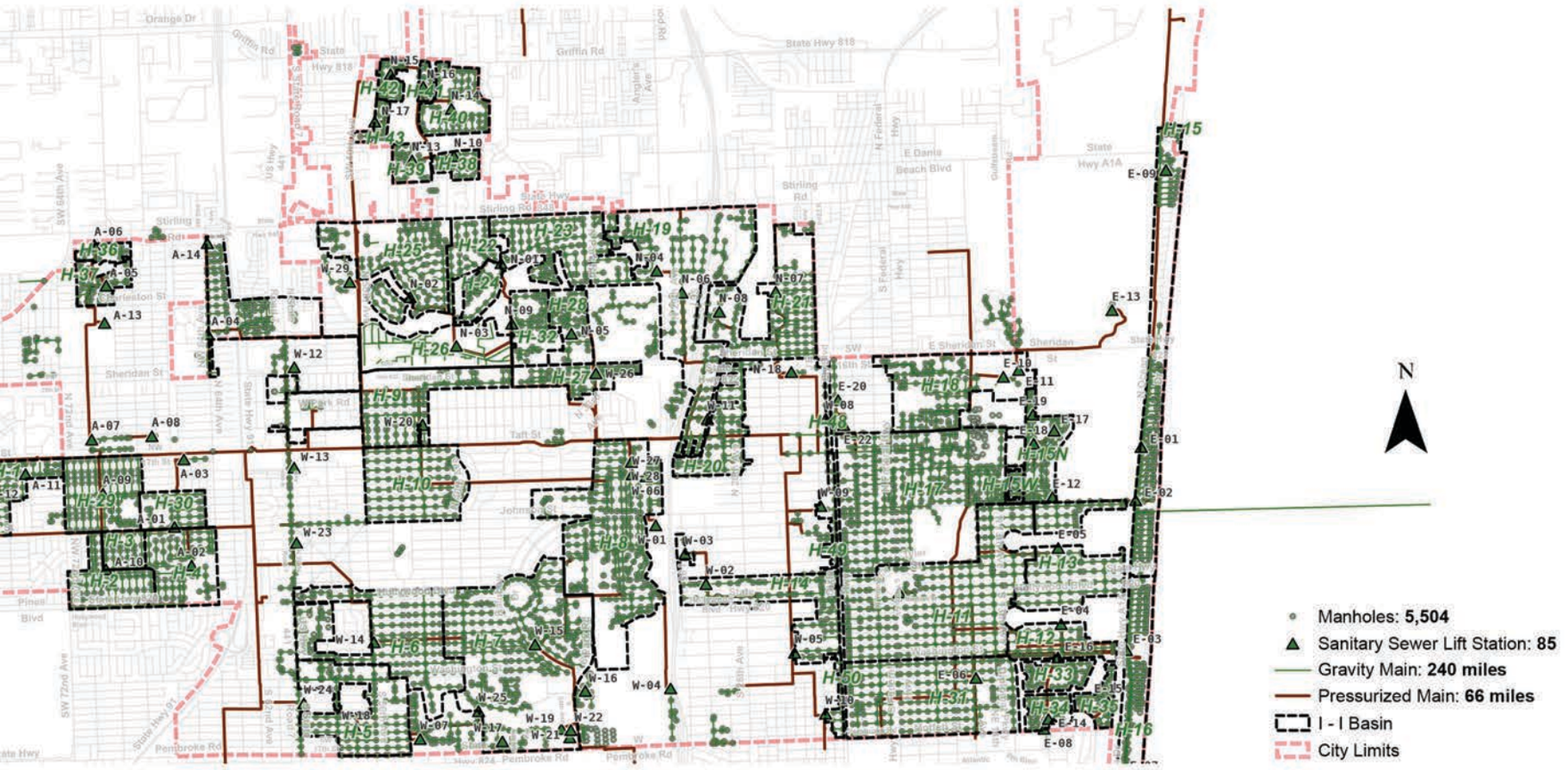
May 24, 2022

A STATEMENT OF QUALIFICATIONS FOR

# Engineering Consulting Services for Infiltration and Inflow (I&I) Program RFQ-4717-22-OT




PREPARED BY:

rjngroup
Engineering infrastructure for tomorrow

PREPARED FOR THE:

City of Hollywood, FL
Department of Public Utilities

1589 Sulphur Spring Road, Suite 102 | Baltimore, MD 21227-2542 | (410) 242-3838 | www.rjn.com

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Engineering infrastructure for tomorrow

www.rjn.com

May 20, 2022

Mr. Otis J. Thomas, Senior Purchasing Agent
City of Hollywood
2600 Hollywood Boulevard
Hollywood, Florida 33020

Subject: Engineering Consulting Services for Infiltration & Inflow (I&I) Program, RFQ-4717-22-OT

Dear Mr. Thomas:

RJN Group, Inc. is very interested in applying our expertise and experience with I&I quantification, investigations, and follow-up repair and rehabilitation services to help the City of Hollywood build a long-term I&I program. We understand the City is looking for a consultant that can provide data collection services, understand where I&I issues are impacting your sewer system, and locate and remediate I&I sources. The program will be conducted over the next five years with a proactive training program to transition the continuing program to City staff for the long-term.

RJN is currently re-entering the Florida market and is in good standing with the Florida Department of State. We have a long history of providing flow monitoring and I&I-related services for Florida utilities including Broward County, Collier County, Fort Lauderdale, Gainesville Regional Utilities, Jacksonville, Kissimmee, and Miami Beach. We are in the process of acquiring our Florida Engineering License through the Department of Business and Professional Regulation. Our teaming partner, McKim & Creed, does hold a current Florida Engineering License and will be working closely with our team of I&I specialists throughout the project.

**I&I Specialists.** Developing staged, budget-friendly programs to help municipalities and utilities restore sewer systems to optimal operating performance is our core service offering. Over the last 47 years, we have worked with small and large clients to address recurring overflow issues, streamline operations and develop continuing maintenance programs, and meet mandates imposed by regulatory authorities. We are fully prepared and excited to learn about your challenges and help you build a sustainable, long-term I&I maintenance program.

**Specialty Resources.** We own a large inventory of flow meters, rain gauges, groundwater gauges, and specialty field inspection equipment and routinely mobilize these resources across our 14-office network. We have also invested in developing Clarity®, our life cycle data management and analytics application, accessible 24/7 through standard Internet browsers. Your staff will have access to dashboards showing project activities and results, collected data, and smart analytical tools to make sense of the results, all as data is being collected.

Thank you for your consideration. We believe upon review of our qualifications, you will find the RJN team to be the right fit for this important and critical project. If you have any questions or require additional information, please do not hesitate to contact either of us.

Sincerely,

Kraig Moodie
Technical Leader/Regional Vice President
(717) 580-0123
kraig.moodie@rjnmail.com

Paul Costa
Project Director/President/CEO
(954) 415-3742
pcosta@rjnmail.com

## ACKNOWLEDGMENT AND SIGNATURE PAGE

This form must be completed and submitted by the date and the time of bid opening.

Legal Company Name (include d/b/a if applicable) RJN Group, Inc Federal Tax Identification Number: 36-2838939

If Corporation - Date Incorporated/Organized: 7/1/1975

State Incorporated/Organized: Illinois

Company Operating Address: 1589 Sulphur Spring Road, Suite 102

City Baltimore State MD Zip Code 21227

Remittance Address (if different from ordering address): 200 West Front Street

City Wheaton State IL Zip Code 60187

Company Contact Person: Kraig Moodie Email Address: Kraig.moodie@rjnmail.com

Phone Number (include area code): (717) 580-0123 Fax Number (include area code): (410) 242-3840

Company's Internet Web Address: www.rjn.com

IT IS HEREBY CERTIFIED AND AFFIRMED THAT THE BIDDER/RESPONDENT CERTIFIES ACCEPTANCE OF THE TERMS, CONDITIONS, SPECIFICATIONS, ATTACHMENTS AND ANY ADDENDA. THE BIDDER/RESPONDENT SHALL ACCEPT ANY AWARDS MADE AS A RESULT OF THIS SOLICITATION. BIDDER/RESPONDENT FURTHER AGREES THAT PRICES QUOTED WILL REMAIN FIXED FOR THE PERIOD OF TIME STATED IN THE SOLICITATION.

Paul J. Costa 5.20.22

Bidder/Respondent's Authorized Representative's Signature: Date

Type or Print Name: Paul J. Costa

THE EXECUTION OF THIS FORM CONSTITUTES THE UNEQUIVOCAL OFFER OF BIDDER/RESPONDENT TO BE BOUND BY THE TERMS OF ITS PROPOSAL. FAILURE TO SIGN THIS SOLICITATION WHERE INDICATED BY AN AUTHORIZED REPRESENTATIVE SHALL RENDER THE BID/PROPOSAL NON-RESPONSIVE. THE CITY MAY, HOWEVER, IN ITS SOLE DISCRETION, ACCEPT ANY BID/PROPOSAL THAT INCLUDES AN EXECUTED DOCUMENT WHICH UNEQUIVOCALLY BINDS THE BIDDER/RESPONDENT TO THE TERMS OF ITS OFFER.

**ANY EXCEPTION, CHANGES OR ALTERATIONS TO THE GENERAL TERMS AND CONDITIONS, HOLD HARMLESS / INDEMNITY DOCUMENT OR OTHER REQUIRED FORMS MAY RESULT IN THE BID/PROPOSAL BE DEEMED NON-RESPONSIVE AND DISQUALIFIED FORM THE AWARD PROCESS**

# TABLE OF CONTENTS

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## SECTION 1

# EXECUTIVE SUMMARY

# EXECUTIVE SUMMARY

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## WHY RJN?

**The RJN team offers the essential ingredients to quantify I&I accurately, identify I&I sources, and produce a staged program to cost-effectively mitigate inflow and infiltration (I&I) in the City's sewer system, always factoring vulnerabilities to climate change and sea-level rise.**

### A TEAM OF INFLOW & INFILTRATION SPECIALISTS

We have no preconceived notions that bind us to prior approaches or technical solutions. We will bring new perspectives to the City's I&I issues as we have creatively done for other clients facing recurring overflows or regulatory actions across the country.

Our approach to every project always starts by discussing performance issues and concerns with key stakeholders, operators, management, and our technical experts. Once we clearly understand all concerns and issues, we will collaboratively build a program that reflects the City's needs and goals and will function well beyond this project.

### UNPARALLELED INFLOW & INFILTRATION EXPERIENCE

For 47 years, with 2,000 successful I&I-driven projects, RJN has helped municipalities and utilities across the country meet the challenges of under-performing sewer systems. Drawing on experience earned through inspecting and analyzing more than 60,000 miles of sewer, we understand how sewer system behavior can be impacted by tidal influences, extreme precipitation events, renewal and redevelopment, and normal growth.

We are fully prepared to meet the unique challenges of the City's system and deliver solutions to ensure a healthy system for the long term.

### PROVEN I&I MITIGATION PROCESSES PRODUCE RESULTS

RJN is a recognized industry leader in I&I quantification, source investigation, analysis, and remediation. We have developed proprietary algorithms to balance total quantified I&I holistically with source I&I contributions. We make sure we find and address all of the significant I&I contributors in a system.

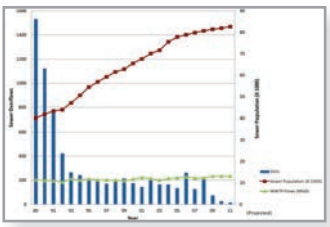
Since we focus on understanding where I&i comes from, we deliver prioritized and staged programs that make sense from a remediation and a budget perspective.

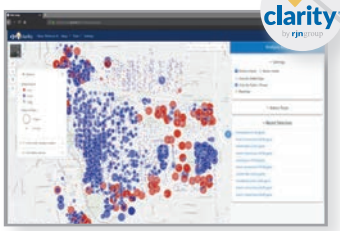
Time and time again, our approach has solved tough I&I issues with solutions constructed well within our estimates.

### TECHNOLOGY = TRANSPARENCY = ANSWERS

Key City of Hollywood staff and stakeholders will know what we know throughout the project. The RJN-developed Clarity® Data Management Hub will house all flow and I&I source data where it will be available 24/7 using standard Internet browsers with secure credentials. Clarity streamlines data services from the point of collection through delivery, with quick access to raw and finalized flow data, on-demand analytics, RDII tools, I&I source details, and reports. All displayed in easy-to-use map views.

Dashboards provide quick project snapshots of each task, status, and action, providing full project transparency.





## WHO IS RJN?

RJN Group, Inc. is a professional engineering and specialty field services firm focused on providing cost-effective and innovative engineering sounds to improve the integrity, service life, and performance of wastewater infrastructure. Established in 1975, our staff of employee-owners—175 nationwide—value our clients. **We are committed to conducting every project professionally, safely, and efficiently to produce solutions that make a difference for our clients.**

- We are known for creativity in solving challenging issues and providing solutions that exceed project goals and expectations.
- We are known for early adoption of innovative inspection, design, construction, and communication tools, technologies, and methodologies, enhancing our ability to deliver results more efficiently without sacrificing quality.
- We strive to make a difference in the communities we serve.

| | |
|---|---|
| **47**<br>years delivering infrastructure solutions | **2,326**<br>projects successfully completed |
| **290M LF**<br>sewer condition inspections and capacity assessments | **9.5M LF**<br>pipeline rehabilitation and design |

We work almost exclusively for municipalities and public utilities. Our engineering professionals understand the deadlines, complexities, and sensitive nature of accurate data collection, insightful analysis, and planning required when working in highly regulated public infrastructure systems. We always work with our clients to build programs that meet their objectives, goals, and budgets.

## INDUSTRY RECOGNITION

2022 ENR TOP 500 DESIGN FIRMS

2021 ENR TOP 200 ENVIRONMENTAL FIRMS

2021 Trenchless Technology TOP 50 Trenchless Engineering Firms

## CORE SERVICES

- Infiltration and inflow (I&I) analysis/reduction
- Condition field investigations and assessments
- Capacity analysis and hydraulic modeling
- Flow and rainfall monitoring
- GIS/asset survey, mapping, and integration
- Pipeline rehabilitation and replacement design
- Lift/pump station assessments and design
- Regulatory and funding assistance
- Asset management and planning solutions
- Construction inspection and management
- Design-build project delivery programs

Leveraging well-rounded experience, we optimize available budgets and minimize risks, costs, and community inconvenience to deliver cost-effective and sustainable solutions.

## OFFICE LOCATIONS

**RJN Main Office**
1589 Sulphur Spring Road, Suite 102
Baltimore, Maryland 21227
(410) 242-3838

**Florida Operations Office (McKim & Creed)**
6501 Congress Avenue, #100
Boca Raton, FL 33487
(386) 274-2828

## PROJECT TEAM LEADERSHIP

The RJN team will be led by Islam Khallaf, PE (Project Manager), Paul Costa (Project Director), and Kraig Moodie (Technical Leader). Islam offers more than 20 years of I&I quantification and analysis experience, and Paul and Kraig are 30 years veterans of the I&I assessment science.

They will be supported by a solid team of RJN and McKim & Creed experts in flow monitoring, I&I source detection, and repair and rehabilitation. RJN team members are primarily based in Baltimore, Maryland, but will operate from the McKim & Creed Boca Raton office for this project. Details about each team member's role and their specific credentials are presented in Section 3.

## SECTION 2

# FIRM QUALIFICATIONS AND EXPERIENCE

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## FIRM QUALIFICATIONS

RJN is a wastewater collection system specialist. We have worked with municipalities and utilities across the country to develop comprehensive, phased programs that address I&I and restore capacity to their sewer systems.

**Founded:** July 1, 1975 in Illinois

**Years of I&I Engineering:** 47

**Business Structure:** employee-owned corporation

**RJN Professionals by Category**

| | |
|---|---|
| Engineers | 63 |
| GIS/CAD/Data Analysts | 33 |
| Field Technicians | 41 |
| Construction Inspectors | 7 |
| Administrative | 28 |
| TOTAL | 172 |

RJN is licensed to work in Florida (P07290) and is in good standing with the Florida Department of State.

**Contact**
Kraig Moodie, Regional Vice President
1589 Sulphur Spring Road, Suite 102
Baltimore, Maryland 21227
kraig.moodie@rjnmail.com
(717) 580-0123

## ABILITY TO PERFORM

I&I quantification and mitigation is a core RJN service offering. Our engineering professionals have helped hundreds of communities with developing I&I studies and executing them through construction with post-rehabilitation proofs. We use experience to interpret data and build programs that produce actionable, prioritized maintenance and rehabilitation solutions.

I&I mitigation programs are not just a science; they are an art, requiring creative thinking to find the right solutions for each unique situation or system.

We work closely with our clients to understand program needs and known performance issues. These critical insights drive development of a flow monitoring strategy using combinations of flow meters, rain gauges, groundwater gauges, and lift station data to get optimal data for system and basin I&I quantifications.

- We use system I&I projections as a foundation for planning staged I&I source investigation programs where areas with the highest I&I are evaluated first.
- I&I contributions for each defect are balanced with overall I&I rates to ensure our rehabilitation recommendations are holistic.
- We can also couple defect I&I rates with risk scoring when planning and prioritizing repair, rehabilitation, and replacement recommendations.

Our objective is always to make measurable improvements and deliver reliable services for the future.

**I&I Assessment/Inspection Services (Last 5 Years)**

| | |
|---|---|
| **3,600** monitoring sites | **58,000** manhole inspections |
| **16M** LF of smoke testing | **4,000** dye testing setups |
| **2.5M** LF of video pipe inspection review | **145** lift station assessments |
| **95,000** structures GPS surveyed and mapped | **175** flow isolations |

Our programmatic approach uses fundamentals and standards many of our clients have adopted for their continuing long-term maintenance and management programs (i.e., CMOM).

**Safety First**. The sewer work environment is harsh, with unpredictable and sometimes caustic flows. RJN engineers and field professionals complete rigorous safety and task training and adhere to RJN Standard Operating Procedures when working in the field. This ensures each data collection task is performed safely while capturing complete and accurate data.

We explore emerging tools and technologies to expedite data collection, data analysis, quality checking, and data delivery such as manhole scanners, rapid inspection pipe inspection tools, and safety equipment.

**24/7 Access to Live Data.** Our Clarity® Data Management Hub will give City staff and stakeholders access to the project 24/7, as data is being collected. Clarity displays results in interactive GIS map views and provides a suite of analytical tools to assess findings throughout the project.

## PROOF OF EXPERIENCE

RJN has successfully completed a number of programs involving I&I quantification, source investigations, and rehabilitation and repair for similar size communities. A number of these communities are illustrated below. Detailed descriptions and reference contact information are provided in Section 5 for the three requested projects

| Similar I&I Program Clients | Flow Monitoring | I&I Quantification | I&I Source Investigation Plan | I&I Source Investigations | I&I Remediation Planning | Design | Construction Oversight | Regulatory Driven | Coastal Influences |
|---|---|---|---|---|---|---|---|---|---|
| Baltimore, MD | ● | ● | ● | ● | ● | ● | | ● | ● |
| MWRA, Boston, MA | ● | ● | | | | | | | ● |
| Virginia Beach, VA | ● | | ● | ● | ● | | | ● | ● |
| Baltimore County, MD | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| WSSC, MD | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Austin, TX | ● | ● | ● | ● | ● | | | | |
| Dallas,TX | ● | ● | ● | ● | ● | ● | | | |
| Fort Worth, TX | ● | ● | ● | ● | ● | ● | ● | | |
| Little Rock, AR | ● | ● | ● | ● | ● | ● | ● | ● | |
| Hot Springs, AR | ● | ● | ● | ● | ● | ● | ● | ● | |
| Joliet, IL | ● | ● | ● | ● | ● | ● | ● | | |
| Houston, TX | ● | | | ● | ● | | | ● | ● |
| Fort Smith, AR | ● | ● | ● | ● | ● | ● | ● | ● | |
| St. Louis, MO | ● | | ● | ● | ● | ● | | | |

## SECTION 3

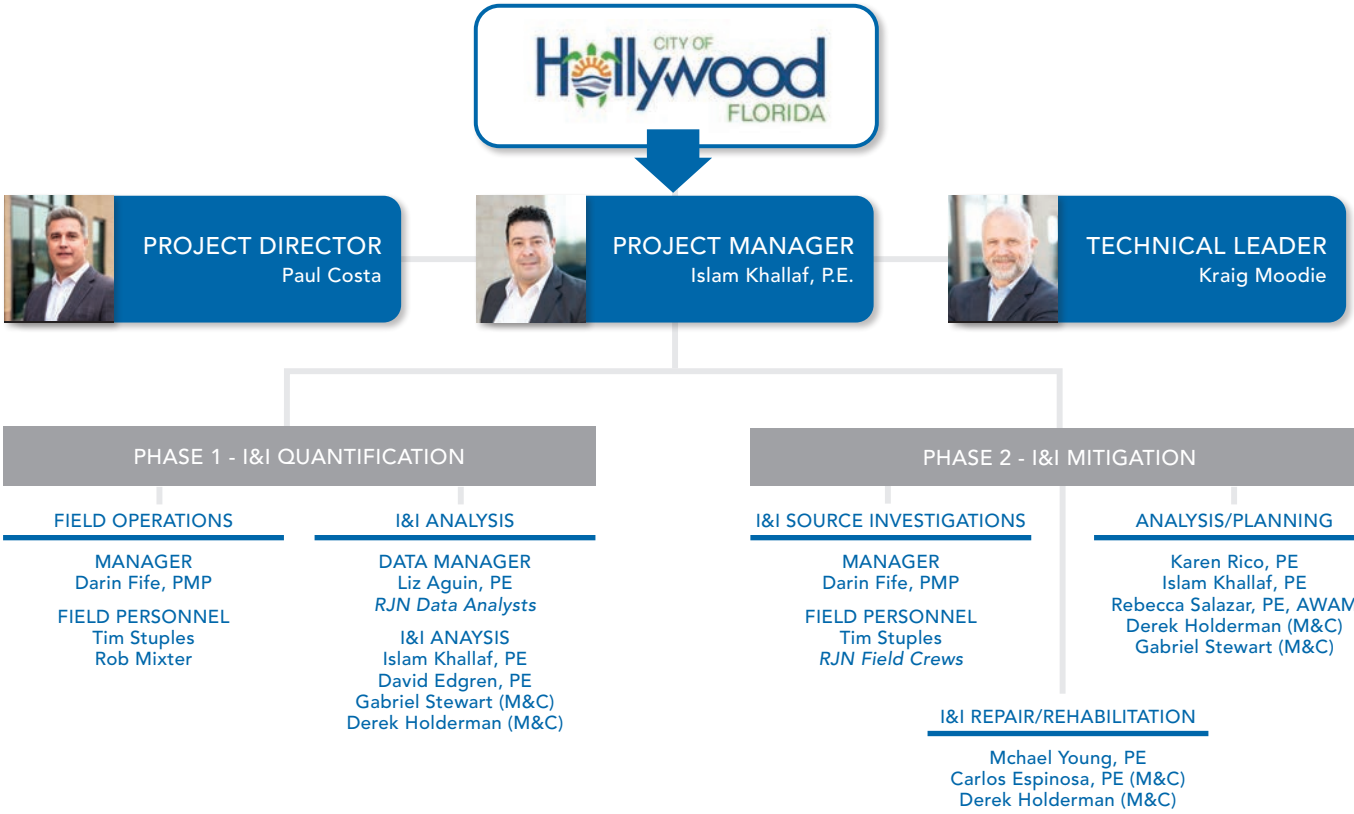
# ORGANIZATIONAL PROFILE/ PROJECT TEAM QUALIFICATIONS

## PROJECT TEAM ORGANIZATION

RJN has assembled a team of professionals experienced in I&I quantification, analysis, and mitigation services (shown below).

Each RJN team member offers expertise in services related to:

- Conducting flow monitoring programs
- Performing rainfall-derived I&I analysis (RDII)
- Planning and executing prioritized and staged I&I source investigations with quantified defect I&I
- Implementing cost and risk-sensitive I&I mitigation strategies




## PROJECT TEAM MEMBER CONTRIBUTION

### Project Manager

**Islam Khallaf, PE** is a licensed PE, bringing 20 years of flow monitoring and I&I analysis and mitigation experience. He will oversee all aspects of the project, ensure staff and resources are allocated to keep the project on schedule and monitor and provide guidance for daily project activities and QA/QC tasks. Islam will be a **primary point of contact** for the City and will:

- Schedule/attend meetings with City
- Manage the project scheduie and work plans
- Ensure the expectations of City staff and stakeholders are met
- Assign and coordinate personnel and resources
- Deliver routine external project status reports, financial updates, and timely invoices
- Ensure timely client deliverables
- Manage and account for data quality

## Project Director

Paul Costa has built his 30-year career helping clients with I&I mitigation programming and strategies. He will be available to the project team and City representatives and accountable for the timely, accurate, and complete delivery of all project contractual obligations.

## Technical Leader

**Kraig Moodie** will utilize his 28 years of knowledge in flow, rainfall, groundwater monitoring technologies, and I&I program experience to guide the project and provide QA/QC oversight. His technical leadership will deliver innovative solutions for the City's I&I program to ensure a healthy, resilient sewer system. Kraig will be available to the City throughout the project and will:

- Track project deadlines, budgets, and deliverables
- Account for the quality of work, and project schedules, budgets, and deliverables.
- Monitor quality control strategies
- Coordinate City staff training programs

## Operations Manager

**Darin Fife, PMP,** has 22 years of experience managing flow monitoring and condition field investigations. He will be available to the City throughout the project and will:

- Manage day-to-day project operations
- Monitor implementation of field safety standards

## Data Manager

**Elizabeth Aguin, PE**, is a licensed PE with 13 years of flow monitoring and condition data management, and QC experience. She will manage system setup and user training for RJN's proprietary Clarity® Data Management Hub and data integration with Clarity. Liz manages our data analyst team and will monitor data quality and provide timely data delivery.

## Field Manager(s)

**Timothy Stuples** and **Rob Mixter** each bring more than 13,000 hours of managing and conducting field operations for flow monitoring and I&I source investigations. They will be responsible for day-to-day field work, manage assignments, and ensure safety regulations and policies are implemented.

## Project Engineering

**Mike Young, PE,** brings 30 years of experience wth I&I quantification and mitigation. He has helped many communities build budget-driven multi-year I&I programs fostering the tenets of CMOM and will lead rehabilitation design.

**David Edgren, PE**, brings ten years of experience with I&I analysis, hydraulic modeling, and I&I defect quantification and balancing. His passion lies in understanding how antecedent moisture impacts sewer performance.

**Karen Rico, PE**, and **Becky Salazar, PE, AWAM,** will be involved in Phase 2 I&I source investigations. Karen has managed I&I reduction efforts for many large consent-driven programs, delivering prioritized and staged mitigation plans. Becky is an experienced strategist, implementing risk analytics to fine-tune i&I mitigation programs.

**Gabriel Stewart** and **Derek Holderman** (McKim & Creed) will perform lift station assessments to enhance I&I quantification and Phase 2 support I&I source identification. They both bring experience with I&I mitigation programs for Florida communities. **Carlos Espinosa, PE**, will leverage 40 years of sewer utility experience to assist with developing I&I mitigation solutions.

# Paul Costa

*Project Director*

**Experience:** 31 years

### Education

MBA—Finance (Northeastern University, Boston, Massachusetts, 2000)

MS—Environmental Engineering (Northeastern University, Boston, Massachusetts, 1994)

BS—Marine Engineering (Massachusetts Maritime Academy, 1991)

**Location:** Jupiter, Florida

### Technical Presentations

"What Can Your Sewer System Tell You? The Science of Sewer Surveillance," 08/26/2020 - Wastewater Sampling and Testing for Pathogens with GT Molecular

"Technology and Its Impact on Reducing Inflow and Infiltration," 01/01/2012 - Trenchless Technology

"Physical Survey Collection System Investigations," 01/01/2006 - CWEA Shortcourse

"Implementation of a Large Scale Collection System Flow Monitoring Project," 01/01/2005 - NC AWWA

"Field Investigations - Smoke Testing & Dye Testing," 01/01/2005 - Chesapeake Operators Training

"Field Investigations - Smoke Testing," 01/01/2004 - Chesapeake Operators Training

"Do's and Don'ts in Collection System Field Investigations," 01/01/2003 - Chesapeake WEA

### Memberships

Water Environment Federation (WEF), Collections Committee Chair

Mr. Costa brings considerable experience with engineering and engineering management. His experience includes condition assessment, sewershed studies, modeling, asset management, and design of water and wastewater collection and treatment facilities. Furthermore, Mr. Costa has worked with some of the largest utilities in the country to meet their stringent consent decree programs.

## RELATED PROJECT EXPERIENCE

**Multi-Year Long-Term Flow Monitoring Program, WSSC Water, Maryland**—Technical Advisor. Long-term flow monitoring services for a permanent flow monitoring network (207 flow meters, 14 meter vault devices, 20 rain gauges). Continuing maintenance services included equipment maintenance, and data collection, verification, and management, I&I analysis, and reporting. I&I analysis quantified I&I levels after specific rainfall events, evaluated causes of increasing flows at a WWTP, and assessed tidal impacts of groundwater levels.

**Long-Term Flow Monitoring (No. 1263), Baltimore, Maryland**—Technical Advisor. Flow and rainfall monitoring, flume evaluation, and SSO monitoring program conducted in multiple sewersheds over a three-year period. Flume evaluation (28) involved meters mirroring the existing flumes (18), meters installed in unmonitored areas (10), and rain gauges (9). SSO monitoring was performed for 12 SSO sites to report overflow conditions. A temporary metering program and I&I analysis was conducted to evaluate completed rehabilitation (5 to 30 meters/6 to 12 month periods).

**On-Call SRRR Plan Services, Baltimore County, Maryland**—Technical Advisor. Multi-year on-call sewershed repair, replacement, and rehabilitation program involving evaluation and analysis of flow monitoring, I&I, and field inspection data to prepare SRRR plans for eight basins, as required under the CD. Services included flow monitoring and groundwater monitoring, I&I analysis, I&I source investigations, hydraulic modeling, GIS updates and preparation of GIS maps, development of rehabilitation recommendations and corrective actions, and preparation of cost estimates for rehabilitation measures.

**Flow Metering System Replacement, Massachusetts Water Resource Authority, Boston, Massachusetts**—Technical Advisor. Flow meter network assessment to upgrade 212 metering sites, including a full evaluation of the existing metering network and data platform, as well as field operational practices. Meter sites varied in shape and size, ranging from 8 inches to 150 x 138 inches, with depths up to 40 feet, many had tidal influences.

**North Area Flow Monitoring, Allegheny County Sanitary Authority, Pittsburgh, Pennsylvania**—Technical Advisor. Long-term flow monitoring program (154 meters/12 months) required to meet the conditions of a Consent Decree. Services included site investigation and selection; equipment installation, maintenance, and monitoring; and data collection, management, and verification. Flow data was used to conduct I&I analysis and hydraulic modeling to prioritize areas for sewer system evaluation activities, efficiently allocate capital available for study and rehabilitation, and minimize future capital improvements projects.

# Islam Khallaf, PE, PMP

*Project Manager*

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**Experience:** 20 years

### Education

MS—Civil and Environmental Engineering (University of Maryland, Baltimore County, 2008)

BS—Civil Engineering (Faculty of Engineering, Alexandria University, Egypt, 2002)

### Registrations

PE—Virginia # 0402061790, Maryland #53537, DC #PE922113

**Location:** Baltimore, Maryland

### Certifications

Project Management Professional, 2237802

NASSCO PACP/MACP/LACP, U-0919-70306737

OSHA 10-Hour Safety Certification, 26-702038112

Maryland DOT Temporary Traffic Control Manager

4-Hour Work Zone Traffic Control

Confined Space Entry and Rescue

First Aid, CPR, and AED (Defibrillator)

### Software

ArcGIS

AutoCAD

### Memberships

Florida Water Environment Association (FWEA)

Chesapeake Water Environment Association (CWEA)

Water Environment Federation (WEF)

Mr. Khallaf offers a broad base of experience with wastewater collection system flow monitoring and I&I analysis programs. He has worked in complex combined and separate collection systems, and designed meter configurations to handle a wide hydraulic range. Islam has also performed hydraulic analysis and hydraulic modeling of piping networks, evaluating and recommending solutions for capacity issues to improve pump station and treatment plant performance.

## RELATED PROJECT EXPERIENCE

**Jones Falls Sewershed I&I Analysis, Baltimore County, Maryland**—Project Manager. Flow monitoring (15 meters) and I&I analysis to evaluate post-rehabilitation performance. Services included site reviews, equipment installation and maintenance, data collection and processing, and I&I and post-rehabilitation analysis. The post-rehabilitation analysis involved verifying system responses predicted for the 10-year, 6-hour storm event, recalibrating the hydraulic model, and identifying additional capacity improvements as required by the CD.

**Long-Term Flow Monitoring (No. 1263), Baltimore, Maryland**—Project Manager. Flow and rainfall monitoring, flume evaluation, and SSO monitoring program conducted in multiple sewersheds over a three-year period. Flume evaluation (28) involved meters mirroring the existing flumes (18), meters installed in unmonitored areas (10), and rain gauges (9). SSO monitoring was performed for 12 SSO sites to report overflow conditions. A temporary metering program and I&I analysis was conducted to evaluate completed rehabilitation (5 to 30 meters/6 to 12 month periods).

**Multi-Year Long-Term Flow Monitoring, WSSC Water, Maryland**—Project Manager. Long-term flow monitoring services for a permanent flow monitoring network (207 flow meters, 14 meter vault devices, 20 rain gauges). Continuing maintenance services included equipment maintenance, and data collection, verification, and management, I&I analysis, and reporting. I&I analysis quantified I&I levels after specific rainfall events, evaluated causes of increasing flows at a WWTP, and assessed tidal impacts of groundwater levels.

**On-Call Flow Monitoring, Baltimore County, Maryland**—Project Manager. On-call flow monitoring services (24 meters/18 months) to collect data and perform I&I analysis for post-rehabilitation evaluations in the Stemmers Run sewershed. Services included site and equipment investigation, installation, and maintenance, data QC and finalization, and I&I analysis to quantify I&I levels, prioritize I&I source investigations, and update the hydraulic model.

**Temporary Flow Monitoring, Fairfax County, Virginia**—Project Manager. Flow monitoring (64 meters/5 rain gauges) to support I&I evaluation and modeling. Services included site investigations, equipment installation and maintenance, data collection and QC, flow and I&I analysis, and reporting.

**Flow Metering System Replacement, Massachusetts Water Resource Authority, Boston, Massachusetts**—Senior Project Engineer. Flow meter network assessment to upgrade 212 metering sites, including a full evaluation of the existing metering network and data platform, as well as field operational practices. Meter sites varied in shape and size, ranging from 8 inches to 150 x 138 inches, with depths up to 40 feet, many had tidal influences.

# Kraig Moodie

*Technical Leader*

**Experience:** 28 years

### Education

BS, Civil Engineering, (Worcester Polytechnic Institute, Massachusetts, 1995)

**Location:** Baltimore, Maryland

### Memberships

Chesapeake Water Environment Association

### Awards

5S Society Presidents Award

Mr. Moodie has decades of experience in the environmental services industry. He worked on various wastewater-related projects across the United States and focused on the Mid-Atlantic region for the past twenty years. As a partner in FlowWav, Inc., Kraig developed expertise in measuring and monitoring sanitary sewer systems for municipal agencies, utilities, and flow-service providers using SmartSensor technology. He was instrumental in developing and implementing the award-winning City of Baltimore YH20 program. The annual program prepares Baltimore City young adults for a career in the water and wastewater industry by providing training, industry exposure, mentorship, and career coaching over a nine-month program.

## RELATED PROJECT EXPERIENCE

**Large Diameter Pipe Assessment, Baltimore, Maryland**—Project Director. Condition assessment of gravity sanitary sewer interceptors 20 inches and greater, pressure sewers, force mains, and siphons (651,879 LF of gravity sewer, 83,061 LF of force main, and 25,878 LF of siphons) using various free-swimming and tethered tools, MSI technologies, and electromagnetic inspection tools. Services included condition assessment planning, inspection technology selection, inspection, and engineering analysis, and risk assessments to develop recommendations for prioritized rehabilitation measures. Bid-ready contract documents were prepared as requested by the City for high-priority improvements.

**Oak Forest Patapsco Wet-Weather Assessment, Baltimore County, Maryland**—Project Director. The wet-weather sanitary sewer assessment identified significant I/I defects within the tributary area causing the Oak Forest pump station to overflow. Services included flow isolation measurements (59), flow monitoring (12 meters), smoke testing (10,170 LF), dye testing (28 setups), manhole inspections (59), and CCTV review. Mitigation measures for I&I removal and alternatives to address existing capacity constraints ere recommended.

## PREVIOUS EMPLOYER PROJECT EXPERIENCE

**Virginia Beach Sewer Study, PUCN-09-0025A, Virginia Beach, Virginia**—QA/QC Manager. Provided project oversight and client coordination to ensure all aspects of the SSES and flow monitoring tasks were completed on schedule in the field and the corresponding data was turned over to the City in accordance with the contract requirements. Managed the QA/QC activities to ensure the data accuracy and reliability. Project also Included the inspection of over 200,000 LF of sewer televising.

**Storm and Sanitary Sewer Inspection Program, Rehoboth Beach, Delaware**—Project Director. Project Director for an inspection program encompassing 50,000 LF of coastal sewers with pipes ranging from 8- to 30-inch diameter. CCTV inspection and cleaning, and defect analysis was performed in accordance with NASSCO PACP coding. The City staff were so pleased with the initial progress that they expedited the schedule for additional inspections for the summer of 2021 since the beaches were closed. The team was able to complete the work in one year, originally planned for three consecutive years.

# Darin Fife, PMP

*Operations Manager*

rjngroup Engineering infrastructure for tomorrow

**Experience:** 22 years

### Education

MBA—Project Management (Strayer University, 2014)

BS—Environmental and Biological Resources Engineering (University of Maryland, 2000)

**Location:** Baltimore, Maryland

### Certifications

Project Management Professional 3212318

NASSCO PACP/LACP/MACP

OSHA 10-Hour Safety Certified

Confined Space Entry

Mr. Fife offers a broad base of experience with wastewater collection systems. He has managed operations involving flow monitoring, manhole and pipeline inspections, and I&I source analysis. He also trains and develops team knowledge in the latest equipment installation and maintenance standards. Darin has also been responsible for managing field safety components and advising major sewer utilities and municipal staff on overflow conditions, sewer pipeline performance, fit-for-purpose equipment selection, and maintenance tasks.

## RELATED PROJECT EXPERIENCE

**I/I Study Cameron Run Area, Fairfax County, Virginia**—Project Manager. I&I analysis to quantify the wastewater components, prioritize the area contributing excessive I&I, and develop source detection recommendations to locate potential sources of I&I. Services included flow monitoring (9 meters) and data analysis to quantify dry and wet weather flows for each metered area. I&I analysis produced I&I source investigation recommendations.

**Multi-Year Long-Term Flow Monitoring, WSSC Water, Maryland**—Project Operations Manager. Long-term flow monitoring services for a permanent flow monitoring network (207 flow meters, 14 meter vault devices, 20 rain gauges). Continuing maintenance services included equipment maintenance, and data collection, verification, and management, I&I analysis, and reporting. I&I analysis quantified I&I levels after specific rainfall events, evaluated causes of increasing flows at a WWTP, and assessed tidal impacts of groundwater levels.

**Jones Falls Sewershed I/I Analysis, Baltimore County, Maryland**—Field Operations Manager. Flow monitoring (15 meters) and I&I analysis to evaluate post-rehabilitation performance. Services included site reviews, equipment installation and maintenance, data collection and processing, and I&I and post-rehabilitation analysis. The post-rehabilitation analysis involved verifying system responses predicted for the 10-year, 6-hour storm event, recalibrating the hydraulic model, and identifying additional capacity improvements as required by the CD.

**Wastewater Metering System Replacement Massachusetts Water Resource Authority Boston Massachusetts**—Project Manager. Flow meter network assessment to upgrade 212 metering sites, including a full evaluation of the existing metering network and data platform, as well as field operational practices. Meter sites varied in shape and size, ranging from 8 inches to 150 x 138 inches, with depths up to 40 feet. Recommended metering configurations were developed for each site.

**Trunk Sewer Inspection and Survey Program, WSSC Water, Maryland**—Field Operations Manager. Survey and condition inspection services for all trunk sewers greater than 14 inches in diameter and in-line manholes (10,750 manholes/480 miles of pipe). Pipeline facilities were located at multiple sites throughout the 625-mile trunk sewer system, including wooded rights-of-way and along or crossing streams. Services included manhole inspections, exposed pipe evaluations, in-pipe assessments (225,000 LF of 15- to 66-inch pipe), dye testing for connectivity, and the inspection of gates and air release valves.

**Long Term Flow Monitoring, Fairfax County, Virginia**—Project Manager. Long-term flow monitoring to manage county-owned billing meters (8). Services included site evaluations, equipment management and maintenance, and data analysis.

# Elizabeth Aguin, PE

*Data Manager*

rjngroup Engineering infrastructure for tomorrow

**Experience:** 14 years

### Education

MS—Civil Engineering (Southern Methodist University, 2011)

BS—Civil Engineering/Mathematics (Southern Methodist University, 2010)

### Registrations

PE—Texas #120233

**Location:** Dallas, Texas

### Certifications

OSHA 10-Hour Safety Certification 28-006011335

4-Hour Work Zone Traffic Control

Confined Space Entry and Rescue

### Software

ADS Profiler

Telog Enterprise

### Technical Presentations

"The Importance of Accurate and Precise Flow Data," 01/01/2017 - AWW & WEA

"The Influence of Record Rains on Sanitary Sewer Collection Systems," 01/01/2016 - WEFTEC

### Memberships

Texas Public Works Association (TPWA)

Water Environment Association of Texas (WEAT)

Water Environment Federation (WEF

Ms. Aguin specializes in data analysis and data management services to support wastewater collection evaluation studies. Liz's specific expertise lies with verification and analysis of collected flow data, field inspection results, utility maps, wastewater treatment plant and lift/pump station records, defect rehabilitation methods, and rain data.

## RELATED PROJECT EXPERIENCE

**Multi-Year Long-Term Flow Monitoring Program, WSSC Water, Maryland**—Data Manager. Long-term flow monitoring services for a permanent flow monitoring network (207 flow meters, 14 meter vault devices, 20 rain gauges). Continuing maintenance services included equipment maintenance, and data collection, verification, and management, I&I analysis, and reporting. I&I analysis quantified I&I levels after specific rainfall events, evaluated causes of increasing flows at a WWTP, and assessed tidal impacts of groundwater levels.

**On-Call Flow Monitoring, Baltimore County, Maryland**—Data Manager. On-call flow monitoring services (78 meters/12 groundwater gauges, multiple work orders) to collect data for calibration of hydraulic models, long-term capacity/peak flow management evaluations, I&I analysis and preparation of I&I source mitigation. Services for each 18-month monitoring period included site investigations, equipment installation and maintenance, 24/7 performance monitoring using condition alerts and alarms, data collection and QC, and hydraulic flow analysis.

**Flow Monitoring Services, Metropolitan Sewer District of Greater Cincinnati (MSDGC), Ohio**—Data Manager. Analysis of flow data and database management services to support operational needs and the wet-weather SCADA System (WWSS). Tasks included review of installation records and initial data, confirmation of data integrity, analysis and editing of flow data, flow balancing analysis, field calibrations, and data management platform customizations.

**Long-Term Flow Monitoring, Austin, Texas**—Project Manager. Multi-year flow monitoring program (65 permanent meters/30 temporary meters/15 level-only monitors). Collected flow data supported ongoing hydraulic modeling, I&I mitigation projects, billing, and capital planning programs. Level-only sensors monitored lift station levels and provided real-time controls (RTC). Metering sites included deep manholes (100 feet) with pipe sizes ranging from 8- to 96-inches, requiring special provisions for field installations and maintenance.

**Short-Term Flow and Rainfall Monitoring Services, DC Water, District of Columbia**—Data Manager. Flow monitoring services (174 meters/6 rain gauges) for a 24-month period. Flow data was used to calibrate hydraulic models, perform I&I analyses, determine a baseline level of services/control, assess the impact of new development and other changes, and support capital planning efforts.

**Flow Monitoring to Support Modeling & Planning, Houston, Texas**—Data Manager. Flow monitoring (71 meters/9 rain gauges) to support hydraulic modeling and capital planning. Equipment was installed in pipes ranging from 15- to 60-inches in diameter with five sites requiring special installation and safety protocols due to depths exceeding 30 feet. Rainfall data was supplemented with radar rainfall data and rainfall hyetograph analysis was performed.

# Michael Young, PE

*Senior Project Manager*

rjngroup Engineering infrastructure for tomorrow

**Experience:** 27 years

### Education

MS—Environmental Engineering (University of Illinois at Urbana/Champaign, 1995)

BS—Civil Engineering (University of Illinois at Urbana/Champaign, 1994)

### Registrations

PE—Florida (application pending), Georgia #PE048617, Illinois #062052840

### Certifications

OSHA 10-Hour Safety Certification 30-003162136

4-Hour Work Zone Traffic Control

Confined Space Rescue

### Technical Presentations

"In-House Remediation of I&I," 06/06/2019 - Watertown Classic Collection System Seminar

"Stormwater: Understanding Your System and MS4 Requirements-IEPA#14080," 05/08/2019 - Illinois Section American Water Works Association

"Reducing Basement Backups through Intergovernmental Cooperation and Design-Build," 01/01/2016 - APWA

"Flow Monitoring, SSES, and I/I Analysis," 01/01/2016 - APWA CMOM Seminar

"Benefits of Long-Term Flow Monitoring," 01/01/2014 - CSWEA Collection Systems Seminar

"Developing a Road Map for a Rehab Program," 01/01/2013 - Trenchless Technology Roadshow

Mr. Young has a wide range of experience with civil engineering addressing improvements to sanitary sewer, combined sewer, and stormwater systems to mitigation I&I and capacity issues. He has conducted and managed flow monitoring, hydraulic modeling, smoke testing, manhole inspections, sewer televising, dye flooding, and building inspection programs and designed and managed construction activities mitigate I&I and restore aging, deteriorated and undersized water sewer, and stormwater assets. Mike has also led multiple design-build projects with lead responsibilities for both design and construction.

## RELATED PROJECT EXPERIENCE

**Belmont Interceptor Rehabilitation and Improvements, Joliet, Illinois**—Sr. Project Manager. Design services to upsize 6,510 LF of 10- to 15-inch interceptor to 24-inch gravity sewers as a results annual I&I studies. Services included site verifications, CCTV review, and hydraulic modeling to confirm conditions and size requirements; he survey and geotechnical coordination; utility research and coordination; traffic control; property owner coordination; permitting and bidding assistance.

**Multi-Year I/I Study and Rehabilitation, Elmhurst, Illinois**—Sr. Project Manager. Multi-year sanitary sewer study and with follow-up rehabilitation to address I&I causing recurring system overflows. Services included flow monitoring (6 permanent meters/7temporary meters/2 rain gauges), manhole inspections (3,382), smoke testing (487,000 LF), dye testing (188 setups), and building inspections (3,992). Engineering analysis develop a prioritized plan for rehabilitation for each annual assessment program. Design and construction management services were provided for 34,000 LF of CIPP, rehabilitation of 780 manholes and 60 cleanouts, and installation of 753 T-lining laterals (mainline diameters ranging from 8- to 15-inches).

**Multi-Year SSES and Rehabilitation Program, Joliet, Illinois**—Sr. Project Manager. Multi-year I&I evaluation and rehabilitation program. Services included flow monitoring (106 temporary and permanent meters/9 CSO sites), I&I analysis to plan field inspections, manhole and storm inlet inspections (4,748), wet-weather investigations, smoke testing (957,366 LF), dye water testing (73 setups), CCTV video review (957,366 LF), hydraulic modeling, and building inspections (808). Rehabilitation design, to date, included point repairs (65), CIPP (56,000 LF), lateral grouting (1,000 LF), lateral lining (800 T-liners), and manhole/storm inlet rehabilitation (420).

**SSES and Rehabilitation Design, Schaumburg, Illinois**—Sr. Project Manager. Sanitary sewer evaluation study, rehabilitation design, and construction management services, including flow monitoring (9 meters), manhole inspections (260), smoke testing (59,000 LF), dye testing (16 setups) to verify connections, and review of CCTV video (59,000 LF), and engineering analysis to recommend I&I mitigation measures and structural repairs. Following design and construction observation was provided for manhole rehabilitation, CIPP lining, point repairs, and T-liner installation.

**Lift Station Evaluation, Utility Services of Illinois, Inc.**—Sr. Project Manager. Lift station assessments (21 lift stations) for six service companies involving a review of operations history, general functionality assessments, confined space entry and/or remote camera inspection of wet/dry wells, valve vaults, and downstream manholes, observation of pump operations, and fill-and-draw tests for each pumping configuration. Prioritized recommendations for rehabilitation were provided.

# Karen Rico, PE

*Project Manager*

rjngroup Engineering infrastructure for tomorrow

**Experience:** 10 years

### Education

BS—Civil Engineering/Mathematics (Southern Methodist University, 2012)

### Registrations

PE—Texas #124988

**Location:** Dallas, Texas

### Certifications

NASSCO PACP/MACP/LACP
U-217-07006961

OSHA 10-Hour Safety Certification
28-005643354

4-Hour Work Zone Traffic Control

Confined Space Entry and Rescue

First Aid, CPR, and AED (Defibrillator)

### Software

ArcGIS

AutoCAD

### Technical Presentations

"Bridging the Gap: Bringing Data Transparency in a Citywide Condition Assessment," 04/21/2022 - WEF Collection Systems Conference

"Maximizing the Return on a Sewer System Evaluation," 06/06/2019 - TPWA

"When the Rains Came: The Impact of Hurricane Harvey on a Wastewater Collection System," 04/04/2019 - Texas Water

Ms. Rico brings expertise with data analysis and management services to support collection system evaluation and improvement programs. She has been responsible for research and analysis related to design and I&I reduction programs requiring field visits for data confirmation, quality control of field and report data, and design and contract development documentation, as well as final client deliverables.

## RELATED PROJECT EXPERIENCE

**Western Branch Basin Sewer Study, WSSC, Maryland**—Project Engineer. Multi-phase sanitary sewer study to assess conditions, and characterize and quantify I&I in compliance with a consent decree. I&I analysis prioritized areas for condition inspections and developed baseline I&I quantification. Services included flow monitoring (43 meters/15 rain gauges), outlet and junction measurements (80), flow isolation measurements (1,500), NASSCO Level I and II manhole inspections (8,500), smoke testing (200,000 LF), dye testing to verify connections (50 setups), CCTV review for mainlines (1M LF) and private services laterals (250), and engineering analysis to develop remediation plans for I&I reduction and capacity upgrades.

**Walnut Basin SSES, Austin, Texas**—Senior Project Engineer. Sewer study to identify I&I sources and provide recommendations for mitigating excess I&I. Services included manhole inspections (802) using manhole scanners, smoke testing (230,550 LF), dye water flooding (20 setups), CCTV tape review (30,000 LF), and private service lateral investigations (98). Found defects were coded using standardized NASSCO PACP and MACP condition and criticality ratings, and analysis was performed to develop recommendations for rehabilitation.

**SECAP & Friars Creek Assessment, Temple, Texas**—Project Manager. Comprehensive, systemwide evaluation of the wastewater collection system to eliminate SSOs in compliance with an EPA administrative order. Services included flow monitoring (36 meters/8 rain gauges) and construction of a systemwide hydraulic model—2.3M LF of gravity sewer, 88,000 LF of force main, 29 lift stations, and 2 WWTPs—to evaluate capacity issues and prioritize basins for condition assessments based on I&I. Condition inspections for the highest priority area included manhole inspections (1,037), smoke testing (323,000 LF), CCTV review (105,000 LF), and dye water flooding (20 setups). Risk analysis was performed using findings to prioritize and recommend remediation measures.

**Sanitary Sewer Evaluation Survey Pilot Study, Houston, Texas**—Project Manager. Pilot sewer study to assess I&I sources. Tasks included smoke testing (80,089 LF), dyed water flooding (24 setups), manhole inspections (73), CCTV review (12,883 LF), data analysis, and public outreach. The studies identified 369 sources of inflow contributing 1.294 mgd (1-year/60-minute) and 197 sources of infiltration contributing approximately 0.058 mgd with recommendations for remediation.

**Wastewater Master Plan Update, Waco, Texas**—Project Manager. Review and evaluation of the 2015 wastewater master plan and hydraulic model. The hydraulic model was updated and expanded to a full system, all-pipe model (4,456,234 LF). Flow monitoring (3 meters/1 rain gauge) was conducted to calibrate the model. Recommendations to alleviate capacity deficiencies were evaluated and prioritized for the 2030 planning horizon.

# Rebecca Salazar, PE, AWAM

*Project Engineer*

**Experience:** 9 years

### Education

BS—Industrial Engineering (Texas Tech, 2013)

### Registrations

PE—Texas #131177

**Location:** Denver, Colorado

### Certifications

Associate Water Asset Manager (AWAM) 0215

NASSCO PACP/MACP/LACP U-316-07003378

OSHA 10-Hour Safety Certification OEC-14891520

4-Hour Work Zone Traffic Control

Confined Space Entry

First Aid, CPR, and AED (Defibrillator)

### Software

ArcGIS

InfoAsset Planner

InfoWorks

### Technical Presentations

"Delivering Actionable Asset Management Results with InfoAsset Planner," 06/22/2021 - Innovyze

"RJN Group Streamlines Processing of Inspection and Survey Data for Condition Assessments and Risk-Based Rehabilitation," 09/24/2019 - innovyze.com

Ms. Salazar brings experience with analyzing the performance of wastewater collection systems, assessing risks, and developing prioritized plans to restore and extend the service life of critical assets. Through flow analysis, condition assessments, and modeling, she delivers practical and incremental solutions, driven by detailed flow and asset evaluations.

## RELATED PROJECT EXPERIENCE

**SECAP & Friars Creek Assessment, Temple, Texas**—Project Engineer. Comprehensive, systemwide evaluation of the wastewater collection system to eliminate SSOs in compliance with an EPA administrative order. Services included flow monitoring (36 meters/8 rain gauges) and construction of a systemwide hydraulic model—2.3M LF of gravity sewer, 88,000 LF of force main, 29 lift stations, and 2 WWTPs—to evaluate capacity issues and prioritize basins for condition assessments based on I&I. Condition inspections for the highest priority area included manhole inspections (1,037), smoke testing (323,000 LF), CCTV review (105,000 LF), and dye water flooding (20 setups). Risk analysis was performed using findings to prioritize and recommend I&I remediation measures.

**Walnut Basin SSES, Austin, Texas**—Project Engineer. Sewer evaluation study to identify I&I sources and provide recommendations for mitigating excess I&I. Services included manhole inspections (802) using manhole scanners, smoke testing (230,550 LF), dye water flooding (20 setups), CCTV tape review (30,000 LF), and private service lateral investigations (98). Found defects were coded using standardized NASSCO PACP and MACP condition and criticality ratings, and analysis was performed to develop recommendations for rehabilitation and capacity improvements.

**Multi-Year Modeling, Asset Management, and I&I Mitigation Program, Richardson, Texas**—Lead Project Engineer. Condition assessment and risk analysis performed to support the City's ongoing CMOM program. Services included NASSCO PACP CCTV and multi-sensor review (550,000 LF), and NASSCO Level 2 manhole inspections using scanners (537). Risk analysis was performed to develop prioritized remediation recommendations and asset management decisions.

**Sanitary Sewer and Water Asset Risk Report Card, Lewisville, Texas**—Project Engineer. Risk assessment of sanitary sewer and water distribution system assets to develop a condition report card for each asset. Ongoing annual SSES programs provided the condition data to support the sanitary sewer system risk assessment. Existing GIS attribute data and record drawings were used to develop risk grades for water system assets. A workshop was held with City staff to establish meaningful likelihood and consequence of failure parameters for the risk assessment. The analysis produced a risk of failure rating for each asset, providing the City with a solid foundation for asset management, future maintenance needs, and capital planning.

**Preventive Maintenance Program, Houston, Texas**—Project Engineer. Preventive maintenance program using InfoAsset Planner for the annual analysis of approximately 4M to 5M LF of CCTV data. The program assigns routine cleaning cycles to each sewer line based on the amount of grease and debris identified from the pre-cleaning CCTV inspection data. InfoAsset Planner was leveraged to apply the City's criteria and assign the appropriate cleaning cycle. Decision tree logic used additional information from the City's GIS to target hot spot areas for the FOG outreach program.

# David Edgren, PE

*Project Engineer*

rjngroup Engineering infrastructure for tomorrow

**Experience:** 8 years

### Education

BA—Liberal Arts Engineering (Wheaton College, 2014)

BS—Civil/Environmental Engineering (Illinois Institute of Technology, 2014)

### Registrations

PE—Illinois #062070712, California #91216

**Location:** San Francisco, California

### Certifications

OSHA 10-Hour Safety Certification 28-004826023

4-Hour Work Zone Traffic Control

Confined Space Entry and Rescue

First Aid, CPR, and AED (Defibrillator)

### Software

PCSWMM

SewerGEMS

XPSWMM

### Technical Presentations

"Improving Model Hydrology Accuracy Using AMM," 03/02/2022 - International Conference on Water Management Modeling (ICWMM)

"Completing the Downtown Trunk Sewer: How Mapping and Modeling Helped the City of Joliet Find a Better Way to Meet Its Long Term Control Plan," 10/06/2021 - APWA Chicago Metro Southwest Chapter Meeting

Mr. Edgren offers a wide range of technical experience in collection system flow data analysis, lift station evaluations, I&I analysis, and hydraulic modeling. He has been involved in developing RJN's standardized practices for assessing the condition and operational performance for comprehensive lift station assessments. David's experience includes constructing and executing complex hydraulic modeling scenarios to guide large, multi-year capital improvement projects and conducting research in statistical measurement of the effectiveness of completed I&I rehabilitation measures through flow monitoring.

## RELATED PROJECT EXPERIENCE

**Multi-Year I&I Study and Rehabilitation, Elmhurst, Illinois**—Project Engineer. Multi-year sanitary sewer study and investigation to pinpoint the location and quantify the magnitude of public and private sector I&I defects. Services included smoke testing (137,530 LF, 726 defects), dye flooding and tracing (62 setups), and building inspections (540). Proactive public outreach programs were conducted to gain resident permissions for private source inspections. The analysis developed recommendations for rehabilitation and disconnections.

**Flow Monitoring and I&I Analysis, Glenbard Wastewater Authority, Illinois**—Project Engineer. Long-term flow monitoring program (16 meters/4 rain gauges) and I&I and billing analysis. Services included equipment management, data collection, and data and I&I analysis to support monthly jurisdictional billing, and construction and calibration of a system wide hydraulic model.

**CMOM Program Assistance, Yorkville-Bristol Sanitary District, Illinois**—Project Engineer. Multi-year program to support the CMOM goal to assess 10% of the system each year. Services included flow monitoring (4 permanent meters/6 temporary meters/3 rain gauges) to evaluate system flow performance and system I&I, and develop a prioritized plan for condition studies based on basin I&I contributions; hydraulic model construction and calibrations; GIS upgrade; interceptor manhole inspections (30); multi-sensor pipe inspection oversight and review (8,450 LF of 24- to 30-inch interceptor) to assess remaining useful life; and staff training on best practices for manhole inspections.

**Sewer Study and Lift Station Assessment Program, Wheeling, Illinois**—Project Engineer. SSES program conducted in compliance with the MWRD I&I program mandates involving manhole inspections (84), smoke testing (17,471 LF), dye testing to assess connectivity issues (5 setups), CCTV video review (18,100 LF), and condition assessment of eight duplex, submersible pump, lift stations. Lift station assessments included drawdown testing to evaluate pump and structural conditions. Improvement recommendations were developed for I&I mitigation and six of the eight lift stations.

**Multi-Year SSES & Rehabilitation Program, Year 1, Joliet, Illinois**—Senior Project Engineer. Multi-year program to inspect the collection system and develop recommendations for rehabilitation to eliminate sources of I&I. Services included flow monitoring (4 permanent meters/8 temporary meters), lift station drawdown analysis (3), hydraulic modeling, manhole inspections (808), smoke testing (180,312 LF), dye flooding, CCTV review (180,312 LF), and building inspections (484) to identify private I&I sources. Recommendations and followup rehabilitation design services were provided to mitigate I&I sources.

# Timothy Stuples

*Field Manager*

rjngroup Engineering infrastructure for tomorrow

**Experience:** 16 years

**Location:** Baltimore, Maryland

### Certifications

NASSCO PACP/MACP
U-508-6871

OSHA 10-Hour Safety Certification
26-702038120

4-Hour Work Zone Traffic Control

Confined Space Entry and Rescue

First Aid, CPR, and AED (Defibrillator)

Mr. Stuples has substantial experience providing a wide array of field inspection services to support wastewater collection system evaluations. He has managed field crews providing services for installation, maintenance and data collection for flow meters and rain gauges, manhole inspections, smoke testing, and dye water flooding. Tim has over 20,000 hours of experience managing and executing flow monitoring and condition field inspection studies.

## RELATED PROJECT EXPERIENCE

**Multi-Year Long-Term Flow Monitoring, WSSC Water, Maryland**—Senior Field Manager. Long-term flow monitoring services for a permanent flow monitoring network (207 flow meters, 14 meter vault devices, 20 rain gauges). Continuing maintenance services included equipment maintenance, and data collection, verification, and management, I&I analysis, and reporting. I&I analysis quantified I&I levels after specific rainfall events, evaluated causes of increasing flows at a WWTP, and assessed tidal impacts of groundwater levels.

**Sewer I/I Study, Phase 1A, Salisbury, Maryland**—Senior Field Manager. Comprehensive I/I program initiated by reviewing existing system data including prior study data, flow histories, GIS data and as-builts, and O&M histories to develop a study strategy. Flow monitoring (9 meters/90 days) captured system performance data for seven mini-basins and was used to perform I&I analysis to prioritize follow-up I&I source inspections. A phased plan for future condition inspections was developed for multi-phase sewer study of the entire system (171 miles of sewer) over multiple years based on capital budgeting.

**Western Branch Basin Sewer Study, WSSC Water, Maryland**—Senior Field Manager. Multi-phase study to quantify I&I and develop a mitigation program in compliance with a consent decree. I&I analysis developed baseline I&I levels and prioritized areas for condition inspections. Services included flow monitoring (43 meters/15 rain gauges), outlet and junction measurements (80), flow isolation measurements (1,500), NASSCO Level I and II manhole inspections (8,500), smoke testing (200,000 LF), dye testing to verify connections (50 setups), CCTV review for mainlines (1M LF) and private services laterals (250), and engineering analysis to develop remediation plans for I&I reduction and capacity upgrades.

**Dundalk Sanitary Sewer Study and Force Main Inspection, Baltimore, Maryland**—Senior Field Manager. Sanitary sewer system evaluation study required under the City's consent order involving I&I quantification and characterization for 185,000 LF and 850 manholes. I&I evaluation and I&I source investigation, pump station and force main inspection and characterization, hydraulic modeling, and a public education program were all components of the project. The assessment of the Dundalk Pump Station included inspecting 4,000 LF of 36-inch cast iron force main to identify leaks, estimate exfiltration quantities, and test pump and valve performance.

**Flow Monitoring Program, North Charleston Sewer District, South Carolina**—Senior Field Manager. Flow monitoring (4 meters/2 rain gauges) program to define I&I levels in the collection system. Services included site evaluation, equipment installation and maintenance, data collection, I&I analysis, and recommendations.

# Robert Mixter

*Field Manager*

**Experience:** 13 years

**Location:** Baltimore, Maryland

### Certifications

NASSCO PACP/MACP
U-310-10252

OSHA 10-Hour Safety Certification
26-702038119

4-Hour Work Zone Traffic Control

Certified Traffic Control Manager, Commonwealth of Virginia

Confined Space Entry

First Aid, CPR, and AED (Defibrillator)

Mr. Mixter brings extensive experience with field inspection services to assess the condition of municipal wastewater and stormwater assets. He has installed, maintained, and collected data for flow meters and rain gauges, manhole inspections, smoke testing, and dye water flooding, and assisted with CCTV inspections. Rob holds current OSHA compliant safety certifications for confined space entry and traffic control.

## RELATED PROJECT EXPERIENCE

**Dundalk Sanitary Sewer Study and Force Main Inspection, Baltimore, Maryland**—Field Manager. Sanitary sewer system evaluation study required under the City's consent order involving I&I quantification and characterization for 185,000 LF and 850 manholes. I&I evaluation and I&I source investigation, pump station and force main inspection and characterization, hydraulic modeling, and a public education program were all components of the project. The assessment of the Dundalk Pump Station included assessing 4,000 LF of 36-inch cast iron force main to identify leaks, estimate exfiltration quantities, and test pump and valve performance.

**Countywide Force Main Inspection, Baltimore County, Maryland**—Field Manager. Multi-year program to evaluate and conduct condition assessments of force mains. Services included collecting historical and institutional data; performing field investigations that include walking the line, transition manhole inspections, valve inspections, and pressure monitoring; executing criticality/consequence of failure reviews; developing a report of findings; and making recommendations for further inspections including soil testing and MSI inspections. More than 138,647 LF of 4- to 24-inch ductile and cast iron force main, and 75,360 LF of 16- to 42-inch PCCP force main have been inspected over a five-year period.

**Long-Term Flow Monitoring (No. 1263), Baltimore, Maryland**—Field Manager. Flow and rainfall monitoring, flume evaluation, and SSO monitoring program conducted in multiple sewersheds over a three-year period. Flume evaluation (28) involved meters mirroring the existing flumes (18), meters installed in unmonitored areas (10), and rain gauges (9). SSO monitoring was performed for 12 SSO sites to report overflow conditions. A temporary metering program and I&I analysis was conducted to evaluate completed rehabilitation (5 to 30 meters/6 to 12 month periods).

**Multi-Year Long-Term Flow Monitoring, WSSC Water, Maryland**—Field Manager. Long-term flow monitoring services for a permanent flow monitoring network (207 flow meters, 14 meter vault devices, 20 rain gauges). Continuing maintenance services included equipment maintenance, and data collection, verification, and management, I&I analysis, and reporting. I&I analysis quantified I&I levels after specific rainfall events, evaluated causes of increasing flows at a WWTP, and assessed tidal impacts of groundwater levels.

**Trunk Sewer Inspection and Survey Program, WSSC Water, Maryland**—Field Manager. Survey and condition inspection services for all trunk sewers greater than 14 inches in diameter and in-line manholes (10,750 manholes/480 miles of pipe). Pipeline facilities were located at multiple sites throughout the 625-mile trunk sewer system, including wooded rights-of-way and along or crossing streams.

# Carlos Espinosa, PE
## SENIOR PROJECT ENGINEER

MCKIM & CREED

## KEY QUALIFICATIONS

- ✓ Infrastructure Renewal and Replacement
- ✓ Asset Management
- ✓ SSES
- ✓ Consent Order Compliance

## EDUCATION

B.S., Mechanical Engineering, Johns Hopkins University

B.S., Engineering, United States Naval Academy, Annapolis, MD

## LICENSURE

Professional Engineer, MD, VA, DE

## LOCATION

Boca Raton, Florida

Mr. Espinosa has 40 years of experience in the design, operation, maintenance, and evaluation of water, wastewater, and stormwater systems. This experience includes working for the Anne Arundel County, MD Department of Utilities as Utility Operations Engineer and Water Operations Superintendent, as well as extensive SSES and R&R experience. He served as Chief of Engineering and Planning for the Harford County, MD DPW – Water and Sewer Division. In that capacity, he was responsible for the execution of the Capital Projects, Master Plan Updates, Developer Services, and Water and Sewer Petitions. Mr. Espinosa served as Chief, Office of Asset Management (OAM) for the Baltimore City Department of Public Works. The OAM is responsible for optimizing the service life of the water, sewer, and stormwater infrastructure through the development and implementation of proactive inspection and preventative maintenance programs. Mr. Espinosa brings this extensive experience and his unique perspectives to infrastructure assessments and SSES work.

## SELECT PROJECT EXPERIENCE

**Comprehensive Flow Monitoring | Baltimore City, MD, Department of Public Works**
The 2002 Consent Decree issued by the Department of Justice required the City of Baltimore to implement a Comprehensive Flow Monitoring Program in the collection system. Mr. Espinosa managed the program from conception to completion as member of the Consent Decree Program Management Team. As Project Manager, Mr. Espinosa was responsible selecting all metering locations, managing the three firms selected by Baltimore to perform the work, developing data collection protocols using the Trimble Enterprise Platform, developing guidelines for the various Consultants for how to analyze the data, and ensuring data quality through various data validation tools. At the peak of the program, over 400 meters of various types were installed, collecting data and communicating wirelessly for over a year. The data generated by the program was used to calibrate the collection system hydraulic model.

**Department of Public Works | Baltimore City, MD**
For 12 years Mr. Espinosa served as Lead Project Manager, Deputy Program Manager, and Program Manager for the Baltimore City Wet Weather Consent Decree (CD), responsible for providing engineering and technical support to the Department of Public Works. The scope of services included technical engineering support and program management services to meet the requirements of a CD issued by the U.S. Environmental Protection Agency (EPA) and the Maryland Department of the Environment (MDE). The CD seeks improvements to Baltimore's wastewater collection system, and addresses problems that contribute to sanitary sewer overflows (SSOs). Requirements of the CD include implementation of capital projects to eliminate known SSOs, evaluations of the collection systems to identify sources of infiltration and inflow (I/I) and deficiencies, identification and implementation of additional projects to reduce I/I and correct deficiencies, and implementation of asset management and preventive maintenance programs to improve the operation and maintenance of the collection system. Furthermore, the CD required developing and calibrating a hydraulic model of the entire collection system in the City.

**Inflow & Infiltration Study | City of Norfolk, VA**
Project Manager responsible for the complete execution of the project. The scope of the project included flow monitoring, smoke testing, manhole inspections, and other inspection services. The project presented a number of challenges caused by the presence of numerous Pumping Stations and flat sewer lines with significant debris.

**Comprehensive CSO Flow Monitoring Program | Department of Public Works | New Castle County, DE**
Project Manager. The project consisted of installing and maintaining flow meters at various CSO structures, and analyzing and reporting flow data. The data was used by the client to determine base and I/I flows in order to design CSO separation projects. The scope of work required prompt response to address and repair equipment malfunctions.

# Derek Holderman
## OPERATIONS SPECIALIST

MCKIM & CREED

## KEY QUALIFICATIONS

- ✓ Sewer Modeling Rehabilitation & Replacement
- ✓ SSES
- ✓ Asset Management

## EDUCATION

B.S., Organizational Leadership & Learning, University of Louisville

## CERTIFICATIONS

PACP #U-0618-0703002134

MACP #U-0618-0703002134

## LOCATION

Boca Raton, Florida

Mr. Holderman began his career in the underground utilities market in 2008. He has successfully led and managed projects and operations across the United Sates with a focus on the assessment, data collection, and rehabilitation of water, wastewater, stormwater, and natural gas distribution systems. These projects included flow monitoring, smoke testing, manhole inspections, cross bore investigation, leak detection, CIPP, pipe bursting, manhole rehabilitation, and trenchless lateral rehabilitation. Derek has also worked on development teams to create proprietary software and applications to enhance field data collections and delivery to internal and external clients. With his wide variety of experience, Derek is familiar with the various equipment, software, and techniques available within the industry which will help to ensure the unique challenges faced are being met with an appropriate solution.

## SELECT PROJECT EXPERIENCE

**HRSD I/I and SSES Assessment at Fort Eustis, American States Utility Services, Inc. (ASUS), Ft Eustis, VA**
Project Manager. McKim & Creed performed a sanitary sewer evaluation survey of the Post's 171,000 LF of gravity sewers, 13 lift/pump stations, 15 miles of sanitary force mains and 980 manholes as part of a Consent Decree agreement with the Virginia Department of Environmental Quality.

**Hurricane Hermine Sanitary Sewer Collection System Engineering Evaluations, City of Largo, FL**
Project Manager. McKim & Creed performed assessments of the City of Largo's sanitary sewer system to evaluate the impact on the system of Hurricane Hermine, and establish and implement a plan to prevent sanitary system overflows (SSOs) from occurring during future wet seasons. Tasks included hydraulic modeling, flow and rainfall monitoring, smoke testing, manhole inspections, CCTV inspections, I/I quantification and abatement, dry and wet weather calibration of the City's InfoWorks model, alternative software evaluation, and identification of system defects and hydraulic deficiencies with recommendations for improvements.

**Falkenburg Sewer Service Area I&I Abatement Phase I | Hillsborough County, FL**
Operations Manager. McKim & Creed is providing sanitary sewer evaluation services to Hillsborough County Public Utilities to investigate and resolve inflow and infiltration into the County's Falkenburg basin area wastewater collection system. The project entails mapping of the services area that includes 162 pump stations that pump into the Falkenburg AWTF. The work is being conducted in two phases. Phase 1 consists of flow and rainfall monitoring and analysis; and phase 2 consists of smoke/dye testing, closed-circuit television (CCTV) inspection, manhole inspections and night flow isolations to identify storm water inflow and groundwater infiltration sources.

**North County Flow Monitoring Study | Pinellas County, Clearwater, FL**
Operations Manager. McKim & Creed developed a flow monitoring plan to define and differentiate eleven (11) sewer zones within the North County Wastewater Collection System. Each zone was divided into approximately nine (9) flow monitoring sub-basins for the purpose of recording and reporting wastewater flows. Our team is currently collecting data using a combination of 40 open channel flow meters and pump run times; plus 10 rain gauges and 10 groundwater monitoring wells dispersed throughout the service area. Data collected will be used to prepare a Sewer Flow Monitoring Study Report which will document the infiltration & inflow characterization and sewer zone prioritization analysis along with recommendations for further investigation and system improvements within each sewer zone and the North County Wastewater Collection System as a whole.

# Gabriel Stewart
## PROJECT ANALYST

MCKIM & CREED

## KEY QUALIFICATIONS

- ✓ Data Analytics
- ✓ GIS
- ✓ Asset Management

## LOCATION

Boca Raton, Florida

Mr. Stewart has served as a Project Manager, Data Analyst Manager, or Data Analyst on hundreds of projects involving sanitary sewer, storm water, water distribution, and natural gas infrastructure. He joined McKim & Creed in October of 2021 as the Wet Weather Program Data Manager. He has focused his efforts on producing excellent engineering data products related to CCTV, Flow Monitoring, Smoke Testing, Manhole Inspections, Sewer Cross Bore Location, and Night Flow Isolation. Mr. Stewart's expertise with GPS and GIS technology helped empower previous employers to integrate these technologies into everyday work flows and final reports.

## SELECT PROJECT EXPERIENCE

**Hurricane Hermine Sanitary Sewer Collection System Engineering Evaluations, City of Largo, FL**
Data Analyst. McKim & Creed performed assessments of the City of Largo's sanitary sewer system to evaluate the impact on the system of Hurricane Hermine, and establish and implement a plan to prevent sanitary system overflows (SSOs) from occurring during future wet seasons. Tasks included hydraulic modeling, flow and rainfall monitoring, smoke testing, manhole inspections, CCTV inspections, I/I quantification and abatement, dry and wet weather calibration of the City's InfoWorks model, alternative software evaluation, and identification of system defects and hydraulic deficiencies with recommendations for improvements.

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## SECTION 4

# APPROACH TO SCOPE OF WORK

## UNDERSTANDING

The City of Hollywood is looking to hire a qualified consultant to assist the City with developing a comprehensive 5-year Inflow & Infiltration (I&I) program that will completed in two phases: **Phase 1 - I&I Quantification** and **Phase 2 - I&I Source Investigation, Repair and Rehabilitation**. Phase 1 will involve flow monitoring and I&I analysis. Analysis will be used to build a phased plan for Phase 2 investigations, design, and installation. The timeline for Phase 1 is estimated to be 7 months and Phase 2 up to 4 years depending on the scope of work proposed as a results of Phase 1.

> The long-term program goal is to develop an I&I program strategy and train City staff so the program can managed and conducted by City staff.

### ADDRESS CITY'S VULNERABILITY TO CLIMATE CHANGES

RJN will design the I&I program and data collection activities accounting for the City's unique coastal location, providing solutions for tracking and minimizing impacts of climate change and the rise in sea levels while ensuring healthy sewer system services for the Hollywood community.

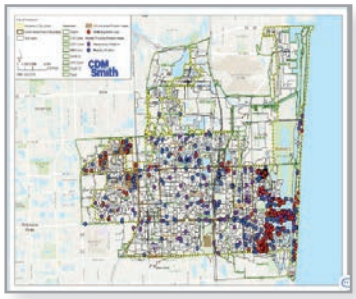
The City is located in one of the most vulnerable geographic locations in the world with respect to sea level rise and storm surge, and has been proactive in researching and understanding how climate change, resulting sea level rise, storm surges, and extreme wet weather events could impact City infrastructure and services. (CM-18-013 Citywide Vulnerability Assessment and Adoption Plan, 2020, Hazen).

RJN will structure the I&I program to address resiliency through careful planning for each phase. We know that the effectiveness of the program relies on flow data that accurately provides a clear picture of system performance during dry and wet-weather events.

Flow analysis results will focus the program where I&I is an issue and will efficiently target I&I source detection and resulting repair and rehabilitation measures. Reducing I&I (stormwater and groundwater) entering the sanitary sewer system will ensure pipes can carry sewage design capacity, minimizing the potential for overflows and reducing the need for capital projects to increase capacity.

We will leverage information from the City's Stormwater Master Plan and Vulnerability Plan when selecting and investigating metering sites.

For example: the map developed for the Master Plan illustrating flood complaints highlights areas that will be closely studied during the flow and rainfall analysis setup phase.



## TECHNICAL APPROACH

RJN has worked with municipalities and utilities across the country providing a full complement of flow monitoring, condition field investigation, and engineering analysis services.

> Our I&I reduction programs focus on understanding where I&I sources exist and how to effectively mitigate them to restore capacity to the collection system, factoring long-term needs and minimizing the potential for overflows.

- RJN will lead flow monitoring, condition field inspections and engineering analysis to produce actionable, and cost-sensitive programs to repair, rehabilitate, or replace I&I sources.
- Our teaming partner, McKim & Creed will work closely with our engineering team performing lift station performance assessments, and providing technical advice, and field and design support.

# VISION, IDEAS, AND METHODOLOGY

## RJN PROGRAM VISION

- Work closely with the City throughout program development and execution
- Provide City access to data and analytical tools as the data is being collected
- Conduct Phase 1 flow, rainfall, and groundwater monitoring
- Perform RDII analysis to understand I&I in the system incorporating lift station performance
- Develop a staged approach for Phase 2 I&I condition inspections starting with the areas with the highest I&I levels
- Recommend and design repair and rehabilitation measures prioritized by severity and risk

## PROJECT DETAILS AVAILABLE 24/7

**RJN project activities will be fully transparent.** All flow and field data will be available to City staff throughout the project as the data is collected and quality checked.

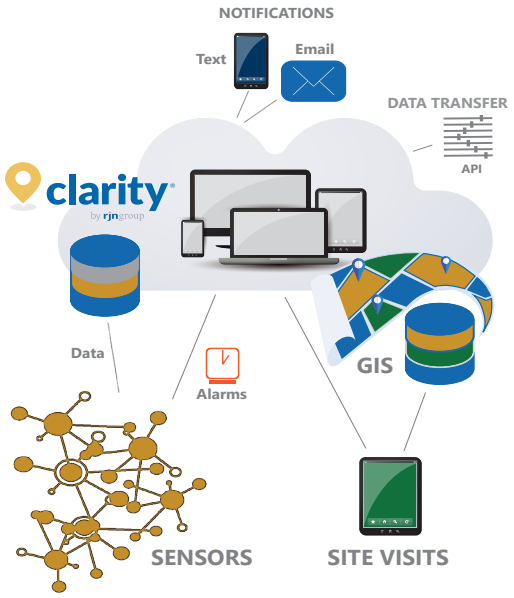
Our internally-developed data management platform, the **Clarity® Data Management Hub (Clarity),** facilitates and streamlines review of the large volumes of flow monitoring and I&I investigation data generated by I&I studies. It is a single-source, project life cycle tool designed to store data, view data, and analyze data.

City staff will have 24/7 access to project data and details using secure, password-protected user logon credentials via standard Internet browsers.

## KEY CLARITY® APPLICATION ELEMENTS

- MS SQL database platform
- Data editing and analysis tools
- Computed measurements
- GIS interface
- Customizable alarm and alert management
- Comprehensive maintenance logging/audit trail
- Secure web-based user access

Clarity communicates with flow monitoring equipment—flow meters, PRVs, rain gauges, groundwater gauges, surcharge gauges, lift stations, pump stations, and pressure sensors—via wireless telemetry, and digital data collectors via cellular communications.



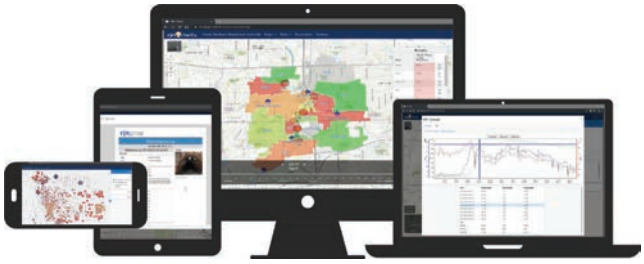

GPS coordinates are captured at each metering site and inspection site and data is seamlessly integrated with GIS layers, providing an intuitive, map-based data management and analysis tool.

| Key Clarity® Features | |
|---|---|
| ☒ | Customizable dashboards provide a concise summary and overview of key project activities. |
| ☒ | Data is available in near real-time (determined by upload schedules). |
| ☒ | City GIS layers can be integrated and exported. |
| ☒ | Metering and condition inspection sites can be quickly located in map views with filters that can focus on trends and performance issues. |
| ☒ | Live, animated I&I analysis tools visually show the impacts of storm events over any specified time and storm event. |
| ☒ | Customizable hydrographs and scattergraphs can be created on-demand and saved with a menu of options. |
| ☒ | Graphic templates can be developed and saved for monthly reporting or regular-cycle reporting. |
| ☒ | Hydrographs, scattergraphs, maintenance records, in situ calibrations, I&I inspection site details, and reports can be exported in multiple formats (.pdf, .jpg, .xlsx). |

| | |
|---|---|
| ☒ | Maintenance logs and work order details/status are available by site. |
| ☒ | The work order function tracks and monitors preventive and corrective flow monitoring maintenance activities. |
| ☒ | The Equipment and Parts Inventory Manager integrates with work orders and provides a comprehensive service and installation history for each meter, gauge, and sensor. |

**Flow Monitoring Data Tools.** Project information is clearly organized and provided with complete transparency, including historical and real-time data from each site, on-demand graphical tools, site reports, and documents. Meter and gauge site information and alarm notifications are displayed geo-spatially. All project reports and documentation, i.e., site sheets, on-demand hydrographs and scattergraphs, trending data, maintenance logs, calibration logs, and other general site documentation, can be quickly accessed by viewing the map and clicking on the site, or using customizable dashboards.

**I&I Source Detection Data Tools.** Project information is clearly organized by inspection site or I&I source site. Manhole inspection, smoke testing, dye testing, CCTV, and lift station inspection results are quickly accessible using color-coded thematic maps including photos, estimated I&I quantification rates, and defect locations. Heat maps and trending tools illustrate where trends and hot spots exist.



**System Setup and User Training.** Clarity requires minimal configuration for use. We will identify City users, permissions, and access levels at project kick-off. Secure user name and password logon credentials will be established for City staff with logon access controls to view and download data and project logs, use analytical tools, and access document libraries.

User training can be done in person or via webinars or zoom calls.

## PHASE 1 FLOW MONITORING

The first phase of the program will involve installing a flow metering network, capturing flow data for at least 120 days, and conducting flow and rainfall-derived I&I (RDII) analysis to develop a staged, prioritized plan for Phase 2 I&I source investigations..

### PROJECT INITIATION/PLANNING

At project initiation, a kick-off meeting will be held to:

- Introduce the team
- Discuss and finalize project details, objectives, timelines, and deliverables
- Understand proposed site details and acquire information and institutional knowledge from City staff and any designated stakeholders
- Identify available historical system data and reports (i.e., stormwater master plan, vulnerability assessment, etc.)
- Establish project communication protocols

When performing flow monitoring and I&I analyses, we generally use a sub-basin approach where the system is divided into meter basins of approximately 15,000 – 40,000 LF of sewer. We have found best practices for basin delineation include establishing:

- **Discrete Basins:** Results will be most effective when working with discrete basins whenever possible – fewer basins with other upstream basins
- **Consistency within Basins:** Keeping residential, commercial, industrial users/areas in separate basins when possible
- **Expected Hydraulics:** Select locations with favorable hydraulics, i.e., avoiding pipe diameter changes, bends, etc. Installing meters in the upstream pipe in a manhole is preferred.
- **Known Problem Areas:** Focus data collection on areas with known performance issues (i.e., reported overflows, recurring repair history). City staff knowledge will be critical to identifying these areas.

Discussing the City's proposed basin delineation and proposed sites, and acquiring all existing information about these sites will be a key focus of the meeting.

We will also assess the City's current pump station monitoring schema to incorporate existing pump station monitoring methods and practices into the monitoring plan. We will offer recommendations for the long-term monitoring plan that the City can self-implement and continue after this project's Phase 1 activities.

## SITE INVESTIGATIONS

RJN engineers will review all site information provided by the City, and will visit each proposed meter and rain gauge site to:

- Confirm accessibility and determine special access needs
- Identify safety measures including traffic control
- Capture manhole and pipe measurements
- Collect in situ hydraulic measurements
- Verify the accuracy of existing system maps

If manhole descent is required to collect information, field crews will adhere to OSHA confined space entry procedures.

The proposed site, and the upstream and downstream manholes, will be investigated to ensure the best locations are recommended for monitoring.

| Site Investigation Check List | |
|---|---|
| ☒ | Site safety and accessibility |
| ☒ | Site hydraulics: in situ depth and velocity ranges |
| ☒ | Manhole chamber configuration |
| ☒ | Pipe-to-manhole transition |
| ☒ | Pipe dimensions |
| ☒ | Silt and debris levels |
| ☒ | Wireless signal strength |
| ☒ | Evidence of surcharging |

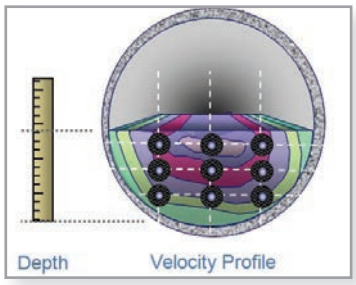
**Groundwater gauge site selection** will be coordinated with flow meter and rain gauge locations based on the overall topography considerations and City-identified problem areas. Where feasible, groundwater gauge sites will be co-located with flow metering equipment at pump station influent pipes so that groundwater levels and monitored flows can be correlated.

**Redundancy.** The site investigations will assess and plan for the installation of redundant depth sensors using in-pipe pressure sensors and ultrasonic measurement capabilities.

**Equipment Selection.** All information collected during the site investigations will be used to select the optimal equipment for each site based on the site hydraulics. We have sufficient equipment available to meet City needs, whether installing in deep manholes or sites requiring unique configurations.

### In Situ Manual Confirmation Measurements

Manual (in situ) depth and velocity confirmations will be taken during site investigations, equipment installation, preventive maintenance site visits, and corrective maintenance site visits when equipment setups have been adjusted or replaced.




These measurements are used to confirm the accuracy of equipment readings for area-velocity meters and level-only meters. Since silt and debris impacts the pipe depth and area when calculating flow rates, silt/debris buildup is also measured.

**Depth.** Measuring depth of flow (coverage in the area) is critical to the accuracy of flow data. The area of a pipe is deduced from the measurements taken during the initial site investigations.

**Velocity Profiles.** A velocity profile is obtained by measuring the instantaneous velocity at pre-defined depths using portable velocity probes; measurements are integrated to derive an average for comparison to the meters' calculated average velocity.

**Silt Levels.** Varying silt levels impact the cross-sectional area of a pipe, which is used to calculate the flow rate. Silt levels will be recorded during each confirmation and a Silt Topo will be generated. The Silt Topo is a grid of measurements between the upstream measured cross-section through the manhole. If a site shows extensive silt deposits, it will be documented on the site sheet and the City staff and designated stakeholders will be notified.

In situ confirmations are recorded, stored for use in hydrograph and scattergraph analysis, and documented in the site's confirmation log available in Clarity.

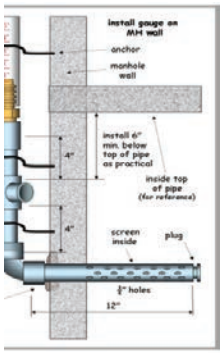
Site reports and site recommendations for flow meters, rain gauges, and groundwater gauges will be submitted to the City for approval prior to installing any equipment.

## EQUIPMENT INSTALLATION

Once sites are approved by the City, experienced and safety-certified RJN field professionals will install the flow meters, rain gauges, and groundwater gauges at the approved sites, adhering to manufacturer's recommendations.

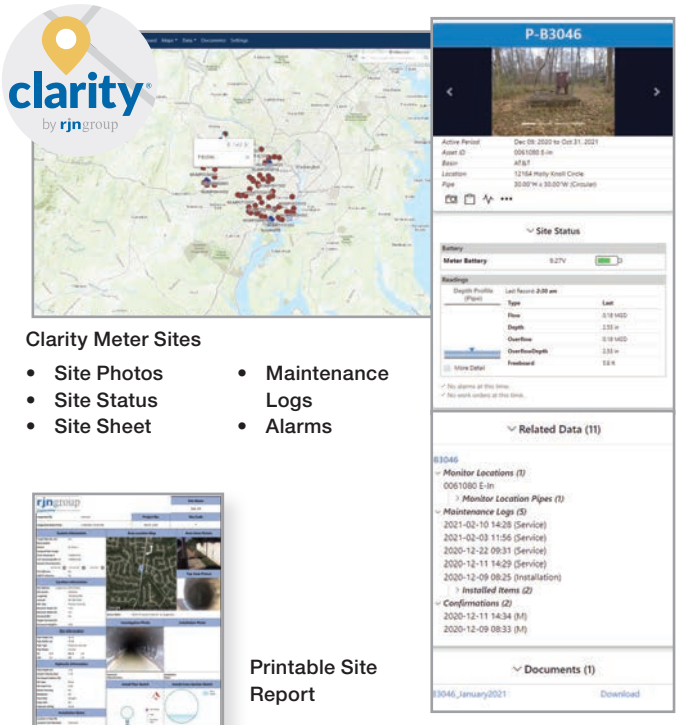
The site report, managed in Clarity, will be updated with installation details, photos of the installation including redundant sensors, and in-situ calibration measurements.

**Groundwater gauges** will consist of a conduit, typically a clear flexible tube, that accommodates a calibrated pressure sensor. They will be connected through the manhole wall (as shown) with a fine mesh to let groundwater through but keep dirt and debris from clogging the pipe. The connections with be sealed with a water-tight silicon caulking. The pressure sensor will be calibrated prior to installation and will communicate using wireless telemetry.




| Installation Check List | |
|---|---|
| ☒ | Flow meters mounted inside the manhole |
| ☒ | Tipping bucket rain gauges use specially constructed mounting configurations for leveling and to minimize dislocation or tipping during wet-weather events |
| ☒ | Smaller pipe installations: sensors installed on a thin metal band |
| ☒ | Large pipe (> 42 inches) and non-circular installations: sensors installed on a flange or partial band |
| ☒ | Cabling securely fastened to the structure wall |
| ☒ | Sensors and monitoring equipment positioned to account for debris and silt (as necessary) |
| ☒ | Water-tight logger: positioned at the top of the manhole to minimize the potential for damage if surcharging occurs |
| ☒ | Wireless telemetry operational strength is good |
| ☒ | Evidence of surcharging documented |

Prior to leaving the site, equipment will be configured and activated. All equipment will undergo a series of diagnostic tests to validate and ensure that equipment is fully operational.




Clarity Meter Sites

- Site Photos
- Site Status
- Site Sheet
- Maintenance Logs
- Alarms



Printable Site Report

### Site Documentation

GPS coordinates and photos will document the site location and conditions, downlooking photos showing the invert and flow direction (north orientation), and all pipe connections. Concerns about hydraulic suitability will be noted with the site recommendations. **Site investigation reports, managed in Clarity, will serve as the site record.**

## COMMUNICATION THROUGH TELEMETRY

**All flow meters, rain gauges, and groundwater gauges will be installed with wireless telemetry** to facilitate communications with the Clarity Data Management Hub and provide real time monitoring.

**Alerts and alarms** will be programmed for each site (flow meters and rain gauges) to monitor data collection, battery levels, flow levels, communications, etc. When alert/alarm conditions are detected, notifications will be sent immediately for review through telemetry to the project data analysts and the RJN Data Group, our team of centralized data analysts.

> Alerts and alarms serve as the foundation for RJN's day-to-day QA/QC processing and corrective maintenance practices, both are monitored and tracked by our data analyst corp.

### Data Transmission

Depth and velocity data will be transmitted through telemetry to the Clarity Data Management Hub and available for on demand download. The data transmission will upload the following information during each transmission.

- Collection status
- Collection date and time
- Monitor status
- Battery strength
- Percent good data

As a standard practice, we will capture meter and rain gauge depth and velocity readings at 5-minute intervals, but this interval can be adjusted to meet other City requirements.

Groundwater levels from the groundwater gauges will be measured and recorded at a minimum once per hour. Gauges will measure the water level above the invert of the effluent pipe. The monitored groundwater level will be used to establish the length of gravity main below recorded groundwater elevations based on manhole rim and pipe invert elevations obtained from the City at the beginning of the project.

Each flow meter will be associated with a rain gauge so that flow patterns at each site can be visually reviewed relative to the rain data during rainfall events using customizable Clarity hydrographs, scattergraphs, and RDII analysis tools.

## NETWORK MONITORING PROCESSES

Monitoring network operations and maintenance (O&M) activities will be performed during the settling in period and throughout the monitoring period. O&M monitoring involves:

- Programmed alert and alarm notifications to identify equipment and data conditions
- Data interrogation for consistency using sophisticated artificial intelligence (AI) tools as the data is uploaded to Clarity
- Scheduled preventive maintenance visits
- Timely corrective maintenance to resolve issues identified through the data reviews and alert/alarm notifications
- Weekly data QA/QC

Data will be reviewed by the RJN data analyst team when alert/alarm notifications are received, and weekly, at a minimum, to perform quality checks and look for trace consistency, data drops, and anomalies.

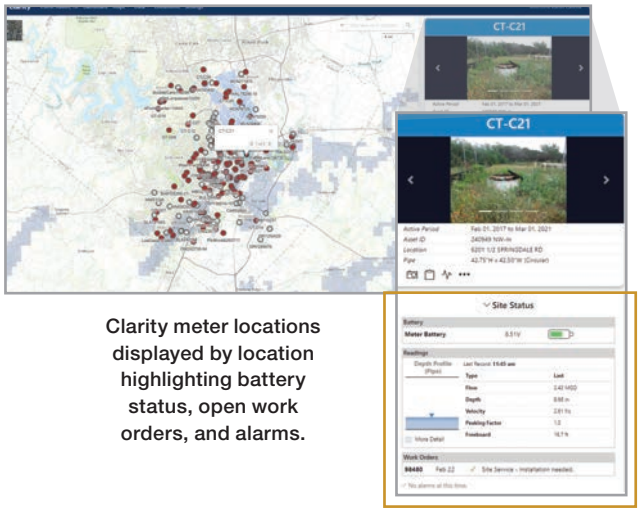
### Standard Alerts/Alarms

At installation, a series of **alerts and alarms** will be programmed to monitor equipment performance and data collection. Auto-notifications are issued to the data analysts, providing the drivers for corrective maintenance activities.

## Standard Alarm Alert Conditions

- **Battery Voltages**—voltages are below minimum thresholds
- **Battery Drop**—last seven days of battery voltages to evaluate drawdown
- **Daily Collection Log**—successful acquisition of full data sets during data transmission
- **Sensor Surveillance**—if depth fails to record during the server call or if the depth reading is flat lined or < 0
- **Communications**—frequency and call duration with Clarity
- **Surcharge Conditions**—exceeds expected depth ranges

The Clarity alert and alarm function is highly customizable. At sites with unique or recurring conditions, additional alarms and notifications can be added, including varying level alerts for level monitors.



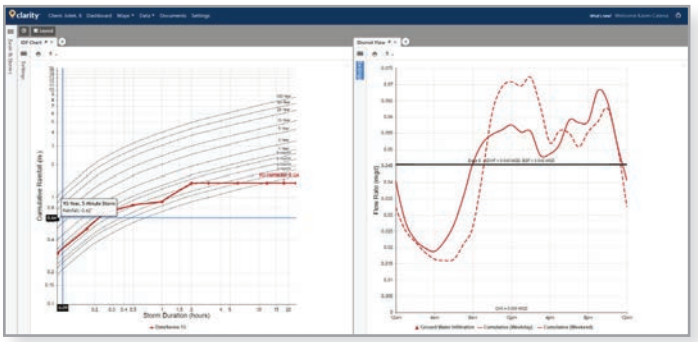

Clarity meter locations displayed by location highlighting battery status, open work orders, and alarms.

Alarm notifications are viewable via Clarity dashboards, and are managed by site, providing an audit trail of alarm conditions. Alarm notifications can also be sent directly to select City staff or designated stakeholders via email or text.


Clarity meter status details with alarm conditions

**Settling-In Period.** During the settling-in period, all equipment will be closely monitored to ensure alerts and alarms are operating as programmed. At least one preventative site visit will be scheduled to obtain in situ calibration measurements, and validate equipment configurations and setups are stable.

During the settling in period, a diurnal pattern can be established for each site and used as a foundation for flow analysis.



Clarity RDII Analysis dashboard

Clarity RDII analytics will be used to monitor I&I levels throughout the project including the impacts of backflow conditions in the system. These tools produce preliminary I&I analyses to assess peaking factors, timelines, rainfall hyetographs, diurnal flow patterns, and other insightful flow analytics information.

## EQUIPMENT O&M PROCESSES

RJN flow meter and rain gauge network management processes address two types of maintenance:

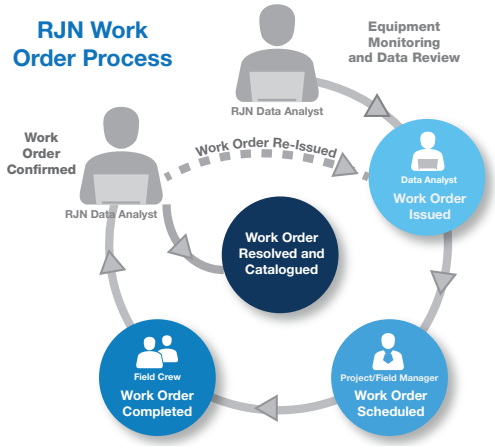
- Planned or preventive maintenance
- Corrective maintenance for operational issues identified through equipment and data monitoring

**Clarity Data Management Hub**
Work Orders

| Preventive Maintenance | Corrective Maintenance |
|---|---|
| • In Situ Calibrations<br>• Battery Swaps<br>• Sensor Cleaning<br>• Equipment Inspections | • Battery or Equipment Failure<br>• Communication Failure<br>• Data Anomalies |

RJN manages all maintenance schedules using the Clarity work order feature. After the settling-in period:

- A **preventive maintenance cycle** will be established for each meter and scheduled using work orders for varying times to capture and confirm the diurnal patterns for each site
- As issues are identified through our stringent equipment and data monitoring process, the **corrective maintenance** work orders will be generated




The RJN Data Group, led by Elizabeth Aguin, PE, will continually monitor equipment and verify data quality. They will:

- Receive all programmed alert and alarm notifications
- Review data upload verifications generated by artificial intelligence (AI) routines to identify trends
- Review data to identify bottlenecks, surcharging, and data anomalies
- Manage and monitor maintenance work orders and follow-up activity

Routine data verifications using hydrographs and scattergraphs will quickly identify unique hydraulic conditions, bottlenecks, surcharging, overflows, data trends, or down turns in data continuity and corrective actions will be scheduled to rectify the problem.

Data analysts also actively monitor wet-weather events and elevate equipment monitoring to entire system checks when significant wet-weather events are forecast.

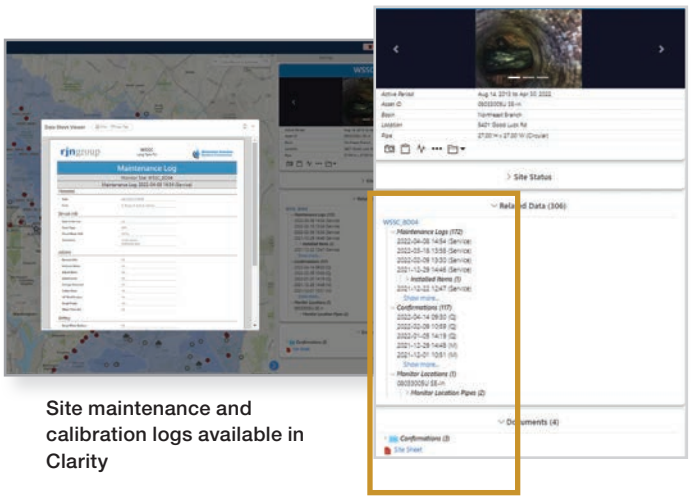
When the data analysts detect equipment or telemetry issues, data anomalies, or wet-weather events, corrective maintenance work orders will be issued and field service crews will be mobilized within 48 hours to fix the issue.

**Maintenance Work Order Process.** Work orders are generated for every maintenance visit to track, monitor, and document maintenance actions. The work order function also interfaces with the Clarity equipment inventory system, providing a complete audit trail for each installed meter and gauge and each location.

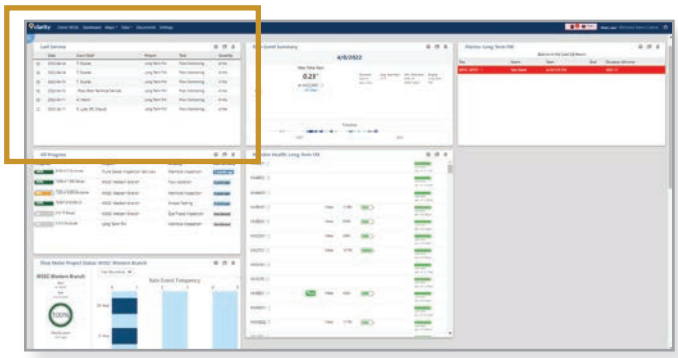
### Work Order Process

- Data analysts review alert/alarm notifications, hydrographs, and scattergraphs to assess equipment and data reliability.
- Work order is created when issues are identified.
- Project managers/field managers review issued work orders and use the Clarity scheduling tools to dispatch field crews.
- Field crews receive a prioritized schedule of work orders and visit sites (identified with GPS coordinates) to resolve issues.
- Work order maintenance logs document maintenance activities and in situ confirmations.

Maintenance logs will be posted in Clarity for each site with summary activities available in the dashboard.



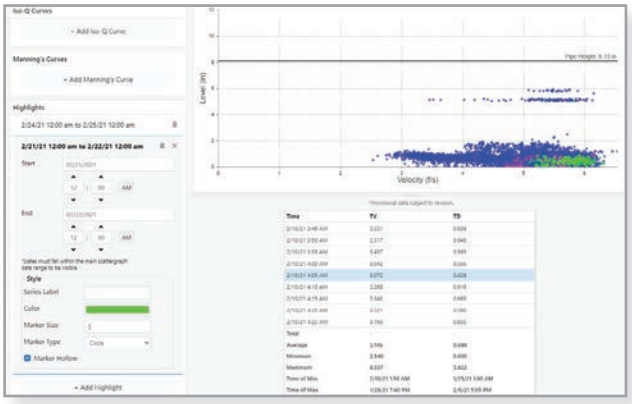
Site maintenance and calibration logs available in Clarity



Maintenance posted in the Clarity dashboard

## DATA QUALITY MONITORING

Scattergraphs showing depth vs. velocity will be reviewed to check for distinctive patterns or trends that indicate data quality issues.



Clarity Scattergraph Features

- Color coding by period
- Manning's curve overlay
- ISO-Q overlay
- Export data and graphs
- Calibration point plotting
- Custom report attributes can be saved as a template

Using hydrographs, specific attention will focus on detecting **sensor drift** so that it can be found early and corrected. Where sensor drift is suspected, corrective maintenance work orders will be generated.

Use of redundant ultrasonic and pressure depth sensors can minimize the potential for sensor drift affecting finalized data.

Clarity Hydrograph Features

- Color coding data type
- Variable time frames
- Export data and graphs
- Calibration point plotting
- Custom report attributes saved as a template.

## MAINTENANCE VISITS

RJN field crews dispatched to a site for maintenance will be outfitted with sufficient equipment, spare parts, and tools to perform in situ diagnostics and correct issues.

- **In situ calibrations** will be captured during every site visit where hydraulic conditions are modified or equipment is adjusted.
- Field crews will be in contact with a data analyst to check communications and data transfers before leaving the site.

All maintenance actions performed on site, including equipment adjustments and in situ calibration measurements, will be recorded in the work order maintenance log and managed in Clarity. This will give the City full accountability and track-ability throughout the project.

Any maintenance issues discovered during site visits will also be reported to the City.

### Preventive Maintenance Practices

Preventive maintenance addresses predictable, routine maintenance tasks, and involves inspections to ensure the site is fully functional, secure, and ready for normal and severe weather data collection.

This includes:

- Capturing in situ calibration measurements
- Inspecting band tightness, cable tie-ups, canister mounting, and all installed hardware
- Measuring silt/debris levels
- Positioning water-tight loggers to allow easy access and minimize the potential for damage/data loss in the event of surcharge conditions

### Corrective Maintenance Practices

Equipment status, battery power issues, communication issues, and data anomalies (level and velocity) will prompt corrective maintenance measures.

Upon arrival at the site, the problem will be diagnosed working with a data analyst while the crew is on site. This ensures that full restoration of monitoring, data collection, and telemetry can be accomplished during the site visit, even if equipment replacement is required.

### Wet-Weather Event Monitoring

Approaching wet-weather events will be tracked and monitoring will be heightened to confirm equipment is working properly. Standard RJN processes recommend site visits and in situ confirmations during wet-weather events, when they can be captured safely. Data analysts will correlate rainfall data with flow monitoring data to ensure proper operation of the flow monitoring network.

## DATA REVIEW AND PROCESSING

RJN data review processes evaluate data as it is uploaded, alert/alarm notifications are received, or when data is finalized for delivery. Flow rate analysis requires:

- Assessment of interim in situ field calibrations to ensure the meter sensor is **precise**
- Velocity profiles to compare peak velocities to average velocities
- Silt measurements to account for change in the pipe cross-section areas. Silt profile measurements are vitally important in calculating accurate flows.
- Hydraulic profiles to ensure the meter's calculated rate is **accurate**

Preliminary data reviews occur when alert/alarms notifications are received or the sensor surveillance AI routines identify concerning data trends. The objective of this review is to drive corrective maintenance visits.

### Data Processing and Finalizing

Data processing finalizes the data by adjusting or correcting errant data. RJN data analysts will analyze the data for accuracy focusing on:

- Data gaps and hydraulic anomalies
- Overall meter performance

Data analysts will validate diurnal patterns, and the reasonableness of depths and velocities to identify anomalies or unusual trends. They will review flow data initially for trace consistency using a variety of analytical tools, including hydrographs and scattergraphs, and will conduct flow balancing to ensure data accuracy.

RJN analysts will not apply corrections or adjustments unless there is a verifiable field activity, verification/calibration record, or recognized hydraulic principal to support it. In other words, no guessing.

- Data will be corrected and adjusted according to verification measurements and flow balances
- Data will be processed and edited in accordance with field confirmations to produce final data sets by site

The flow balance between flow meters will also be evaluated to ensure that recorded flows at each site are reasonable when compared to flows being recorded at upstream and downstream sites.

Flow rate calculations will generally use the Continuity equation with recorded depths, velocities, silt measurements, and pipe geometry.

RJN may also calculate or verify any adjustments to flow rates using Manning's, Colebrook-White, and Best-Fit curve equations.

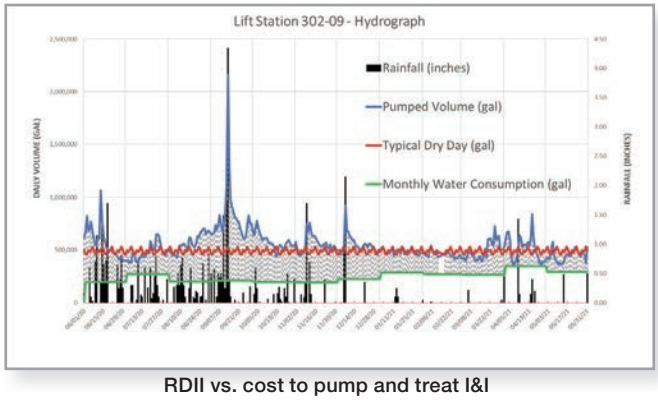
## LIFT STATION PUMP RUN TIME ANALYSIS

Monitoring wastewater flow at lift stations is challenging for utilities in coastal areas. Frequent backwater from a station can create adverse hydraulic conditions for flow monitoring. McKim & Creed staff will perform supporting lift station testing to provide an additional data point for flow analysis and prioritizing lift station performance issues based on the severity and cost of I&I.

We can leverage pump station data to support I&I analyses that will focus follow-up inspections and field-testing activities in basins with severe I&I. The lift station analysis will evaluate daily wastewater volumes pumped by the lift station during dry and wet-weather periods.

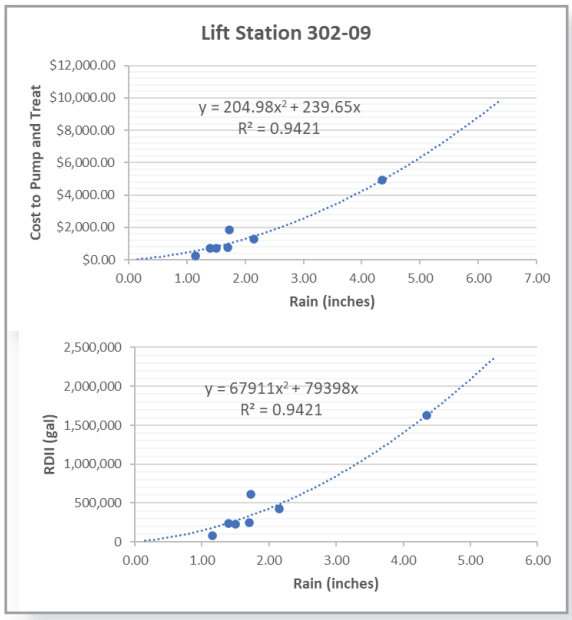
- A typical dry week is created using selected dry-weather days based on a dry-day criteria (typically three consecutive days of no rain).
- The daily dry-weather volumes are then compared with the daily volumes pumped during rain events. The difference represents the RDII.
- The dry-weather volumes are also compared with monthly water consumption records to estimate base infiltration.

The difference in daily volumes between water consumption and the typical dry week represents base infiltration, whereas the difference between the typical dry week and the pumped volume (mostly during rain) represents RDII.




RDII vs. cost to pump and treat I&I

The example above is from a lift station in a southwest Florida coastal community; it shows total wastewater volume above the water consumption is I&I (the hatched area). In this case, the station pumps more than double the volume of wastewater generated by the customers.




Lift station flow analysis

The lift station prioritization can also be performed based on the cost to pump and treat I&I volumes. We will select significant rain events and develop curves to forecast RDII volumes and the cost to pump and treat RDII per inch of rain. In the example on the previous page, the cost to pump and treat I&I exceeded $250,000.

This approach has been used to prioritize lift stations in coastal communities in Southwest Florida and the Florida Panhandle, making collection system flow monitoring and follow-up inspections and testing activities more efficient.

## DATA ANALYSIS AND PHASE 1 RECOMMENDATIONS

Once the metering period is complete, RJN engineers will conduct flow analysis to produce the following information for each meter site:

- Average daily flow rates under dry- and wet-weather condition
- Peak flow rates under dry- and wet-weather conditions
- Peak inflow rates
- Calculated base flows and diurnal patterns during dry-weather

We will analyze collected flow data, lift station flow performance, and develop I&I rates for each meter. This will involve:

- Developing base consumptive flow from water consumption records
- Evaluating metered flows relative to the predicted consumptive flow
- Developing ground water infiltration rates, inflow rates, and performing statistical and flow balancing analysis to evaluate relative I&I for each metered sub-basin.

From this analysis, basins where relative I&I rates are high will be prioritized and a phased plan will be developed for Phase 2 I&I source detection work. Data, analysis details, and a report will be provided to the City sufficient for a third party quality audit.

## PHASE 2 - I&I SOURCE INVESTIGATION, REPAIR, AND REHABILITATION

Comprehensive investigations will be conducted of the City's sewer infrastructure to locate and quantify structural defects that may be contributing to I&I levels. We will proposed "targeted investigations", where the initial focus will be on basins/sub-basins exhibiting the highest level of I&I.

Our standard approach involves not only locating I&I sources, but quantifying the I&I contribution for each source, and balancing the total defect I&I contribution to the total basin I&I level to ensure we have found all of the significant defects.

Typically, all manholes will be inspected, smoke testing will be performed in high inflow areas, flow isolations will target high infiltration areas, and sewer lines should be televised in areas with high infiltration rates.

Most I&I source/defect data will be collected using digital data collectors designed to facilitate field data collection for condition inspections. Site attribute, GPS coordinates, and condition data is recorded by the field inspector using customizable views designed to guide inspection activities and validate data entry. These scripts ensure that all required data elements are captured efficiently and accurately.

### Digital Data Collector Features

| | |
|---|---|
| ◈ | GPS X and Y coordinates are captured for each site. |
| ◈ | Inspection scripts are customized to facilitate unique client data requirements and utilize drop down lists and dependency checks to validate data on entry. |
| ◈ | Digital photos and/or video (pending on the type of inspection) records site conditions and found defects. |
| ◈ | Field schematics created for manhole inspections, dye testing, and night flow isolations can be digitally recorded |
| ◈ | All photos and inspection dialogues are managed by the inspection site GPS coordinates. |
| ◈ | Collected field data is transferred to Clarity via cellular communication |
| ◈ | All data can be easily integrated with GIS, modeling, CMMS, and life cycle/risk modeling applications. |

## MANHOLE INSPECTIONS

Manhole inspections are conducted to identify deteriorating structures or connections allowing I&I into the collection system. These inspections will produce:

- Comprehensive above- and below-ground assessments of the condition of the manhole structure (surface and interior) and the pipes entering and exiting the manhole
- Verification of connectivity and pipe sizes
- Accurate mapping-grade coordinates of each manhole

RJN field professionals maintain current NASSCO certifications and can conduct MACP Level 1 or Level 2 manhole and visual pipe inspections for pipes entering and exiting the manhole to locate I&I sources.

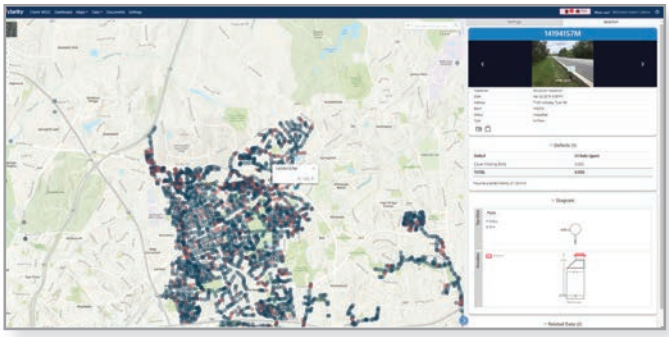
Manhole scanners support Level 2 Inspections without manned entry

Our field crews hold OSHA-compliant safety certifications and can conduct these inspections by visual inspection, using zoom cameras and 360° manhole scanners, or full descent. Manhole inspections record:

- Location and manhole identification number
- Potential for stormwater ponding on the cover
- Cover types, fit, distance above or below grade, and evidence of inflow
- Frame adjustment, type and condition of seal, and evidence of inflow
- Corbel construction, condition, and evidence of inflow
- Wall construction, condition, and evidence of infiltration
- Bench/trough construction, condition, deposition, and evidence of infiltration
- Pipe seal condition and evidence of infiltration
- Step condition
- Inside diameter
- Surcharging or evidence of surcharging
- Indication of groundwater level at time of inspection
- Rim-to-invert dimensions, pipe diameters and materials for all connecting lines. Sewer inverts will be measured using a level rod with a horizontal bar laid across the rim of each structure.

RJN uses NASSCO MACP standards to categorize defects and establish priorities for data evaluation, quality control, and defect assessment.

In many cases, a surface inspection will be sufficient to locate I&I sources. We will work with the City to establish a set of criteria to determine when Level 1 inspection (surface) are sufficient and when elevating the inspection protocol to a full MACP Level 2 inspection is required.



Clarity Manhole Inspection Viewer

### Manhole Inspection Deliverables

- Clarity manhole inspection views
- Technical memorandum outlining
  - Summary of work completed
  - GIS maps of identified defects
  - List of defects prioritized by cost effectiveness for rehabilitation
  - Recommendations for repair/rehabilitation

## SMOKE TESTING

Areas to be smoke tested will be identified based on the inflow analysis. Smoke testing simulates rainfall by forcing smoke through pipelines and laterals using high-intensity blowers. Optimal results are produced during dry ground periods.

Main line defects and service lateral defects will be carefully scrutinized to ensure that a conservative determination of public vs. private side defects is made. If necessary the line will be earmarked for dye testing in conjunction with television inspection.

### Smoke Testing Standards

| | |
|---|---|
| ◈ | Smoke testing is conducted using dual blowers. |
| ◈ | Liquid smoke will be used to generate smoke. |
| ◈ | Smoke testing lengths are limited to one line segment between the upstream and downstream blower locations. |
| ◈ | Each 12-inch diameter and smaller segment will be isolated by sandbagging. |
| ◈ | Segments totaling less than 500 feet may include straight through manholes. |
| ◈ | Flags are placed at all observed smoke locations and digital photo images will be captured. |
| ◈ | GPS coordinates are captured for smoke defect locations and suspect source sites or by sketches. |
| ◈ | All private sector smoke defect images are managed in the field inspection database linked by GPS coordinate. |

## Suspect Sources

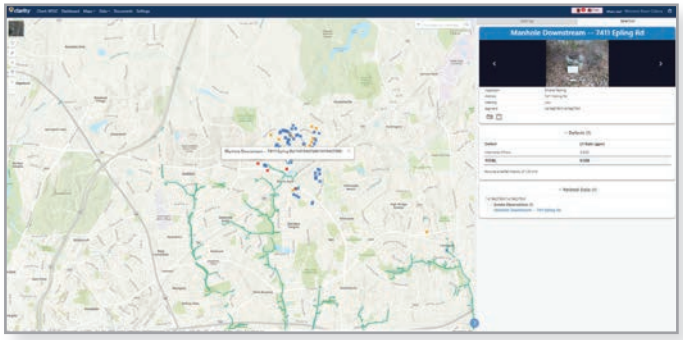
During the smoke testing, each building in the vicinity of the line segment will be observed for evidence of illegal or illicit connections, or other defects.

These “suspect sources” will be noted and recorded with GPS coordinates. Where suspect defects are identified but are not confirmed by the smoke test, the building address, type, and suspected defect will be noted and provided to the City.

## Community Outreach

**Smoke testing is very visible to the community and has the highest probability of causing public concern and alarm.** Community outreach and advance notification are a standard practice for smoke testing. Door hangers, web site posting, and coordination with City social media teams have been successful communication methods.

First responders (police/fire departments) will be apprised of testing locations, and special attention will be paid to commercial areas to minimize disruption to businesses during operating hours. Schools, hospitals and other sensitive institutions will also be specifically targeted for enhanced notification.



Clarity Smoke Testing Viewer

### Smoke Testing Deliverables

- Clarity smoke testing views
- Technical memorandum outlining
  - Summary of work completed
  - GIS maps of identified defects
  - List of defects prioritized by cost effectiveness for rehabilitation
  - Recommendations for dye testing

## FLOW ISOLATIONS

Sub-basins exhibiting excessive infiltration may be recommended for flow isolations.

While excessive infiltration varies relative to the region and groundwater conditions, a good rule of thumb for excessive infiltration is the value greater than or equal to 5,000 GPD/idm as determined from available flow monitoring data.

RJN maintains an inventory of three types of weirs.

- Volumetric Thelmar weirs (gallons per day)
- V-notch weirs (two levels of notches that aid in measurements in debris situations)
- Y-notch NB weirs (gallons per day)

Our standard practice uses the plug and isolate method because this method produces higher quality data related to each isolated segment. Target locations will be mapped to determine the required number of readings, and the quantity and size of sewer weirs. Field crews will begin at the most upstream sewer section and complete the flow isolation in sequence, moving towards the area outlet.

Flow isolation measurements are generally performed during low flow nighttime conditions, between the hours of midnight and 5 AM. Starting with the first cluster, a weir will be installed in the downstream manhole of the cluster. If the upstream reach is a dead-end manhole or a cleanout, plugging will not be performed. Plugs will be used to isolate other sections into 1,000 to 1,500 I&M segments.

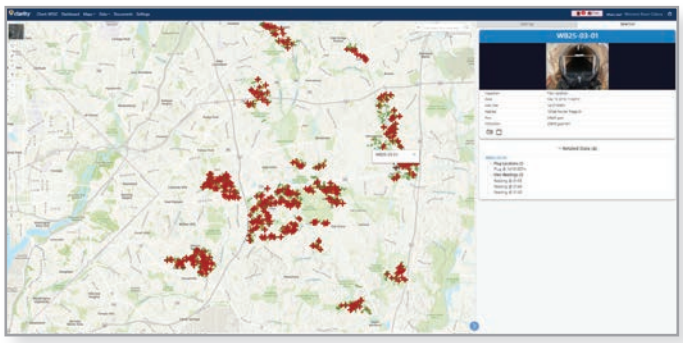
## Weir Installation

Before installing the weir in the line, RJN field crews will verify all lines entering the manhole regarding:

- Pipe diameter
- Pipe material
- Flow direction
- Flow stabilization

The weir must be perpendicular with the pipe, must be level, and must form a watertight seal. Field crew will document the amount of time required for the flow coming over the weir to stabilize. Where the flow is too high and the weir is unusable, technicians will perform multiple depth and velocity profile measurements to replace the weir readings.

Each weir reading will be photographed, to provide additional data for QA/QC reviews. We employ specific field data review protocols implemented by the field crews and reviewed by engineers to reduce the probability of invalid measurements caused by time differences between flow isolation measurements, and the impact of usage on the net flow calculation results.



Clarity Flow Isolation Viewer

### Flow Isolation Deliverables

- Clarity flow isolation views
- Technical memorandum outlining:
  - Line segment details
  - Picture of weir setup showing time and level of the instrumentation
  - Flow calculation
  - Recommendation for CCTV inspection

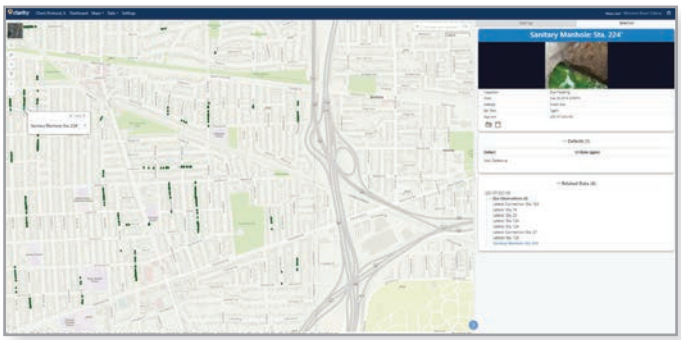
## DYE WATER TESTING

Dyed water testing is typically performed by flooding an area with fluorescent dye to identify the location and magnitude of a defect. Inflow sources are identified by dye water flooding storm sewer sections, stream sections, ditch sections, and ponding areas that may be contributing to inflow. Dye test areas are typically selected based on the results of the smoke testing program.

**Dye testing processes** will depend on the type and location of "suspect sources" identified through smoke testing and will assess various connections (indirect cross connections with storm sewer or ditches, or defective sanitary sewer manholes, direct catch basin connections, connected downspouts, etc.)

Positive dye tests are quantified for leakage rate. **Dye testing can also be performed concurrently with TV inspection allowing dye to be traced with TV inspection to locate the source, etc.**

All field data including sketches of the dye flow, GPS coordinates for located defects, photos, and TV inspection video will be captured during dye testing.



Clarity Dye Testing Viewer

### Dye Water Testing Deliverables

- Clarity dye testing views
- Technical memorandum outlining:
  - Dye test listing indicating test location, date, and results
  - Digital copies of dye test form and photos
  - CCTV record, where applicable

## CCTV INSPECTIONS

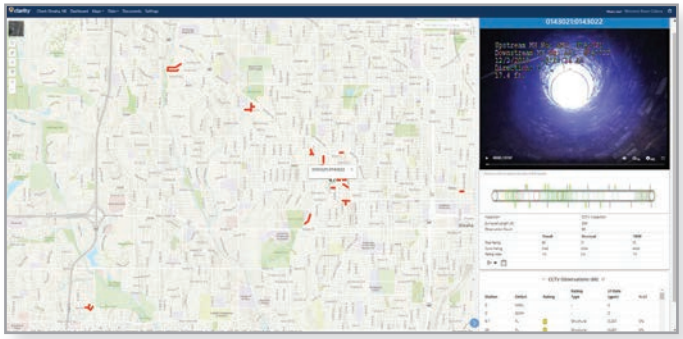
Sewer televising pinpoints structural pipeline defects, root intrusions, and fat, oil, and grease (FOG) buildup. Lines to be televised will be primarily identified through flow isolation results. However, additional CCTV segments may be recommended based on the results of other inspections and will focus on:

- Stream crossings and other floodplain areas
- Major transportation crossings
- Locations where access is difficult (i.e., sewers under buildings, backyard sewers)
- Locations where high levels of I&I were identified during flow monitoring
- Locations of consistently high ground water as determined from the manhole inspections

All TV inspection results will be coded using the standardized NASSCO PACP or LACP coding schema. RJN PACP certified staff will review the video and will advise the City of all line capacity reducing issues in including grease, debris, sags, exposed, roots as well as identified I&I and structural defects.

Locations that require immediate attention either due to structural condition or buildup of fats, oil or grease will be documented and presented to the City. This information can be used to develop annual televising and rehabilitation programming.

GPS coordinates for upstream and downstream manholes will be used to determine the GPS coordinates of defects based on the distance from the manhole. I&I quantification is developed for each located defect.



Clarity CCTV Viewer

### CCTV Deliverables

- Clarity CCTV Viewer
- Summary listing of pipe segments televised, including length, diameter, and date televised
- CCTV inspection report for each pipe segment televised
- PACP compliant database including video and audio record of CCTV inspections completed

## QUANTIFYING DEFECT I&I

Success in I&I removal is determined by not only locating I&I defects, but by understanding the defect's relationship to the overall problem so that the proper solution can be recommended.

RJN will analyze and categorize all I&I defects located through inspections. We will quantify I&I contributions for each defect and will balance found I&I with the overall basin I&I levels. We have pioneered techniques to assign meaningful I&I quantification rates for each asset/defect. **These quantification and balancing methods go well beyond what is traditional industry analyses.**

### RJN I&I Quantification/Balancing Features

| | |
|---|---|
| ◈ | Identified defects will be assigned a flow rate value based on the extent and type of defect. |
| ◈ | Each defect will be analyzed and compared to the flow data analysis and to the corresponding flow isolation reading. |
| ◈ | The flow data analysis provides the level of excess I&I each sub-basin experiences during a expected wet-weather event. |
| ◈ | As a defect is found, it is assigned a quantification value using proven algorithms for I&I quantification. |
| ◈ | All of the assigned defect quantifications for a sub-basin are summarized and balanced to meet the sub-basin total excess I&I value. |

*For example, sub-basin AA may experience 400,000 gallons/day of I&I during a 1 inch, 60 minute storm event. Each defect is assigned a quantification value, i.e. a pick hole in a manhole may be estimated based on the hole's orifice size and the manholes' location in relationship to potential ponding to contribute 8 gpm of inflow during the same rain event, a missing private service lateral cap may contribute 24 gpm, and an indirect cross-connection to storm drain may contribute 210 gpm. The sum of the quantified I&I contribution for each defect in the sub-basin should equal 400,000.*

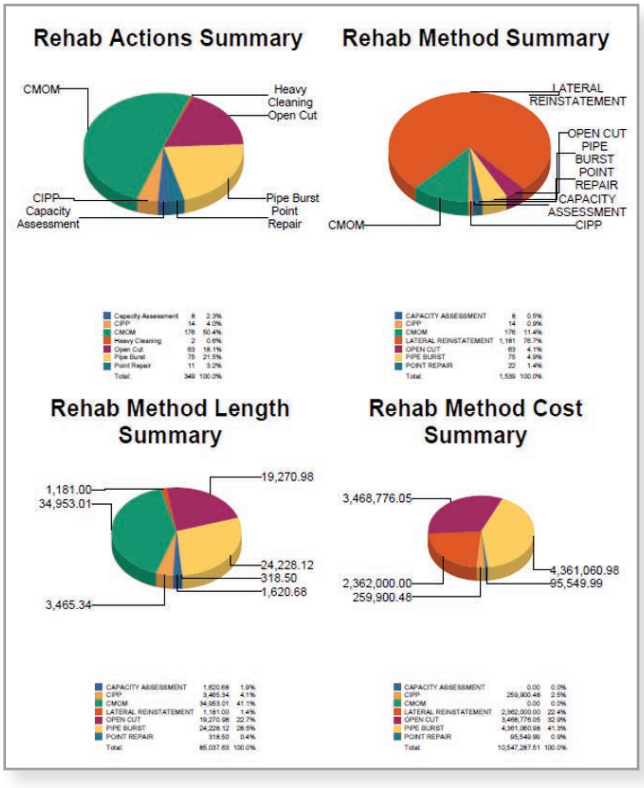
The goal in each case is for the quantified sum of the sub-basin defects to be equal to the excess I&I identified through flow analysis. This ensures a high degree of certainty that the improvement recommendations deliver impressive results.

The RJN method for defect flow balance analysis is not just limited to infiltration but also addresses inflow.

## SOURCE DEFECT RISK ASSESSMENT

RJN can also implement risk analytics and modeling using InfoAsset Planner to complement the I&I repair and rehabilitation recommendations. As each I&I inspection task progresses, the data will be reviewed for quality and accuracy and then migrated to the risk analytics tools. Risk modeling with apply asset attributes, I&I rates, and NASSCO criticality and severity coding to develop consequence of failure (COF) and likelihood of failure (LOF) ratings with an overall risk score that can be used to prioritize repair and rehabilitation measures.

Decision tree logic can be programmed to systematically assign repair and rehabilitation methods and recommendations with costs.




I&I sources and sewer lines with grease, roots, or other debris will be shown with a corresponding I&I. The manhole and pipeline leakage quantities will be balanced with flow monitoring data and flow isolation data.

## REMEDIATION PLAN

The RJN approach and strategy for developing rehabilitation recommendations includes evaluating each type of defect, various rehabilitation alternatives, and costs associated with recommended repair methods using current local contractor bid schedules.

RJN engineers will review each inspected manhole and pipe segment, and each observed I&I source defect to recommend a comprehensive rehabilitation approach for an entire structure. Repair and rehabilitation recommendations may range from the simple installation of a manhole insert to complete pipe replacement.

Our summary recommendations will be provided with sufficient detail to be used as the Basis for Design document to plan and perform repairs or defect rehabilitation.

I&I source defects identified for repair or rehabilitation will be grouped by rehabilitation methods. We will discuss viable repair and rehabilitation methods and will utilize preferred City methods. Recommendation groupings may include:

- No design actions (i.e., future watch lists, FOG cleaning, etc.)
- Manhole rehabilitation (i.e., new frame and seal, cover replacement, epoxy liners, or replacement)
- Point repair open-cut
- Trenchless (i.e., CIPP, pipe bursting, slip lining)
- Complex design (i.e., full replacement)

Cost estimates will be a primary consideration when developing the remediation alternatives. We will gain input from the City when determining costs as well as assessments comparing rehabilitation costs to costs to transport and treat.

Repair, rehabilitation, and replacement recommendations will be drafted based on a cost-effectiveness analysis that will utilize City standards and available local rehabilitation costs.

## DESIGN AND BIDDING ASSISTANCE

Once the City approves repair and rehabilitation methods, RJN and McKim & Creed team members will prepare design and construction documents for recommended improvements and will be available to provide bidding assistance and construction oversight.

## TRAINING

**At the end of this project, the City intends to independently manage its I&I Program with in-house staff.** To ensure long-term success for the City, we will strive to develop straight forward processes and procedures that will be relatively simple to understand and implement, be reliable and repeatable, and be cost-efficient.

We envision City training will be implemented in two phases.

**Phase 1 training guidance** will coincide with program Phase 1 activities and will focus on:

- Establishing a reliable and maintainable long-term monitoring network using pump station, rainfall, and groundwater level records.
- Developing I&I analysis tools that the City can utilize to assess I&I severity in the system on a periodic and also on a longer-term trending basis.

An initial workshop will be held to assess current Hollywood staff analysis capabilities, discuss fundamental approaches and available tools for I&I analysis, and define the City's goals for the program. We will develop a training plan for fundamental I/I analysis techniques tailored to produce outcomes consistent with City goals.

We can leverage Clarity on-line tools, or develop custom templates for City staff that incorporate flow, rainfall, and groundwater data. Means and methods will be developed to allow the City to perform ongoing I&I

analysis that meets the needs of the City's intent for the program. The monitoring plan developed at project initiation will form the basis for the I&I evaluation training program.

The I&I analysis training for City staff will be conducted in conjunction with the development of the Phase 1project report. We believe upon submittal of the final Phase I report, City staff will be fully capable of replicating and performing basic I&I analysis, using a documented methodology.

The **Phase 2 training program** will be developed in conjunction with implementation the Phase 2 project actvities, consisting of source investigation, defect analysis, development of repair and rehabilitation techniques, preparation of contract documents and specifications for bidding repair, rehabilitation, and replacement contracts, and ultimately administration, management, and inspection of contracted sewer system remediation work. The specifics of this training program will be dependent on the results of the Phase I work to be performed, and will complement the I&I analysis training to be conducted under Phase I. We can also explore using City staff, teaming with our field crews, to provide hands on training for Phase 2 activities.

## CURRENT WORKLOAD

RJN is prepared to mobilize our project team to meet all timelines for this important program. This team will be committed to the project and will be available to proceed upon notice of project award.

RJN has sufficient capacity to meet the timelines and objectives of this project. When we undertake a project, we plan for contingencies and ensure that the staff and resources needed to complete the project on time and within budget are available. Should the need for additional staff be identified during the course of the project, we can quickly mobilize experienced and qualified resources from other locations throughout the company to meet those needs. Our teaming partner, McKim & Creed also has additional staff available to support project activities.

## RESOURCES/TECHNOLOGIES

### SPECIALIZED EQUIPMENT

RJN owns a large inventory of flow monitoring equipment from the leading major equipment manufacturers (ADS, Hach, ISCO) as well as safety equipment, digital data collectors, zoom cameras, 360° manhole scanners, and smoke blowers to perform I&I source inspections.

**RJN Equipment Inventory**

| Equipment | Inventory |
|---|---|
| Flow Meters with Telemetry | 600 |
| Portable Velocity Probes | 25 |
| Tipping Bucket Rain Gauges | 185 |
| Digital Lift Station Recorders | 25 |
| Precalibrated Weirs | 50 |
| Zoom Camera Setups \| Go Pros | 25 |
| Manhole Scanners | 12 |
| iPad/Digital Data Collectors | 55 |
| Confined Space Entry Setups | 30 |

## PHASE 1 TIMELINE

**City of Hollywood, FL I/I Analysis Project Schedule - Phase One Flow Monitoring and I/I Analysis**

| Task No. | Task Description | NTP | Month One | | Month Two | | Month Three | | Month Four | | Month Five | | Month Six | | Month Seven | | Month Eight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Project Administration | ★ | | | | | | | | | | | | | | | | |
| | Initial Kickoff Meeting | | | | | | | | | | | | | | | | | |
| | Dry-weather flow measurement progress meeting | | | | | | | ★ | | | | | | | | | | |
| | Monitoring mid-point progress meeting | | | | | | | | | ★ | | | | | | | | |
| | Post-monitoring progress meeting | | | | | | | | | | | | | ★ | | | | |
| | Site and Pump Station Investigations | | | | | | | | | | | | | | | | | |
| | Monitoring Equipment Installation | | | | | | | | | | | | | | | | | |
| | Rain Gauge Equipment Installation | | | | | | | | | | | | | | | | | |
| | Ground Water Gauge Installation | | | | | | | | | | | | | | | | | |
| | Settling In Period | | | | | | | | | | | | | | | | | |
| | 120 Day Monitoring Period | | | | | | | | | | | | | | | | | |
| | Flow and Lift Station Data Review and Anaysis | | | | | | | | | | | | | | | | | |
| | Equipment Removal | | | | | | | | | | | | | | | | | |
| | Report Preparation | | | | | | | | | | | | | | | | | |
| | Report Delivery - Phase Two Reccomendations | | | | | | | | | | | | | | | | | |
| | I/I Analysis Training Program Development and Implementation | | | | | | | | | | | | | | | | | |

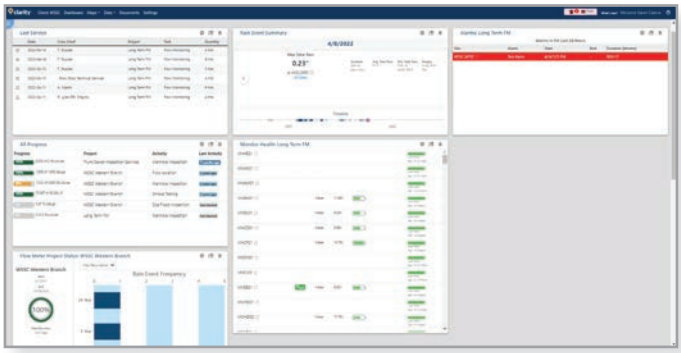
| Equipment | Inventory |
|---|---|
| Dye Water Flooding Setups | 25 |
| High Density Smoke Blowers | 25 |
| Mechanical Plugs, Sandbags | 125 |
| Lamping Equipment Setups | 25 |

## TECHNOLOGIES | DATA AND REPORTING

The Clarity Data Management Hub, discussed in detail at the beginning of this section, will be used to manage collected data, facilitate status meetings and provide unlimited secure access for City staff to:

- Project data (raw and finalized)
- Analytical tools
- Reports
- Maintenance histories
- Alarm/alert conditions

**Customizable Clarity dashboard widgets** will provide a birds' eye view of the project, rainfall events, equipment states, and condition inspection progress and tracking.

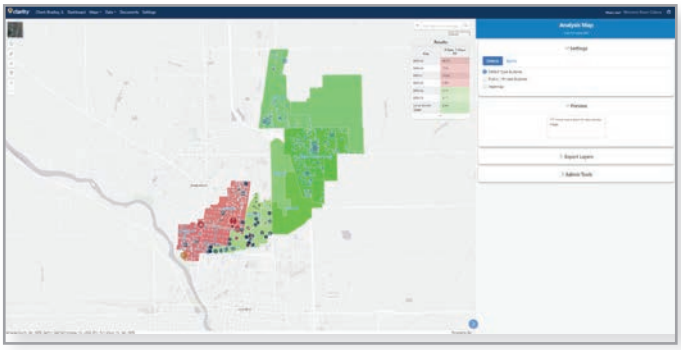


Clarity customizable dashboards

City staff and stakeholders can easily monitor project activities, view results and trends, build on-demand scattergraphs and hydrographs showing raw and/or edited data, use the RDII toolbox to evaluate results, review detail condition data photos with quantified I&I for each defect identified by manhole inspections, smoke testing, dye testing, and CCTV review. Clarity reporting features will provide:

- Flow meter mass balance analysis tools
- Rainfall inflow and infiltration (RDII) estimation tools
- Meter and gauge grouping tools for analysis
- Online alarm notifications
- ISO-Q graphs
- Calculation of "dry day" averages for diurnal curves
- Comparison of rain events to IDF curves
- Condition inspection photos and findings
- Condition trends and hot spot analyses

**Clarity RDII Inflow and Infiltration (I/I) Estimate Graph displays average dry weather flow (ADWF), ground water infiltration (GWI), base flow, and RDII estimates.**



I&I defect hot spots with flow rates

**Sharing Digital Data.** All collected flow meter, rain gauge, inspection site, and equipment maintenance data will be available in Clarity.

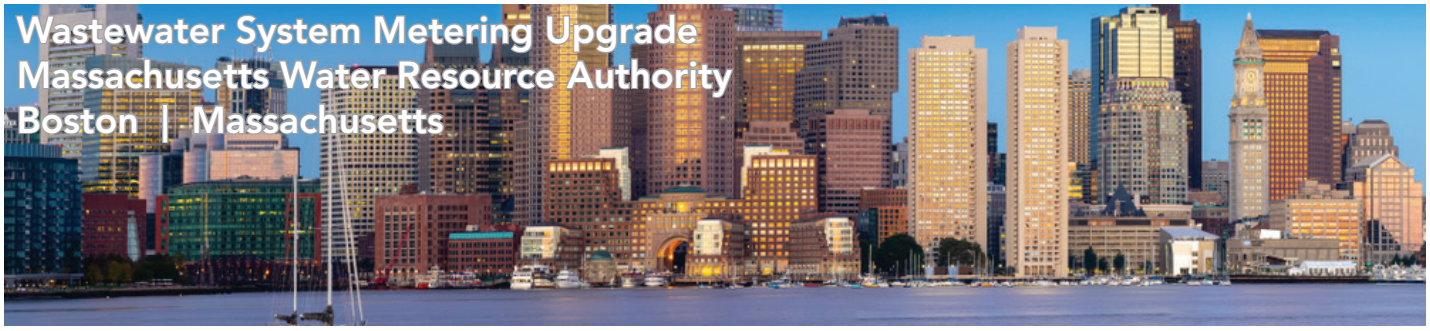
- Flow and precipitation data can be easily downloaded in tabular or graphic format.
- Customizable hydrographs and scattergraphs can be created and downloaded; templates can be saved for future analysis
- Detail condition reports can be quickly downloaded for manhole inspection, smoke testing defects, dye testing, flow isolations, CCTV results, and lift station assessments
- Digital versions of reports, technical memorandum,, daily construction logs, and site sheets are managed in the Clarity document library and can be printed or downloaded.

## SECTION 5

# REFERENCES

# REFERENCES


| | |
|---|---|
| **Contact** | Tim Wolfe, PE, BCEE \| Chief, Office of Engineering & Construction<br>(410) 396-3437 \| timothy.wolfe@baltimorecity.gov |
| **Description of Work** | RJN was selected to conduct a comprehensive sewershed study of the Dundalk sewershed located in the congested, industrial harbor district. The study was required to meet consent decree mandates and involved I&I quantification and characterization of 185,000 LF and 850 manholes. I&I evaluation and I&I source investigation, pump station and force main inspection and characterization, hydraulic modeling, and a public education program were all components of the project. The assessment of the aging 36 mgd Dundalk Pump Station involved inspecting 4,000 LF of 36-inch cast iron force main to identify leaks, estimate exfiltration quantities, and test pump and valve performance.<br><br>The City's long-term flow monitoring program focused on evaluated the City's billing flume network, actively monitoring SSO sites, and performing on-call temporary flow monitoring to support hydraulic modeling, I&I analysis, and post-rehab I&I assessments. Flume evaluations (28) installed a network of permanent meters mirroring the existing flumes (18) with support meters installed in unmonitored areas (10), and rain gauges (9). SSO monitoring (12 SSO sites) used programmed auto-notifications to report overflow conditions. The on-call metering implemented 5 to 30 meters for 6- to 12-month periods in areas where the City identified data needs; ground water gauges were also installed to support data analysis. RJN performed site investigations, equipment installations and maintenance, data collection and QC, and I&I analysis. Some metering sites areas were in low lying, tidally influenced areas. |
| **Start \| Complete Dates** | Dundalk: 2002 - 2006 ● Long-Term Flow Monitoring: 2012 - 2023 |
| **Project Budget \| Actual** | Dundalk: $3M \| 2.8M ● Long-Term Flow Monitoring: $13.5M \| $13.5M |
| **Amendments \| Change Orders** | Initial Long-Term contract 2012 - 2018, Contract Extension 2018 - 2023 |
| **Stop Work Orders** | 0 |




| | |
|---|---|
| **Contact** | Charles Ryan \| Director of Wastewater O&M<br>(617) 305-5846 \| charles.ryan@mwra.com |
| **Description of Work** | The MRWA permanent metering system has 212 metering sites located throughout MWRA's 43 wastewater member communities. RJN was hired in 2003 to convert the meter network and upgrade the data management platform to communicate using wireless telemetry. In 2017, RJN upgraded and reconfigured the metering equipment and locations. The network now consists of 189 rate meters and 23 non-rate meters; 187 are located inside of sewer manholes and 25 Remote Terminal Units (RTU) are installed inside of MWRA and community facilities. Most of the meters are installed in gravity sewer lines and due to the coastal location, many of the sites are tidally influenced. The sewers range in size from 8 inches to 150 x 138 inches, with manhole depths ranging from 5 feet to over 40 feet deep.<br><br>Comprehensive evaluations of each site were conducted to assess hydraulic conditions and site suitability for the metering equipment. Unique meter configurations were designed for each site and included matching site hydraulics with equipment technologies. Resident engineering services were also provided to validate installation and operability. in addition to managing the project, extensive agency/community coordination was required, temporary flow meters captured data for hydraulic analysis, existing Community Flow Formulas (CFF) and metering methodologies were evaluated. Flow data for analysis was captured using several methods:<br><br>▪ Temporary meters were installed at sites with anticipated flows greater than 35,000 gpd.<br>▪ Flow isolations installed weirs at sites with anticipated flows less than 35,000 gpd in pipe sizes, ranging from 11- to 15-inches<br>▪ Instantaneous depth and velocity measurements were captured for sites with flows less than 10,000 gpd. |
| **Start \| Complete Dates** | 2003 - 2005 ● 2017 - 2021 |
| **Project Budget \| Actual** | $5.15M \| $5.15M ● $3M \| $3M |
| **Amendments \| Change Orders** | 0 |
| **Stop Work Orders** | 0 |

# Citywide Sewer Evaluation Study and Post-Rehab Flow Monitoring
## Virginia Beach | Virginia

| | |
|---|---|
| **Contact** | Steve Motley, PE (retired), stephenmotley@hotmail.com |
| **Description of Work** | RJN was selected by the City of Virginia Beach to conduct comprehensive I&I source investigation services in compliance with a VDEQ consent order issued to the Hampton Roads Sanitation District and 12 other Hampton Roads localities. The program required reducing the sanitary sewer overflow (SSO) occurrences throughout the system. RJN engineering professionals conducted:<br>▪ Manhole inspections (8,262) using remote zoom camera technology. Defects where coded using MACP standards.<br>▪ Smoke testing (1,509,223 LF) was performed for all pipes in the system<br>▪ Flow isolations (2,436), conducted using the non-plugging method, identified segments with high infiltration<br>▪ CCTV inspection and cleaning (630,092 LF) segments were selected based on the result of manhole inspections and smoke testing. CCTV was also performed for all segments with high infiltration rates, as determined from flow isolations.<br>▪ Dye water testing (413 setups) verified connectivity and was performed with CCTV and lateral inspections<br>▪ Lateral CCTV inspections (592) were determined by smoke testing results<br>▪ Field crews also installed clean-out caps (2,361) and manhole inserts (6,136) to eliminate inflow sources as outlined by City standards.<br><br>in 2013, RJN was selected to provide flow monitoring services to produce data to measure the effectiveness of completed I&I abatement measures. Flow data was also used to dvevlop baseline I&I quantification for the City's prioritized management, operations, and maintenance (MOM) basins prior to conducting sanitary sewer evaluation studies to meet regulatory commitments. Services for the multi-year program included site verifications, installation, maintenance, and data collection/verification for 142 meters and 38 rain gauges. |
| **Start \| Complete Dates** | SSES: 2008 - 2012 ● Post Rehab Flow Monitoring: 2013 - 2018 |
| **Project Budget \| Actual** | SSES: $4.47M \| $4.5M ● Post Rehab Flow Monitoring: $1.6M \| $1.6M |
| **Amendments \| Change Orders** | 0 |
| **Stop Work Orders** | 0 |

# VENDOR REFERENCE VERIFICATION FORM

It is the responsibility of the contractor/vendor to provide a minimum of three (3) similar type references using this form and to provide this information with your submission. Failure to do so may result in the rejection of your submission.

City of Hollywood Solicitation No. and Title: RFQ-4717-22-OT, Engineering Consulting Services for I&I Program

Reference for: RJN Group, Inc.

| | | | |
|---|---|---|---|
| Organization/Firm Name providing reference: | Department of Public Works, City of Baltimore | | |
| Organization/Firm Contact Name: | Timothy Wolfe | Title: | Chief, Office of Engineering and Construction |
| Email: | Timothy.Wolfe@baltimorecity.gov | Phone: | (410) 396-3437 |
| Name of Referenced Project: | Project 1263 - Rainfall and Flow Monitoring Services for the Sanitary Sewer System | Contract No: | Project 1263 |
| Date Services were provided: | June 27, 2018 - June 27, 2023 | Project Amount: | $8,558,235.50 |
| Referenced Vendor's role in Project: | ☒ Prime Vendor | ☐ | Subcontractor/ Subconsultant |
| Would you use the Vendor again? | ☒ Yes | ☐ | No. Please specify in additional comments |

| Description of services provided by Vendor: |
|---|
| The main scope of P1263 is to design, install, operate and maintain flow and rainfall monitoring network, to provide representative accurate, and precise data of sufficient quality to use for hydraulic model calibration and for verification of the effectiveness of I/I reduction rehab projects. RJN P1263 scope also include performing site investigations prior to equipment installations, developing site reports including GIS coordinates and digital images, installing flow monitoring equipment in sewer pipes ranging in size from 8-inch to 12- foot in diameter. Scope of work also include providing alarm notifications for Sanitary Sewer Overflow (SSO) activations 24 hours per day and 7 days per week and analyzing and reporting SSO activation duration and volume at monitored locations to the City within 12 hours of the start of the SSO event. |

| Please rate your experience with the Vendor | Need Improvement | Satisfactory | Excellent | Not Applicable |
|---|---|---|---|---|
| Vendor's Quality of Service | | | | |
| a. Responsive | ☐ | ☐ | ☒ | ☐ |
| b. Accuracy | ☐ | ☐ | ☒ | ☐ |
| c. Deliverables | ☐ | ☐ | ☒ | ☐ |
| Vendor's Organization: | | | | |
| a. Staff expertise | ☐ | ☐ | ☒ | ☐ |
| b. Professionalism | ☐ | ☐ | ☒ | ☐ |
| c. Staff turnover | ☐ | ☐ | ☒ | ☐ |
| Timeliness of: | | | | |
| a. Project | ☐ | ☐ | ☒ | ☐ |
| b. Deliverables | ☐ | ☐ | ☒ | ☐ |

| Additional Comments: (provide additional sheet if necessary) |
|---|
| **RJN under P1263 contract is constantly working to improve the quality of submittal, deliverables, and is open to suggestions in keeping the City's best** |
| **interest. RJN staff is readily available and responds to City's concerns and issues in a timely manner.** |
| |

| ****THIS SECTION FOR CITY USE ONLY**** | | | | | | |
|---|---|---|---|---|---|---|
| Verified via: | Email: | ☐ | Verbal: | ☐ | Mail: | ☐ |
| Verified by: | Name: | | | | Title: | |
| | Department: | | | | Date: | |

# VENDOR REFERENCE VERIFICATION FORM

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City of Hollywood Solicitation No. and Title: RFQ-4717-22-OT, Engineering Consulting Services for I&I Program

Reference for: RJN Group, Inc.

Organization/Firm Name providing reference: Mass. Water Resource Authority

Organization/Firm Contact Name: Charles Ryan Title: Director of Wastewater Ops.

Email: charles.ryan@mwra.state.us Phone: 781-724-8696

Name of Referenced Project: Flow Monitoring Program Contract No: 7191

Date Services were provided: 2004-Current Project Amount: $ 9M +

Referenced Vendor's role in Project: ☒ Prime Vendor ☐ Subcontractor/ Subconsultant

Would you use the Vendor again? ☒ Yes ☐ No. Please specify in additional comments

| Description of services provided by Vendor: |
|---|
| RJN Group was selected to update our 200+ flow and rainfall monitoring program. This critical program generates over $500M annually in revenue covering the City of Boston and 48 member communities. The Program is used for billing, inflow/infiltration and O&M Managament. |

| Please rate your experience with the Vendor | Need Improvement | Satisfactory | Excellent | Not Applicable |
|---|---|---|---|---|
| Vendor's Quality of Service | | | | |
| a. Responsive | ☐ | ☐ | ☒ | ☐ |
| b. Accuracy | ☐ | ☐ | ☒ | ☐ |
| c. Deliverables | ☐ | ☐ | ☒ | ☐ |
| Vendor's Organization: | | | | |
| a. Staff expertise | ☐ | ☐ | ☒ | ☐ |
| b. Professionalism | ☐ | ☐ | ☒ | ☐ |
| c. Staff turnover | ☐ | ☐ | ☐ | ☒ |
| Timeliness of: | | | | |
| a. Project | ☐ | ☐ | ☒ | ☐ |
| b. Deliverables | ☐ | ☐ | ☒ | ☐ |

| Additional Comments: (provide additional sheet if necessary) |
|---|
| When it comes to collection system assessment, RJN is the best in the industry. They are a true team of specialists that are passionate about collection systems. We have a very challenging system that deals with billing, tidal influences, major storms and sensitive receiving water and RJN always delivers. |

| ****THIS SECTION FOR CITY USE ONLY**** | | | | | | |
|---|---|---|---|---|---|---|
| Verified via: | Email: | ☐ | Verbal: | ☐ | Mail: | ☐ |
| Verified by: | Name: | | | | Title: | |
| | Department: | | | | Date: | |

# VENDOR REFERENCE VERIFICATION FORM

It is the responsibility of the contractor/vendor to provide a minimum of three (3) similar type references using this form and to provide this information with your submission. Failure to do so may result in the rejection of your submission.

City of Hollywood Solicitation No. and Title: RFQ-4717-22-OT, Engineering Consulting Services for I&I Program

Reference for: RJN Group, Inc.

Organization/Firm Name providing reference: Retired - City of Virginia Beacc

Organization/Firm Contact Name: Steve Motley, P.E. Title: Engineer V - Project Manager

Email: stephenmotley@hotmail.com Phone:

Name of Referenced Project: Consent Order SSES Project Contract No:

Date Services were provided: 2008-2012 Project Amount: $5,000,000.00

Referenced Vendor's role in Project: ☒ Prime Vendor ☐ Subcontractor/ Subconsultant

Would you use the Vendor again? ☒ Yes ☐ No. Please specify in additional comments

| Description of services provided by Vendor: |
|---|
| Provided SSES tasks to include, Flow Monitoring, CCTV, smoke testing, night flow isolations, dye water testing, manhole inspoections, City wide. |
| |

| Please rate your experience with the Vendor | Need Improvement | Satisfactory | Excellent | Not Applicable |
|---|---|---|---|---|
| Vendor's Quality of Service | | | | |
| a. Responsive | ☐ | ☐ | ☒ | ☐ |
| b. Accuracy | ☐ | ☐ | ☒ | ☐ |
| c. Deliverables | ☐ | ☐ | ☒ | ☐ |
| Vendor's Organization: | | | | |
| a. Staff expertise | ☐ | ☐ | ☒ | ☐ |
| b. Professionalism | ☐ | ☐ | ☒ | ☐ |
| c. Staff turnover | ☐ | ☐ | ☒ | ☐ |
| Timeliness of: | | | | |
| a. Project | ☐ | ☐ | ☒ | ☐ |
| b. Deliverables | ☐ | ☐ | ☒ | ☐ |

| Additional Comments: (provide additional sheet if necessary) |
|---|
| RJN has done work for the City under a number of contracts. I am currently retired, but was the direct POC and project manager for the City when this work was performed. All of the work completed on this contract was part of the City's consent order commitments to DEQ and EPA. A lot of work was completed in a short period of time. |

| ****THIS SECTION FOR CITY USE ONLY**** | | | | | | |
|---|---|---|---|---|---|---|
| Verified via: | Email: | ☐ | Verbal: | ☐ | Mail: | ☐ |
| Verified by: | Name: | | | | Title: | |
| | Department: | | | | Date: | |

## SECTION 6

# SUB CONSULTANTS

# SUB CONSULTANTS

Our teaming partner, McKim & Creed (M&C), will provide services to assess lift stations and support field activities during Phase 1. They will work with RJN team members to evaluate I&I sources and provide repair and rehabilitation services for Phase 2 efforts. M&C resumes and staff roles are provided in Section 3.

## MCKIM & CREED, INC.

### FIRM HISTORY

McKim & Creed, Inc. is a team of talented professionals who live and work in the communities they serve. Their company's mission is to improve the quality of life for the businesses and communities they serve by providing exceptional engineering solutions.

Their technical specialties include manhole inspections, flow monitoring, I&I abatement, hydraulic modeling, field inspections, wet weather program management, SSO studies, modeling collection capabilities, cost estimating, capital improvement planning, and engineering design. As an employee-owned company that has been in operation since 1978, they provide these services through excellent work, dedicated service, and a passionate desire to solve problems and impact lives.

McKim & Creed entered into water and wastewater in the mid-1980s and has provided a wide range of water/wastewater infrastructure engineering services and solutions since. Their first major projects included sewer system design for commercial and residential neighborhoods. Since that time, they have expanded throughout the Southeastern US.

### EXPERTS IN WET-WEATHER PROGRAM MANAGEMENT

McKim & Creed's wastewater collection systems group is focused on providing a full suite of field services necessary to identify and plan for elimination of I&I sources from sanitary sewer systems. Their in-house capabilities with personnel and equipment include:

- Manhole inspections
- Flow monitoring
- Rainfall gauging
- Groundwater gauging
- Smoke testing including public communication and notification planning and implementation
- Dye water tracing and flooding testing
- Night flow Isolation monitoring
- Pipeline CCTV
- I&I reduction planning, budgeting, and prioritization
- I&I reduction design

# Hurricane Hermine Sewer Collection System Evaluations

Our team evaluated the impact on the system due to Hurricane Hermine and established a plan to prevent sanitary system overflows (SSOs) from occurring during future wet seasons. Initial tasks included **hydraulic modeling, capacity assessments, flow and rainfall monitoring**, smoke/dye testing, 780 manhole inspections, night flow isolations, 128,000 LF of CCTV inspections, I/I quantification and recommended abatement. The design effort included both trenchless and traditional open cut and replacement.

McKim & Creed performed assessment of the wastewater collection/conveyance system in five (5) lift station service areas. The assessments were driven by recurring SSOs within the five (5) lift station service areas. The project included open channel flow monitoring at eighteen locations, comprehensive smoke testing of each service area, comprehensive manhole inspections in each service area, comprehensive night flow isolation measurements of each service area and internal pipeline CCTV inspection of every gravity sewer that had high levels of groundwater infiltration and the gravity sewers that connected to manholes that required some form of rehabilitation. Hydraulic models of the collection/conveyance systems in each lift station service area were developed based on the recorded flow data and water usage records and various return wet weather rainfall flow simulations were conducted. With the information obtained through our field investigations and modeling results, McKim & Creed developed both capacity enhancement and infrastructure rehabilitation designs and specifications. Rehabilitation designs included mainline/lateral curedin-place lining and polyurethane and epoxy manhole coatings. Capacity enhancements and replacement designs (due to alignment irregularities) required permitting, traffic control and landscaping improvements.

This project required an accelerated schedule due to past Sanitary Sewer Overflows (SSOs) events the City was experiencing and the associated fines that were being levied by the state. This was an accelerated schedule due to "consent order, the owner, or to address an asset with high consequence and likelihood of failure.

## Project Details

**OWNER:**

City of Largo

Largo, FL

**CONTACT:**

Jerry Woloszynski, PE

1000 2nd Street

Largo, FL 33779-0296

727.587.6713 x4400

JWoloszy@Largo.com

**DURATION:**

2017 - 2020

**ROLE:**

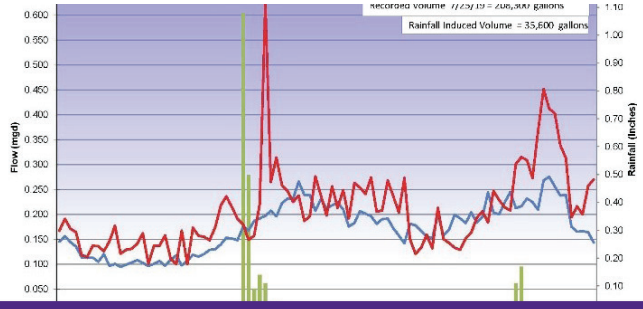
Prime

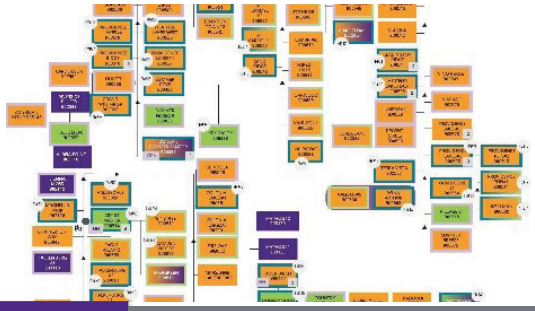
**CONTRACT VALUE:**

$534,290

"We believe this project has saved the City of Largo more than $2.6 million in fines that would have occurred had we not resolved our SSO issues expediently. With the execution of the abatement plan developed by McKim & Creed, we will eliminate backup and lower costs at our treatment plant, which is a win-win for our citizens and our environment."

Jerald L. Woloszynski, PE, | City of Largo, FL



# Falkenburg Sewer Service Area I&I

McKim & Creed is providing sanitary sewer evaluation services to Hillsborough County Public Utilities to investigate and resolve inflow and infiltration into the County's Falkenburg basin area wastewater collection system. The project entails mapping of the services area that includes 162 pump stations that pump into the Falkenburg AWTF. The work is being conducted in two phases. Phase 1 consists of flow and rainfall monitoring and analysis; and phase 2 consists of smoke/dye testing, closed-circuit television (CCTV) inspection, manhole inspections and night flow isolations to identify storm water inflow and groundwater infiltration sources.

Phase 1 involved deployment of 62 flow meters, 25 rainfall gauges and 20 groundwater monitors for a 3-month period throughout the Falkenburg AWWTF service area. McKim & Creed provided the County with a Proposed Flow Monitoring Plan prior to the placement of any equipment. Once approval was gained from the County McKim & Creed began the equipment installations. Because the County was purchasing all of the rainfall gauging, groundwater monitoring systems and 5 permanent flow meters the equipment installations occurred as the various equipment was delivered. All of the flow monitoring equipment was in place and calibrated prior to June 1, 2019. Sixty-two (62) lift station collection systems were directly monitored, numerous lift station service areas were indirectly monitored; the lift station's force main discharged to an adjacent lift station service area that was being directly monitored and 56 lift station service areas were not included in the monitoring effort. For these lift station service areas McKim & Creed relied on the County's SCADA data to assess any flow increases caused by the various recurring rainfall events. The data gained from the flow monitoring effort, and SCADA data review, has allowed for the conduction of a stormwater inflow and groundwater infiltration assessment of the majority of the wastewater collection systems within the Falkenburg AWWTF service area; 118 lift station service areas. Lane Engineering provided groundwater gauge installation and calibration, similar to the services they will provide Pinellas County on this project.

The results of the Phase 1 flow monitoring and SCADA data review efforts lead to the recommendation of smoke testing in 15 of the 62 metered areas (556,000 LF) and the completion of groundwater infiltration source investigations in 30 of the 62 metered areas (1,300 manhole Level 1 manhole inspections and night flow isolations). The inflow source and the infiltration source investigations were completed in 2020..

## Project Details

**OWNER:**

Hillsborough County

Tampa, FL

**CONTACT:**

Richard Cummings

925 E. Twigg St.

Tampa, FL 33602

813.209.3003

cummingsr@HCFLGov.net

**DURATION:**

2019 - Ongoing

**ROLE:**

Sub

**CONTRACT VALUE:**

$1.7MM

# North County Flow Monitoring

The North County Wastewater Collection System conveys wastewater to the W.E. Dunn Water Reclamation Facility (WEDWRF) and consists of approximately 340 miles of gravity sewers, 85 miles of force mains, and 152 pump stations. The wastewater collection system transports an average of 6.5 million gallons of wastewater daily.

McKim and Creed (McKim & Creed) was contracted to monitor wastewater, determine the flow characteristics, and prioritize areas in the collection systems based on infiltration and inflow (I&I) severity. The findings and recommendations will be used for calibrating the collection system hydraulic model; and to implement operation, maintenance, and capital improvements projects. The County's objective is to maintain a resilient and sustainable level of service for its customers.

The scope of the project included 40 flow meters, 10 rainfall gauges, and 10 groundwater gauges. Using the Pinellas Public Utilities' GIS to delineate the metering basins, McKim & Creed assisted the County select the meter locations and perform site investigations. A flow monitoring plan was submitted for approval prior to installing the equipment. For the project, McKim & Creed deployed FloWav PSA-AV flow meters and Texas Instruments rainfall gauges, coupled with Trimble RU-35 and RG-32A loggers respectively. Data from the meters and rain gauges is collected and reviewed daily by means of Trimble Enterprise Platform and maintenance crews deployed to as needed to address and resolve data issues. This approach has resulted in 100% uptime. Final flow data is reported to the County each month.

In addition to the 40 metering locations, McKim & Creed evaluated 40 small lift stations within the sewershed. The pump run times were used to calculate daily wastewater volumes pumped to ascertain how each lift station reacts to wet-weather events, and to prioritize the stations by severity of rain derived I&I (RDII).

## Project Details

**OWNER:**

Pinellas County

Clearwater, FL

**CONTACT:**

Daniel E. Glaser, PE, Senior Engineer

Pinellas County Utilities Department

22211 US 19 N.

727.464.5209

dglaser@pinellascounty.org

**DURATION:**

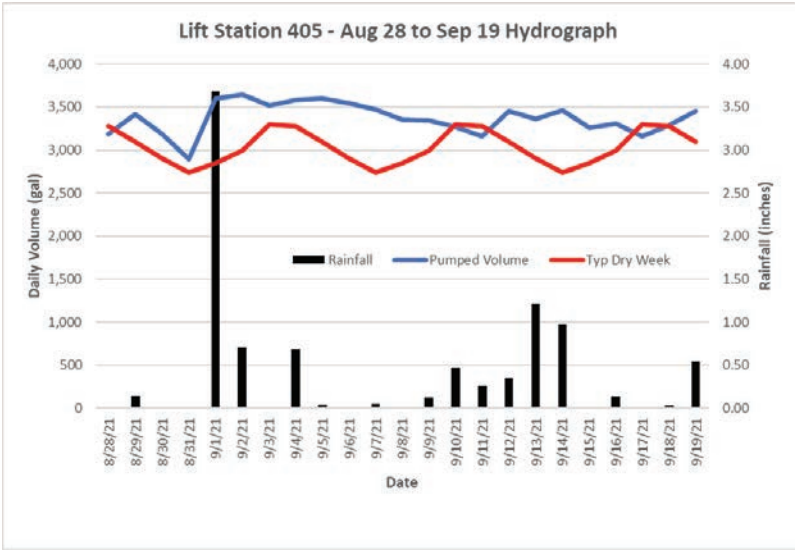
Ongoing

**ROLE:**

Prime

**CONTRACT VALUE:**

$1.0MM



# VENDOR REFERENCE VERIFICATION FORM

It is the responsibility of the contractor/vendor to provide a minimum of three (3) similar type references using this form and to provide this information with your submission. Failure to do so may result in the rejection of your submission.

City of Hollywood Solicitation No. and Title: RFQ-4717-22-OT Engineering Consulting Services for Infiltration and Inflow

Reference for: McKim & Creed, Inc.

| | | | |
|---|---|---|---|
| Organization/Firm Name providing reference: | Hillsborough County, FL | | |
| Organization/Firm Contact Name: | Richard Cummings | Title: | Director |
| Email: | cummingsr@HCFLGov.net | Phone: | 813.209.3003 |
| Name of Referenced Project: | Sewer Service Area I&I Abatement | Contract No: | |
| Date Services were provided: | 2019-Ongoing | Project Amount: | $1.7MM |

Referenced Vendor's role in Project: ☐ Prime Vendor ☑ Subcontractor/ Subconsultant

Would you use the Vendor again? ☐ Yes ☐ No. Please specify in additional comments

| Description of services provided by Vendor: |
|---|
| McKim & Creed is providing sanitary sewer evaluation services to Hillsborough County Public Utilities to investigate and resolve inflow and infiltration into the County's Falkenburg basin area wastewater collection system. |
| |

| Please rate your experience with the Vendor | Need Improvement | Satisfactory | Excellent | Not Applicable |
|---|---|---|---|---|
| Vendor's Quality of Service | | | | |
| a. Responsive | ☐ | ☐ | ☐ | ☐ |
| b. Accuracy | ☐ | ☐ | ☐ | ☐ |
| c. Deliverables | ☐ | ☐ | ☐ | ☐ |
| Vendor's Organization: | | | | |
| a. Staff expertise | ☐ | ☐ | ☐ | ☐ |
| b. Professionalism | ☐ | ☐ | ☐ | ☐ |
| c. Staff turnover | ☐ | ☐ | ☐ | ☐ |
| Timeliness of: | | | | |
| a. Project | ☐ | ☐ | ☐ | ☐ |
| b. Deliverables | ☐ | ☐ | ☐ | ☐ |

| Additional Comments: (provide additional sheet if necessary) |
|---|
| |
| |
| |

| ****THIS SECTION FOR CITY USE ONLY**** | | | | | | |
|---|---|---|---|---|---|---|
| Verified via: | Email: | ☐ | Verbal: | ☐ | Mail: | ☐ |
| Verified by: | Name: | | | | Title: | |
| | Department: | | | | Date: | |

# VENDOR REFERENCE VERIFICATION FORM

It is the responsibility of the contractor/vendor to provide a minimum of three (3) similar type references using this form and to provide this information with your submission. Failure to do so may result in the rejection of your submission.

**City of Hollywood Solicitation No. and Title:** RFQ-4717-22-OT Engineering Consulting Services for Infiltration and Inflow

**Reference for:** McKim & Creed, Inc.

**Organization/Firm Name providing reference:** City of Largo, FL

**Organization/Firm Contact Name:** Jerry Woloszynski, PE **Title:** Director

**Email:** JWoloszy@Largo.com **Phone:** 727.587.6713 x4400

**Name of Referenced Project:** Sewer Collection System Evaluations **Contract No:**

**Date Services were provided:** 2017-2020 **Project Amount:** $534,290

**Referenced Vendor's role in Project:** ☒ Prime Vendor ☐ Subcontractor/ Subconsultant

**Would you use the Vendor again?** ☐ Yes ☐ No. Please specify in additional comments

| Description of services provided by Vendor: |
|---|
| Tasks included hydraulic modeling, capacity assessments, flow and rainfall monitoring, smoke/dye testing, 780 manhole inspections, night flow isolations, 128,000 LF of CCTV inspections, I/I quantification and recommended abatement. The design effort included both trenchless and traditional open cut and replacement. |

| Please rate your experience with the Vendor | Need Improvement | Satisfactory | Excellent | Not Applicable |
|---|---|---|---|---|
| **Vendor's Quality of Service** | | | | |
| a. Responsive | ☐ | ☐ | ☒ | ☐ |
| b. Accuracy | ☐ | ☐ | ☒ | ☐ |
| c. Deliverables | ☐ | ☐ | ☒ | ☐ |
| **Vendor's Organization:** | | | | |
| a. Staff expertise | ☐ | ☐ | ☒ | ☐ |
| b. Professionalism | ☐ | ☐ | ☒ | ☐ |
| c. Staff turnover | ☐ | ☒ | ☐ | ☐ |
| **Timeliness of:** | | | | |
| a. Project | ☐ | ☐ | ☒ | ☐ |
| b. Deliverables | ☐ | ☐ | ☒ | ☐ |

| Additional Comments: (provide additional sheet if necessary) |
|---|
| |
| |
| |

| ****THIS SECTION FOR CITY USE ONLY**** | | | | | |
|---|---|---|---|---|---|
| **Verified via:** | **Email:** | ☒ | **Verbal:** ☐ | **Mail:** | ☐ |
| **Verified by:** | **Name:** | Jerald Woloszynski | | **Title:** | Director |
| | **Department:** | Engineering Services | | **Date:** | 5/17/2022 |

# VENDOR REFERENCE VERIFICATION FORM

It is the responsibility of the contractor/vendor to provide a minimum of three (3) similar type references using this form and to provide this information with your submission. Failure to do so may result in the rejection of your submission.

City of Hollywood Solicitation No. and Title: RFQ-4717-22-OT Engineering Consulting Services for Infiltration and Inflow

Reference for: McKim & Creed, Inc.

| | | | |
|---|---|---|---|
| Organization/Firm Name providing reference: | City of Gulf Breeze, FL | | |
| Organization/Firm Contact Name: | Thomas Lambert, PE | Title: | Public Works Director |
| Email: | tlambert@gulfbreezefl.gov | Phone: | (850) 934-4094 |
| Name of Referenced Project: | Area 1 and Desk Top I&I Study | Contract No: | |
| Date Services were provided: | Ongoing | Project Amount: | $94,820 |
| Referenced Vendor's role in Project: | ☒ Prime Vendor | ☒ | Subcontractor/ Subconsultant |
| Would you use the Vendor again? | ☒ Yes | ☐ | No. Please specify in additional comments |

| Description of services provided by Vendor: |
|---|
| McKim and Creed (McKim & Creed) was contracted to monitor wastewater, determine the flow characteristics, and prioritize areas in the collection systems based on infiltration and inflow (I&I) severity. |
| |

| Please rate your experience with the Vendor | Need Improvement | Satisfactory | Excellent | Not Applicable |
|---|---|---|---|---|
| Vendor's Quality of Service | | | | |
| a. Responsive | ☐ | ☐ | ☒ | ☐ |
| b. Accuracy | ☐ | ☐ | ☒ | ☐ |
| c. Deliverables | ☐ | ☐ | ☒ | ☐ |
| Vendor's Organization: | | | | |
| a. Staff expertise | ☐ | ☐ | ☒ | ☐ |
| b. Professionalism | ☐ | ☐ | ☒ | ☐ |
| c. Staff turnover | ☐ | ☐ | ☒ | ☐ |
| Timeliness of: | | | | |
| a. Project | ☐ | ☐ | ☒ | ☐ |
| b. Deliverables | ☐ | ☐ | ☒ | ☐ |

| Additional Comments: (provide additional sheet if necessary) |
|---|
| McKim & Creed provide valuable services to the City, from local project management, to experts in the specific area of inflow & infilitration. |
| The services in the field studies were exceptional, above any contractor service we have ever used. Very minimal complaints form the field work. |
| |

| ****THIS SECTION FOR CITY USE ONLY**** | | | | | | |
|---|---|---|---|---|---|---|
| Verified via: | Email: | ☐ | Verbal: | ☐ | Mail: | ☐ |
| Verified by: | Name: | | | | Title: | |
| | Department: | | | | Date: | |

## SECTION 7

# REQUIRED FORMS

# DRUG-FREE WORKPLACE PROGRAM

IDENTICAL TIE BIDS - Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids that are equal with respect to price, quality, and service are received by the state or by any political subdivision for the procurement of commodities or contractual services, a bid received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied vendors have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employee that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program (if such is available in the employee's community) by, any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of these requirements.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

Paul J. Costa
SIGNATURE

Paul J. Costa
PRINTED NAME

RJN Group, Inc.
NAME OF COMPANY

RFQ/RFP/ITB Number: RPQ-4717-22-OT Title: Engineering Consulting Services for I&I Program

# CERTIFICATIONS REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

The applicant certifies that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, sentenced to a denial of federal benefits by a state or federal court, or voluntarily excluded from covered transactions by any federal department or agency;

(b) Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction, violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and

(d) Have not within a three-year period preceding this application had one or more public transactions (federal, state, or local) terminated for cause or default.

Applicant Name and Address:

RJN Group, Inc.

1589 Sulphur Spring Road, Suite 102

Baltimore, Maryland 21227

Application Number and/or Project Name:

Engineering Consulting Services for I&I Program

Applicant IRS/Vendor Number: 36-2838939

Type/Print Name and Title of Authorized Representative:

Paul J. Costa, President/CEO

Signature:  Date: 5.20.22

RFQ/RFP/ITB Number: RFQ-4717-22-OT Title: Engineering Consulting Services for I&I Program

# NON-COLLUSION AFFIDAVIT

**STATE OF:** Illinois

**COUNTY OF:** DuPage, being first duly sworn, deposes and says that:

(1) He/she is Paul Costa of RJN Group, Inc., the Respondent that has submitted the attached Bid.

(2) He/she has been fully informed regarding the preparation and contents of the attached Bid and of all pertinent circumstances regarding such Bid;

(3) Such Bid is genuine and is not a collusion or sham Bid;

(4) Neither the said Respondent nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Respondent, firm or person to submit a collusive or sham Bid in connection with the contractor for which the attached Bid has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Respondent, firm or person to fix the price or prices, profit or cost element of the Bid price or the Bid price of any other Respondent, or to secure an advantage against the City of Hollywood or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Respondent or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

**(SIGNED)** Paul Costa

**Title:** President/CEO

Subscribed and sworn to before me this

20th day of May, 20 22

My commission expires:

RFQ/RFP/ITB Number: RFQ-4717-22-OT Title: Engineering Consulting Services for I&I Program

# City of Hollywood
# Vendor Reference Verification Form

RJN Vendor Reference Verification Forms are provided at the end of Section 5.

## 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) RJN Group, Inc.

Name/Principal/Project Manager: Kraig Moodie

Address: 1589 Sulphur Spring Road, Suite 102

City: Baltimore State: MD Zip: 21227

Telephone No. (410) 242-3838 **FEIN/Tax ID No**. 36-2838939 Email: kraig.moodie@rjnmail.com

Does your firm qualify for MBE or WBE status: NO MBE _____ WBE _____

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

| Addendum No. | Date Issued | Addendum No. | Date Issued |
|---|---|---|---|
| Addendum 1 | 5.19.22 | | |
| | | | |

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 Respondent 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 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.**

The below signatory 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 agrees, by virtue of submitting or attempting to submit a response, 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 $500.00This 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:

Kraig Moodie
Name (printed)

Signature

5.20.22
Date:

Regional Vice President
Title

# SWORN STATEMENT PURSUANT TO SECTION 287.133 (3) (a) FLORIDA STATUTES ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS

1. This form statement is submitted to City of Hollywood, Florida
By Paul J. Costa, President/CEO for RJN Group, Inc.
(Print individual's name and title) (Print name of entity submitting sworn statement)
whose business address is 1589 Sulphur Spring Road, Suite 102, Baltimore, Maryland 21227
and if applicable its Federal Employer Identification Number (FEIN) is 36-2838939 If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement.

2. I understand that "public entity crime," as defined in paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid, proposal, reply, or contract for goods or services, any lease for real property, or any contract for the construction or repair of a public building or public work, involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misinterpretation.

3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in an federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

4. I understand that "Affiliate," as defined in paragraph 287.133(1)(a), Florida Statutes, means:

1. A predecessor or successor of a person convicted of a public entity crime, or
2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

5 I understand that "person," as defined in Paragraph 287.133(1)(e), Florida Statutes, means any natural person or any entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and that bids or applies to bid on contracts let by a public entity, or that otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

6. Based upon information and belief, the statement that I have marked below is true in relation to the entity submitting this sworn statement. (please indicate which statement applies.)

✓ Neither the entity submitting sworn statement, nor any of its officers, director, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989..

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime, but the Final Order entered by the Hearing Officer in a subsequent proceeding before a Hearing Officer of the State of the State of Florida, Division of Administrative Hearings, determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the Final Order).

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN THAT IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THAT PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017 FLORIDA STATUTES FOR A CATEGORY TWO PROJECT OF ANY CHANGE IN THE INFORMATION CONTAINED ON THIS FORM.

Paul G Cook
(Signature)

Sworn to and subscribed before me this 22nd day of May, 20 22.

Personally known ✓

Or produced identification _____ Notary Public-State of Illinois

My commission expires 10/16/23

KAREN S CATENA
Official Seal
Notary Public - State of Illinois
My Commission Expires Oct 16, 2023

Karen S. Catena
(Printed, typed or stamped commissioned name of notary public)

RFQ/RFP/ITB Number: RFQ-4717-22-OT Title: Engineering Consulting Services for I&I Program

# HOLD HARMLESS AND INDEMNITY CLAUSE

**RJN Group, Inc./Paul Costa**

, the contractor, shall indemnify, defend and hold harmless the City of Hollywood, its elected and appointed officials, employees and agents for any and all suits, actions, legal or administrative proceedings, claims, damage, liabilities, interest, attorney's fees, costs of any kind whether arising prior to the start of activities or following the completion or acceptance and in any manner directly or indirectly caused, occasioned or contributed to in whole or in part by reason of any act, error or omission, fault or negligence whether active or passive by the Contractor, or anyone acting under its direction, control, or on its behalf in connection with or incident to its performance of the Contract.

| | |
|---|---|
| Paul Costa | Paul Costa |
| SIGNATURE | PRINTED NAME |
| RJN Group, Inc. | 5/20/22 |
| COMPANY OF NAME | DATE |

**Failure to sign or changes to this page shall render your bid non-responsive.**

## SOLICITATION, GIVING, AND ACCEPTANCE OF GIFTS POLICY

Florida Statute 112.313 prohibits the solicitation or acceptance of Gifts. - "No Public officer, employee of an agency, local government attorney, or candidate for nomination or election shall solicit or accept anything of value to the recipient, including a gift, loan, reward, promise of future employment, favor, or service, based upon any understanding that the vote, official action, or judgment of the public officer, employee, local government attorney, or candidate would be influenced thereby.". The term "public officer" includes "any person elected or appointed to hold office in any agency, including any person serving on an advisory body."

City of Hollywood policy prohibits all public officers, elected or appointed, all employees, and their families from accepting any gifts of any value, either directly or indirectly, from any contractor, respondent, consultant, or business with whom the City does business.

The State of Florida definition of "gifts" includes the following:

Real property or its use,
Tangible or intangible personal property, or its use,
A preferential rate or terms on a debt, loan, goods, or services,
Forgiveness of indebtedness,
Transportation, lodging, or parking,
Food or beverage,
Membership dues,
Entrance fees, admission fees, or tickets to events, performances, or facilities,
Plants, flowers or floral arrangements
Services provided by persons pursuant to a professional license or certificate.
Other personal services for which a fee is normally charged by the person providing the services.
Any other similar service or thing having an attributable value not already provided for in this section.

Any contractor, Respondent, consultant, or business found to have given a gift to a public officer or employee, or his/her family, will be subject to dismissal or revocation of the Contract.

As the person authorized to sign the statement, I certify that this firm will comply fully with this policy.

| | |
|---|---|
| _____ | Paul Costa |
| SIGNATURE | PRINTED NAME |
| RJN Group, Inc. | President/CEO |
| NAME OF COMPANY | TITLE |

**Failure to sign this page shall render your bid non-responsive.**

# DRUG-FREE WORKPLACE PROGRAM

IDENTICAL TIE BIDS - Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids that are equal with respect to price, quality, and service are received by the state or by any political subdivision for the procurement of commodities or contractual services, a bid received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied vendors have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employee that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program (if such is available in the employee's community) by, any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of these requirements.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

CEspinosa

SIGNATURE

Carlos Espinosa, PE

PRINTED NAME

McKim & Creed, Inc.

NAME OF COMPANY

RFQ/RFP/ITB Number: Bid RFQ-4717-22-OT Title: Engineering Consulting Services for Infiltration and Inflow

## CERTIFICATIONS REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

The applicant certifies that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, sentenced to a denial of federal benefits by a state or federal court, or voluntarily excluded from covered transactions by any federal department or agency;

(b) Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction, violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and

(d) Have not within a three-year period preceding this application had one or more public transactions (federal, state, or local) terminated for cause or default.

Applicant Name and Address:

6501 Congress Avenue, #100

Boca Raton, FL 33487

Application Number and/or Project Name:

Bid RFQ-4717-22-OT Engineering Consulting Services for Infiltration and Inflow

Applicant IRS/Vendor Number: 56-2136769

Type/Print Name and Title of Authorized Representative:

Carlos Espinosa, PE | Wet Weather Manager

Signature: CEspinosa Date: 5.18.22

RFQ/RFP/ITB Number: Bid RFQ-4717-22-OT Title: Engineering Consulting Services for Infiltration and Inflow

## NON-COLLUSION AFFIDAVIT

**STATE OF:** Florida

**COUNTY OF:** Sarasota, being first duly sworn, deposes and says that:

(1) He/she is Carlos Espinosa of McKim & Creed, the Respondent that has submitted the attached Bid.

(2) He/she has been fully informed regarding the preparation and contents of the attached Bid and of all pertinent circumstances regarding such Bid;

(3) Such Bid is genuine and is not a collusion or sham Bid;

(4) Neither the said Respondent nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Respondent, firm or person to submit a collusive or sham Bid in connection with the contractor for which the attached Bid has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Respondent, firm or person to fix the price or prices, profit or cost element of the Bid price or the Bid price of any other Respondent, or to secure an advantage against the City of Hollywood or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Respondent or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

**(SIGNED)** CEspinosa

**Title:** Wet Weather Manager

Subscribed and sworn to before me this

18th day of May, 2022

My commission expires: April 14, 2023

SHELLY LUDWIG
Notary Public - State of Florida
Commission # GG 285158
My Comm. Expires Apr 14, 2023
Bonded through National Notary Assn.

Shelly Ludwig

RFQ/RFP/ITB Number: Bid RFQ-4717-22-OT Title: Engineering Consulting Services for Infiltration and Inflow

# City of Hollywood
# Vendor Reference Verification Form

McKim & Creed Vendor Reference Verification Forms are provided at the end of Section 6.

## 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) McKim & Creed, Inc.

Name/Principal/Project Manager: Carlos Espinosa, PE

Address: 6501 Congress Avenue, #100

City: Boca Raton State: FL Zip: 33487

Telephone No. 386.274.2828 **FEIN/Tax ID No.** 56-2136769 Email: cespinosa@mckimcreed.com

Does your firm qualify for MBE or WBE status: No MBE _____ WBE _____

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

| Addendum No. | Date Issued | Addendum No. | Date Issued |
|---|---|---|---|
| | | | |
| | | | |

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 Respondent 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 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.**

The below signatory 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 agrees, by virtue of submitting or attempting to submit a response, 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 $500.00This 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:

| | |
|---|---|
| Carlos Espinosa, PE | C Espinosa |
| Name (printed) | Signature |
| 5.18.22 | Wet Weather Manager |
| Date: | Title |

# SWORN STATEMENT PURSUANT TO SECTION 287.133 (3) (a) FLORIDA STATUTES ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS

1. This form statement is submitted to City of Hollywood, FL
By Carlos Espinosa, PE for McKim & Creed, Inc.
(Print individual's name and title) (Print name of entity submitting sworn statement)
whose business address is 6501 Congress Avenue, #100, Boca Raton, FL 33487
and if applicable its Federal Employer Identification Number (FEIN) is 56-2136769 If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement.

2. I understand that "public entity crime," as defined in paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid, proposal, reply, or contract for goods or services, any lease for real property, or any contract for the construction or repair of a public building or public work, involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misinterpretation.

3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in an federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

4. I understand that "Affiliate," as defined in paragraph 287.133(1)(a), Florida Statutes, means:

1. A predecessor or successor of a person convicted of a public entity crime, or
2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

5 I understand that "person," as defined in Paragraph 287.133(1)(e), Florida Statutes, means any natural person or any entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and that bids or applies to bid on contracts let by a public entity, or that otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

6. Based upon information and belief, the statement that I have marked below is true in relation to the entity submitting this sworn statement. (please indicate which statement applies.)

X Neither the entity submitting sworn statement, nor any of its officers, director, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989..

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime, but the Final Order entered by the Hearing Officer in a subsequent proceeding before a Hearing Officer of the State of the State of Florida, Division of Administrative Hearings, determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the Final Order).

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN THAT IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THAT PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017 FLORIDA STATUTES FOR A CATEGORY TWO PROJECT OF ANY CHANGE IN THE INFORMATION CONTAINED ON THIS FORM.

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CEspinosa
_____
(Signature)

Sworn to and subscribed before me this 18th day of May, 2022

Personally known Carlos Espinosa

Or produced identification _____ Notary Public-State of Florida

My commission expires April 14, 2023

SHELLY LUDWIG
Notary Public - State of Florida
Commission # GG 285158
My Comm. Expires Apr 14, 2023
Bonded through National Notary Assn.

Shelly Ludwig
(Printed, typed or stamped commissioned name of notary public)

RFQ/RFP/ITB Number: Bid RFQ-4717-22-OT Title: Engineering Consulting Services for Infiltration and Inflow

## HOLD HARMLESS AND INDEMNITY CLAUSE

**(Company Name and Authorized Representative's Name)**

, the contractor, shall indemnify, defend and hold harmless the City of Hollywood, its elected and appointed officials, employees and agents for any and all suits, actions, legal or administrative proceedings, claims, damage, liabilities, interest, attorney's fees, costs of any kind whether arising prior to the start of activities or following the completion or acceptance and in any manner directly or indirectly caused, occasioned or contributed to in whole or in part by reason of any act, error or omission, fault or negligence whether active or passive by the Contractor, or anyone acting under its direction, control, or on its behalf in connection with or incident to its performance of the Contract.

| | |
|---|---|
| SIGNATURE | Carlos Espinosa, PE<br>PRINTED NAME |
| McKim & Creed, Inc.<br>COMPANY OF NAME | 5.18.22<br>DATE |

**Failure to sign or changes to this page shall render your bid non-responsive.**

## SOLICITATION, GIVING, AND ACCEPTANCE OF GIFTS POLICY

Florida Statute 112.313 prohibits the solicitation or acceptance of Gifts. - "No Public officer, employee of an agency, local government attorney, or candidate for nomination or election shall solicit or accept anything of value to the recipient, including a gift, loan, reward, promise of future employment, favor, or service, based upon any understanding that the vote, official action, or judgment of the public officer, employee, local government attorney, or candidate would be influenced thereby.". The term "public officer" includes "any person elected or appointed to hold office in any agency, including any person serving on an advisory body."

City of Hollywood policy prohibits all public officers, elected or appointed, all employees, and their families from accepting any gifts of any value, either directly or indirectly, from any contractor, respondent, consultant, or business with whom the City does business.

The State of Florida definition of "gifts" includes the following:

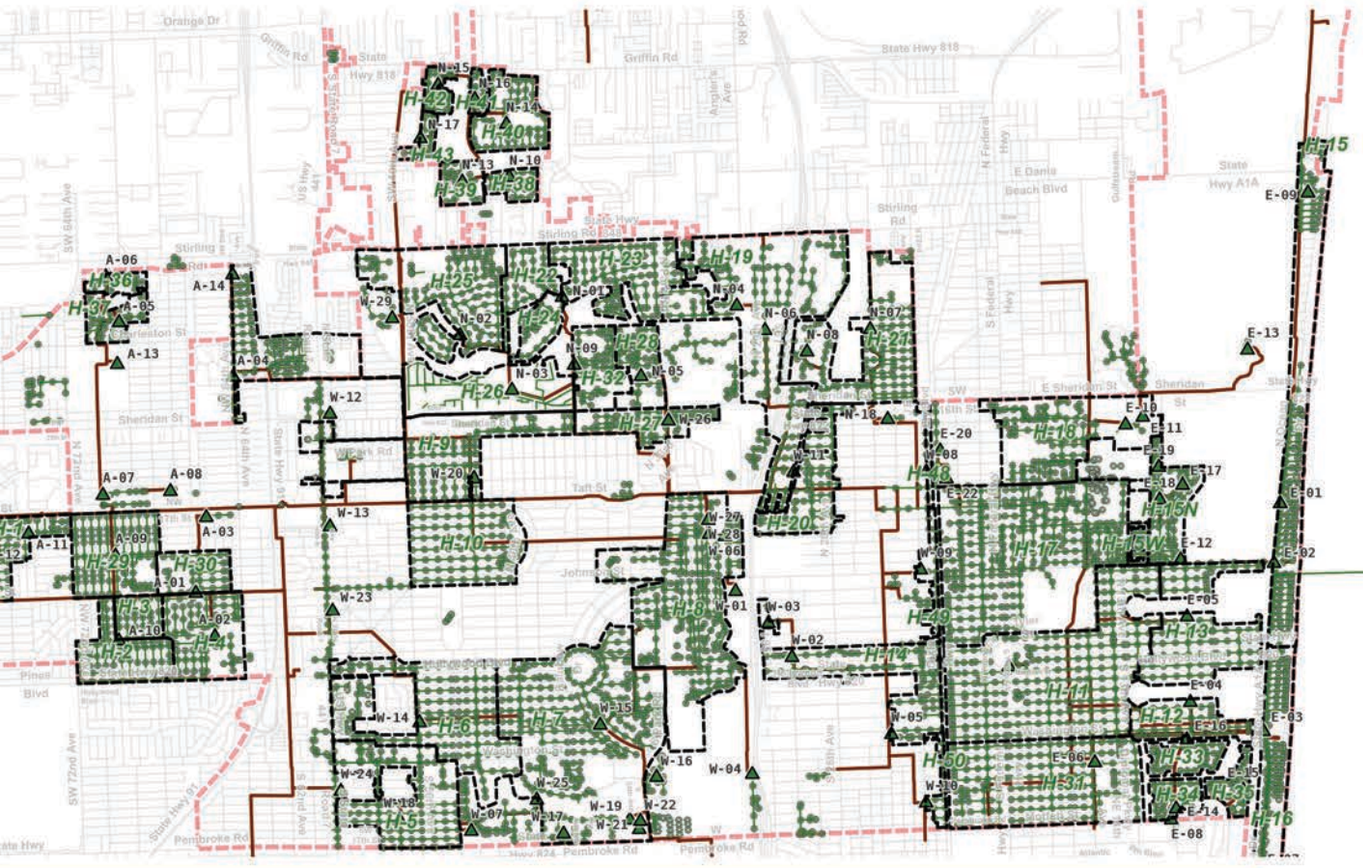
Real property or its use,
Tangible or intangible personal property, or its use,
A preferential rate or terms on a debt, loan, goods, or services,
Forgiveness of indebtedness,
Transportation, lodging, or parking,
Food or beverage,
Membership dues,
Entrance fees, admission fees, or tickets to events, performances, or facilities,
Plants, flowers or floral arrangements
Services provided by persons pursuant to a professional license or certificate.
Other personal services for which a fee is normally charged by the person providing the services.
Any other similar service or thing having an attributable value not already provided for in this section.

Any contractor, Respondent, consultant, or business found to have given a gift to a public officer or employee, or his/her family, will be subject to dismissal or revocation of the Contract.

As the person authorized to sign the statement, I certify that this firm will comply fully with this policy.

| | |
|---|---|
| CEspinosa | Carlos Espinosa, PE |
| SIGNATURE | PRINTED NAME |
| McKim & Creed, Inc. | Wet Weather Manager |
| NAME OF COMPANY | TITLE |

**Failure to sign this page shall render your bid non-responsive.**

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