i>(City and State)</i> Nutting Engineers of Florida, Inc., Boynton Beach, Florida					
16. EDUCATION <i>(DEGREE AND SPECIALIZATION)</i> University of Florida - B.S. Civil Engineering			17. CURRENT PROFESSIONAL REGISTRATION <i>(STATE AND DISCIPLINE)</i> Florida Professional Engineer #50858 Registered Building Inspector BN #3580 SBCCI #6528, ACTI Level 1, UBCI, Lab Technical Services Manager (AASHTO)		
18. OTHER PROFESSIONAL QUALIFICATIONS <i>(Publications, Organizations, Training, Awards, etc.)</i> Florida Engineering Society- Past Chapter President, National Society of Professional Engineers, Treasure Coast Builders Association, American Red Cross First Aid & CPR Certification					

**19. RELEVANT PROJECTS**

(1) TITLE AND LOCATION <i>(City and State)</i>	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION <i>(If applicable)</i>
City of Sunrise, Florida, Springtree WTP Water Stabilization and Solids Handling		2017
a. (3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Provided construction materials testing services for the WTP water stabilization and solids handling project including demolishing the east filters and pump station, installation of a new settled water transfer pump station, new carbon dioxide system, demolishing and replacing the lime sludge dewatering system, installation of a chloride dilution system, repair of damaged concrete, installation of a thickener supernatant forcemain, replacement of guard railing, and coat the west filters and pump station.		
Okeechobee Utilities Authority Surface WTP, Okeechobee, Florida	2018	
b. (3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Provided geotechnical exploration/engineering to determine subsurface conditions, proposed earthwork procedures, and foundations recommendations to support the planned construction of a new water tank to hold approx. 3.0 million gallons of water with an estimated diameter of 120' with a height of approx. 35.5' at the subject site.		
WTP #2 Improvements, West Palm Beach, Florida	2017	
c. (3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Performed geotechnical exploration/engineering for the proposed construction of two (2) new concrete pads to support new pump systems west of treatments units one and two.		
Provided geotechnical engineering and/or construction materials testing services for various projects throughout the STOF reservations including: Brighton Waste	2014	2016
d. (3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Provided geotechnical engineering and/or construction materials testing services for various projects throughout the STOF reservations including: Brighton Waste Water Treatment Plant: installed monitoring wells around retention pond, Immokalee Reservation Public Works Facility: 120' x 50' storage pad, Immokalee Seminole Indian Reservation WWTP, Hollywood Reservation Water Main and Sewer Replacement		
Broward County, (Qualification Based Contract), Multiple Depts. inc. Public Works, Building, Parks & Rec., Aviation, Fire Rescue, Roadway	ongoing since '87	ongoing
e. (3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.)</i> AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Providing phase I/II environmental assessments, geotechnical engineering, site and building pad preparation monitoring, construction materials testing, special/threshold inspection services. Projects under this contract include West Regional Library and Parking Garage, EDP Laboratory, Pembroke Park Fire Stations #17 and #27, multiple roadway improvements, Aviation Dept. (several new bldgs., new terminal building and apron, a 1.3M SF 7-story short term parking structure, fuel line relocations, roadways and bridges).		

**E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT**

*(Complete one Section E for each key person.)*

12. NAME Scott H. Ersland	13. ROLE IN THIS CONTRACT Drilling Division Manager	14. YEARS EXPERIENCE	
		a. TOTAL 19	b. WITH CURRENT FIRM 14
15. FIRM NAME AND LOCATION (City and State) Nutting Engineers of Florida, Inc., Boynton Beach, Florida			
16. EDUCATION (DEGREE AND SPECIALIZATION)  University of Wisconsin-General Education Palm Beach Community College Rochester Community College		17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) SFWMD Water Well Contractor	
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) OSHA training for Hazardous Operations and Emergency Response with 8-hour refresher course, The National Groundwater Association			

**19. RELEVANT PROJECTS**

a.	(1) TITLE AND LOCATION (City and State) Okeechobee Utilities Authority Surface WTP, Okeechobee, Florida	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES 2018	CONSTRUCTION (If applicable)
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Provided geotechnical exploration/engineering to determine subsurface conditions, proposed earthwork procedures, and foundations recommendations to support the planned construction of a new water tank to hold approx. 3.0 million gallons of water with an estimated diameter of 120' with a height of approx. 35.5' at the subject site.	<input checked="" type="checkbox"/> Check if project performed with current firm	
b.	(1) TITLE AND LOCATION (City and State) NRWWTP Electrical Load Center, Pompano Beach, Florida	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES 2015	CONSTRUCTION (If applicable)
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Performed geotechnical exploration/engineering services for the proposed construction of an approx. 800 square foot electrical and motor room building.	<input checked="" type="checkbox"/> Check if project performed with current firm	
c.	(1) TITLE AND LOCATION (City and State) Proposed Lime Preparation Building, Coral Springs, Florida	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES 2015	CONSTRUCTION (If applicable)
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Performed geotechnical exploration/engineering services for the proposed construction of a lime preparation building at the subject site. The building will consist of a twenty-four feet high silo, which will house approx. 200 tons of lime. The remainder portion of the building will be approx. eleven feet in height and constructed of concrete block.	<input checked="" type="checkbox"/> Check if project performed with current firm	
d.	(1) TITLE AND LOCATION (City and State) WTP #2 Improvements, West Palm Beach, Florida	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES 2017	CONSTRUCTION (If applicable)
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Performed geotechnical exploration/engineering services for the proposed construction of two (2) new concrete pads to support new pump systems west of treatments units one and two.	<input checked="" type="checkbox"/> Check if project performed with current firm	
e.	(1) TITLE AND LOCATION (City and State) Palm Beach County Board of County Commissioners, Various Departments (Qualification Based Contracts)	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES ongoing	CONSTRUCTION (If applicable) ongoing
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE Qualification based continuing service contract. Providing geotechnical engineering/exploration services, construction materials testing, and/or special/threshold inspection services on new roadways, intersection and roadway improvements, municipal buildings, parks and recreation facilities, drainage evaluations, airport runway extensions and rehabilitations, drive and parking areas.	<input checked="" type="checkbox"/> Check if project performed with current firm	

<b>F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT</b> <i>(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)</i>	<b>20. EXAMPLE PROJECT KEY NUMBER</b> 1 & 2
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<b>21. TITLE AND LOCATION (City and State)</b> City of Sunrise & City of Hollywood, Florida, Various Projects	<b>22. YEAR COMPLETED</b>				
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">PROFESSIONAL SERVICES</td> <td style="width:50%; text-align: center;">CONSTRUCTION (if applicable)</td> </tr> <tr> <td style="text-align: center;">ongoing</td> <td style="text-align: center;">ongoing</td> </tr> </table>	PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)	ongoing	ongoing
PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)				
ongoing	ongoing				

<b>23. PROJECT OWNER'S INFORMATION</b>
--

<b>a. PROJECT OWNER</b> City of Sunrise & City of Hollywood	<b>b. POINT OF CONTACT</b> Various - see below	<b>c. POINT OF CONTACT TELEPHONE NUMBER</b>
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<b>24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT</b>
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Nutting Engineers of Florida, Inc. (NE) has been providing geotechnical exploration/engineering and construction materials testing services on various City of Sunrise and City of Hollywood projects through City Personnel, local architects, civil engineers and general contractors.

**2016: City of Sunrise - SW WWTP Repair & Replacement Upgrades and High Level Disinfection/Reuse Facilities:**  
 ~\$11M demolition and replacements/ upgrades of the existing oxidation ditches, existing secondary clarifiers, repair of existing chlorination building. Construction of new headworks facility, odor control system, master lift station, filter feed pump station, deep bed filters, chlorine contact basins, sodium hypochlorite facility, RAS/WAS pumping station, main electrical and headworks electrical buildings, power to all new facilities and re-feed power to all of the existing equipment, emergency generator, diesel fuel storage tank, and automatic transfer switch to provide 100% standby power for both existing and proposed facilities. Installation of SCADA system, site work, yard piping, paving, grading and drainage and modifications to 2 existing percolation ponds.

Kirlin Florida, Inc., Mr. Sam Akrouk,  
 p: 954-739-8100

**Cont. City of Sunrise 2014 and 2013:-**

- City of Sunrise SW WTP Lime Silo and relocation of filters
- Springtree Water Treatment Plant Improvement/ Phase I
- Sawgrass Waste Water Treatment Plant Upgrades

Pool and Kent, Mr. Jose Ponce, p: 305-325-1930

-Sawgrass Water Treatment Plant

Cardinal Contractors, Mr. Nick Forbes,  
 p: 954-587-0520

**City of Hollywood**

**2015:**

-Water Main Replacement Program South 26th Avenue to Dixie Highway

**2014 and 2013:**

- WTP Scrubber System Expansion, Hollywood Boulevard and North 35th Avenue Alleyways between 54th and 55th Avenue
- Hollywood WWTP @ 1621 North 35th Avenue

**2012 and 2011:**

- Hollywood WTP, Hollywood Boulevard
- WWTP Reuse Water Expansion, North 14th Avenue

**City Personnel Contact:**

Mr. Clece Aurelus, p: 954-921-3930, Mr. Leslie Pettit,  
 p: 954-921-3995, Mr. James Mortel, p: 954-621-3930

<b>25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT</b>
--

a.	(1) FIRM NAME Nutting Engineers of Florida, Inc.	(2) FIRM LOCATION (City and State) Boynton Beach, Florida	(3) ROLE Geotechnical Engineering Firm - full scope of services
b.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
c.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
d.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
e.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
f.	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE

<b>F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT</b> <i>(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)</i>	20. EXAMPLE PROJECT KEY NUMBER <b>3 &amp; 4</b>
---	--

21. TITLE AND LOCATION <i>(City and State)</i> City of Lauderhill, Various Projects & Okeechobee Utilities WTP Proposed Water Tank	22. YEAR COMPLETED PROFESSIONAL SERVICES: Since 1972 CONSTRUCTION <i>(If applicable)</i> : ongoing
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<b>23. PROJECT OWNER'S INFORMATION</b>
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a. PROJECT OWNER City of Lauderhill/Okeechobee Utilities	b. POINT OF CONTACT see below	c. POINT OF CONTACT TELEPHONE NUMBER
---	----------------------------------	--------------------------------------

<b>24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT</b>
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Nutting Engineers of Florida, Inc. (NE) has been providing geotechnical exploration/engineering, construction materials testing and special/threshold inspection services various projects for the City of Lauderhill. In 2011 Nutting was awarded a qualification based continuing service contract to further provide those services.

Projects for the City include, but are not limited to:

**2014-2015: Lauderhill Fire Station #110** - NE was retained by West Construction, Inc to perform geotechnical exploration/engineering and construction materials testing services for the construction of a new 2-story 3-bay, ~61,012 SF fire station with paved parking and drive areas.

**2013: Lauderhill Performing Arts Center and Library** - NE performed construction materials testing and threshold inspection service for the construction of an approximately 33,000 SF performing arts center and adjacent 10,000 SF library. The geotechnical exploration/engineering services for this project was performed by others.

**2009: City of Lauderhill Water Treatment Plant** - NE performed geotechnical exploration/engineering for the construction of a 3,000 gallon above ground storage tank supported upon a concrete pad designed as a mat foundation system and an adjacent one-story, concrete block electrical pump house on a shallow foundation system.

Mr. Martin Cala/ Ms. Joan Fletcher  
 p: 954-654-4293/ 954-730-4204

**2017: Okeechobee Utilities: Proposed Water Storage Tank** - Nutting Engineers was retained by Eckler Engineering on behalf of Okeechobee Utilities to perform a geotechnical exploration to determine subsurface conditions, proposed earthwork procedures, and foundations recommendations to support the planned construction of a new water tank at the subject WTP site.

Proposed plans inc. a new ~3.0M gallon ground supported water tank, with an estimated diameter of 120' with a height of ~35.5'. We were provided a plan indicating two proposed locations of the tank. Our office was requested to review each location to provide an opinion as to which location may be best suited for the proposed tank based on our findings: however final decision for the location would ultimately be determined by others.

The CROM type tank was assumed to be designed on a mat slab shallow foundation system with an associated concrete slab and pump house buildings to be constructed adjacent to the tank. The building would include some below grade (~10') pump structures as well within a concrete block building.

Report discussion included analysis of conditions, recommended site preparation, anticipated settlement due to elastic-plastic compression, design considerations for below grade walls capable of resisting earth pressures from granular backfill, surcharge loads and unbalanced hydrostatic forces, general fill placement and designations as they all related to the tank and the pump building and ancillary structures.

Eckler Engineering, Inc., Mr. Doug Hammann,  
 p: 954-510-4700

<b>25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT</b>
--

a.	(1) FIRM NAME Nutting Engineers of Florida, Inc.	(2) FIRM LOCATION <i>(City and State)</i> Boynton Beach, Florida	(3) ROLE Geotechnical Engineering Firm - full scope of services
b.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
c.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
d.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
e.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE
f.	(1) FIRM NAME	(2) FIRM LOCATION <i>(City and State)</i>	(3) ROLE



**H. ADDITIONAL INFORMATION**

30. PROVIDE ANY ADDITIONAL INFORMATION REQUESTED BY THE AGENCY. ATTACH SHEETS AS NEEDED.

**Relevant Experience:** As a current contract holder for geotechnical engineering, construction material testing, and inspection services for multiple South Florida and Treasure Coast entities, Nutting Engineers of Florida, Inc. is very familiar with the needs and expectations of the City of Sunny Isles Beach. Additionally, as we celebrate our "50 Year Anniversary" in S. Florida and the Treasure Coast we are very knowledgeable of local conditions and building standards.

**Safety Director:** Another aspect that sets Nutting Engineers of Florida, Inc. apart from other firms is having on staff a full-time Safety Director, Mrs. Mattie Allen, who ensures that our team members are providing services in the safest way possible, benefiting both the County and the Nutting team. Our team has developed a strict Safety Program which includes a standard method of operations and employee training program to minimize risks at all costs, taking all precautions against accidents, injuries, liabilities and other work stoppages for the benefit of and to protect our personnel, our clients and the safety of all parties involved.

Mrs. Allen's daily procedures include un-announced job-site visits ("safety checks") to ensure appropriate safety harnesses/vests, hard hats, eye wear, footwear and procedures are being implemented. Through use of our GPS tracking system she also monitors the speed and driving patterns of the members of the fleet. She oversees mandatory safety meetings, where she or a topic geared outside speaker address different topics, such as proper lifting techniques, job site safety, protective gear usage, safe driving techniques, OSHA practices, to name a few. She also oversees the in-house "Safety First" incentive program which includes quarterly meetings and newsletters as well as the CPR and First Aid training of every field AND in-house Nutting employee.

Mrs. Allen is also responsible for the "Jessica Lunsford Act" Screenings for our employees that work on school projects. Given our number of relevant qualification based contracts with School Districts and Counties, including Broward, Miami Dade, Martin and Indian River Counties, a lot of our employees are already screened and badged throughout South Florida and the Treasure Coast.

Nutting Engineers of Florida is proud to report in the last 2 years our EMR has dropped from 1.13 (2015), 1.16 (2016) to .72 (projected for July 2017). This was accomplished through the concerted effort of all employees.

**Our Drug-Free Workplace Program is an integral part of our Safety program:** Our stringent Drug Free Workplace Program, overseen by Mrs. Betsy Butler, Principal, and Mrs. Mattie Allen, Safety Officer, involves pre-employment and random testing of every employee regardless of rank or position. Three to four employees are randomly chosen per month by an outside testing agency. The chosen employees are immediately dispatched to a testing facility to provide a sample. An employee is also sent for testing if there is reasonable suspicion, as well as post-accident situations. In any situation, if the employee tests positive for drugs and/or alcohol, they may be subject to disciplinary action including 12 months of random testing, referral to the Employee Assistance Program (see below) and/or suspension, or immediate termination.

An added benefit of Nutting's employee benefit package includes an "Employee Assistance Program" (EAP), a confidential outside resource Center, at no cost to the employee and their dependents. Access to the EAP is through self-referral or by a supervisor. One of the many benefits offered at this Program/ Center is substance abuse assessment and counseling or referral, as well as counseling for marriage, divorce adjustment, job-related issues, parent/ child, mental health and legal/ financial consultations.

**I. AUTHORIZED REPRESENTATIVE**

The foregoing is a statement of facts.

31. SIGNATURE

32. DATE

September 28, 2018

33. NAME AND TITLE

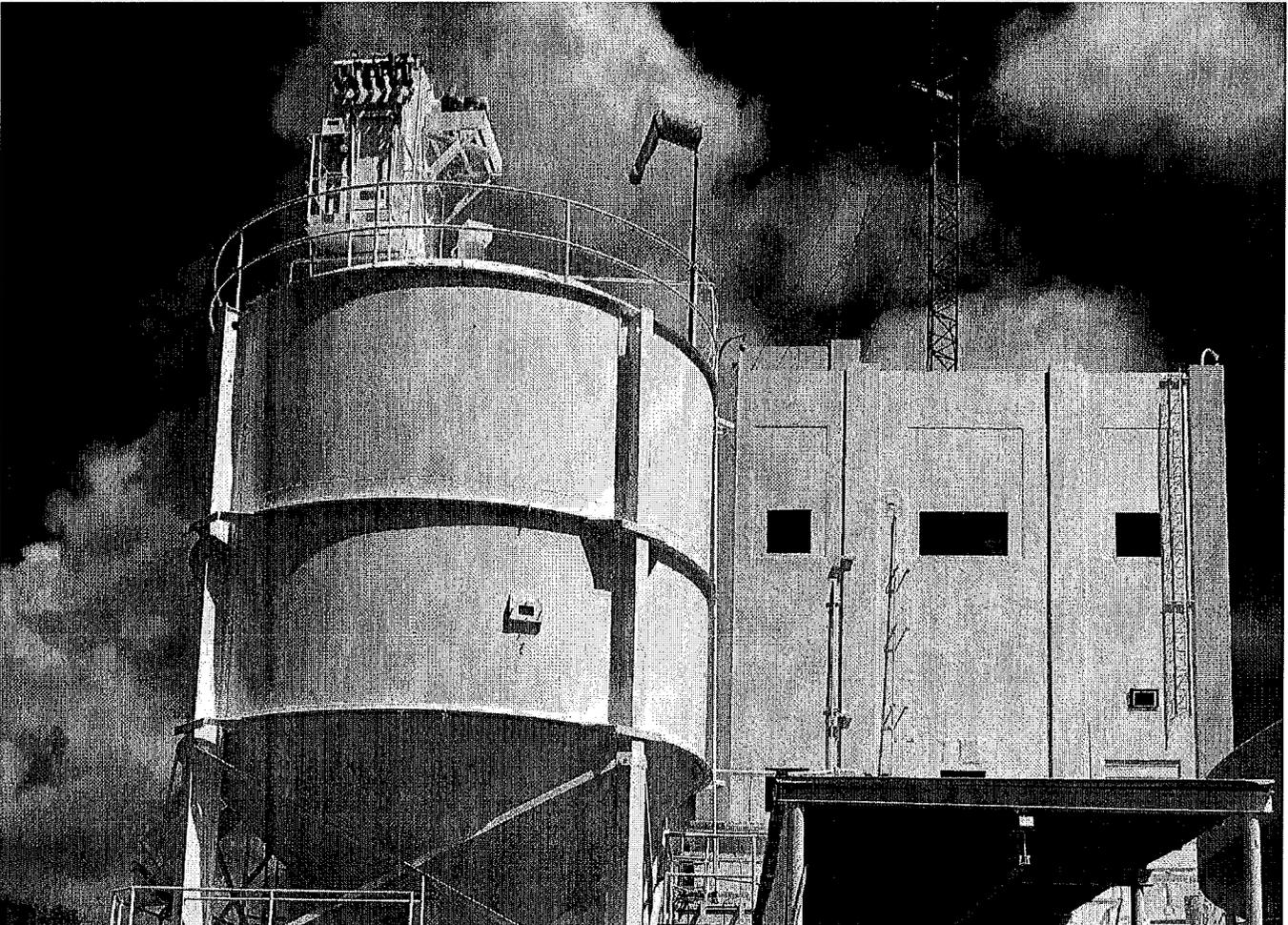
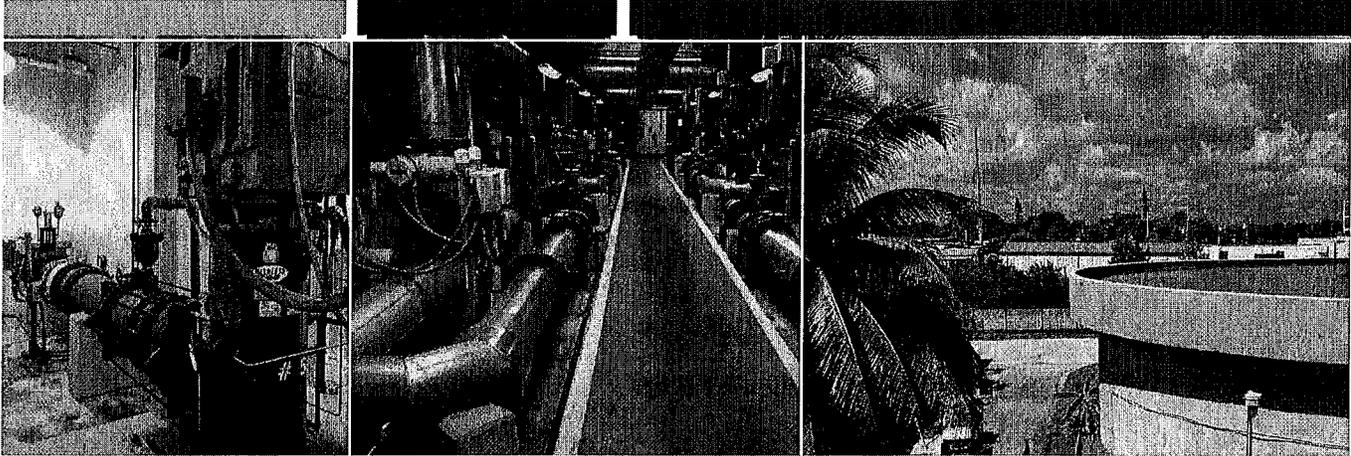
Mr. James J. Flaig, PE, Principal/Chief Engineer



SECTION

9

Required Forms



Section 9:  
Required Forms

STATEMENT OF QUALIFICATION CERTIFICATION

Please Note: All fields below must be completed. If the field does not apply to you, please note N/A in that field.

If you are a foreign corporation, you may be required to obtain a certificate of authority from the department of state, in accordance with Florida Statute §607.1501 (visit http://www.dos.state.fl.us/ ).

Company: (Legal Registration) CDM Smith Inc.

Address: 621 NW 53rd Street, Suite 265

City: Boca Raton State: FL Zip: 33487

Telephone No. 561.571.3800 FAX No. 561.247.7084 Email: Lizamall@cdmsmith.com

Does your firm qualify for MBE or WBE status: MBE N/A WBE N/A

ADDENDUM ACKNOWLEDGEMENT - Proposer acknowledges that the following addenda have been received and are included in the proposal:

Table with 4 columns: Addendum No., Date Issued, Addendum No., Date Issued. Row 1: 1, 9/26/18, blank, blank.

VARIANCES: State any variations to specifications, terms and conditions in the space provided below or reference in the space provided below all variances contained on other pages of bid, attachments or bid pages. No variations or exceptions by the Proposer will be deemed to be part of the bid submitted unless such variation or exception is listed and contained within the bid documents and referenced in the space provided below. If no statement is contained in the below space, it is hereby implied that your bid/proposal complies with the full scope of this solicitation. If this section does not apply to your bid, simply mark N/A. If submitting your response electronically through BIDSYNC you must click the exception link if any variation or exception is taken to the specifications, terms and conditions.

N/A

The below signatory hereby agrees to furnish the following article(s) or services at the price(s) and terms stated subject to all instructions, conditions, specifications addenda, legal advertisement, and conditions contained in the bid/proposal. I have read all attachments including the specifications and fully understand what is required. By submitting this signed proposal I will accept a contract if approved by the City and such acceptance covers all terms, conditions, and specifications of this bid/proposal. The below signatory also hereby agrees, by virtue of submitting or attempting to submit a response, hereby agrees that in no event shall the City's liability for respondent's indirect, incidental, consequential, special or exemplary damages, expenses, or lost profits arising out of this competitive solicitation process, including but not limited to public advertisement, bid conferences, site visits, evaluations, oral presentations, or award proceedings exceed the amount of five hundred dollars (\$500.00). This limitation shall not apply to claims arising under any provision of indemnification or the City's protest ordinance contained in this competitive solicitation.

Submitted by:

Ignacio L. Lizama, PE, ENV SP
Name (printed)

October 5, 2018
Date:

Signature
Vice President
Title





City of Fort Lauderdale • Procurement Services Division  
100 N. Andrews Avenue, 619 • Fort Lauderdale, Florida 33301  
954-828-5933 Fax 954-828-5576  
[purchase@fortlauderdale.gov](mailto:purchase@fortlauderdale.gov)

**ADDENDUM NO. 1**

RFQ No. 12191-996

**TITLE: Granular Activated Carbon Pilot and Plant Evaluation at the Fiveash Water Plant**

ISSUED: 9/26/18

This addendum is being issued to make the following change(s):

1. Under item 3.4.2. Water Treatment Plants - Treatment and Process - Item d.2, Change from "MIOX" to "Magnetic Ion Exchange".

All other terms, conditions, and specifications remain unchanged.

James Hemphill  
Asst. Mang. Procurement and Contracts

Company Name: C.D.MSmith Inc.  
(please print)

Bidder's Signature: Ignacio L. Lizama, PE, ENV SP; Vice President 

Date: October 5, 2018



**NON-COLLUSION STATEMENT**

By signing this offer, the vendor/contractor certifies that this offer is made independently and *free* from collusion. Vendor shall disclose below any City of Fort Lauderdale, FL officer or employee, or any relative of any such officer or employee who is an officer or director of, or has a material interest in, the vendor's business, who is in a position to influence this procurement.

Any City of Fort Lauderdale, FL officer or employee who has any input into the writing of specifications or requirements, solicitation of offers, decision to award, evaluation of offers, or any other activity pertinent to this procurement is presumed, for purposes hereof, to be in a position to influence this procurement.

For purposes hereof, a person has a material interest if they directly or indirectly own more than 5 percent of the total assets or capital stock of any business entity, or if they otherwise stand to personally gain if the contract is awarded to this vendor.

In accordance with City of Fort Lauderdale, FL Policy and Standards Manual, 6.10.8.3,

3.3. City employees may not contract with the City through any corporation or business entity in which they or their immediate family members hold a controlling financial interest (e.g. ownership of five (5) percent or more).

3.4. Immediate family members (spouse, parents and children) are also prohibited from contracting with the City subject to the same general rules.

**Failure of a vendor to disclose any relationship described herein shall be reason for debarment in accordance with the provisions of the City Procurement Code.**

<u>NAME</u>	<u>RELATIONSHIPS</u>
N/A _____	_____
_____	_____
	_____
	_____

**In the event the vendor does not indicate any names, the City shall interpret this to mean that the vendor has indicated that no such relationships exist.**



**LOCAL BUSINESS PRICE PREFERENCE CERTIFICATION STATEMENT**

The Business identified below certifies that it qualifies for the local business price preference classification as indicated herein, and further certifies and agrees that it will re-affirm its local preference classification annually no later than thirty (30) calendar days prior to the anniversary of the date of a contract awarded pursuant to this ITB. Violation of the foregoing provision may result in contract termination.

- (1) \_\_\_\_\_  
Business Name is a **Class A** Business as defined in City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the City of Fort Lauderdale current year Business Tax Receipt **and** a complete list of full-time employees and evidence of their addresses shall be provided within 10 calendar days of a formal request by the City.
- (2) \_\_\_\_\_  
Business Name is a **Class B** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the Business Tax Receipt **or** a complete list of full-time employees and evidence of their addresses shall be provided within 10 calendar days of a formal request by the City.
- (3) \_\_\_\_\_  
Business Name is a **Class C** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the Broward County Business Tax Receipt shall be provided within 10 calendar days of a formal request by the City.
- (4) \_\_\_\_\_  
Business Name requests a **Conditional Class A** classification as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. Written certification of intent shall be provided within 10 calendar days of a formal request by the City.
- (5) \_\_\_\_\_  
Business Name requests a **Conditional Class B** classification as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. Written certification of intent shall be provided within 10 calendar days of a formal request by the City.
- (6) CDM Smith Inc.  
Business Name is considered a **Class D** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186 and does not qualify for Local Preference consideration.

BIDDER'S COMPANY: CDM Smith Inc.

AUTHORIZED COMPANY PERSON: Ignacio L. Lizama, PE, ENV SP  October 5, 2018  
NAME SIGNATURE DATE



**CONTRACT PAYMENT METHOD BY P-CARD**

The City of Fort Lauderdale has implemented a Procurement Card (P-Card) program which changes how payments are remitted to its vendors. The City has transitioned from traditional paper checks to payment by credit card via MasterCard or Visa. This allows you as a vendor of the City of Fort Lauderdale to receive your payment fast and safely. No more waiting for checks to be printed and mailed.

Payments for all services will be made utilizing the City's P-Card program (MasterCard or Visa). Accordingly, firms must presently have the ability to accept credit card payment or take whatever steps necessary to implement acceptance of a credit card before the commencement of the agreement.

Please indicate with which credit card you prefer to be paid:

Master Card

Visa Card

Company Name: CDM Smith Inc.

Ignacio L. Lizama, PE, ENV SP  
Name (printed)

Signature



October 5, 2018  
Date:

Vice President  
Title





# CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY)  
09/19/2018

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

<b>PRODUCER</b> Aon Risk Services northeast, Inc. Boston MA Office 53 State Street Suite 2201 Boston MA 02109 USA	<b>CONTACT NAME:</b> PHONE (A/C. No. Ext): (866) 283-7122      FAX (A/C. No.): (800) 363-0105															
	<b>E-MAIL ADDRESS:</b>															
<b>INSURED</b> CDM Smith Inc. 75 State Street, Suite 701 Boston MA 02109 USA		<table border="1"> <thead> <tr> <th>INSURER(S) AFFORDING COVERAGE</th> <th>NAIC #</th> </tr> </thead> <tbody> <tr> <td>INSURER A: National Union Fire Ins Co of Pittsburgh</td> <td>19445</td> </tr> <tr> <td>INSURER B: New Hampshire Insurance Company</td> <td>23841</td> </tr> <tr> <td>INSURER C: American Home Assurance Co.</td> <td>19380</td> </tr> <tr> <td>INSURER D: Illinois National Insurance Co</td> <td>23817</td> </tr> <tr> <td>INSURER E: Lloyd's Syndicate No. 2623</td> <td>AA1128623</td> </tr> <tr> <td>INSURER F:</td> <td></td> </tr> </tbody> </table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A: National Union Fire Ins Co of Pittsburgh	19445	INSURER B: New Hampshire Insurance Company	23841	INSURER C: American Home Assurance Co.	19380	INSURER D: Illinois National Insurance Co	23817	INSURER E: Lloyd's Syndicate No. 2623	AA1128623	INSURER F:	
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INSURER D: Illinois National Insurance Co	23817															
INSURER E: Lloyd's Syndicate No. 2623	AA1128623															
INSURER F:																

**COVERAGES**      **CERTIFICATE NUMBER: 570073097519**      **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS. **Limits shown are as requested**

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input checked="" type="checkbox"/> LOC OTHER:			GL3629894	01/01/2018	01/01/2019	EACH OCCURRENCE \$2,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$300,000 MED EXP (Any one person) \$10,000 PERSONAL & ADV INJURY \$2,000,000 GENERAL AGGREGATE \$4,000,000 PRODUCTS - COMP/OP AGG \$4,000,000
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY			CA 1921822 AOS CA 1921821 MA	01/01/2018	01/01/2019	COMBINED SINGLE LIMIT (Ea accident) \$2,000,000 BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)
	<input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input type="checkbox"/> RETENTION						EACH OCCURRENCE AGGREGATE
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below			WC014649625 AOS WC014649626 AK, AZ, VA	01/01/2018	01/01/2019	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER E.L. EACH ACCIDENT \$1,000,000 E.L. DISEASE-EA EMPLOYEE \$1,000,000 E.L. DISEASE-POLICY LIMIT \$1,000,000
E	Archit&Eng Prof			PSDEF1800033 Professional/Claims Made	01/01/2018	01/01/2019	Each Claim \$1,000,000 Aggregate \$2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)  
 Re: Sample Insurance for RFQ12191-996 Granular Activated Carbon Pilot and Plant Evaluation at the Fiveash Water Plant. City of Fort Lauderdale and its employees are included as Additional Insured in accordance with the policy provisions of the General Liability policy. A waiver of Subrogation is granted in favor of City of Fort Lauderdale in accordance with the policy provisions of the General Liability and Automobile Liability policies.

<b>CERTIFICATE HOLDER</b>  City of Fort Lauderdale c/o Procurement Services Division 100 N. Andrews Avenue, #619 Fort Lauderdale FL 33301 USA	<b>CANCELLATION</b>  SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.  AUTHORIZED REPRESENTATIVE  <i>Aon Risk Services Northeast Inc.</i>
--	---

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Holder Identifier : ACDFGJ

Certificate No : 570073097519



**CONTRACTOR'S CERTIFICATE OF COMPLIANCE WITH  
NON-DISCRIMINATION PROVISIONS OF THE CONTRACT**

The completed and signed form should be returned with the Contractor's submittal. If not provided with submittal, the Contractor must submit within three business days of City's request. Contractor may be deemed non-responsive for failure to fully comply within stated timeframes.

Pursuant to City Ordinance Sec. 2-17(a)(i)(ii), bidders must certify compliance with the Non-Discrimination provision of the ordinance.

- (a) Contractors doing business with the City shall not discriminate against their employees based on the employee's race, color, religion, gender (including identity or expression), marital status, sexual orientation, national origin, age, disability or any other protected classification as defined by applicable law.

Contracts. Every Contract exceeding \$100,000, or otherwise exempt from this section shall contain language that obligates the Contractor to comply with the applicable provisions of this section.

The Contract shall include provisions for the following:

- (i) The Contractor certifies and represents that it will comply with this section during the entire term of the contract.
- (ii) The failure of the Contractor to comply with this section shall be deemed to be a material breach of the contract, entitling the City to pursue any remedy stated below or any remedy provided under applicable law.

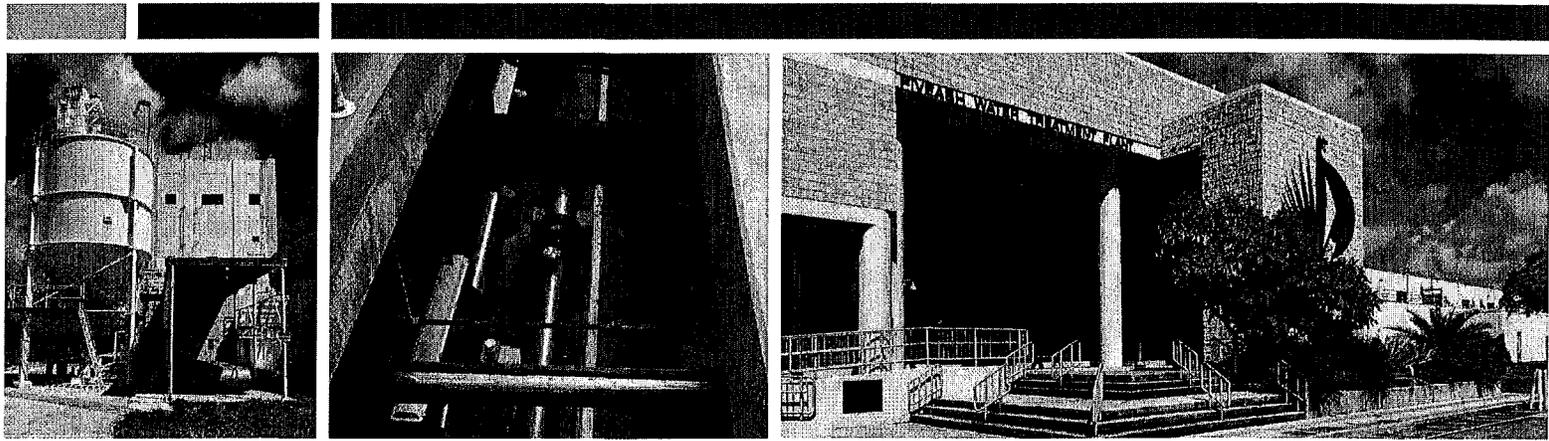


\_\_\_\_\_  
Authorized Signature

Ignacio L. Lizama, PE, ENV SP; Vice President  
\_\_\_\_\_  
Print Name and Title

October 5, 2018  
\_\_\_\_\_  
Date





**CDM  
Smith**  
cdmsmith.com