READY.
RESPONSIVE.
RELIABLE.

GENERAL ENGINEERING SERVICES

RFQ #12-005

City of Key West, Florida

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1 AUGUST 2012

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Rafael E. Frias III, PE
Senior Project Manager
and Client Director,
Water

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August 1, 2012

Mr. Doug Bradshaw
Senior Project Manager
The City of Key West
3140 Flagler Avenue
Key West, FL 33040

Subject: RFQ #12-005 – General Engineering Services

Dear Doug,

During the past year, Black & Veatch Team members, including our Project Manager, **Rafael Frias**, Client Service Advocate, **Robert Chambers**, have met with Utilities Department professionals to thoroughly understand the issues impacting the utility and the City of Key West now and into the future.

We have learned that the Utilities Department is tasked with providing a high level of infrastructure services that include wastewater, stormwater and solid waste to its existing customers through proper implementation of its Capital Improvement Plan and maintenance of its facilities. We have also learned that the City could benefit from a firm with proven national experience on the development of infrastructure projects, such as sanitary and storm sewers, pump stations and historic building preservation.

To this end, Black & Veatch is committed to supporting the Utilities Department by providing a **highly-qualified team** that will bring its **national expertise** and **diverse experience** to implement **local solutions**. Our Team is **Ready**, **Responsive** and **Reliable** and its goal for this General Engineering Services (GES) contract is to partner with the Utilities Department in support of its vision of being a leader in environmental protection, while improving the quality of life.

The Black & Veatch Team will provide the following value to the City of Key West:

- A **resourceful Project Manager**, Rafael Frias, who will ensure that the Utilities Department has full access to the best technical resources available within Black & Veatch.
- A **committed Client Service Advocate** in Robert Chambers, who will ensure complete Utilities Department satisfaction on all task order assignments performed for the City.
- **National expertise** in wastewater, stormwater and solid waste with specialized Task Leaders that will focus on successfully completing any assignment for the City.
- A team with **diverse experience and proven capabilities** in utility, environmental and civil engineering services.

- A **historic building preservation expert** in **James Sullivan**, who has completed multiple historic preservation assessments and structural evaluations throughout the U.S. for the National Park Service.

- **Timely, high-quality work products** delivered consistently throughout the term of the contract.

The Black & Veatch Team includes the local collaboration of small business partners, all of which have successfully completed projects in South Florida, including the City of Key West. Our Team is comprised of **CRJ & Associates** (FDOT certified firm for civil, inspection and transportation projects)**, Avirom & Associates** (surveying) and **GEOSOL** (geotechnical and testing).

The Black & Veatch Team believes that our committed leadership and national wastewater, stormwater, solid waste and historic building preservation expertise will provide the Utilities Department with value that will result in timely, high-quality work products and cost-effective improvements.

We welcome the opportunity to discuss the details of our qualifications and invite you to contact me at (954) 465-6872. Thank you for your time and consideration; we look forward to partnering with the City of Key West Utilities Department on this important GES contract.

Very truly yours,
BLACK & VEATCH

Rafael E. Frias III, PE
Senior Project Manager and
Client Director

Robert Chambers
Client Service Advocate

Table of Contents

Firm Qualifications

The City of Key West Utilities Department is tasked with providing a high level of infrastructure services that include wastewater, stormwater and solid waste to its existing customers through proper implementation of its Capital Improvement Plan and maintenance of its facilities. To this end, **Black & Veatch is committed to supporting the Utilities Department by providing a highly-qualified team that will bring its national expertise and diverse experience to implement local solutions.** Our goal for this General Engineering Services (GES) contract is to partner with the Utilities Department in support of its vision of being a leader in environmental protection, while improving the quality of life.

Based on discussions with City staff and our collective experience managing numerous GES contracts, we are ready to support the Utilities Department in delivering the best infrastructure services solutions. Our team is **Ready, Responsive and Reliable**. The ideas and drivers supporting this theme are instilled throughout this proposal and include the following commitments:

- **A resourceful point of contact** in your Project Manager, **Rafael Frias,** for all contractual and administrative matters.
- **A committed Client Service Advocate** in **Robert Chambers,** who will ensure complete Utilities Department satisfaction on all task order assignments performed for the City.
- **National expertise** in wastewater, stormwater and solid waste and specialized Task Leaders to successfully complete multiple, simultaneous task orders.
- A team with **diverse experience and proven capabilities** in utility, environmental and civil engineering services, including **historic building preservation expertise.**
- **Timely, high-quality work products** delivered consistently throughout the term of the contract.

Ready, Responsive and Reliable

The goal of the Black & Veatch Team is to partner with the City of Key West Utilities Department in support of its vision of being a leader in environmental protection, while improving the quality of life.

DISCIPLINE OFFERINGS

Black & Veatch is uniquely qualified to provide the City of Key West infrastructure services in the following disciplines, for which we are including our qualifications:

- **Utility Engineering Services**
- **Environmental Engineering Services**
- **Civil Engineering Services**

Our proposal will demonstrate Black & Veatch's specialized experience and national technical expertise in these disciplines.

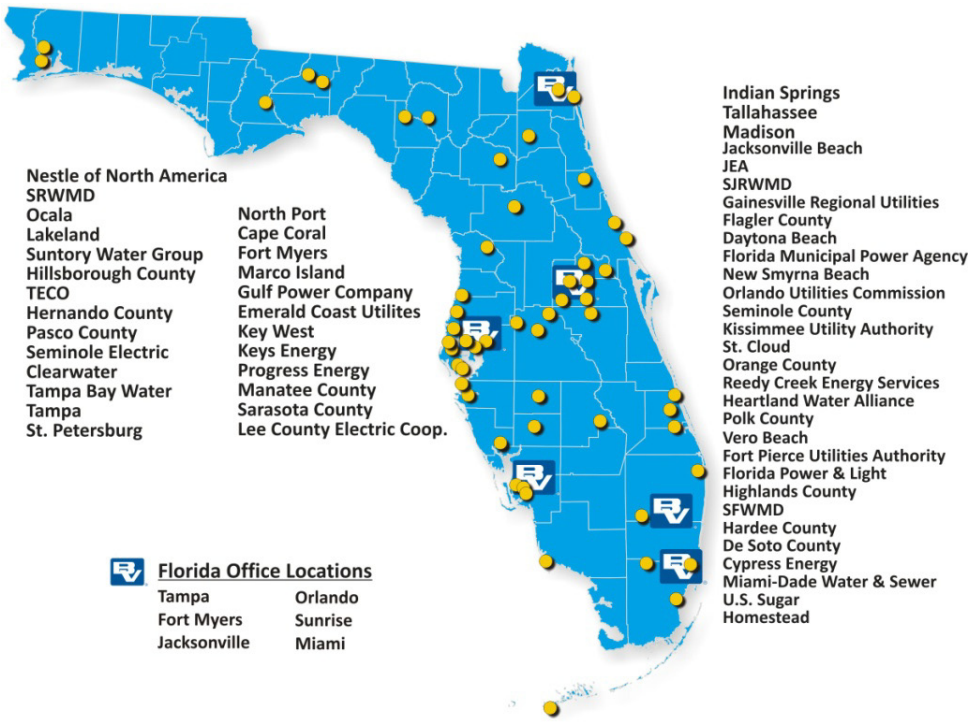
BLACK & VEATCH COMPANY PROFILE

As a national leader in infrastructure development in the water, environmental, management consulting, energy, telecommunications and federal markets,

Black & Veatch will provide the Utilities Department with single source solutions for concept-to-completion work and lifecycle support for all City projects.

Black & Veatch Corporation is a leading global engineering, construction and consulting company specializing in civil infrastructure development in the fields of **water, wastewater, reclaimed water, stormwater, environmental, energy, management consulting and telecommunications.** We provide a full complement of conceptual and preliminary engineering services, engineering design, procurement, construction, financial management, asset management, information technology, environmental, security design and consulting, and management consulting services. This knowledge base has allowed us to develop our engineering services skills and capabilities based on our national experience and understanding of all aspects of a project from conception through commissioning. **Black & Veatch's diverse capabilities will enable us to complete any assignment for which the City of Key West Utilities Department requires engineering assistance.**

Black & Veatch was founded as a partnership in 1915. Today, the firm operates as an employee-owned corporation and maintains more than 100 offices worldwide with approximately 9,000 professionals. Through a network of offices, our clients have access to sophisticated design and planning tools as well as our global network of highly-skilled and experienced engineers, scientists and technicians who specialize in water and wastewater technologies. These experts lead the water and wastewater industry by conducting research and developing new and innovative technologies, enhancing existing processes and integrating the latest industry developments into realistic, reliable and affordable solutions for our clients. Our office locations in Florida and a list of our clients are illustrated in the figure below.



Black & Veatch is continuously ranked as one of the top engineering-design firms by Engineering News-Record (ENR). We have risen to the top of our field by providing open and productive working relationships with our clients; effective project management; development and implementation of innovative and sustainable solutions for complex projects; and flexible project-delivery systems that meet aggressive budgets and schedules. Our success is based on principles of sustainable development, which means, we serve public and private clients of every size with a strong focus on life-cycle economy, efficiency and reliability.

By combining the reliability, responsiveness and commitment of our dedicated project Team with cost-effective specialized support services to meet the unique needs of each City project, Black & Veatch will exceed the Utilities Department expectations. **The Utilities Department can expect high quality, cost effective and safe projects, delivered on time and within budget.**

Black & Veatch provides engineering services in Florida from six offices, located in Miami, Sunrise, Fort Myers, Orlando, Tampa and Jacksonville. Black & Veatch has more than 100 professionals in the state with expertise in a broad range of engineering related fields. We have been serving clients throughout Florida since the 1950s.

2012 TOP 500 DESIGN FIRM SOURCEBOOK

Overall Ranking

14 Top 500 Design Firms

Environmental

6 Top 25 in Transmission Lines and Aqueducts

7 Top 50 in Water Supply

8 Top 25 in Sanitary and Storm Sewers

8 Top 50 in Sewerage and Solid Waste

Our national expertise will ensure reliable and peace-of-mind solutions to the Utilities Department.

UTILITY ENGINEERING SERVICES QUALIFICATIONS

Specific to Utility Engineering Services, the Black & Veatch Team will provide the Utilities Department with comprehensive services that may include master planning, pump/lift stations evaluations, sanitary and storm sewers design, stormwater management, hydraulic modeling, hydrogeology support, utility rate studies and bond engineering reporting, organizational optimization and change management, and sustainability and energy efficiency analyses for improved sewer and stormwater system operations and cost savings.

We understand that the Utilities Department focuses on wastewater, stormwater and solid waste services. Black & Veatch will provide practical solutions to the City of Key West through our world-class technical capabilities specific to these services. **Our proof: Black & Veatch is ranked seventh in the world amongst the Top 25 Firms in Sanitary and Storm Sewers.**

Pump/Lift Stations

The Black & Veatch Team understands the Utilities Department is responsible for approximately 22 sanitary pump stations throughout the City. Black & Veatch brings experience and expertise in virtually every type of pumping condition, pumping equipment, piping size and material, control scheme, and power source. Additionally, we have successfully conducted surge analyses for many of these systems, including models to simulate surge conditions; field tests to calibrate the model; and surge control devices including surge anticipator valves, air/vacuum valves, control valves, tanks, flywheels, control systems, and other similar equipment.

The Utilities Department will benefit from Black & Veatch's experience and expertise in virtually every type of pumping condition, pumping equipment, piping size and material, control scheme and power source.

Black & Veatch will provide comprehensive pump/lift station services to the City, including design of new facilities and rehabilitation / upgrading of existing operating systems.

Black & Veatch has designed all types of pumping stations as stand-alone projects and as integral components of treatment facilities. Our experience includes stations with all types of pumps, including horizontal centrifugal, vertical turbine and submersible pumps, many with variable speed capability. Our experience includes new pumping stations, as well as upgrades to existing facilities. Black & Veatch pump station designs provide maximum flexibility to allow for pumping over a wide range of capacities. In addition, our designs include pump stations that resemble and are compatible with local aesthetics, each tailored to the particular capacity and head conditions of the project.

Black & Veatch also has in-depth experience with the design of wastewater lift stations that manage grit and solids in the system and provide odor control technologies to minimize impacts on the neighborhoods.

Black & Veatch Representative Florida Pumping Station Projects

PROJECT | CLIENT	WATER	WASTEWATER	SUBMERSIBLE	VARIABLE FREQ. DRIVES	RAW WATER/WSW INTAKE	CONCEPTUAL/PRELIM DESIGN	FINAL DESIGN	CONSTRUCTION/CM	CONST. PHASE SERVICES	NEW	UPGRADE/RETROFIT
Southwest Regional WWTP | Manatee County		■					■		■		■
TBW System Engineer | Tampa Bay Water	■				■				■		
Everglades Agricultural Area Reservoir Phase I | South Florida Water Management District	■						■			■	
Cedar Island & Woodmere Triplex Pump Stations | JEA	■	■	■				■			■	
Oakwood Villa Septic Tank Phase-Out | JEA		■	■				■				■
Buckman WRF | JEA		■					■				■
District II WRF | JEA		■					■			■	
Bradley Road Master Pump Station | JEA		■	■				■				■
Highlands WTP Expansion | JEA	■						■	■			■
C. Wayne Combee WTP | City of Lakeland	■						■		■	■	
WRF Reuse Improvements | City of Ocala		■		■			■				■
Western Regional WTP | Orange County Utilities	■					■	■		■		■
Eastern Regional Water Supply Facility | Orange County Utilities	■			■			■		■		■
Metro West Pumping Station | Orlando Utilities Commission	■						■	■			■
Pine Hills WTP Expansion | Orlando Utilities Commission	■					■	■		■		■
Main Street WWTP | Emerald Coast Utilities Authority	■	■					■	■			■
Consumers WTP | Seminole County Environmental Services	■				■		■		■	■	

Sanitary/Storm Sewers

Black & Veatch has been a leader in the study, evaluation, analysis, design, and implementation of sewer system collection and conveyance facilities. Our sewer system utility planning and design project experience include development of sewer system master plans; and implementation programs as large as $2.2 billion in improvements. State-of-the-art tools such as geographical information systems (GIS) and computer modeling are used to ensure the accuracy and efficiency of each project.

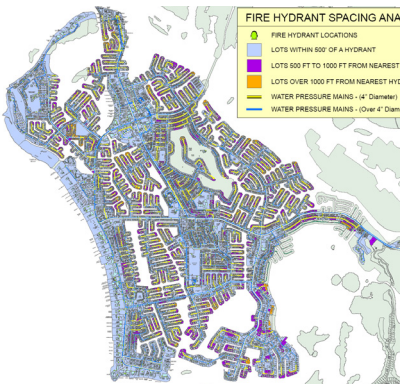
Our diverse sanitary and storm sewer pipeline experience will benefit the Utilities Department when designing or rehabilitating piping systems of any size and material, including ductile iron, PVC, steel, and HDPE.

Black & Veatch has helped hundreds of communities with sanitary and storm sewer systems. We have encountered and successfully solved every conceivable type of problem related to the design and construction of sewers, including pre-stressed concrete cylinder pipes. **As part of a CIP Engineering Services Contract, Black & Veatch recently provided pipeline analysis, engineering, environmental, geotechnical, and surveying services for rehabilitation of approximately five miles of a 36-inch ductile iron transmission main for the Florida Keys Aqueduct Authority (FKAA), adjacent to the Overseas Highway (US 1) near MM93.**

Construction conditions have ranged from highly-developed urban and residential areas to open country, and have required various construction procedures including open-cut, trenching with shoring, tunneling and above-ground piering. A wide range of soil and groundwater conditions has required the use of procedures such as dewatering the trench prior to construction or installing the pipe; piling to prevent settlement; air pressurizing (for tunnels); and weighting to protect against flotation. Highly corrosive soils encountered on some projects have required special corrosion measures such as coating or wrapping the pipe, or the use of cathodic protection systems.

Wastewater Collection Systems Modeling

Our national hydraulic modeling team are experts in their field and maintain software licenses in most hydraulic model platforms, including Innovyze Products **(InfoWater, H2OMap Water, H2OMap Sewer, CapPlan, Infoworks CS, H2OSurge, and InfoSWMM)**; Bentley products **(WaterGEMS, SewerGEMS, and Hammer)**, DHI products **(Mouse and Mike 11)**, **EPANET, XPSWMM** and **Synergee**. Black & Veatch can also perform **computation fluid dynamic (CFD)** modeling of systems.



City of Marco Island, FL, Hydraulic Model in InfoWater

Pipeline Rehabilitation

Black & Veatch offers a variety of distribution and conveyance system rehabilitation experience. The firm has been investigating system conditions and designing the rehabilitation of damaged water and wastewater lines for over 50 years. We offer expertise in investigation, repair, and detailed design of distribution and conveyance systems.

Black & Veatch is one of the few firms that can provide the City with proven experience sliplining large diameter mains with HDPE liners.

Black & Veatch rehabilitation designs have included all types of materials including vitrified clay, concrete, brick, ductile iron, and polyvinyl chloride. Based on our extensive and diverse pipeline rehabilitation experience, clients nationwide have called on Black & Veatch to study, analyze, and design system rehabilitation projects.

Black & Veatch has utilized a wide array of trenchless techniques in rehabilitation or replacement of existing systems. The technologies used include cured-in-place pipe (CIPP), sliplining, fold and form, epoxy coating, pipe bursting, directional drilling, and micro-tunneling. Black & Veatch professionals keep abreast of new technologies as they evolve, and continually evaluate their effectiveness to ensure that our clients receive high quality and cost-effective products. A sampling of representative pipeline projects performed by Black & Veatch in Florida is provided in the table below.

Black & Veatch Representative Pipeline Experience in Florida

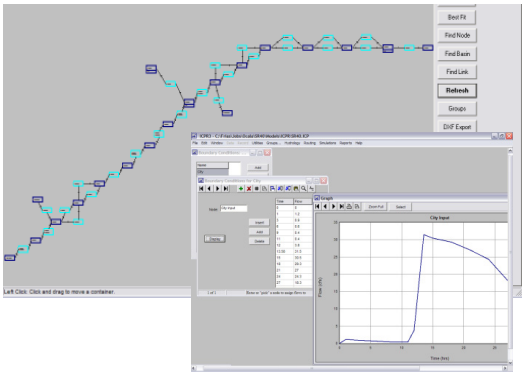
PROJECT | CLIENT	PIPELINE DIAMETER (INCHES)	LENGTH (LINEAR FEET)	PIPE MATERIAL	SERVICES			
				STUDY	DESIGN	PERMITTING	CPS
SW 137th Avenue Forcemain | Miami-Dade Water and Sewer Dept	36 – 72	53,000	PCCP	■	■	■	■
Water Transmission Main Evaluation and Replacement | Florida Keys Aqueduct Auth.	36	26,250	Steel	■			
Reclaimed Water Transmission Main Crossing of Caloosahachee River | Cape Coral	30	16,000	HDPE	■			
Reclaimed Water and Sanitary Sewer Pipelines | Fort Myers	24	12,000	DIP	■	■	■	
West Lakeland Wasteload Reduction Facility, Influent & Effluent Forcemains | Lakeland	16-20	8,000	DIP	■	■	■	■
Riverview Transmission Facilities | Hillsborough County	8-30	63,360	PVC, DIP, HDPE, HOBAS	■	■	■	■
Falkenburg Reclaimed Water Pipeline | Hillsborough County	24	47,520	PVC/DIP	■	■	■	■
Lynn Turner Rd RCWM | Hillsborough County	20	8,000	PVC/DIP	■	■	■	
Bell Shoals Rd/Mulrennan Rd WM Ext. | Hillsborough County	10	2,000	DIP	■	■	■	
Carrollwood Springs Reclaimed Water | Hillsborough County	8-12	5,000	PVC	■	■		
Armand Drive Gravity Sewer | Hillsborough County	10-12	5,000	PVC	■		■	■
Dove Field Place Watermain Interconnect | Hillsborough County	10-12	2,000	DIP	■		■	■

Sewer System Evaluation Surveys (SSES) – Infiltration/Inflow Studies

Regulations regarding abatement of sanitary sewer overflows and the need to provide safe and effective sewerage service in our aging infrastructure systems are resulting in increased attention to infiltration/inflow management. Black & Veatch has helped many communities evaluate the capability of existing facilities and develop a capital improvements program to address population or land use changes. Our systems planning specialists use infiltration/inflow analyses to determine whether more detailed investigations, such as sewer system evaluation studies, should be performed. Sewer system evaluation surveys enable us to evaluate existing collection system conditions through a sequence of tasks, including flow and rainfall monitoring and data analyses, cost effectiveness analyses, and development of an implementation plan. **The SSES would assist the Utilities Department in identifying overloaded sewer lines, system defects, and maintenance conditions that should be addressed.**

Stormwater Management

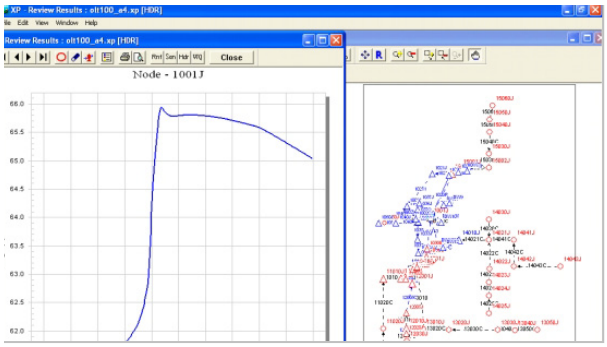
In the not too distant past, civil and environmental solutions for the management and control of urban stormwater runoff consisted mainly of engineered solutions to mitigate peak flows. Minimal consideration was given to the long-term effects of these solutions on biological, water quality and aesthetic aspects. Today, however, stormwater management requires a talented mix of technical and regulatory expertise to consider all of the ramifications of an engineering solution.



Stormwater model in ICPR for Marion County, FL

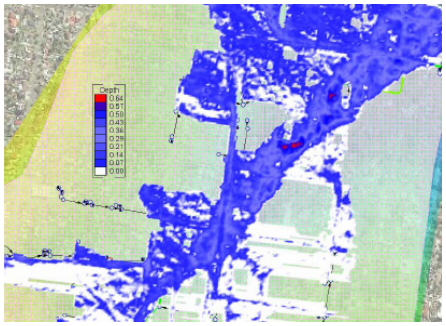
To meet these requirements for the City of Key West, Black & Veatch offers unmatched technical expertise, as well as extensive local knowledge of various regulatory issues. From the technical side, we have conducted engineering studies and design of stormwater management systems nationwide that include hydrologic, hydraulic, water quality studies and stream restoration. These facilities include large detention structures, open channels, and underground drainage systems, as well as best management practices (BMPs) evaluations. **For efficient hydrologic and hydraulic stormwater evaluations for the City, we will employ the use of state-of-the-art computer models linked to GIS such as HEC-1, HEC-HMS, HEC-2, HEC-RAS, XP-SWMM and ICPR.**

The City of Key West stormwater system consists of approximately 63 permitted outfalls, 54 vertical exfiltration drains, 5 pressurized wells 121 gravity recharge wells and associated collection and treatment systems. We know that the Utilities Department recently updated the City's Stormwater Master Plan, following the last update in 2006. The stormwater system was modeled in ICPR, which is a typical one-dimensional, stormwater link-node model commonly used in Florida. **Black & Veatch has significant experience with ICPR and will use this software for the City's stormwater modeling needs, if it is the preferred tool of the Utilities Department.**



Stormwater Model in XP-SWMM for the City of Ocala, FL

However, **Black & Veatch's national experience has allowed us to develop expertise with other modeling tools such as XP-SWMM, which is a FEMA-approved stormwater model used throughout the United States, including Florida, with the capability to model both, sewer collection systems and stormwater drainage systems.** On the stormwater side, this software provides the advantages of having two-dimensional capabilities for spatially distributed hydraulic models, resulting in more accurate evaluations of water interaction between surface water (overland flow) and underground systems and natural channels; allowing for precise mapping and representation of flooding extents. XP-SWMM may also be used for the modeling and analysis of stormwater BMPs for water quality (in addition to water quantity), such as erosion control and street sweeping, for the evaluation of non-point sources and pollutant tracking in watersheds.



Two-dimensional modeling in XP-SWMM

The fresh perspective that the Black & Veatch Team brings to the Utilities Department will allow us to recommend nationally-proven state-of-the-art solutions and share our lessons learned to address the City's stormwater needs, while representing the best interests of the City of Key West.

In addition, the stormwater engineering techniques utilized by Black & Veatch focus on natural solutions for land and water resource protection under a green approach. This approach incorporates sustainable projects to meet specific environmental goals and, where applicable, to meet regulatory requirements. Black & Veatch has a strong understanding of implementation of cost effective natural design projects to accomplish these goals.

Black & Veatch was selected by the Water Environment Research Foundation (WERF) to conduct a study of stormwater BMPs and sustainable urban drainage systems (SUDS), which can be used by the Utilities Department to manage the adverse impacts of stormwater.

Floodplain Management

A detrimental effect of increasing urbanization is the increase in flooding problems during severe storm events. Black & Veatch is a leader in Floodplain Mapping and Management. **Our extensive work with FEMA throughout the nation on flood insurance studies and in the ongoing Map Modernization Program is evidence that DHS/FEMA has put their trust in Black & Veatch.** Our work has included complex data review, intensive hydrologic/hydraulic analysis to determine floodplain changes over time, mapping floodplains to allow governments, property owners, and others to mitigate specific flooding risks, and communicating updated information to the public and affected agencies. Black & Veatch also has a number of certified flood plain managers on staff to meet our clients' needs in floodplain management.

Best Management Practices (BMP) Design/Implementation/Retrofits

Black & Veatch provides geomorphic field services including measurements of channel geometry (channel width, bank heights, sinuosity, entrenchment), identification of stream bed and stream materials (soil gradation, rock sizes and types), identification of stream bank vegetative conditions (riparian buffer, wetlands), identification of bank failure conditions (bank cutting, mass wasting), and sediment transport (sediment deposition/scour). We also provide habitat and biological field services including identifying channel habitat conditions (pool and riffle structure), habitat complexity, substrate conditions, presence of invertebrates, amphibians, fish and other wildlife.

A BMP locator GIS procedure developed by Black & Veatch aims to find suitable locations for implementation of structural stormwater BMPs. The procedure also allows the selection and design of appropriate BMPs based on location within the watershed, contributing drainage area and site conditions. The procedure takes into account topography, land use/cover (including impervious surfaces mapping), zoning and land ownership to find suitable locations. It then characterizes the individual potential locations in terms of their contributing drainage area size and land use/cover characteristics, soil types, local topography, and proximity and connectivity to streams. These characteristics allow estimating stormwater discharges, respective contaminant loads and their impact to the receiving water bodies.

Black & Veatch certified floodplain managers will be fully available to the Utilities Department in support of its stormwater projects.

Recharge/Injection Wells/Hydrogeology

Thorough understanding of the local hydrogeologic conditions is critical to ensure proper design and installation of a new well and pipeline or rehabilitation of an existing well and pipeline. The evaluation of groundwater conditions may include groundwater flow modeling, geological exploration, aquifer testing, aquifer yield estimates, and well troubleshooting, among others.

Members of our team have been involved with all types of well construction design from 2-inch monitor wells to Class I injection wells in South Florida since the 1980s. Our team has practical experience with the local geology, aquifer systems, confining units, aquifer parameters (such as hydraulic conductivity, recharge, leakance and storage), water quality and production zones.

A summary of Black & Veatch's overall representative water resources, stormwater and hydrogeology experience throughout Florida is provided in the table below.

Black & Veatch Representative Water Resources, Stormwater and Hydrogeology Experience

CLIENT	Groundwater	Surface Water	Stormwater	Erosion Control	Water Quality Treatment	Water Quality Evaluation	Water Quality Monitoring	Structures	Reuse Assessment	Source Water Assessment	Pollutant Loadings	GIS	BMP Evaluations	Wetlands	Dams/Levees	Pumping Stations	Reservoirs/Channels/Flowways	Wells	Inspection	Rehabilitation	Permitting	Modeling
Florida Power & Light	■	■	■	■											■		■	■			■	■
EPA Region 4 – Palm Beach Co.	■				■	■	■					■				■		■	■		■	
Florida Keys Aqueduct Authority	■															■		■			■	
City of Fort Myers									■					■							■	
City of North Port	■	■			■	■		■	■	■		■				■		■			■	■
Manatee County	■	■	■	■	■	■		■	■			■			■		■		■	■	■	■
Heartland Water Alliance	■	■	■			■		■	■	■		■		■			■	■			■	■
City of Lakeland		■			■	■	■		■	■	■					■		■	■		■	■
South Florida WMD	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■	■	■	■	■
City of Ocala	■	■	■	■	■			■	■		■	■	■		■	■	■	■	■		■	■
Orlando Utilities Commission	■	■	■	■	■	■	■	■	■	■	■				■	■	■	■	■		■	■
Orange County Utilities				■												■	■	■	■			
Tampa Bay Water	■	■			■	■	■	■	■	■		■				■	■	■			■	■
Hillsborough County	■	■		■		■			■		■					■	■	■				
City of St. Petersburg					■	■			■							■		■		■	■	
Tampa Electric Company	■	■	■	■	■	■	■		■	■	■						■	■			■	■
Sarasota County	■	■			■				■							■						
St. Johns River WMD	■	■	■		■	■		■	■	■		■			■	■	■				■	■
Reliant Energy Osceola			■	■	■	■	■		■												■	
Jacksonville Electric Authority	■	■	■	■	■	■	■		■	■	■		■	■		■	■	■	■	■	■	■
Nestle' Water of America	■	■				■	■			■								■			■	■
Florida Power Corp.	■			■	■	■	■	■		■								■			■	■
KUA	■	■	■	■	■	■	■		■	■	■							■	■		■	■
Escambia County Utilities									■		■			■		■	■					

Utility Rate Studies and Bond Engineering Reports

Utility Rate Studies

Black & Veatch specializes in providing financial and management consulting services to public and investor-owned utilities, government agencies, and industry. **In the past five years, Black & Veatch has performed over 1,000 financial and management studies and services.** Utility consulting services are provided in three key areas: Strategic Financial Planning/Modeling, Information Management, and Institutional Planning/Management. Revenue requirements, Capital Improvements Program review, rate studies, innovative user charges, financial modeling, bond feasibility, asset/resource management, management information systems strategic services, performance measurement/evaluation, utility strengthening services, and customer community relations are just some of the services Black & Veatch has performed to support utility objectives.

Utility rates are the primary source of revenues for supporting a utility's operations and capital funding needs. As such, a periodic review and evaluation of rates is necessary to ensure that the revenue requirements are sufficiently recovered, and that cost recovery is done in an equitable manner. In general, a cost-of-service based rate study provides a methodology to distribute costs by functional component to customer classes using class units of service. With this information, the proportional responsibility of each customer class for the total system costs can be specifically identified. The resulting allocation of costs to the various customer classes can then be compared to the revenues generated under existing and proposed rates from each class in order to determine if cross-class subsidizations are occurring and the ability of the utility to meet class cost obligations due to factors such as drought mandates and triggers.

We conduct cost-of-service based rate studies in a systematic manner that will provide the Utilities Department with a reasonable and legally defensible mechanism to recover system costs.

An additional rate study aspect is the development of projected operating results for future planning periods. The customer and level of service characteristics identified in the study can be used to forecast future revenues from user rates. **Applying the revenue forecasts against projected revenue requirements provides a mechanism to estimate the timing and magnitude of future rate adjustment and the associated impacts on customers.** In general, projected operating results will provide utility management with a strategic planning tool to help guide budgeting and capital funding decisions.

Bond Engineering Reports

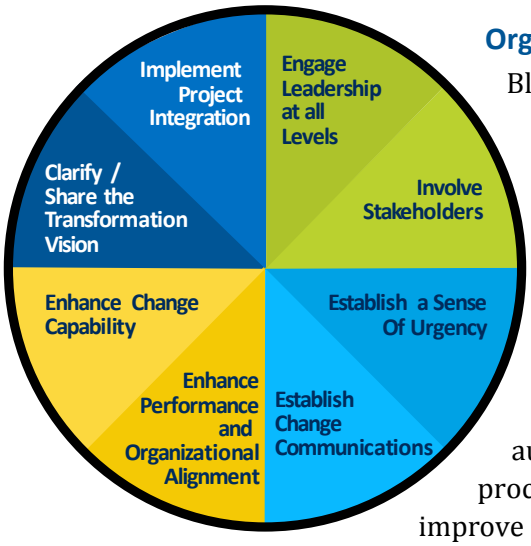
Black & Veatch is often engaged in the role of Bond Engineer of Record. As such, specific utility bond indenture and rate covenants constitute the manner in which the Bond Engineer serves the utility. **Black & Veatch has served in this capacity by developing materials, such as annual reports, to be included in official statements for the sale of utility revenue bonds, including the normally required engineer's certificate of financial feasibility and/or an independent engineer's report.** In addition, bond indenture provisions frequently require that the independent engineer's report include an inspection

of utility plant facilities to determine the adequacy of facilities to meet future customer requirements and whether or not the properties have been maintained in good repair and sound operating condition.

Over the past five years, Black & Veatch has been involved in assisting clients with the issuance of over $10 billion in utility revenue bonds; we'll bring our lessons learned to the City of Key West.

Black & Veatch has completed such physical reviews in conjunction with engineering certifications. In addition to the physical inspections, the engineering reports also generally include an assessment of the proposed capital improvement program, an evaluation of the adequacy of the overall organization and staff to carry out the utility's mission, a review of the compliance with regulatory requirements, and a financial projection showing compliance with bond indenture requirements.

Black & Veatch personnel have coordinated entire official statements from text writing, demographic and economic summaries, and inclusion of auditor and bond attorney statements, to the printing of the official statement and bid forms and the mailing of this material to prospective bidders.



Organizational Optimization and Change Management

Black and Veatch's approach focuses on understanding how the existing processes, new processes, and organizational changes will impact an organization. Creating detailed maintenance plans, management policies, and operating procedures to communicate potential change all begins with developing a thorough understanding of the basic functional operations of the utility system.

The desired benefits of improved services, improved compliance, and productivity enhancements are not automatically realized by just implementing and documenting the processes and configuring the system accordingly. To maintain and improve upon existing services, the support and understanding of desired improvement by personnel at all levels within the organization is important to the successful implementation of any program.

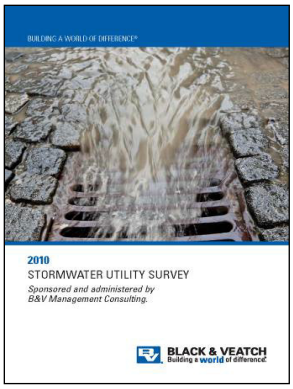
Black & Veatch has been successful at completing and implementing specific organizational optimization programs and recommendations by researching, managing and communicating early through all stages of the development cycle.

Stormwater Utility Evaluations

Stormwater utilities are not widely used in Florida, but their implementation is growing. Since 1991, Black & Veatch has conducted a bi-annual national inventory and assessment of stormwater utilities covering more than 20 states in the U.S.

Black & Veatch has supported government (finance, public works, manager, commission, etc.) in structuring the governance necessary to establish and evaluate Stormwater Enterprise Funds.

When it comes to the development and evaluation of stormwater utilities, Black & Veatch is not only a Thought Leader, but also leads the practice of assessing the potential for entities to develop and implement such a program. Specific stormwater utility benchmarks are housed and tracked by Black & Veatch.



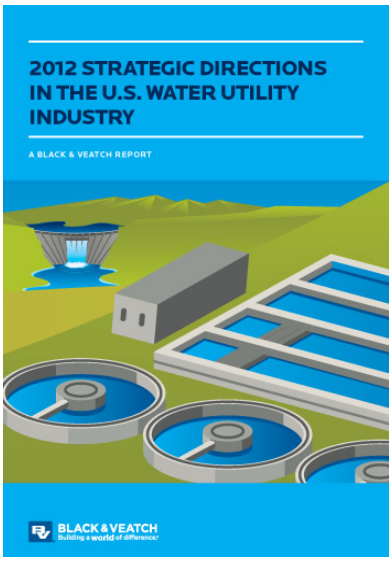
Black & Veatch is leading the industry in the area of stormwater utilities. Our benchmarking capabilities can be used to successfully evaluate the City's stormwater utility.

Sustainability/Energy Efficiency

The Black & Veatch Team understands that as part of its **greenkeywest** efforts, the City of Key West has developed an **Annual Sustainability Report, Climate Action Plan and Greenhouse Gas Emissions Report.** This is a great forward-thinking approach by the City to climate change adaptation and we look forward to partner with the City on these efforts.

As part of our **Ready, Responsive and Reliable** philosophy, we are working to develop innovative solutions to address climate change, water scarcity, green space design and sustainability planning. Many clients today are seeking triple-bottom-line solutions that meet social, economic and environmental goals; are sustainable; and are politically and commercially viable. Examples of the types of sustainability services our team can offer the City of Key West are listed in below.

- Energy Audits of Existing Facilities
- Sustainability Assessments
- Supply/Demand Gap Analysis
- Best Management Practices (BMPs)
- Triple Bottom Line Analysis
- Green Infrastructure Network Analysis
- Social Impact Analysis
- Environmental Impact Assessment
- Low Impact Development (LID)
- Urban Water Resource Planning
- Economic Assessments and Trade-Off Analysis
- Energy/Carbon/Water Footprint Assessments
- Risk Management and Statistical Analysis
- Total Water Management Planning



Based on Black & Veatch's 2012 Strategic Directions in the U.S. Water Utility Industry Report, which evaluates the input of water and wastewater utilities worldwide, the most significant sustainability issue facing utilities is energy efficiency, as energy can account for as much as 30 percent of utility budgets. Black & Veatch has worked with many clients around the world to implement energy management strategies that address demand and supply side issues. We have designed facility enhancements incorporating advanced technologies that can help reduce energy demand, either directly or indirectly due to adjacent benefits.

Black & Veatch routinely considers energy conservation for all new and retrofit projects. Black & Veatch helps clients develop implementable plans that minimize energy requirements consistent with economic constraints through the use of an on-site energy audit. Black & Veatch audit teams consist of two or more experienced professionals with mechanical and electrical backgrounds, as well as knowledge of system operations and building systems technologies. The audit team will work with the client, learning about site-specific facility operations and reviewing the electrical load profile of the facility. The audit team will conduct a walk-through of the facilities, collecting data and observing existing plant conditions. **From experience, we find that using the experience of senior level professionals provides flexibility to the audit and enhances the resulting report by providing additional energy savings recommendations.**

ENVIRONMENTAL ENGINEERING SERVICES QUALIFICATIONS

Black & Veatch provides comprehensive environmental engineering services to our clients, including full support in addressing regulatory permitting and licensing requirements. Our environmental services capabilities support all phases of project development including the identification of environmental regulatory requirements, establishment and implementation of a comprehensive licensing strategy, conducting environmental field studies, characterization, modeling and analysis of impacts and preparation of permit applications for review by regulatory agencies and the public. Black & Veatch professionals are also experienced with environmental impact studies, multi-volume environmental assessment reports, site certification applications, and expert testimony.

Black & Veatch is currently ranked 16th within the Top 200 Environmental Firms by Engineering-News Record (ENR).

Placing first load of contaminated soil into containment cell constructed at the Escambia Treating Company site.

Black & Veatch has been permitting projects in Florida for over 35 years, and has provided environmental and licensing services to over 15 major industrial and utility projects in the state within the last seven years. Our experienced staff of specialists has played a major role in assisting clients comply with the federal, state and local environmental legislation. Areas we have provided environmental support in Florida include

- Environmental Compliance Services
- Wetland Services
- EPCRA Section 313 TRI Form R Support Services
- Permitting Support
- Air Services and Clean Air Compliance
- Major Licensing Support
- Training Services

Representative Black & Veatch Environmental Projects in Florida

PROJECT | CLIENT	REGULATORY REVIEW	CLEAN AIR ACT COMPLIANCE	CLEAN WATER ACT COMPLIANCE	CONSUMPTIVE WATER USE	ENVIRONMENTAL ASSESSMENT	ENVIRONMENTAL COMPLIANCE SERVICES	RCRA COMPLIANCE	EPCRA SECTION 313 TRI FORM R	TRAINING SERVICES	CONSTRUCTION COMPLIANCE	COMPLIANCE PLANS
Treasure Coast | FMPA	■	■	■	■	■	■			■	■	■
West County | FPL											
Turkey Point | FPL			■			■				■	■
Stock Island | FMPA	■	■	■		■	■			■	■	■
Brandy Ranch Generating Station | JEA		■	■	■	■			■		■	■
Northside Generating Station | JEA	■	■	■			■	■	■			
Southside Generating Station | JEA						■		■			
Kennedy Generating Station | JEA		■				■		■			
St. Johns River Power Park | JEA		■						■			
Beckman WWTF | JEA						■					
Hansel Generating Station | KUA	■		■						■		■
Cane Island Power Park | KUA	■	■	■	■	■	■			■	■	■
Stanton | OUC		■	■		■	■			■	■	■
Indian River Plant | OUC			■						■		■
Indian River Plant | Reliant Energy			■	■	■						
Osceola County Power Station | Reliant Energy		■	■		■					■	
Martin Unit 8 & Manatee Unit 3 | FP&L			■			■				■	■
Gainesville Regional Utilities			■								
Palatka Plant | Seminole Electric Cooperative			■								
Separation Technologies		■									
Power Plant | City of Vero Beach			■	■		■					■
Water Treatment Facility | Escambia County		■									

Environmental/Contamination Assessments

Preparing to excavate tar well after placing sheet piling around a structure.

Studies and evaluations may be performed prior to the implementation of future facility improvements to identify the potential alternatives available. Numerous parameters are considered during these evaluations including siting feasibility, operational constraints and conceptual capital costs. Based on the results from these studies, the most efficient and cost-effective improvement alternative is identified for implementation. Black & Veatch is experienced with key technologies that would assist with the completion of studies, including numerous water and reclaimed water distribution system modeling software (e.g. **WaterGEMS/WaterCAD, H2OMap/H2ONet, InfoWater**), **GIS** and **Criterium Decision Plus (CDP)** for evaluation of alternatives and decision-making processes.

Ecological and Environmental Studies

Federal, state, and local regulatory programs often require the preparation of environmental assessment and environmental impact statements (EA/EIS) to assess the impacts of projects and describe proposed mitigation measures. **Black & Veatch staff has experience in preparing EA/EIS reports in accordance with the guidelines of the lead agency identified in the scoping process.** Results of subcontractor investigations are also incorporated.

When project schedule allows and agencies agree, an EA/EIS report is informally reviewed with the federal, state, and local agencies prior to formal issuance to ensure that the document satisfies all requirements. Experience has shown that the informal review substantially reduces overall review time.

Biological/Habitat Assessment Reports

Environmental scientists at Black & Veatch can provide expertise on changes in water quality; soil and topography; flows; sediments; and land use and how they individually and collectively affect the presence of endangered, protected or exotic species. We provide an understanding of hydrological patterns and determine which key ecological driving forces require restoration or preservation, or wetlands conservation and sustainable management.

Black & Veatch will support the Utilities Department in all facets of wetland design and construction administration for environmental enhancement, mitigation and flood control.

Wetlands Monitoring/Mitigation

Wetlands are biologically rich habitats that support thousands of plant and animal species, help minimize downstream flood impacts and improve water quality. In recognition of the valuable ecological benefits of wetlands, laws and regulations have been enacted to ensure development projects avoid, minimize, and/or mitigate wetland impacts. These regulatory programs require development projects to avoid or minimize impacts to wetlands to the maximum extent possible. Permits and compensatory mitigation are typically required for unavoidable wetland impacts.

Technical considerations for wetland delineation, permitting, mitigation, and constructed wetland design require the involvement of trained personnel to ensure a project complies with applicable regulations and meets project objectives. Black & Veatch offers comprehensive wetland services for all types of development projects. A multi-disciplinary team of botanists, ecologists and engineers work together to identify the optimum wetlands solution for each project. **Black & Veatch is experienced in identifying and delineating wetlands and preparing permit applications and mitigation plans for impacts to wetlands.**

Black & Veatch has specific experience with wetlands in Florida, including the design of detention structures, as well as mitigation for the construction of infrastructure.

Mitigation Banking

The Final Compensatory Mitigation Rule (May 2008) generally states that the preferred choice for mitigating impacts to jurisdictional waters is through mitigation banking. A project can also take credit for preservation and enhancement. Creation of a new wetland is typically the least preferred choice for mitigating impacts. **Under this framework, we can work with the USACE to determine appropriate burden-sharing options that maximize value to the City of Key West.** Based on our experience with USACE Districts around the country and the world, our coordination efforts can be as brief or as extensive as required by the City's project needs.

Federal Emergency Management Agency (FEMA)/US Army Corps of Engineers Regulatory and Permitting

The Black & Veatch team has extensive experience in supporting clients on the types of environmental regulatory issues, which require coordination with FEMA and the USACE. Black & Veatch successfully navigates plan formulation and regulatory approval processes with agencies through pre-application consultation meetings held prior to beginning design so that agency concerns can be identified and fully addressed. A series of review workshops are provided during the design phase, application submittal and review process. **This permitting strategy guarantees close coordination with the appropriate agencies**, and in every experience where this process has been utilized, the outcome has been mutually beneficial.

Regulatory Compliance

We are prepared to assist the Utilities Department in obtaining permits and approvals from Federal, state, and local agencies, as needed. Early permit activities will include meetings with applicable regulators to confirm the required permits and requirements. **At the City's approval, members of our team will arrange, coordinate and attend all pre-application meetings with permitting agencies. All permit applications will be prepared for review and signature by appropriate City staff.**

From a regulatory perspective, our experience with Federal and State of Florida stream and wetland mitigation rules and guidelines will be used for successful permitting of all City projects.

An important step to reducing permitting issues is to attend pre-application meetings and maintain constant communication with regulators. We have also found that early involvement in the project by regulators results in these parties becoming a part of the team. **Meeting with the review agencies and the City will result in an approach that affords the permitting authorities the opportunity to have buy-in and ownership of the project's success.**

For this GES contract, the principal focus of permitting activities may involve the following regulatory entities:

South Florida Water Management District

SFWMD will review and permit source water withdrawals and will issue a modified consumptive WUP for water treatment plant facilities. Given the Utilities Department does not oversee water supply and treatment for the City of Key West, coordination with SFWMD may be required and Black & Veatch has proven experience working with SFWMD on behalf of our clients. SFWMD, in conjunction with the Florida Department of Environmental Protection (FDEP), will also review and permit site modifications and issue an Environmental Resource Permit (ERP).

Florida Department of Environmental Protection

The FDEP will be involved, with the SFWMD in the review and permitting of site modifications through an ERP. FDEP will also review and permit any UIC Program construction and operation permits. NPDES Construction Activity permit applications will also need to be filed with FDEP.

Presently, FDEP is in the process of developing, a new Statewide Stormwater Rule to assure that post-development stormwater conditions and pollutant loads do not exceed pre-development conditions. New statewide Numeric Nutrient Criteria for discharges to streams and lakes are also being developed in compliance with the Clean Water Act and USEPA mandate. Both rules will expand the basis of review currently being implemented under the ERP process.

CIVIL ENGINEERING SERVICES QUALIFICATIONS

Civil/Site development for a Tampa Bay Water facility.

Black & Veatch offers comprehensive civil engineering services, including studies, planning, preliminary and detailed design, permitting assistance, utilities relocation, construction management and construction phase services involving resident engineers and field inspectors.

Based on our discussions with City staff, we understand that the following Civil Engineering Services are representative of the Utilities Department's civil infrastructure needs: Civil/Site Engineering, Structural Design, Transportation/Roads, Architecture/**LEED**

Buildings, and **Historic Building Preservation**. We have assembled a Team that specializes in these services and will provide full support to the City in the completion of any civil engineering task assignment.

Civil/Site

Black & Veatch provides civil/site services related to site development, geotechnical, foundations, buildings, structures, and materials handling systems. Our professionals coordinate of the development of the site layout and design and prepare construction drawings for site work, roads, railroads, waterways, drainage, and underground utilities. We regularly provide our clients with preparation of subsurface exploration programs, coordination of drilling and laboratory contracting, preparation of boring logs, and preparation of the foundation design recommendations.

Black & Veatch provides comprehensive civil/site services related to site development, geotechnical, foundations, buildings, structures and materials handling systems.

Black & Veatch employs engineers with a specialized focus in analysis and design of foundations for large vibrating equipment; vibration investigation, consideration, and alleviations; review of special structures such as chimneys, stacks, and silos; and finite element modeling. We provide feasibility studies, system designs, contract administration, and consultation assistance during erection and system startups.

We also provide basic analysis and design calculations required to prepare documents, specifications, and drawings for geotechnical analysis of foundations, dams, and earth retaining structures in addition to foundation design for shallow and deep foundations. **Our detailing capabilities provide projects with in-house steel and reinforcing detailing capability that can significantly shorten the overall project schedule.**

Structural

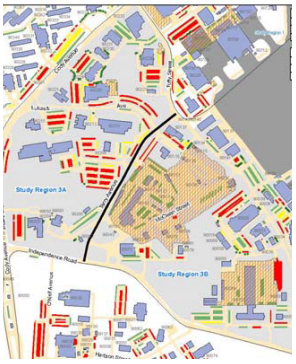
Black & Veatch has a large base of structural engineers and technicians focused on delivering customized structural packages to meet the City's specific standards. This group provides erection drawings, fabrication drawings, bills of material, point-to-point bolt lists and field assembly lists. The section can also supply CNC information to fabricators and helps support projects, which are detailing steel out-of-house by advising the steel designers on alternate or more economical connection design.

For Tampa Bay Water, Black & Veatch designed a new building to house an aqua ammonia storage/feed system and process water booster pump station. The building was constructed of split-face concrete block with a decorative standing seam metal roof.

Black & Veatch has provided structural services on projects for Florida clients such as the City of Lakeland, Orlando Utilities Commission, City of St. Petersburg, Tampa Bay Water, Orange County, Manatee County, New Smyrna Beach Utilities Commission, City of Ocala, JEA, Sarasota County, Emerald Coast Utility Authority, and Hillsborough County. These services have included structural analysis, support and foundation design, site plans, permitting, and construction support.

Transportation/Roads

Black & Veatch offers comprehensive transportation engineering services, including planning, preliminary and detailed design, permitting assistance, studies, utility adjustment, planning, construction management, design/build and construction phase services, including resident engineering and field inspection.



Black & Veatch performed a Traffic Engineering Study for Hulburt Field, Florida which included field investigations, conceptual engineering services, analysis of existing and future traffic conditions, analysis of existing and future parking requirements, and development of short- and long-term transportation improvement projects.

Our multi-disciplinary staff has the proven capabilities to successfully design and manage a diverse array of transportation infrastructure projects. Whether the project requires traffic, civil, bridge, railroad, structural, geotechnical, environmental, telecommunications, or electrical engineers, Black & Veatch has the specialized personnel to address every detail, while meeting the City's schedule and budget goals.

Black & Veatch has provided road design services that address the multiple facets of roadway projects in both the public and private sector. We have designed hundreds of miles of highway and access roads for state government agencies; as well as arterial, collector, and residential roads for municipal clients; and numerous site access roadways for private clients. We have prepared engineering reports, analyzed existing road systems, performed traffic studies, and developed road maintenance programs. Our designs incorporate road improvement programs to resurface, landscape, widen, and beautify major highways and streets. Our roadway experience encompasses the following types of projects: new alignments, roadway widening, highway interchange/ intersection design, signalization, corridor studies, reconstruction, rehabilitation, resurfacing, and restoration.

In addition, our subconsultant, **CRJ & Associates, is a Florida Department of Transportation (FDOT) certified engineering consulting firm with expertise in transportation planning and design, as per FDOT criterion, FDOT construction management (certified FDOT CEI firm), master drainage and stormwater studies, FDEP MS4 municipal assistance, and FDEP NPDES SWPPP Inspection services.** As part of the Black & Veatch team, they will provide local civil engineering and transportation support to the Utilities Department.

CRJ & Associates, Inc.
Consulting Engineers and Planners

Architectural/LEED Buildings

Architectural

Pump station designed by Black & Veatch to resemble a private residence.

Black & Veatch provides architectural services to clients in a variety of technical roles. The professionals in our architectural group hold professional registrations in 29 states. They are well versed in all methods of project delivery, are a company leader in the execution of projects utilizing Black & Veatch's global workforce and regularly interface between various Black & Veatch divisions. **Our Architectural Department technicians are proficient in 3D modeling and BIM+ implementation, which improve project design efficiency.**

Black & Veatch provides full modeling and rendering services. Using computer software to create an electronic model of the design, Black & Veatch creates an exact model of a facility including rooms, spaces, stairs and furniture, as well as pipes, pumps, equipment, and ductwork. In addition, the model can be expanded to include the surrounding site showing roads, vehicles, landscaping and other existing buildings or facilities. Walkthroughs of the interior spaces take the viewer through the space on a predetermined path, while flyovers take the viewer over and around the exterior of a facility or site.

Our rendering views of a facility from any angle, inside or out, will illustrate the City exactly how a space or building will appear when construction is complete, helping solve design issues before construction.

Black & Veatch offers a wide variety of architectural services including:

- Conceptual Design
- Code Analysis
- Programming
- Laboratory Design & Layout
- Color, Finish & Furniture Selection
- Sustainable Design & LEED Certification Assistance
- 3D Modeling
- Intelligent Design
- Marketing and Presentation
- Computer Renderings & Animations
- Artist Renderings
- Construction Documents (Plans & Specs)
- Construction Phase Services
- Permitting Assistance
- BIM+ Execution

A current project for the City of Durham, NC includes a goal of LEED Silver certification for a new Administration Building at the Brown WTP.

LEED

Black & Veatch has over 85 professionals on staff who are LEED™ accredited (Leadership in Energy and Environmental Design). LEED is the nationally accepted benchmark for the design, construction and operation of high-performance green buildings and facilities. Design and construction industry practices incorporating sustainable design and construction principles embodied in the LEED™ rating system have become an integral part of our clients design solutions.

Additional Information on our LEED qualifications is located in the "Other Certifications" section of this document.

These individuals are fully qualified, through both formal training and practical work experience, to integrate all aspects of sustainable design into the performance of City projects. Throughout our history, we have incorporated the concepts of environmentally friendly design and cost-effective reuse of waste materials into our projects for both the US Government and private clients. These strategies were pursued as much for economic benefit as for minimizing environmental impact. For example, lowering construction costs through the reuse of waste material, or optimizing heating/cooling effectiveness through careful ventilation and window design affords both environmental and economic benefits.

In recent years, however, as the nation's understanding of the potential environmental impacts of both large and small construction projects has grown, Black & Veatch has worked even harder to integrate the latest technology and insightful thinking into our designs. These design strategies, grouped under the umbrella of Sustainable Design, or alternatively, Green Building, are not pursued as simply eco-friendly add-ons to an existing project. They are considered at the beginning of the design process and are seamlessly and almost invisibly integrated into the final product.

Historic Building Preservation

"Black & Veatch Engineering Firm was absolutely outstanding, especially working in such a tight, historically sensitive area, an area of early irreplaceable homes. Archeologists were utilized when needed and the onsite inspector allowed no detail to escape his watchful eye. In addition, neighbors were regularly informed, consulted, and advised."

Excerpt from an unsolicited letter from a homeowner in downtown Charleston, SC.

Black & Veatch has provided architectural, engineering and planning services for the preservation and maintenance of historic assets throughout the United States. Specialized knowledge is necessary for the design and construction of these special facilities; **Black & Veatch is able to offer our structural and historic building preservation knowledge to the City of Key West to ensure cost-effective structural evaluations, design, accurate cost estimates and viable construction schedules.**

Black & Veatch has provided asset assessments for the National Park Service, including historical preservation, at well over 100 of the 390 parks in the NPS portfolio. We led a $130M multi-phase tunnel replacement program under historic downtown Charleston, South Carolina that involved an extensive cultural resource impact study to ensure minimization of the impact to historic structures. **We have been entrusted by our clients to provide services such as security upgrades and risk assessments at the Mount Rushmore National Memorial and the St. Louis Arch.** We also designed a communication data network for the Yosemite National Park; Black & Veatch understands the cultural significance and design limitations that must be considered when working at historical sites.

Construction

Black & Veatch has the experienced staff to support the City with every aspect of implementing any project undertaken as part of the Capital Improvement Program. This includes bidding phase services, construction phase services, and facility commissioning and training.

We will help maximize the competition on projects and recommend the bid that provides the best value for the City.

Bidding Phase Services – Black & Veatch routinely administers the advertising of construction contracts, and will help receive competitive bids from qualified contractors and timely award of the contract. Through identifying prospective contractors and suppliers, conducting a pre-bid conference, responding to questions from bidders, preparing addenda, and reviewing bids and qualifications, we will help maximize the competition on projects, and recommend the bid providing the best value for the City.

Construction Phase Services – Black & Veatch is prepared to provide a full array of field and office related construction services to ensure that the construction work is being carried out in accordance with the Contract. We have considerable experience in fostering a team approach to completing the construction work. Black & Veatch has qualified individuals experienced in observing the construction work. We are committed to providing a full-time resident in support of the construction effort, and will provide the best professional from our team for the work.

Control of all project documentation, from routine correspondence, memoranda, meeting minutes and the like up to complex 3D model files and complex drawings created by relating many CAD sheets or models requires a comprehensive document management system. **Black & Veatch utilizes Bentley ProjectWise V8i, which provides complete and robust functionality to manage and control documents in a centralized database-driven platform, resulting in increased project efficiencies.**

Microsoft Office SharePoint Server is used in conjunction with ProjectWise to provide a web-based content management and maximize collaboration between project Team members. SharePoint facilitates the aggregation and integration of content from a number of sources in a web portal setting. User access to this portal can be secured as necessary and appropriate, but can also be expanded to the public and agencies outside the project team. Each individual's access and the content exposed to them can be tailored to their role and responsibility.

Through the use of a custom-designed database and our technology tools, we have a proven, efficient means to track the processing of shop drawings for the project. In addition, on several recent projects, RFIs have been managed on-line between Black & Veatch and the Contractor through the use of our technology tools, providing all parties with current information to manage the project more efficiently. Following construction, we will prepare record drawings to document changes that occurred during construction.

Our technology tools provide an efficient means to track the processing of shop drawings, reducing the shop drawings review time for a project.

Construction Management – Black & Veatch offers the City the combination of proven construction management experience and technical excellence to drive its projects through construction to successful start up and operation. Black & Veatch provides integrated engineering, procurement, and construction management services worldwide to optimize the efficiency of project delivery.

As Construction Managers, Black & Veatch will manage projects giving in a way that will give the Utilities Department control of project safety, cost, schedule and quality through the use of Black & Veatch's integrated construction management system and experienced engineers and construction personnel. We will manage the City's construction projects as though they were our own, with the same project management philosophy and systems Black & Veatch uses for our own "at risk" construction projects.

Black & Veatch is ranked by Engineering News-Record as 19th in the Top 50 Program Management Firms and 30th in the Top 100 Construction Management-for-Fee firms.

GENERAL ENGINEERING SERVICES CONTRACTS EXPERIENCE

Black & Veatch has provided engineering services under continuing services contracts in Florida for over 25 years and we have performed more than a thousand individual Task Orders under these contracts. Black & Veatch has extensive experience successfully serving clients under GES contracts. Assignments for these clients have been diverse, including planning, permitting, design, bidding, construction, and various studies relating to water, wastewater, reclaimed water, and stormwater systems. We have provided civil, environmental, mechanical, electrical, geotechnical, structural and hydrogeological engineering, as well as architectural and financial services. The table below lists a sampling of the assignments we have completed under recent continuing services contracts. We have been selected by the majority of these clients for multiple contract terms, which demonstrate our ability to deliver responsive service and complete successful projects.

Black & Veatch Representative GES Services Contract Projects

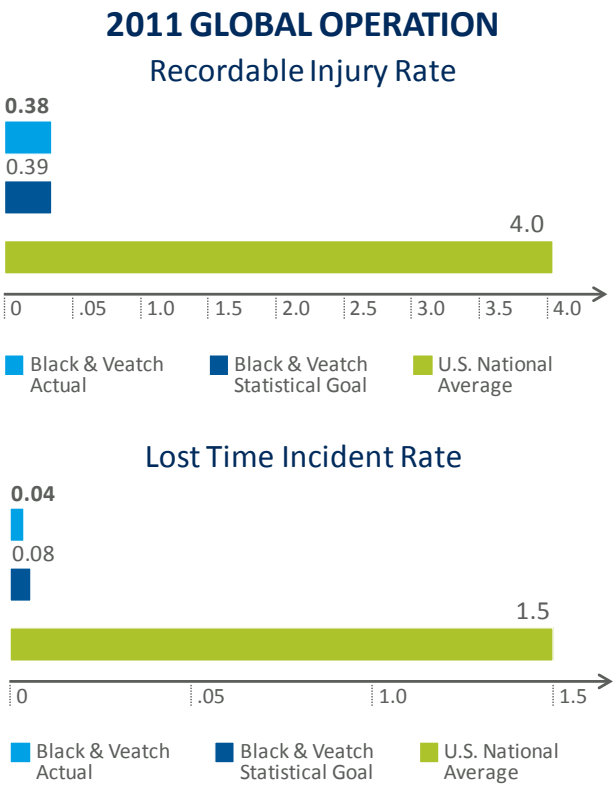
CLIENT, LOCATION	PROJECTS	
Florida Keys Aqueduct Authority (2006-Ongoing)	▪ **36-Water Transmission Main Evaluation and Replacement** ▪ Value Engineering – WWTP Process Evaluation Study	▪ Pipeline Condition Evaluation Study ▪ Key Largo Transmission Main Replacement – Design and Construction Phase Services ▪ Cudjoe Key Advanced WRF
Marco Island, Florida (2008-Ongoing)	▪ **Water System Hydraulic Modeling (InfoWater)**	
Cape Coral, Florida (2008-Ongoing)	▪ Funding Alternatives Study ▪ Caloosahatchee River Reclaimed Water Crossing Study	
City of St. Petersburg, Florida (1986-Ongoing)	▪ WRF Disinfection Alternatives Study ▪ Southwest Water Reclamation Facility Master Plan ▪ **Oberly Water Distribution Pumping Station Improvements** ▪ **Washington Terrace Water Pumping Station Improvements** ▪ Gulf-to-Bay Pumping Station Transformer Replacement ▪ Water System Vulnerability Assessment ▪ Water System Emergency Operations Plan	▪ Cosme WTP Electrical System Rehabilitation ▪ Oberly Pumping Station Construction Services ▪ Oberly Pumping Station 150 kVA Transformer Replacement ▪ Cosme WTP Electrical Switchgear Rehabilitation ▪ Water Supply Electrical Transformer Evaluation ▪ Sludge Handling and Disposal Study ▪ Reclaimed Water System Expansion
Tampa Bay Water Clearwater, Florida (1998-Ongoing)	▪ Hundreds of assignments as System Engineer ▪ **Surface Water Treatment Plant Expansion** ▪ Seawater Desalination Facility – Remediation Efforts ▪ **Energy Management Program Roadmap and Energy Efficiency Services** ▪ Hydraulic Modeling	▪ Facility Design, Permitting, and Construction Services ▪ Value Engineering Studies ▪ Technical Reviews ▪ Bond Report ▪ Water Supply and water Quality Planning ▪ Water Quality Modeling ▪ Pipelines
Lakeland, Florida (2001-Ongoing)	▪ West Lakeland Wasteload Reduction Facility Design ▪ C. Wayne Combee Water Treatment Plant and Well field Treatability Study ▪ **C. Wayne Combee WTP and Wellfield** ▪ C. Wayne Combee Chlorine Process Safety Manual ▪ **English Oaks Booster Station and Pipeline**	▪ **Drane Field Road Booster Pumping Station** ▪ **Air Park Lift Station** ▪ WWTP Operator Training ▪ English Oaks Site Suitability Study ▪ Glendale Water Reclamation Facility Operations Assistance ▪ Wastewater Pretreatment Plant Pilot Plant Study and Design

SAFETY

Black & Veatch is recognized globally for its record-setting efforts in managing all aspects of safety and security for our professionals, clients, business partners and contractors at project sites and office locations.

The company goes beyond simply providing the right equipment for the job. Black & Veatch focuses on educating project teams to raise awareness and encourages safe behaviors on the jobsite to assist with incident prevention. We also make sure that we positively impact the local community by educating local workers and helping them develop technical skills and safety awareness. **At Black & Veatch, we make sure our clients directly benefit from our commitment to safety.** Our safety record is marked by third-party validation and confirmed by clients who choose us repeatedly for our safety practices, performance and reputation.

Our EMR is nearly 60% better than our industry peers. We consistently deliver safety statistics that significantly surpass a benchmark in the U.S., known as the CII (Construction Industry Institute).



Regardless of the performance benchmarks used in regions across the globe, Black & Veatch's safety record stands at the top. Our EMR (Experience Modification Rate) is nearly 60 percent better than our industry peers. We consistently deliver safety statistics that significantly surpass a benchmark in the U.S., known as the CII (Construction Industry Institute).

The City of Key West will benefit from Black & Veatch's attention to safety in the work scopes, schedules, and construction documents prepared.

SUBCONSULTANT COMPANY PROFILES

Anticipating the types of services and projects to be facilitated through contracts resulting from this RFQ, we intend to use local, south Florida small business subconsultants for the following services as noted, as they may be applicable to the specific City project:

- Civil Engineering and Transportation: **CRJ & Associates, Inc.**
- Surveying: **Avirom & Associates, Inc.**
- Geotechnical: **GEOSOL, Inc.**

Black & Veatch makes every effort to ensure effective utilization of local businesses in the delivery of engineering services for the City of Key West, including alignment with goals and objectives for diversity in the provision of professional services through the utilization of Minority and/or Women-owned Business Enterprises and Micro-Local Business Enterprises. The above identification of potential team members is not intended to be limited; in the course of development of detailed requirements for assignments resulting from this RFQ, we will ensure due diligence in identifying opportunities and candidates for such opportunities for providing professional services with the goal of ensuring inclusion reflective of the City's diverse business community.

The remainder of this section provides information on the history and qualifications of the subconsultant firms. Please refer to the 'Staff Qualifications and Experience' section of this document for expanded role definitions and resumes of key subconsultant personnel.

CRJ & Associates, Inc.

Anticipated Service Offerings: Civil Engineering, Transportation, FDOT and LAP

CRJ & Associates, Inc. Consulting Engineers and Planners

CRJ & Associates (CRJ) is a minority-owned multi-disciplined engineering consulting firm with expertise in engineering design, aviation planning, construction management, environmental engineering, and site inspection services. **CRJ is qualified by the FDOT, Florida Department of Management Services and other government agencies to perform roadway design, construction inspection and management, aviation planning, and related civil engineering services.**

CRJ's staff of highly qualified engineers, planners and technicians offers over 65 years of combined civil engineering experience and is available to provide comprehensive services to the City in support of the Black & Veatch Team. CRJ has offices throughout South and West Central Florida and is a certified disadvantaged business enterprise (DBE) with the FDOT, Florida Department of Management Services, and major Florida airports in Jacksonville, Miami, Orlando, Tampa and West Palm Beach.

Avirom & Associates, Inc.

Anticipated Service Offering: Surveying

Avirom & Associates, Inc. was founded in 1981, as a company dedicated solely to the land surveying profession, with the philosophy to provide the highest quality product in a timely and professional manner. The firm continues to achieve this through customer service, extensive knowledge of the land surveying profession and our commitment to excellence.

Avirom has a staff of 22 employees with an average length of service of 17 years. The dedication of our employees is a testament to Avirom & Associates' integrity and values as both an employer and a professional land surveying firm. We are one of the few firms in the State of Florida that has six Registered Land Surveyors. Our 31-year history represents our firm's strength and stability in the South Florida area. **Avirom maintains a dedicated service office in the City of Key West.**

Avirom has considerable experience in creating legal descriptions, having submitted in excess of 200 submerged land leases throughout the State of Florida for the FDEP and the USACE. The firm is knowledgeable and experienced with the formats and requirements of these agencies for submittals.

Avirom has worked with many engineering and architectural firms throughout South Florida, and strives to provide a seamless product for design. Our surveys have been the base maps for numerous designs, not only for engineering and architecture, but also landscape architectural and urban design firms.

GEOSOL, Inc.

Anticipated Service Offering: Geotechnical/Testing

Geosol, Inc. (GEOSOL) is a small professional firm that was established in the year 2000. Since its inception, the firm has grown from 2 to 12 employees. The firm provides geotechnical engineering and testing services, including subsurface exploration studies, laboratory testing, engineering, consulting, and design of foundation systems. The firm has a reputation for providing high quality, creative and cost effective geotechnical engineering solutions for clients in the public sector. GEOSOL has become very actively involved in the rapid growth of South Florida and has already participated as a Soils, Foundations and Materials Testing subconsultant in more than 250 major projects. **GEOSOL clients include FDOT, Tri-County Commuter Rail Authority Miami-Dade, Miami-Dade County Transit Authority, County Housing Agency, Miami-Dade County Public Works Department, and South Florida Counties.** GEOSOL engineers have over 50 years of geotechnical engineering experience and knowledge to evaluate subsurface conditions to provide sound, practical and cost-effective foundation and earthwork design solutions and recommendations.

Past Work Experience

Black & Veatch has been serving clients in Florida for over 50 years, providing engineering services from our six Florida offices with a total staff of more than 115 professionals. The firm has more than 120 professional engineers registered in the State of Florida. These engineers are backed by Black & Veatch's 95 years of experience providing services in a wide range of disciplines including civil, structural, water, wastewater, reclaimed water, architectural, geotechnical, environmental, electrical, and mechanical engineering, as well as construction, operations, science, economics, planning and finance.

Survey respondents to Environmental Technology Magazine rated Black & Veatch as their #1 choice among providers of consulting services, based on such evaluation criteria as "*demonstrated experience in related projects*", "*qualifications of key personnel*" and "*price and ability to meet time constraints*".

Since its establishment, Black & Veatch has completed more than 32,000 projects for more than 6,400 different clients worldwide, including the City of Key West. Over 80 percent of Black & Veatch's work comes from repeat clients. These repeat engagements demonstrate that we are a firm that listens to, and works with our clients to produce a final product that meets or exceeds expectations.

Our experience includes all aspects of Utility Engineering, Environmental Engineering and Civil Engineering services including:

- Wastewater and Stormwater Collection Systems
- Wastewater and Stormwater Master Planning and Modeling
- Environmental Studies
- Hydrogeologic Studies and Modeling
- Hazardous Waste Remediation
- Regulatory Review and Permitting
- Solid Waste Management
- Construction Inspection and Management
- Financial Planning
- Sustainability Planning

The broad range of experience and specialized expertise of our Team members ensures the Utilities Department of our ability to produce quality work.

PAST FIVE YEARS OF SPECIFIC RELEVANT EXPERIENCE

The following project descriptions provide details of representative projects completed within the past five years and the involvement by our proposed team members. Client and contractor references are provided for each project.

We encourage you to contact our references to gain a better understanding of our expertise and capabilities to complete projects on time, within budget, and to the complete satisfaction of the client.

36-Inch Water Transmission Main Evaluation And Replacement

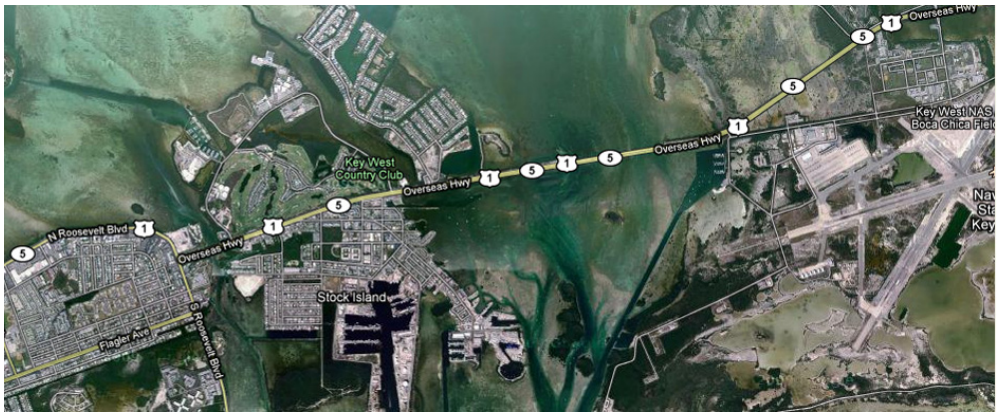
Key West, Florida

As part of a CIP Engineering Services Contract, a Black & Veatch team provided pipeline analysis, engineering, environmental, geotechnical, and surveying services for rehabilitation of approximately five miles of a 36-inch ductile iron transmission main for the Florida Keys Aqueduct Authority (FKAA) adjacent to the Overseas Highway (US 1) near MM93.

The pipeline is the transmission main feeding the entire Keys from their Florida Cities WTP in northern Monroe County. The FKAA had experienced several failures in the pipeline over recent years and the frequency was increasing.

Therefore, the first phase of the project was to perform a condition assessment and determine the reason for failure. Black & Veatch's pipeline specialists performed an on-site analysis of the pipeline and provided an evaluation to the FKAA. The next phase included the recommendations to replace the pipeline and determine the limits of replacement.

Following the study phase, an engineering design was developed to cover the new section of pipeline, which was approximately five (5) miles. Specifications and contract documents were developed, which provided incentives to enhance bidder participation. Black & Veatch also assisted the FKAA with the pre-purchase of the replacement pipe to expedite the process since this had become a public safety issue.



Florida Keys Aqueduct Authority

Project Elements
- Water Transmission Main
- Failure analysis
- Pipe Design and Specifications

Key Personnel Involved in Design Phase Services
Tom Cummings

Period of Service
2006 - 2008

Cost
Total Engineering Cost
$425,621

Black & Veatch Portion
$214,000

Construction Cost Estimate
$16,433,000

Project Award Amount
$11.3M

Client Reference
Florida Keys Aqueduct Authority
Tom Walker
1100 Kennedy Drive
Key West, FL 33041-1239
305.296.2454

Contractor Reference
Garney Companies, Inc.
Jason Seibert
3018 Michigan Ave
Kissimmee, FL 34744
407.846.3121

Cudjoe Key Advanced Water Reclamation Facility

Cudjoe Key, Florida

Black & Veatch has teamed with TKW Consulting Engineers to perform planning, engineering, bidding, and construction phase activities necessary for the design of a wastewater forcemain system and new advanced water reclamation facility for the Florida Keys Aqueduct Authority. Services provided included elements associated with a traditional design-bid-build project delivery approach.

The project includes the design a wastewater forcemain transmission system, an advanced wastewater treatment plant, biosolids thickening and dewatering, and effluent disposal wells on an approximately 3-acre site located on Cudjoe Key. The Cudjoe Key AWRF will be designed to treat domestic wastewater generated by the Big Pine Key, Cudjoe Key, Summerland Key, and Upper Sugarloaf Key service areas. The Cudjoe Key AWRF will have a process design capacity of 0.94 million gallons annual average daily flow. Initially, the plant will be permitted through the FDEP for a capacity of 0.74 million gallons per day (mgd).

The new 0.94-mgd AWRF will be designed with two trains each consisting of influent screening, flow equalization, 5-stage biological nutrient removal, clarification, filtration and disinfection. Treated water will be disposed of by gravity in new Class V shallow injection well. Biosolids processing will be accomplished with new rotary drum thickeners, biosolids storage tanks, and a dewatering centrifuge. Dewatered biosolids will be transported to the landfill for final disposal.

Services provided under this project include planning, engineering design, environmental permitting, geotechnical and hydro-geotechnical investigations, preparation of contract documents, construction cost estimates, bidding and award, and construction phase services.

Project Elements
- Emergency Power System
- Influent Screening Facility
- Flow Equalization
- 5-Stage Bardenpho Biological Treatment Basins
- Final Clarifiers
- Tertiary Filtration
- Chlorine Contact Basins
- Effluent Disposal
- Biosolids Thickening and Dewatering
- Plant Drainage Lift Station
- Chemical Storage and Feed Facilities
- Operations Building
- Site work
- Security Access Control System

Key Personnel Involved in Design Phase Services
Larry Brouillette
Tom Cummings

Period of Service
2008 - 2010 (Design)
Construction Deferred

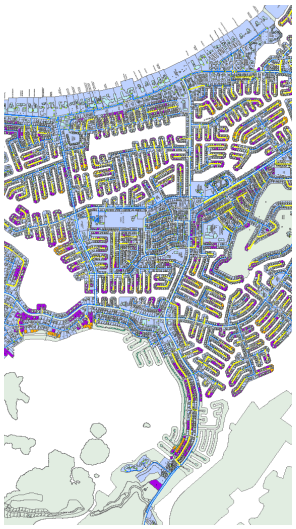
Cost
Engineering Fee
$1,596,383

Construction Cost Estimate
$24.6M (90% Estimate)

Project Award Amount
Not Applicable

Client Reference
Florida Keys Aqueduct Authority
Tom Walker
Utilities Engineering Division
1100 Kennedy Drive
Key West, FL 33040
305.295.2140

Contractor Reference
Not Applicable



Hydraulic Modeling and System Analysis

Marco Island, Florida

Black & Veatch has performed a variety of system evaluations and hydraulic modeling analyses to determine improvements that would enhance the operations and reliability of the City's water supply and distribution system. The City's water system includes a surface water supply system, brackish groundwater supply system, two water treatment plants, two high service pumping stations, and numerous miles of 4-inch through 30-inch diameter piping to deliver an annual average potable water supply of 8 mgd to its residents. Peak hour demands for the system can be as high as 25 mgd.

The analyses performed by Black & Veatch included:

- **Update and Calibration of the Water System Models** – The City's models for the water distribution system and raw water transmission system were updated in InfoWater modeling software. The accuracy of the updated models was verified by comparing the model results with SCADA data and field data that was collected throughout the system.
- **Hydraulic Analysis of Current and Future Operating Scenarios** – A number of scenarios were created in the model to evaluate current and projected future system operating conditions. When potential system issues were identified, the model was used to develop and evaluate improvement options to address the issues.
- **Water Age and Water Trace/Blending Analyses** – Extended period simulations were developed in the model to perform water age and water trace analyses. The results of the analyses provided answers to the City's questions regarding water age and water blending issues in the distribution system.
- **Fire Flow and Fire Hydrant Spacing Analyses** – Comprehensive fire flow and fire hydrant spacing analyses were performed to determine system improvements that are necessary to maintain compliance with the City's fire flow and hydrant spacing goals. GIS and the water system model were used to complete the analysis.
- **CIP Planning and Prioritizing** – Black & Veatch assisted the City with organizing and prioritizing the recommended system improvements that were identified. Black & Veatch created graphics and summary tables requested by the City for use in City Council meetings and presentations.

Project Elements
- Hydraulic Modeling
- System Analysis
- Model Calibration
- Fire Flow Analysis
- Fire Hydrant Spacing Evaluation
- Water Age Analysis
- Water Trace and Blending Analyses
- CIP Planning

Key Personnel Involved in Design Phase Services
Robert Burchett

Period of Service
2008 - 2010

Cost
Engineering Fee
$95,350

Construction Cost Estimate
Not Applicable

Project Award Amount
Not Applicable

Client Reference
City of Marco Island
Rony Joel, PE, DEE
50 Bald Eagle Drive
Marco Island, FL 34145
239.389.5064

Contractor Reference
Not Applicable

Nature's Way Pump Station Upgrade

Hillsborough County, Florida

Black & Veatch provided services to Hillsborough County to implement upgrades to the Nature's Way Pumping Master Pumping Station. Under this project, the capacity of the facility was increased from 5,600 to 9,200 gpm. Improvements were made throughout the facility, including:

- Refurbish two existing wetwells and add a third new wetwell (12' diameter, 25' deep)
- Install six (six) new submersible pumps two (2) in each of the three wetwells
- Replace existing pump electrical equipment, providing VFDs for all pumps
- HVAC improvements in electrical building to accommodate the increased heat loading associated with the new drives
- Provide new instrumentation and control equipment including flow metering and level sensing devices, and a new PLC to control the entire station
- Site work and miscellaneous improvements to support these improvements, including the implementation of a new stormwater management system.

The pumping station was successfully upgraded in a staged approach whereby the facility remained operational throughout the construction. Neighborhood sensitivities include odor, noise, and aesthetics.

Services provided by Black & Veatch included preliminary and detailed design, permitting, bidding services, and construction administration and construction observation.

The facilities were designed to be neighborhood friendly taking into consideration odor, noise, and aesthetics.

Project Elements
- Wastewater Pumping
- Emergency Backup Power
- Odor Control Accommodations
- Refurbishment of Existing Facilities
- Expansion of Capacity
- Comprehensive Electrical Upgrade
- New Stormwater management System
- Complex Construction Staging

Key Personnel Involved in Design Phase Services
Alan Dethloff
Larry Brouillette
Steven King

Period of Service
2008 - 2012

Cost
Engineering Fee
$480,000

Construction Cost Estimate
$2,795,000

Project Award Amount
$2,555,813

Client Reference
Hillsborough County
Jim Adair
925 E. Twiggs Street
Tampa, FL 33602
813.272.5977 Ext 43490

Contractor Reference
RTD Construction
Alex Zettel
5344 9th Street
Zephyrhills, FL 33542
813.783.9119

Project Elements
- Hydraulic Modeling
- Force Main Sizing
- Pumping Station Design

Key Personnel Involved in Design Phase Services
Tom Cummings
Arthur Miller

Period of Service
2006 - 2009

Cost
Engineering Fee
$1.5M

Construction Cost Estimate
Drane Field: $3,990,000
Air Park: $2,260,000

Project Award Amount
Drane Field: $3,040,000*
Air Park: $1,883,000*

*Low bid Contractor included alternative deduction of $60,000 if awarded both projects which was accepted, resulting in lower accepted bid price

Client Reference
City of Lakeland
Tom Mattiacci
501 East Lemon Street
Lakeland, FL 33801-5079
863.834.8316

Contractor Reference
RTD Construction Inc.
Orlando Serrano
5344 9th Street
Zephyrhills, FL 33542
813.783.9119

English Oaks Accommodations Phase II

Lakeland, Florida

The City of Lakeland Southwest Service Area projected growth requires infrastructure upgrades. Black & Veatch was selected to perform a hydraulic model of the City's Southwest Service Area. This effort included the following activities:

- Prepare a hydraulic model of the City's Southwest Service Area that would be a tool for future planning and engineering uses.
- Assist in the determining of the size of a proposed major collection force main to deliver flow from the service area to the Glendale Water Reclamation Facility
- Assist in the design of the Drane Field Road Booster Pumping Station
- Assist in the design of the Air Park Drive Pump Station
- Determine the effect of the new force main and BPS on existing lift stations that contribute flow into the existing and proposed collection system.

The model results were presented in report and provided the capacities and pressures for the designed English Oaks Accommodations Phase II Project.

Based on the model recommendations, Black & Veatch preceded to design the following:

- Airpark Pump Station (5.7 MGD) that included the construction of a wetwell to house three variable speed pumps and accessories, a prefabricated building that houses the MCC and AFD, a 24" gravity sewer line, and an 18" forcemain.
- Drane Field Road Booster Pump Station (14.4 MGD) that includes the construction of a super Structure to house two variable speed immersible pumps and accessories.

Both Pump Stations also included site work; grading and paving of the area, piping of the main transmission lines and the related plumbing work, electrical, instrumentation and control work.

Oberly and Washington Terrace Pumping Station Improvements

St. Petersburg, Florida

Black & Veatch provided engineering services for improvements to the City's two potable water distribution pumping stations with a combined firm capacity of 94 mgd. Responsibilities on these projects include engineering analysis, alternatives evaluation including present worth cost comparison, hydraulic modeling, detailed design, permitting, procurement assistance, bidding phase services, and construction administration. Improvements at the facilities implemented under this project included the following:

- Addition of variable frequency drives for high service pumps
- Replacement of high service pump switchgear
- Replacement of transformers
- Replacement of emergency engine-generators and associated switchgear
- Replacement of the diesel-fuel system for generators
- Replacement of pump motors
- Replacement of the City's SCADA System serving all water facilities
- Architectural renovation of the buildings to provide a interior air conditioned spaces for new electrical equipment. Improvements included building expansion and upgrade, replacement of roofs, addition of HVAC systems, replacement of lighting, etc.
- Implementation of a new system-wide pump control system based on pressure control utilizing the new VFDs

One of the critical challenges of this project was developing a design that would accommodate precise sequencing of the improvements to avoid disruptions of service at either facility. With 75% of construction completed, execution has been highly successful with all goals for maintaining service having been achieved.

Project Elements
- Engineering Analysis
- Present Worth Cost Comparison
- Hydraulic Modeling
- Detailed Design
- Permitting
- Procurement Assistance
- Bidding Services
- Construction Administration

Key Personnel Involved in Design Phase Services
Robert Burchett
Richard Taylor

Period of Service
2005 - 2011

Cost
Engineering Fee
$667,600

Construction Cost Estimate
$7,939,000

Project Award Amount
$7,770,000

Client Reference
City of St. Petersburg
Engineering Department
Steve Leavitt
One Fourth Street North, St. Petersburg, FL 33701-3804
727.893.4165

Contractor Reference
Wharton-Smith
Mike Nagy
4912 W. LaSalle St.
Tampa, FL 33607
813.288.0068

Oakwood Villa Septic Tank Phase Out

Jacksonville, Florida

Project Elements
- Vacuum Sewers
- Trenchless Technologies
- Feasibility Study
- Detailed Design Services
- Master Pump Station Design
- Multiple Duplex Pump Station Designs
- Pipeline Design
- ROW and Utility Coordination
- Permitting

Key Personnel Involved in Design Phase Services
Arthur Miller
Bobby Burchett

Period of Service
2004 to 2007

Cost
Engineering Fee
$1,957,945 (All phases)

Construction Cost Estimate
$6M (Phase 2)

Project Award Amount
$5.5M (Phase 2)

Client Reference
JEA
Jim Connolly
21 West Church Street
Jacksonville, Fl 32202
904.665.6313

Contractor Reference
J.B. Coxwell Contracting, Inc.
Nan Nanney
6741 Lloyd Road West
Jacksonville, FL 32254
904.421.4540

Because of the serious negative environmental and health impacts caused by the potential failure of septic systems, JEA, through funding provided by the City of Jacksonville, embarked on a septic tank phase-out program. The Oakwood Villa subdivision was identified as a high priority for septic tank phase-out. Oakwood Villa includes over 1,600 homes on septic systems. JEA retained Black & Veatch to provide study and design services to identify the best options for septic tank phase-out.

Through a feasibility study prepared by Black & Veatch, the recommended solution was a combination of gravity sewer and vacuum sewer. As illustrated in the left figure, the project has been divided into three phases: Phase I – Gravity Sewer System; Phase II – Gravity Sewer System & Vacuum Sewer System; and Phase III – Vacuum Sewer System. JEA has selected Black & Veatch to provide design for all phases. For the Vacuum system to serve 850 homes, Black & Veatch has also assisted JEA in developing standards for both vacuum sewers and quadraplex pump stations.

Design elements for the gravity sewer system to serve the remaining 750 homes include the hydraulic modeling of the gravity sewer system, pipeline design, multiple pump station designs with microtunneling and directional drilling techniques identified at strategic locations. Pump station design includes a master quadraplex pump station that will replace the existing duplex station. Black & Veatch is also serving a lead role in coordinating efforts with the drainage design being done by multiple consultants. All pipelines are in the City of Jacksonville ROW's.

Significant project elements include:

- Multi-phase project with significant utility and drainage design coordination,
- A quadraplex master pump station (fast-tracked), multiple duplex and low flow submersible pump stations,

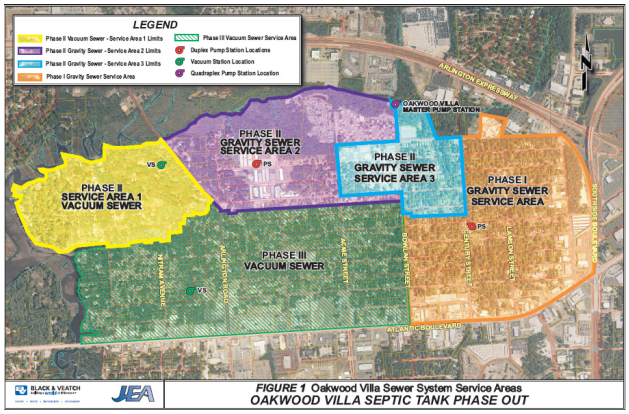


FIGURE 1 Oakwood Villa Sewer System Service Areas
OAKWOOD VILLA SEPTIC TANK PHASE OUT

- 42,000 feet of gravity sewer, pipeline sizes 8"- 18"
- 51,000 feet of vacuum sewer
- 3,300 feet of 16" force main as well as multitude of small force mains.
- Two areas with hybrid pilot tube drilled to grade
- 330 foot horizontal directional drill under a creek.
- City of Jacksonville ROW permits, MOT coordination, FDOT permit; and coordination with the City's drainage and roadway consultant.

Taylor Creek ASR Well System Re-Activation

Okeechobee City, Florida

The Lake Okeechobee Technical Advisory Committee recommended that a study be conducted to determine the feasibility of reducing the phosphate loads into Lake Okeechobee from tributaries such as Taylor Creek and Nubbin Slough. In response to this recommendation, the U.S. Geological Survey in cooperation with South Florida Water Management District (SFWMD) conducted a series of freshwater subsurface injection tests over a period of 17 months. The study had three objectives: (1) to assess the feasibility of subsurface injection, storage, and recovery as a mechanism for reducing the phosphate levels; (2) to examine the chemical behavior of mixing canal water with native groundwater; (3) to estimate recovery efficiency.

A 24-inch diameter deep Floridan Aquifer ASR well and an accompanying deep monitor well were constructed adjacent to the L-63 N canal (Taylor Creek). The surface system was designed, constructed, and placed into operation in April 1991, and the injection and recovery tests were carried out until August 3, 1992. Over this 17-month period, three complete injection and recovery tests were completed. The fourth and final test, which consisted of injection only, was designed to determine the dynamics of the aquifer system. The complete report, "Analysis of Tests of Subsurface Injection, Storage, and Recovery of Freshwater in the Lower Floridan Aquifer, Okeechobee County, Florida", U.S. Geological Survey Open-File Report 95-765, can be obtained on line at http://sofia.usgs.gov/publications/ofr/95-765/.

The Taylor Creek ASR test site has remained idle since the conclusion of this study. Following the original ASR study, numerous ASR test wells were constructed as part of the Comprehensive Everglades Restoration Plan (CERP), and new water treatment systems were designed. The first two ASR facilities under the CERP are under construction at Hillsboro Canal and Kissimmee River sites. During the same period, based on similar reasons, reactivation of the Taylor Creek ASR site was proposed. This project is part of the Lake Okeechobee Estuary Recovery (LOER) initiative and will provide as an alternative means of storage/disposal for the phosphate-laden surface water.

Project Objective – Following a successful pressure test of the ASR well, a notice to proceed was issued to Black & Veatch to document current conditions (Phase II), and to develop a conceptual design for reactivation of the Taylor Creek ASR facility using as many of the original components as possible, with a combination of filtration and disinfection to meet primary drinking water standards before injection (Phase III), followed by re-permitting the ASR system and pilot testing (Phase IV).

Project Elements
- Documentation of Current Condition
- Conceptual Design
- UIC Permitting
- Bench-scale Testing
- Pilot-scale Testing
- Alternatives Analysis

Key Personnel Involved in Design Phase Services
Rafael Frias
Brad Vanlandingham

Period of Service
2006 - 2007

Cost
Engineering Fee
$286,000

Construction Cost Estimate
Not Applicable

Project Award Amount
Not Applicable

Client Reference
South Florida Water Management District (SFWMD)
Bob Verrastro
3301 Gun Club Road
West Palm Beach, FL 33306
561.682.6139

Contractor Reference
Not Applicable

Study Conclusion – The purpose of the bench-scale and pilot-scale testing was to demonstrate that the disinfectants could achieve the following goals:

- Total coliform concentration less than 4 cfu/100mL
- No presence of fecal coliforms in the treated water

During the course of testing it became apparent that the total and fecal coliform concentrations were much lower than anticipated, which was attributed to the drought conditions that persisted during the testing. Therefore, it was necessary to use a surrogate organism to demonstrate the effectiveness of the different disinfectants to achieve the treatment goals. HPC bacteria were selected because they are slightly more resistant to UV light, compared to total coliforms, and therefore, provided a more conservative approach.

Based on the results of the pilot-scale testing, the following conclusions were made:

- The UV disinfection system could provide from 1-log inactivation (90% inactivation) to 1.5-log inactivation (96% inactivation), depending on the dose applied.
- Based on the developed dose response curve from the bench-scale testing, a UV dose of 54 mJ/cm2 would provide 1-log inactivation and a dose of about 100 mJ/cm2 would provide 1.5-log inactivation.

The bench and pilot data demonstrated that with low concentrations of total and fecal coliforms, each disinfectant at a low dose would achieve the treatment goal of total coliforms less than 4 cfu/100mL and a fecal coliform concentration of zero. However, based on the historical data from Taylor Creek, the total coliform concentration may exceed 1,500 cfu/100mL. In this situation, at least two disinfectants would be required to meet the treatment goals.

Energy Management Program Roadmap and Energy Efficiency Projects

Tampa, Florida

Tampa Bay Water is a regional water supply authority that provides approximately 170 mgd of potable water supply to three counties and three cities in the Tampa Bay area. The 2009 budget for power costs to operate the supply and transmission system was over $15 million. In recognition of the potential for significant cost savings and environmental benefits associated with improving energy efficiency, Tampa Bay Water began an official energy management program with a goal achieving a 10% reduction in energy over the next 10 years through efficiency improvements and development of alternative energy sources. An initial step of this program was the development of an Energy Management Program Roadmap. Black & Veatch is working with Tampa Bay Water to development the Roadmap, which includes:

Involvements Process

This task involved the development of an effective and sustainable energy management team, and a process for continuing to keep key stakeholders engaged throughout the Program.

Condition Inventory

This task involved a review of the current energy efficiency and management ideas, plans, projects and technology investments that Tampa Bay Water has already made. This task involved a review of a range of documents and interviews of numerous Staff. The information gathered served as a basis for the Roadmap.

Development of an Energy Management Program Roadmap

The Roadmap provides a way to visualize, collect, and analyze the desired technology outcomes along a timeline with O&M and capital budgeting considerations.

Project Elements
- Energy Efficiency Management and Road Mapping

Key Personnel Involved in Design Phase Services
Robert Burchett

Period of Service
2010 - 2011

Cost
Engineering Fee
$99,865

Construction Cost Estimate
Not Applicable

Project Award Amount
Not Applicable

Client Reference
Tampa Bay Water
Maribel Medina
2575 Enterprise Road
Clearwater, FL 33763
727.791.2378

Contractor Reference
Not Applicable

TAMPA BAY WATER
Supplying Water To The Region

Wastewater and Stormwater Utility Rate and Feasibility Analysis

City of Key West, Florida

Project Elements
- Rate Sufficiency Analysis
- Stakeholder Engagement
- Procurement/Financing Support

Key Personnel Involved in Design Phase Services
Robert Chambers

Period of Service
2010

Cost
Engineering Fee
$39,000

Construction Cost Estimate
Not Applicable

Project Award Amount
Not Applicable

Client Reference
City of Key West
David Fernandez
3132 Flagler Avenue
Key West FL 33040
305.809.3879

Contractor Reference
Not Applicable

Black & Veatch has been providing financial consulting services to the City of Key West as the City endeavors to complete over $50 million in wastewater construction projects required to enhance environmental protection in the Florida Keys. The City, which operates a wastewater collection and treatment system as well as a stormwater system, is responding to requirements of the Florida Department of Environmental Protection, as well as the desires of the citizenry.

The construction program has been supported by the acquisition of Federal and State grant funds, and is being completed using retained revenues of the wastewater and stormwater enterprise funds. Black & Veatch provided annual rate study updates for the City's wastewater and stormwater system since the inception of the wastewater construction project.

Comprehensive Water and Wastewater Rate and Cost of Service Study

Miami, Florida

Project Elements
- Cost of Service and Cost Allocation Rate Studies
- Bond Feasibility Studies
- Impact Fee Analysis
- Annual Bond Engineer Reports
- Capital Budgeting Plans
- Regulatory Compliance Review
- Dynamic Financial Computer Based Models

Key Personnel Involved in Design Phase Services
Robert Chambers

Period of Service
2008 – On-going

Cost
Engineering Fee
$170,000

Construction Cost Estimate
Not Applicable

Project Award Amount
Not Applicable

Client Reference
Miami-Dade Water & Sewer Department
Peter Velar
1001 Northwest 11th Street
Miami, FL 33136
786.552.8544

Contractor Reference
Not Applicable

Black & Veatch in conjunction with Planning and Economics Group was recently chosen to serve Miami-Dade Water and Sewer Department (MDWASD) as its Financial Consultant and Bond Engineer. Miami-Dade serves approximately 2 million customers in Florida's largest metropolitan area, is the sixth largest water system in the United States, and has over 3,600 miles of sewage pipes, a service area of 341 square miles and 954 pump stations.

Currently Black & Veatch is in the second phase of the initial financial consulting work for MDWASD that includes annual financial reviews and updates to previously completed studies. The first phase involved completing water and sewer cost-of-service and rate study for both wholesale and retail customers. The rate study also included developing an interactive and comprehensive financial rate model for use by MDWASD. The model includes user friendly navigation, help and data input features and is currently in use.

Bond Engineering services are provided on an annually recurring basis to ensure compliance with MDWASD's bond ordinance, which specifies a number of operational and financial requirements that must be met on a recurring basis and for the issuance of additional bonds. As such, Black & Veatch has completed specific operational studies and inspections, financial performance assessments, organizational reviews, and other related studies in support of completing and fulfilling specific Bond Engineer's requirements. These reports have been provided to bond holders, bond rating agencies, and others in accordance with the terms of the master bond ordinance.

Comprehensive Water and Wastewater Rate Structure Review

Broward County, Florida

Over the last fifty years, the South Florida region has experienced a total of nine periods of significant water scarcity. These drought conditions emanated from monthly rainfall deficits and a decline in water storage volumes which prompted the Water Management Authorities to issue drought management mandates.

As a result of the most recent drought condition (2007 – 2010 ongoing), the Water and Wastewater services of Broward County experienced a reduction in total treated water which continually adjusted the forecast of projected revenues. The County required a water and sewer rate structure review that simulated the County's revenue generation ability. While at Red Oak Consulting, Mr. Chambers lead the project team that performed an independent review of the assumptions and philosophical drivers considered prior to developing the County's existing rates.

In addition, the team developed specific simulations of water and wastewater revenues utilizing price elasticity coefficients, the South Florida Water Management District phased drought criteria as developed by the County, incorporated specific customer water usage characteristics in the South Florida region, whilst maintaining the original rate setting principles of revenue stability and water conservation during the process of simulating specific events.

Project Elements
- GAP Analysis
- Financial Forecasting
- Rate Design Model

Key Personnel Involved in Design Phase Services
Robert Chambers

Period of Service
2009

Cost
Engineering Fee
Not Available

Construction Cost Estimate
Not Applicable

Project Award Amount
Not Applicable

Client Reference
Broward County
Mrs. Len Neff
2555 W. Copans Road
Pompano Beach, FL 33069
954.831.0909

Contractor Reference
Not Applicable

Rate Study for Water and Wastewater Service

North Miami, Florida

Black & Veatch completed comprehensive water and sewer rate study including the implementation of conservation based rates in order to be compliant with the South Florida Water Management District water use permit mandates. The rate study required a comprehensive analysis of the cost and rates associated with providing water and sewer service to the City's customers.

The goals of this study were to: (i) fully evaluate and optimize the revenue generating potential of water and sewer rates considering the water conservation mandates and regulatory requirements issued by the water management districts in Florida, (ii) evaluate the appropriateness and adequacy of cost recovery mechanisms for the water and sewer system (iii) obtain buy-in from external and internal stakeholders, and (iv) develop rates fair and equitable water and sewer rates. In addition, Black & Veatch is currently assisting the City in an effort to procure alternative financing to fund planned water and wastewater utility system improvements.

Project Elements
- Cost of Service Analysis
- Rate Design Analysis
- Stakeholder Engagement

Key Personnel Involved in Design Phase Services
Robert Chambers

Period of Service
20011-2012

Cost
Engineering Fee
$128,000

Construction Cost Estimate
Not Applicable

Project Award Amount
Not Applicable

Client Reference
City of North Miami
Aleem Ghany
776 NE 125 Street
North Miami, FL 33161
305.895.9830

Contractor Reference
Not Applicable

Facility and Site Condition Assessments and Historical Preservation, IDIQ for Architecture – Engineering Services

Various Locations Nationwide (including Florida)

Project Elements
- Historic Preservation Assessments
- Asset Condition Assessments

Key Personnel Involved in Design Phase Services
James Sullivan

Period of Service
2004 - 2010

Cost
Facilities Assessment Services
$5M (Black & Veatch Fee)

Construction Cost Estimate
Not Applicable

Project Award Amount
Not Applicable

Client Reference
National Park Service,
Department of the Interior
Gayle Burgess
Curecanti NRA
102 Elk Creek
Gunninson, CO 81230
970.641.2774

Contractor Reference
Not Applicable

Black & Veatch provided the National Parks Service (NPS) with architectural, engineering and planning services for the preservation and maintenance of modern and historic assets throughout the United States. Black & Veatch provided Code and Condition Assessments services at over 100 of the total 390 Parks in the NPS portfolio, throughout the continental United States, Alaska and Hawaii. Asset assessments have included, but are not limited to:

- Historical Preservation Assessments and Reports for Building Structures
- Comprehensive Facility/Architectural/Systems Assessments
- Accessibility Condition Assessments (Pilot Program)
- Unique Asset Condition Assessments for Water Fronts, and Monuments
- Comprehensive Assessments of Fuel Systems, Heating, and Cooling Plants

Black & Veatch personnel conduct comprehensive assessments including a detailed inspection and documentation of assets at various NPS facilities. Virtually everything regarding an asset is surveyed and evaluated, including architectural conditions assessments, primary building systems, equipment, functional or operational components, and structural. The assessments can range from very modest-sized projects to very large. This process populates a database for providing a baseline for the repair/ maintenance of each asset and provides the NPS with the basis for annual funding requests. Upon the completion of the assessments, construction cost estimate recommendations are developed for each repair or maintenance item, or new item, as well as, future operations and maintenance schedules.

Black & Veatch also provided additional professional support services to the NPS for pilot programs. These programs have included the evaluation of handicap accessibility for buildings/sites and the assessment of water fronts, monuments and fortifications.

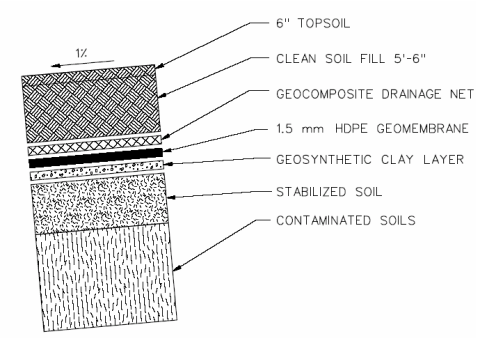
Black & Veatch staff utilized their training obtained from the National Park Service at the National Center for Preservation Technology and Training in Natchitoches, LA. The program focused on a practical approach to engineering for older and historical buildings. Black & Veatch completed building deficiency assessments, reports that defined unique historical building components, structural analysis reports, analyzed building deficiencies that included percentage of material lost, recommendations for improvements, and cost estimates for the NPS for historical fort sites, including Fort Moultrie and Sumter in Charleston, SC. In Pensacola, Florida, the team inspected the following historical forts and batteries: Fort Pickens, Fort Barrancas, Battery 234, Battery Langdon, Battery Worth, Battery Pensacola, and Battery Van Swearingen.

Escambia Treating Company Environmental Title I Design Project #2

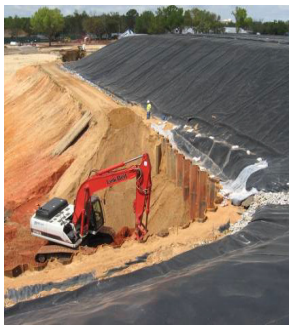
Escambia County, Florida

The Escambia Treating Company (ETC) site is an abandoned wood preserving facility located in Pensacola, Florida that operated from 1942 until its closing in 1982. During its operational period, the ETC facility treated utility poles, foundation pilings, and lumber with coal-tar creosote and pentachlorophenol (PCP). Wastewater generated as part of the wood treating process was disposed in two unlined holding ponds. Operations at the ETC site have contaminated the soils and groundwater within the former facility and the surrounding residential neighborhoods with wood treating chemicals and their by products including dioxins, pentachlorophenol, and polynuclear aromatic hydrocarbons (PAHs). In 1991-1992, the U.S. Environmental Protection Agency (EPA) conducted an emergency removal action at the ETC site which involved the excavation of the former holding ponds and highly contaminated soil. An estimated 225,000 cubic yards of heavily contaminated soil were placed into a lined and capped soil stockpile. Additional investigations at the site and surrounding neighborhoods determined that an additional 300,000 cubic yards of soil exceeded the established cleanup goals. Starting in 1997, EPA began relocating residents from the neighborhoods surrounding the ETC facility. Nearly 400 families were relocated as part of this effort which ranks as the third largest relocation effort by the EPA.

EPA subcontracted Black & Veatch special Projects Corp. (Black & Veatch) to prepare the remedial design and to verify that the cleanup is constructed in accordance with the approved plans and specifications. The remedy selected by the EPA for the cleanup of the ETC contaminated soils was excavation and placement of the contaminated soils into a lined and capped subsurface containment cell that was constructed at the site. The more highly contaminated soils were solidified with cement to immobilize the contaminants and form a 3-feet thick subcap. The local community has plans to redevelop the property for light commercial use; therefore, the containment cell and cap were designed to support the redevelopment. Black & Veatch designed a 525,000 cubic yard containment cell to permanently dispose of the contaminated soils. Black & Veatch is currently onsite observing the remedial construction, providing engineering support, and collecting air samples from the perimeter air monitoring stations for dioxin, PAH, and Total Suspended Particulate (TSP) analysis.



Black & Veatch designed the low-profile multi-layered cap specifically to allow construction of a commercial office park over the capped area.



Project Elements
- Preliminary Design/Feasibility Study
- Design Overview
- Remedial Design
- Design Review and Modifications
- Cost Estimating
- Design Plans and Specifications
- Project Schedule
- O&M Schedule
- Environmental Design Reviews

Key Personnel Involved in Design Phase Services
Daralene Pondo

Period of Service
2005 - 2009

Cost
Engineering Fee
$1,688,000

Construction Cost Estimate
$14,000,000

Project Award Amount
$6,365,000

Client Reference
USEPA Region 4
W. David Keefer
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303
404.562.8932

Contractor Reference
CMC, Inc.
Clay Coreman
1151 Jessamine Station Pike,
Nicholasville, Jessamine,
KY 40356
888.854.3732

Holmberg Road and University Drive - Mill and Overlay Construction Inspection Services

Parkland, Florida

CRJ & ASSOCIATES, INC was selected to provide Limited Construction Phase Services for the Mill & Resurfacing of:

- Holmberg Road from University Drive to the western leg of the Riverside Drive Round-About
- University Drive from Sawgrass Expressway Right-of-Way to Holmberg Road's Brick Pavers

This project was considered by the City of Parkland as a Maintenance Effort to remedy the above-mentioned roadway segments. As per current understanding, the Project warranted neither widening nor modifications to the roadway geometry. The only roadway modification, which the City had already completed, was the addition of concrete curbing. In addition, there was a re-striping (i.e., thermoplastic) and reflective pavement markings (RPMs) effort after the installation of the new asphalt lift.

Construction Engineering Inspection (CEI) Services

CRJ & Associates, Inc. assisted the City to monitor the Construction Activities for the Duration of Work. CRJ provided the following Construction services:

- Observations of Contractor Set-Up, Breakdown and Mobility of MOT as per the 2010 FDOT Standard Index (Index 600 thru Index 670)
- NPDES Erosion & Sediment Field Inspections and observation of installation of BMPs within the existing drainage system prior to the start-up of the Project (i.e., prior to Milling Operation). Also, provide assurance at the end of project that said BMPs have been properly removed.
- Field Inspection – Basic Services that included Asphalt Temperature Measurements, Asphalt Daily Tonnage Tickets, Tack Tickets and tally for Daily Asphalt Production.
- Striping Field Observations – Basic confirmation of Installation Quantities of Linear Footage of Thermoplastic and RMPs.
- Through Field Observations, CRJ provided the City of Parkland assurance that Mill & Overlay process remained within the tolerable limits identified within the FDOT Specifications (Latest ed. 2010).
- Reviewed the General Contractor's Asphalt mix design and provided recommendation for approval to the City.
- Conducted the Final Lift Rolling Straight Edge Check with the General Contractor.

Project Elements
- Construction Phase Services
- Road Resurfacing

Key Personnel Involved in Construction Phase Services
Marc Fermanian
Carlos Ortega

Period of Service
2011

Cost
Engineering Fee
$14,080

Construction Fee
$460,000

Construction Cost Estimate (Performed by City Engineer)
$900,000

Project Award Amount
$433,805

Client Reference
City of Parkland Public Works Department
Sowande Johnson
Parkland City Hall
Engineering Department
6600 University Drive
Parkland, FL 33067
954.757.4144

Contractor Reference
General Asphalt Co., Inc. (GAC)
Rob Lopez, Jr.
4850 NW 72nd Avenue
Miami, FL 33166
305.592.3480

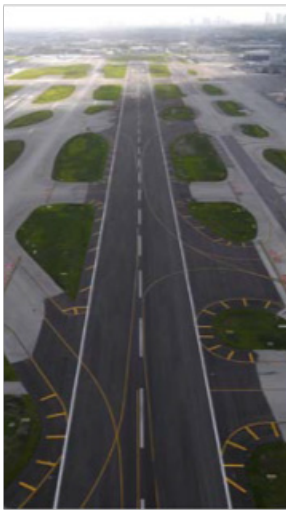
Runway 8R-26L Pavement Reconstruction - Construction Inspection Services

Miami-Dade County, Florida

In addition to CRJ & ASSOCATE's involvement with the design component of the Runway 8R-26L reconstruction effort, CRJ served as the Construction Inspection Services (CIS) Manager for the client. The Project was an extremely fast-tracked project with an aggressive construction schedule. The project's first phase, which commenced on November 2009, started the Project's Journey off to conquer Runway 8R-26L, Taxiway M and Taxiway N for a mill & overlay and a significant modification to the Airfield Lighting System, which equated to more than 2,160 fixtures. The project was provided with 454 calendar days for work to which Bulletin #1/Change Order #1, as per the Owner's request, added $7Million dollars of additional work to the Project with no adjustment to the duration of the Contract; this was a daunting challenge for all parties involved – to which the Project was considered to be a success.

The CIS team lead by CRJ was on call and on site for 24 hours-a-day, 7 days-a-week. The long hours on our staff, and overall coordination with the Contractor and Sub-Contractors were a trying and tiring endeavor on the staff. However, perseverance and determination to get the job done brought the project to a success and high regards from the client. Above all, CRJ staff's ability to work with the Contractor, build professional relationships with their key employees, and track the job as it progresses on a daily basis was the key to the Project's success. Key responsibilities had included:

- Daily Field Inspection and Progress Reporting
- Weekly Construction Meetings
- Quality Assurance for P-401 Asphalt
- Review and Approval of Project Work Orders
- Project Documentation Control for Owner
- Time Impact Analysis for Weather Events
- Review/Approval of Contractor's Pay Requests
- Coordination of CIS Manpower and scheduling



Project Elements
- Construction Inspection Services

Key Personnel Involved in Construction Phase Services
Marc Fermanian (CRJ)

Period of Service
2009 - 2011

Cost
Engineering Fee
$232,000

Construction Cost Estimate
$27,037,943

Project Award Amount
$26,037,943

Client Reference
Miami-Dade Aviation Department

Ernesto Beltre
MDAD Bldg. 5A
P.O. Box 594040
Miami, Florida 33159
305.876.0787

Jim Murphy
Miami Int'l Airport
Concourse E - Airside Operations
P.O. Box 025504
Miami, FL 33102
305.876.7359

Contractor Reference
General Asphalt Co., Inc. (GAC)
Rob Lopez, Jr.
4850 NW 72nd Avenue
Miami, FL 33166
305.592.3480

Treasure Coast Unit 1 Site Selection, Site Certification, Environmental Permitting & Owner's Engineering

Fort Pierce, Florida

In 2004, Florida Municipal Power Agency (FMPA) set out to develop the Treasure Coast Energy Center (TCEC) located in Ft. Pierce, Florida. The TCEC is a 69-acre site that, one day, could provide up to 1200 MW of electricity to Florida residents. TCEC is owned by FMPA and operated by Ft. Pierce Utilities Authority (FPUA). TCEC is a 1x1 combined cycle configuration, utilizing General Electric 7FA natural gas-fired combustion turbines and fuel oil backup. TCEC Unit 1 (TCEC 1) is a 300 MW high-efficiency, natural gas power plant and the first unit on the site, completed in 2008.

After weighing numerous alternatives, FMPA determined the best way to meet its members' future demand was to develop additional generation capacity. With only four years to select a site, obtain permits, and construct the project, time was of the essence. Having never taken on such a development project of this magnitude, FMPA turned to Black & Veatch, which had previously been selected as FMPA's gas-fired generation engineer. Together, FMPA and Black & Veatch worked seamlessly through the site selection, permitting, and procurement phases of the TCEC 1 Project.

In April 2005, and on behalf of FMPA, Black & Veatch prepared and submitted the Need for Power to the Florida Public Service Commission; Site Certification Application, including the PSD construction permit, to the FDEP; and Section 404 Permit Application to the COE. The Need for Power Order was issued in July 2005. The Site Certification Order was issued in May 2006. The COE issued an Individual Section 404 Permit in August 2006. Black & Veatch experts provided written and oral testimony at the February 2006 combined land use/certification hearing in support of the project.

Upon project construction in August 2006, Black & Veatch was retained to provide compliance audit and monitoring services. Compliance monitoring involved development and maintenance of the compliance schedule, regular contact with the site and FMPA to confirm compliance activities/submittals, and regular issue of a one month look-ahead compliance schedule. Black & Veatch also prepared a Spill Prevention, Control and Countermeasures (SPCC) Plan, Water Conservation Plan, Storm Water Pollution Prevention Plan (SWP3), and Title V Air Permit application for site operations. Refresher training required by the above listed site compliance plans was provided to plant staff in March 2009.

Project Elements
- Greenfield Site
- Six Miles Offsite Transmission and New Site Substation
- Hurricane Design Conditions
- Project Certified One Month Ahead of Schedule
- All Activities Completed Under Budget
- Unique County Requirements Addressed
- Combined Land Use and Certification Hearing

Period of Service
2004 - 2009

Cost
Engineering Fee
$1.35M

Construction Cost Estimate
Not Applicable

Project Award Amount
$1.4M

Client Reference
Florida Municipal Power Agency
Jim Hay
8553 Commodity Circle
Orlando, FL 32819
407.355.7767

Contractor Reference
Thomas Lucido & Associates
Lynda Paye
100 Ave. A, Ste 2A
Fort Pierce, FL 34950
772.467.1301

Bowyet-Singleton & Associates
William Donley
520 South Magnolia Avenue
Orlando, FL 32801
407.843.5120

Stock Island CT 4 Owner's Engineering & Permitting

Key West, Florida

Black & Veatch was selected by Florida Municipal Power Agency (FMPA) to provide continuing engineering services for its gas-fired generation. The first assignment was the addition of a simple cycle combustion turbine generator to the KEYS Energy Services Stock Island Power Plant. KEYS is a member of the FPMA All-Requirements Power Supply Project (ARP). The FMPA ARP provides all the power supply needs of KEYS. The majority of KEYS's power is provided by a tie-line to the Florida peninsula with on-island generation, which meets peak needs and power supply when the tie-line is out of service. FMPA is required to have on-island generation equal to 60% of KEYS peak load. Additional on-island capacity was needed for the summer of 2006.

The 44 MW unit addition at Stock Island was FMPA's first sole ownership project. Black & Veatch assisted FMPA as an EPC provider in project development, technology selection, permitting, procurement, and execution management. Black & Veatch performed a permitting assessment, scheduled and conducted agency pre-application meetings, and completed agency consultations prior to submittal of permit applications. Black & Veatch also provided the appropriate federal, state, and local permitting services to support construction and operation of the proposed peaking generation facility.

Stock Island Combustion Turbine 4 is a LM6000PC Sprint unit burning fuel oil. In addition to the combustion turbine generator with is auxiliaries, site fuel oil and demineralized waste storage capacities were increased. This unit is critical in meeting KEYS power needs following hurricanes and incorporated many special features including extended foundations to locate equipment above island wash over waves, hurricane proof enclosures, design for sustained 150 mph winds, and the ability to synchronize to a dead bus. Additionally, this project is located on an island remote from the mainland, therefore, the project's only fuel is #2 fuel oil.

Project Elements
- Owner's Engineer
- Permitting
- Fires Only Fuel Oil #2
- Ability to Synchronize to Dead Bus
- Hurricane Design Conditions

Period of Service
2004 - 2006

Cost
Engineering Fee
$1.3M

Construction Cost Estimate
Not Applicable

Project Award Amount
$1.33M

Client Reference
Florida Municipal Power Agency
Jim Hay
8553 Commodity Circle
Orlando, FL 32819
407.355.7767

Contractor Reference
Bowyet-Singleton & Associates
William Donley
520 South Magnolia Avenue
Orlando, FL 32801
407.843.5120

Staff Qualifications & Experience

The City of Key West expects the highest level of service from the engineering firm selected to perform GES. Black & Veatch is proud to offer the City this level of service with a highly-qualified team that understands the various issues associated with municipal facility planning, design, and construction. With a reputation for providing innovative solutions and turning obstacles into opportunities, we offer a highly skilled team of professionals to work with City staff on their important projects.

The Black & Veatch team will work with the Utilities Department to deliver economic, operable, reliable and flexible solutions that are tailored to meet the City's specific needs.

This section of our proposal will demonstrate the high quality of professionals who will work for the City and their capacity to accomplish work under any task that may be assigned.

IDENTIFICATION OF TEAM MEMBERS

To follow through on our commitment to apply effective management, available resources and quality deliverables, we have taken great care to bring to this project our most qualified technical staff by assembling a Team that provides redundancy in some skill sets. Redundancy provides assurances that our Team resources will not be stretched by the requirements of this GES contract, and that a high level of expertise rounds out our team.

Our team structure is designed to yield maximum results for the Utilities Department.

PROJECT DIRECTOR
Brent Reuss

PROJECT MANAGER
Rafael Frias

CLIENT SERVICE ADVOCATE
Robert Chambers

KEY PROFESSIONAL ENGINEERING SERVICES

UTILITY ENGINEERING
Task Leader – Mark Martin

- **Pump / Lift Stations** — Bobby Burchett
- **Sanitary / Storm Sewers** — Allen Dethloff
- **Stormwater Management** — Rafael Frias
- **Hydraulic Modeling** — Bobby Burchett
- **Recharge / Injection Wells / Hydrogeology** — Bob Moresi
- **Utility Rate Studies and Bond Engineering Reports** — Robert Chambers
- **Sustainability / Energy Efficiency** — Steve Tarallo

ENVIRONMENTAL ENGINEERING
Task Leader – Alejandro Toro

- **Environmental / Contamination Assessments** — Daralene Pondo
- **Wetlands Monitoring / Mitigation** — Ralph Brooks
- **Regulatory Compliance** — Bob Moresi

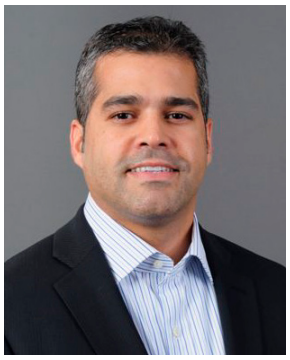
CIVIL ENGINEERING
Task Leader – Brad Vanlandingham

- **Civil /Site** — Curt Smith
- **Structural** — Brad Vanlandingham
- **Transportation / Roads** — Terry Thomas, CRJ & Associates
- **Architecture / LEED Buildings** — Lou Nemeth
- **Historic Buildings Preservation** — James Sullivan

SPECIALIZED PROJECT SUPPORT

- **Surveying** — Avirom & Associates
- **Geotechnical / Testing** — GEOSOL
- **Regulatory Review and Permitting** — Steve King
- **Mechanical** — Tom Cummings
- **Electrical** — Richard Taylor
- **Instrumentation and Control** — Larry Brouillette
- **GIS/CAD Design** — Jay Miller, Paul Ginther
- **Construction Inspection and Management** — George Lattin
- **Funding** — Tami Ray

CAPACITY OF ASSIGNED PERSONNEL



Rafael is a resourceful Project Manager with strong leadership and communication skills. As the Manager of our South Florida operations, Rafael has full access to Black & Veatch's pool of talented professionals and will commit these resources to the Utilities Department.

Successful delivery of any project will require close collaboration with City staff, a skilled and experienced team, and 100 percent accountability. Our **Project Manager, Rafael Frias,** is a resourceful, take-charge leader who motivates others and focuses on close communication between clients and our project teams. He will ensure that appropriate resources are provided to support any task required by the City, and that our projects are delivered on time and within budget.

Rafael Frias will lead the projects and serve as the City's primary point of contact. As Project Manager, Rafael will provide leadership and direction, as well as consistency through project tasks during their entire duration. His responsibilities will entail budget estimates and schedules, meeting facilitation, technical input initiation, and assuring conformance with the City's objectives.

Rafael's experience is in water resources, including water supply and treatment; he has completed numerous master planning projects in Florida and Puerto Rico, involving water supply, wastewater, reclaimed water and stormwater. Rafael currently serves as Project Manager for the implementation of over $450 million of capital improvements for the Puerto Rico Aqueduct and Sewer Authority that involve planning, design and construction phase services for water and wastewater treatment projects. **He is also the Project Manager for an Energy Efficiency Master Plan that will be developed for the City of Hollywood, Florida, water and wastewater treatment facilities.**

The City of Key West will directly benefit from Rafael's experience, attention and commitment to client service. In addition, he will apply his skill in communicating complex technical ideas to a broad audience in the areas of water and wastewater treatment. He will work closely with his Task Leaders to successfully deliver projects to the City.

Rafael is an active member of the WateReuse Association – Florida Section Potable Reuse Committee, which is task with promoting reuse development in Florida. He also recently served as a National Board Member of the American Water Resources Association.

KEY PERSONNEL EXPERTISE

One project management philosophy guided how we selected the Black & Veatch Team — to provide access to a proven, experienced Team of experts through an accessible, knowledgeable and local leader.

Key to fulfilling the City's objectives is a team that understands the technical, regulatory, financial and operational requirements of effective civil, utility and environmental facilities. The experienced specialists and technical experts that compose our Team were selected with close regard to the need to deliver successful deliver projects in all aspects of the identified disciplines.

Supporting Rafael is a core Team of discipline Task Leaders and Specialists, who bring specialized expertise to the Utilities Department in their respective areas. They will support Rafael by overseeing the design team members performing services for the City.

Our Task Leaders and Specialists will apply a systematic framework that focuses on delivering quality products, which will:

- Define all planned quality activities to establish expectations for the team;
- Provide confidence that the documents are complete, and issues related to the ease of bidding and construction are addressed;
- Produce a quality product that will meet performance requirements; and
- Provide QC techniques and practices to ensure the quality of the performance of our team during project execution.

In the following pages, we have included brief qualifications of selected key Team members identified in the organizational chart.

Expertise of Task Leaders and Specialists

Brent Reuss | Project Director

Brent has over 30 years of experience in the study, design and construction of a variety of water and wastewater facilities for clients in the Southeastern U.S. He is a Vice President of Black & Veatch and brings strong project management, people management and technical skills to this project. **As Project Director, Brent will ensure that all project deliverables and milestones are meeting the City's needs and expectations.** He serves as President of the Carolina's Water and Environment Association.

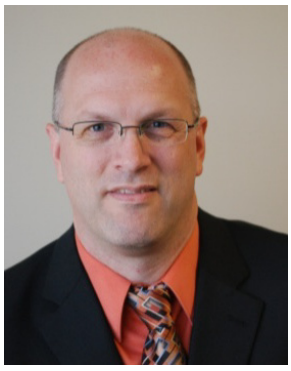
As Vice President of Black & Veatch's East Region of the Americas, Brent has led the planning, design and construction of numerous water and wastewater treatment projects in the southeastern United States.

Robert Chambers | Client Service Advocate, Specialist

As a Specialist for Business Processes tasks, Robert will lead the involvement of Black & Veatch on the preparation of utility rate and fee studies, engineering bond reports and other management related evaluations for the Utilities Department.

Robert is a Manager with Black & Veatch and has extensive utility and consulting experience involving a variety of projects associated with water and wastewater, both public and private, throughout the southeastern United States. His utility knowledge covers a wide range of utility finance issues, including support, alternative financing analysis, utility rates, utility regulatory processes, economic feasibility studies and cost-of-service studies. In addition, Mr. Chambers has developed dynamic and interactive financial models for utility cost-of-service studies, rate studies, financial benchmarking, data retrieval and analysis, feasibility analyses, system expansion programs, capital acquisition alternatives, wholesale capacity transactions and utility regionalization scenarios. **In 2010, Robert completed a Wastewater and Stormwater Utility Rate and Feasibility Analysis for the City of Key West, which involved the evaluation of wastewater and stormwater rates and supporting over $50 million in wastewater construction projects required to enhance environmental protection in the Florida Keys.**

Robert holds a MBA with a concentration in Finance; he has led projects similar in nature in southeast Florida and will serve the City of Key West as Client Service Advocate and Specialist for all Business Processes assignments.



An experienced Engineering Manager, Mark will lead the daily execution of all Utility Engineering tasks performed for the City of Key West under this GES contract.

Mark Martin | Utility Engineering Task Leader

As Utility Engineering Task Leader, Mark will be in charge of the daily execution of all utility engineering tasks being performed for the City of Key West encompassing the key disciplines of Utility Engineering Services.

Mark has 25 years of experience managing a wide variety of engineering projects, including water and wastewater treatment plants, pumping stations, and pipelines. His involvement in these projects has included feasibility studies, facility design and construction services. As an Engineering Manager, he has led many large design projects with the task of managing multiple engineering design staff members.

Alejandro, a Professional Engineer with over 25 years of experience, will serve as the Task Leader for all Environmental Engineering tasks with the City.

Alejandro Toro | Environmental Engineering Task Leader

As a Task Leader for environmental engineering tasks, Alejandro will lead the involvement of Black & Veatch and subconsultant resources during the completion of environmental projects for the City.

Alejandro is a Professional Engineer with over 25 years of experience in the, planning, design, construction management, and operation of water and wastewater infrastructure systems. Mr. Toro has managed projects in the United States, Mexico, Central America, and South America. He serves as project director for Black & Veatch's bond engineering consultancy efforts for Miami Dade Water and Sewer Department and provides scope development, technical direction, scheduling, and contract management for projects. He is responsible for resource management and oversees quality control and technical and financial reviews of projects.

Brad will lead all Civil Engineering tasks, utilizing his 20 years of structural engineering experience designing and evaluating facilities for a variety of projects.

Brad Vanlandingham | Civil Engineering Task Leader

Brad will lead all civil engineering tasks under this contract. **As a structural engineer, Brad has extensive experience designing and evaluating civil facilities for a variety of projects including water and wastewater treatment plants, solid waste transfer stations, laboratories, and power stations.** He has served as the project engineer for regional water treatment facilities in Orange and Seminole counties which included new supply wells, raw water mains, treatment facilities, storage, and high service pumping.

James Sullivan | Civil Engineering – Historic Building Preservation Specialist

James is an Architectural Historical Preservationist and has proven experience with historic building preservation, including structural evaluations. James has been trained to perform preservation analysis by the National Park Service at the National Center for Preservation Technology and Training in Natchitoches, LA. Training covered historical and building pathology, diagnostics methodology, and treatment strategies for preserving historical landmarks. The program was focused on a practical approach to engineering for older and historical buildings. A summary of the buildings he as evaluated for the National Park Service includes structures along the Cane River Creole

National Historical Park (approximate age of structures: 300 years). **His knowledge also includes experience with the National Historical Preservation Act (NHPA) and Historical American Building Survey (HABS).**

James completed building deficiency assessments and developed new spreadsheets for the National Parks Service for historical fort sites, which included Fort Moultrie and Sumter located in Charleston, SC. **In Pensacola, Florida, historical forts and batteries inspected included Fort Pickens, Fort Barrancas, Battery 234, Battery Langdon, Battery Worth, Battery Pensacola, and Battery Van Swearingen.** Task included developing methods to document material loss rates that could be recorded onto spreadsheets; defining terminology unique to the fort; listing and breaking down building components into manageable parts, based on function that would be used as a tool for estimating repairs. Mr. Sullivan has inspected and reviewed projects for adaptive reuse that included Washington National Monuments and Memorials, Visitor Center in Stehekin, WA, American and British Camp in San Juan Island, WA, and Townsend Hall (Battle Seminar Facility) at Fort Leavenworth, KS.

James is Black & Veatch's historic building preservation expert. As an Architectural Historical Preservationist and member of the National Trust of Historic Preservation, James has proven experience assessing and restoring historic buildings. He will be fully available to the City of Key West for structural evaluation and preservation of its historic buildings.

Key Team Member Expertise

Our Team can provide each of the services required by the City, and has successfully worked together on similar projects in the past. The team members selected for the project have proven their ability to address the issues and elements that are expected and have successfully implemented similar projects for other communities. Highlights of our team members' expertise and qualifications are included in the following table. Please refer to the resumes included as an appendix for additional details and specific project experiences of each Team member.

Please refer to the resumes included as an appendix for additional details and specific project experiences of each Team member.

Key Team Member Expertise

NAME | ROLE	EXPERTISE & QUALIFICATIONS
Brent Reuss Project Director	• Extensive experience serving as project manager, project engineer, and resident engineer for the design and construction of both water and wastewater projects, including water quality sampling, modeling, and permitting
Rafael Frias Project Manager / Stormwater Management	• Specializes in the management of water resources projects, including water supply, water treatment, hydropower and stormwater planning and design • Experienced in incorporating sustainability principles into project designs • Experience using of surface water and groundwater modeling applications
Robert Chambers Client Service Advocate/Utility Rate Studies and Bond Engineering Reports	• Extensive consulting experience involving projects associated with electric, water and wastewater utilities • Knowledge covers wide range of utility finance issues including capital financing analyses, valuation studies for acquisitions, revenue bonds, utility rates, utility regulatory processes, economic feasibility studies and cost-of-service studies

NAME | ROLE	EXPERTISE & QUALIFICATIONS
Mark Martin Utility Engineering Task Leader	• Experience in a wide variety of projects, including water and wastewater treatment plants, pumping stations, and pipelines • Project involvement has included feasibility studies, facility design and construction services
Alejandro Toro Environmental Engineering Task Leader	• Experienced in conducting Environmental Assessments and negotiating with regulators • Managed resolution of technical and compliance issues for 130 water filtration plants, 400 drinking water wells, 70 wastewater treatment facilities, and more than 1,000 pumping stations
Brad Vanlandingham Civil Engineering Task Leader/Structural	• Extensive experience designing and evaluating facilities for a variety of projects including water and wastewater facilities, solid waste transfer stations, laboratories, and power stations • Performed structural engineering for numerous municipal facilities including buildings, pump stations, and retaining walls
Bobby Burchett Pump/Lift Stations Hydraulic Modeling	• Experience with water and wastewater system master planning studies, energy efficiency and management, hydraulic modeling, water quality modeling and pump station analysis and design
Alan Dethloff Sanitary/Storm Sewers	• Variety of experience in civil engineering, process mechanical engineering, permitting and construction management. Projects have included water disposal facility design, chemical feed system layout, pumping station design/improvements, stormwater management design, and pipeline design.
Bob Moresi Recharge/Injection Wells/Hydrogeology/Regulatory Compliance	• Spent 25 years in water resources consulting including Florida's Water Management Districts for 10 years where he was instrumental in early development of rules and regulations, as well as Director of Water Use Permitting for two Districts • Past President of the American Water Resources Association
Stephen Tarallo Sustainability/Energy Efficiency	• Responsibilities have included energy optimization studies, renewable energy alternative evaluations, greenhouse gas emissions inventories, life cycle analyses, life cycle cost estimating, and sustainability assessments
Daralene Pondo Environmental/Contamination Assessments	• Has been involved in the management and execution of hundreds of multi-task order environmental projects, including all phases of investigative and remedial projects • Environmental experience focuses on soil, sediment and groundwater site assessment, design and remediation
Ralph Books Wetlands Mitigation/Permitting	• Extensive training and more than 20 years of professional experience in the areas of wetlands, threatened and endangered species, plant ecology, wetlands, botany, and environmental permitting
Curt Smith Civil/Site	• Performed all aspects of site design for parcels ranging in size from less than one acre to over 1,300 acres for grading, storm water management systems, water distribution and sanitary sewer collection systems, roadway design, structural analysis and foundation design
Terry Thomas Transportation/Roads	• Expertise in design of roadway, highway, site work, and storm drainage projects including pavement section structural design, material layer selection and material and construction specifications preparation, access roadway layout and parking lot design, pavement design and utilities route location
Marc Fermanian (CRJ) Transportation/Roads	• Diverse background in both civil engineering and construction; has worked on FDOT Projects in Districts 1, 3, 4, 6, and 7 • Skilled in developing civil site/ land development construction plans, as well as roadway design plans utilizing FDOT plans preparation standards and indexes

NAME | ROLE	EXPERTISE & QUALIFICATIONS
Carlos Ortega (CRJ) Transportation/Roads	• Specializes in the design and permitting of civil site projects, transportation-related development, stormwater pipe networks/ ICPR modeling, roadway design, and utility projects
Lou Nemeth Architectural	• Well versed in all phases of architectural services including building design, construction document production, specification writing and constructability reviews • Experience includes work on water and wastewater treatment facilities as well as participating in value engineering studies
James Sullivan Historic Building Preservation	• Experience in developing LEED checklists, architectural design, developing architectural presentations, preparation of contract documents, estimating, project procurement, value engineering, construction administrative, and historical preservation
Keith Chee-A-Tow (Avirom) Surveying	• Over 38 years of land surveying experience, including boundary, topographic, hydrographic and GPS surveys, jurisdictional wetlands, aerial mapping and expert witness testimony.
Oracio Riccobono (GEOSOL) Geotechnical/Testing	• Experience includes interpretation of subsurface conditions, planning and execution of laboratory testing programs, geotechnical analysis and design of foundation elements of structures, management of geotechnical projects and preparation of numerous geotechnical reports providing conclusions and recommendations
Steve King Regulatory Review and Permitting	• Experience in regulatory coordination and permitting for wellfields, pump stations, pipelines and treatment facilities within Florida.
Tom Cummings Mechanical	• Experience in the development and design of water and wastewater conveyance and treatment facilities and solid waste facilities including facility planning, permitting, preparation of drawings and specifications, and construction contract administration
Richard Taylor Electrical	• Experience in project management, design and implementation of process automation and control systems in water, wastewater, oil and gas, citrus, pulp and paper and petrochemical industries
Larry Brouillette Instrumentation & Controls	• Experience in process design and development of various wastewater, reclamation, and potable water facilities • Participated in a wide range of project activities including feasibility studies, alternative technologies review, design, construction services, final commissioning and training
Jay Miller GIS/CAD Design	• Experience in the water and wastewater drafting/engineering field including CAD drafted construction drawings, field data surveying, and construction cost estimating
Paul Ginther GIS/CAD Design	• Specializes in defining user requirements, system specifications, economic feasibility options, and workflow processes • 30 years of project management, consulting and implementation experience on projects for engineering, pipeline, utilities and government agencies
George Lattin Construction Inspection and Management	• Experienced in onsite observation and contract administration of construction of water treatment plants, wastewater treatment plants, installation of supervisory control and data acquisition (SCADA) systems, water lines, sewer lines, pump stations, low water dams, and elevated water storage tanks
Tami Ray Funding	• Wide variety of grant and loan experience with strong emphasis on federal and state program development and multi-discipline project funding and management • Created financial initiative plans that provide alternative financial resources for programs exceeding $1.6B in Florida

Management Approach

Nowadays, cities are being asked to do more with less. Black & Veatch has the management capabilities to help the City of Key West prioritize their projects to execute the most important projects when resources are limited. **Black & Veatch has provided engineering services under GES services contracts in Florida for over 25 years and we have performed more than a thousand individual Task Orders under these contracts.** Through our extensive experience under these agreements, we have developed a project management approach that is highly effective at meeting our clients' needs.

The project management approach described below details the process Black & Veatch has successfully implemented on previous GES services contracts, as well as the process planned for use on the City's projects. This approach has been successfully applied to water, wastewater, stormwater, energy and other municipal projects. Additionally, we have described the process envisioned to interface with the City through our Project Manager, Rafael Frias.

A key objective of our approach to this project is to ensure that we have a firm understanding of your needs for each assignment for which we are selected. We will gain this understanding by working with your Project Manager and the City personnel involved with the project. By focusing on your specific needs and asking questions, we will work with your staff to zero in on the most cost-effective solutions that truly meet the project objectives.

Coordination and Communication

Rafael Frias is the Project Manager. He will be the City's single point-of-contact for all contractual and administrative matters and has been given overall responsibility and authority to manage the contract with the County. He will also be the primary point-of-contact for task order assignments as they are provided by the City, and will be responsible for the reporting requirements set forth by the Utilities Department.

To aid information management and communication, the Black & Veatch team can provide access to documents, schedules, reports and other materials through a secure web portal and FTP (file transfer protocol) site to appropriate City staff. This system is in place for use by all Team members and subconsultants.

Proven Methods of Communication

The Black & Veatch Team will utilize the following methods of communication to interact effectively with the City of Key West:

Document Control and Management
Microsoft Office SharePoint Server will be used to provide a web-based content management and collaboration environment for this project. SharePoint facilitates the aggregation and integration of content from a number of internal and external sources in a web portal environment.

Email
Utilized for communications that need more immediate response, and to transmit electronic documents. This will be the most common communication.

Face-to-Face
Utilized to discuss key issues, Face-to-Face interaction is more personal, and allows team members to interact in-person to solve problems and discuss important items.

Written Documents
Written reports and technical memoranda will be used to formally provide updates to the City.

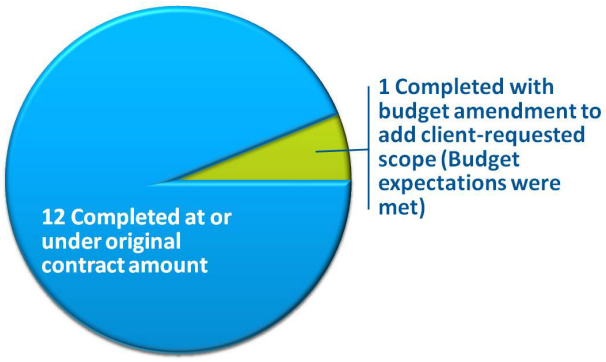
Telephone and Conference Calls
Used frequently, calls allow team members, both local and remote, to discuss issues and problem solve as a group.

Video Conferencing and Screen Sharing
Great tools which often help yield results that would normally come from a face-to-face meeting, while saving on travel costs. Screen sharing can be done from anywhere there is an internet connection.

Approach to Task Order Development

Rafael Frias will track and manage all active task orders, managing cost, schedule, resource assignments, QA/QC, invoicing and reporting. Continuous communication between Rafael and the City will ensure the City has access to the current status of all task orders and administrative matters.

13 Projects Completed To-Date Under Current Hillsborough County Continuing Services Contract



Black & Veatch has consistently delivered engineering services under continuing services contracts within or under the Owner's budgets.

When the City issues a task order to Black & Veatch, Rafael will coordinate with the City assigned Project Manager to assess the nature of the task and then assign the most qualified Task Leader and technical staff. Rafael and the assigned Task Leader will then meet with the City's assigned Project Manager to establish the interface and kick off the scoping of the task order.

We recommend a schedule be included as an attachment to a work plan for each task order to identify all major milestones and significant phases of the effort.

It is standard procedure for Black & Veatch Project Managers to develop a project schedule and engineering budget at the onset of every assignment. We have developed powerful tools for use by Project Managers in tracking schedule and budget progress. Through our IT network **(BISNET)**, data on project charges is available to Project Managers within one-day of time reporting. **This supports timely adjustments to ensure that the appropriate level of effort is being expended to complete the work on time and under budget.** Through application of this approach, we have an excellent record of success. The table below summarizes our success meeting the engineering budget on previous assignments completed under continuing services contracts.

WORK ORDER ASSIGNMENT	PERFORMANCE
Lakeland: Disinfection Alternatives Evaluation	On Budget
Lakeland: Disinfection Facility Upgrades Preliminary Design Report	On Budget
Lakeland: Williams WTP Process Control System Upgrade Design	On Budget
Tampa Bay Water: Surface WTP Expansion Construction Management & Program Management	Under Budget
Hillsborough County: River Oaks Sinkhole Remediation	Under Budget
Hillsborough County: NWRWRF 36th Isolation Valve Replacement	Under Budget
Hillsborough County: Armand Drive Gravity Sewer Replacement	Under Budget
Hillsborough County: Gunn Hwy. Utility Relocations	On Budget
St. Petersburg: Water System Vulnerability Assessment	Under Budget
St. Petersburg: Oberly P.S. Improvements (BODR)	Under Budget
Combined	**> $2 Million Under Budget**

Black & Veatch has an outstanding history of completing projects under an accelerated schedule. We understand the importance of completing each project milestone on time. We will successfully complete time sensitive projects on time for the City by 1) establishing a project schedule at the onset, 2) tracking progress closely and adjusting resources, 3) following a solid work plan with no rework, and 4) communicating frequently with City staff to seek timely input. Black & Veatch has tremendous firm-wide resources, and we can bring these resources to bear on assignments if it is advantageous to the City in meeting any highly aggressive schedules.

Black & Veatch has an outstanding history of completing projects under an accelerated schedule. We will deliver all City projects on schedule.

Construction Cost Estimating

Black & Veatch is a leading contractor in the water and wastewater industry, with half of our project volume coming from alternative delivery projects in recent years. Through the expertise of our construction and procurement professionals, Black & Veatch is in-touch with the latest trends and supply chains of construction pricing. We have developed sophisticated estimating tools and databases which we utilize in developing our own bid prices. Few consultants can offer the level of detail and accuracy in construction cost estimating that is available through application of this construction expertise. Accurate construction estimates are a key element in helping the City properly budget projects and control project costs during a progressing design. We will develop an opinion of cost at the onset of each project and update it at each project milestone. We utilize trend logs to track project changes and associated cost impacts, and we will communicate those impacts to the City throughout design, making adjustments to the design to ensure a project can be constructed within budget. The table below provides a few examples of recent effective construction cost estimating by Black & Veatch.

Construction Cost Estimating

PROJECT/LOCATION	ENGINEER'S ESTIMATE	ACTUAL BID	VARIANCE
Williams WTP Process Control System Replacement, Lakeland, FL	$2,000,000	$1,904,000	4.8%
Nature's Way Pump Station Upgrade, Hillsborough County, FL	$2,541,000	$2,535,488	0.2%
Oberly and Washington Terrace PS Improvements, St. Petersburg, FL	$7,939,313	$7,770,000	2.1%
Fawn Ridge Chemical Feed Trim Improvements, Hillsborough County, FL	$1,585,370	$1,405,000	11.4%

Innovative Management Tools and Techniques

Managing large, complex task orders has always provided opportunities to develop and apply innovative management tools and techniques. There are several key tools and techniques that will be applied to this contract.

We will apply a deliberate approach that ensures calculations, specifications, equipment components, systems, operating processes, and constructed facilities provide high quality infrastructure for the City of Key West.

The internet provides a host of opportunities for improved coordination and communication, both within single and multi-firm projects and between the project team and the City. Centralized document management, file sharing for maps, drawings, photos and videos, version control for design and contract documents, and access to the most recent schedule and cost information are some examples of efficiencies realized using electronic communications, all of which will be used for this contract. These systems will be established and managed by Black & Veatch, and secure access will be provided to all team members and subconsultants, as well as to the City.

We have learned over many years of multi-firm projects that standardized tools and procedures are necessary to manage the flow of information. We also plan to coordinate our design work with the City's existing standard specifications and design details. For example, the Black & Veatch team will standardize by using the following software tools:

- **Microsoft Outlook** for email and meeting scheduling.
- Scheduling using **Microsoft Project** and **Primavera**.
- Document Tracking using **Primavera's Scheduling and Contract Manager** V12.0.
- **SharePoint**, an internet- based archival and document control system.
- Groundwater Modeling – **MODFLOW**.
- Hydrologic and Hydraulic modeling (stormwater management) – **HEC-HMS, HEC-RAS, ArcGIS, ICPR and XP-SWMM**, as needed.
- Water Distribution Modeling – **Cybernet, EPANET, H20NET, WaterCAD, InfoWater**, as needed.
- Computer-Aided Drafting and Mapping – **AutoCAD 2008, Civil 3D 2008 and ArcGIS**

Budget and Schedule Control – Earned Value Management

Earned Value Management (EVM) is Black & Veatch's basis for our Project Control Methodology. EVM is a project control process based on a structured approach to planning, cost collection and performance measurement. It facilitates the integration of project scope, time and cost objectives and the establishment of a baseline plan for performance measurement. **EVM provides a sound basis for problem identification, corrective actions and re-planning as required.**

Insight is Black & Veatch's unique Project Control tool, developed in collaboration with Microsoft, used for successful project planning, cost collection and performance measurement.

Black & Veatch in collaboration with Microsoft has developed a unique tool called **Insight**. Insight is used for all Black & Veatch projects throughout the world. A key component of Insight is EVMS Professional (Earned Value Management System Professional), which is based on the EVM project control processes used in all our project and program controls to ensure successful completion of projects.

Schedule Control

Our team will use a common scheduling approach and method using Microsoft Project software. For each task order, the assigned Task Leader will work with the City to establish a schedule, including key milestone dates, appropriate internal and City review periods and the task's critical path. All schedules will be resource loaded to identify the required technical and support staff.

Rafael, as overall Project Manager, will be responsible for combining the individual task order schedules into a master project schedule and for managing that schedule to assure that all tasks are completed and all deliverables are presented on schedule. **The resource-loaded master schedule will allow Rafael to proactively identify staffing requirements, track the progress of each task order, identify any scheduling and staffing bottlenecks, and to develop and implement corrective actions and recovery plans should any schedules slip.** As each task order progresses, the Task Leaders will be responsible for periodic updates of their task order schedules, uploading changes to the master schedule, and coordinating with Rafael to ensure adequate progress.

The master program schedule will be a key management tool for use by both Rafael and the Task Leaders. They will have overall responsibility for assuring that task orders remain on schedule, adequate technical and support staff is available when necessary, and the Utilities Department is regularly informed of the status of all active task orders.

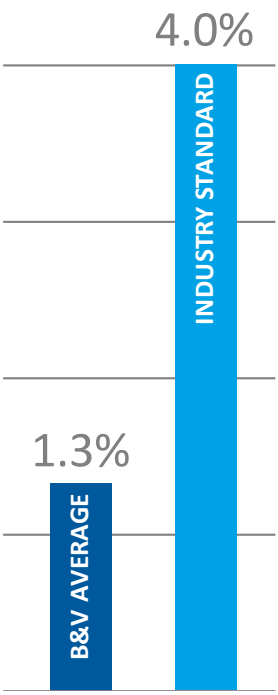
QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

Black & Veatch places a high level of importance on work-product quality. We set ourselves apart from our competitors by consistently performing superior work. One of the ways we achieve superior performance is through our corporate policy requiring project managers to develop a Quality Control Plan at the onset of every project, which must be approved by the company's quality control officer. Each plan provides for a scheduled quality-control review at key project milestones.

Over 80 percent of our engineering projects are for clients we have served previously – a testament to the quality of our work.

Reviews for City of Key West assignments will be led by senior engineers in particular disciplines, directing a specifically-selected team of engineers who bring a wealth of knowledge in the areas pertinent to the assignment.

Partly as a result of our focus on quality, **Black & Veatch's change order percentage on construction projects is less than half of the national average.** One of the benefits of Black & Veatch's strong quality control review procedures is that our experienced reviewers, in addition to checking work for



Effective Quality Control Program Provides Confidence in Cost Control.

Black & Veatch's average change order percentage over the past five years was 1.3%, compared to the industry standard of approximately 4%.

correctness, also provide alternative approach suggestions to our project designers. Our clients benefit from considering alternative approaches being used throughout the world. Black & Veatch has invested substantially in the development of design standards, standard details, and standard specifications to supplement CCWA standards. **Our firm adherence to proven standards helps to ensure a quality constructed product.**

Quality Control Plan

Independent quality assurance and quality control review is a key element of our projects. This affirmation of the design is essential to ensuring high-quality projects for our clients. All of our quality control reviewers are senior staff members who will be selected for their experience and expertise in the specific issues contained in the City's authorized tasks.

The Quality Control Plan organizes the activities related to assuring quality on a project (by the designers) and controlling the quality on the project (by reviewers). The purpose of the Quality Control Plan is:

- To communicate essential administrative information to all team members regarding quality objectives and activities;
- To identify the technical basis of design so that all team members have a complete understanding of the project;
- To list any standards to be incorporated into the design so that consistency and efficiency are maintained throughout the design; and
- To establish scope and schedule for quality control activities.

Ability to Perform Expeditiously

Black & Veatch will approach tasks in a consistent and uniform manner that will allow us to efficiently respond to changing project requirements, while developing engineering solutions that meet the Utilities Department's needs. The foundation of this strategy is effective communications and establishing clear responsibility and understanding of the work requirements at the outset of the task.

The numerous technical and non-technical issues of potential projects will require a collaborative approach that encourages the direct involvement of City staff in workshops and selected meetings; we believe this approach is vital to the success of the project. Our collaborative approach will bring together project stakeholders on a regular basis.

Black & Veatch recognizes the importance of meeting schedule and budget requirements. **We are prepared to devote the necessary resources to meet even the most challenging schedules.** We control the schedule and budget on projects through experienced and attentive project management. Development of a Work Plan at the beginning of each project and diligent adherence to that Work Plan are key to executing projects in an efficient and timely manner. Our Project Manager, Task Leaders and Technical Support Staff are highly experienced in the types of work to be performed under this GES contract, providing them the knowledge to develop a solid Work Plan and efficiently guide the work.

Black & Veatch will ensure that the City receives top quality services in an efficient, timely and cost-effective manner.

LOCATION

Although Black & Veatch is a large company with worldwide resources and unmatched engineering expertise, we take a local approach to serving our clients and have established stable, self-sufficient regional offices for that purpose. **This GES contract will be led from our Sunrise office, together with our subconsultants' offices in Key West and Miami.** Through our local south Florida office, we have developed relationships and practices to bring the company's global expertise and nationally-recognize resources to the City of Key West.

AVAILABILITY

Black & Veatch is committed to providing the key staff identified in this proposal as well as other local, regional, national and international resources required to successfully complete any task assigned by the Utilities Department. Based upon our current level of commitment and the recent and upcoming completion of several projects, **Black & Veatch has sufficient available capacity to complete multiple task orders under this General Engineering Services contract.**

Black & Veatch employs more than 115 professionals in Florida.

The group of Black & Veatch professionals in our local offices is diversely skilled and highly productive. We are backed by tremendous firm-wide resources that enhance the efficiency and quality of our services. Our local offices are equipped with state-of-the-art drawing and document production equipment. Our self-sufficiency as production offices and unmatched resources support our daily ability to meet the needs of our clients and respond quickly to task-order related requests.

ACCESS TO COMPANY-WIDE RESOURCES

Only Black & Veatch gives the Utilities Department access to a unique cross-discipline workforce that brings together some of the best brains in the global water business to share information and develop new, tailored solutions to the City of Key West.

Black & Veatch currently has a global workforce of more than 9,000 working in over 100 offices worldwide with projects completed in more than 100 countries on six continents. Black & Veatch has 20 regional offices on the East Coast, with more than 600 professionals working from these offices. For the City of Key West, we will coordinate and provide our expert and dedicated service from our full-service design office in Sunrise. Additional nearby expertise and support will be provided from our additional Florida offices as required. We will provide specific technical expertise from other offices of our firm, as needed, to bring the best and latest technology to the Utilities Department that we have to offer. **The combination of Black & Veatch's local and national experts available to the City and our global technical resources provides the Utilities Department a "value added" relationship that will meet and exceed the requirements and expectations of any GES assignment under this contract.**

Other Certifications

LEED

With national membership in USGBC (U.S. Green Building Council) and over 85 LEED® Accredited Professionals (APs) representing every discipline; Black & Veatch is well prepared to implement LEED certification requirements on new construction and major renovation projects for the City of Key West. To date, our teams of LEED APs have assisted in designing more than 45 buildings with a LEED certifiable rating or better. These APs are fully qualified, through both formal training and practical work experience, to integrate all aspects of sustainable design into the construction and life-cycle performance of our green projects. Black & Veatch has the capability to design to any LEED rating level, and to execute USGBC-required commissioning for the purposes of registration and certification of LEED projects. Our team offers the tools to truly bring environmental conservation to the City's water and wastewater facilities.

Black & Veatch is ranked in the Top 100 Green Design Firms by Engineering-News Record (ENR).

To date, our over 85 LEED APs have assisted in designing more than 45 buildings nationwide. Our LEED capabilities will provide the City with Energy and Environmental efficient projects.

Black & Veatch focuses on continuously upgrading standard design practices so that LEED certification is a readily employed option for our projects. Project execution strategies place emphasis on the integrated design efforts necessary for successful projects seeking LEED certification. As many of the LEED prerequisites and credits depend on site selection, meeting certain design requirements, and selecting acceptable materials, the siting study and conceptual development period is the optimal time to consider the incorporation of LEED elements into the design.

Black & Veatch designed and constructed a LEED Certified 14,000 square foot Plant Services Building for Pacific Gas & Electric as part of the Gateway combined cycle power generating plant in Antioch, California. The Black & Veatch LEED accredited project architect and team leaders worked closely with the client in early meetings to understand their specific needs before initiating the design process, to educate the team on the LEED rating system and the certification process, and to establish consensus on the targeted LEED points. Black & Veatch involved the commissioning agent early and worked closely with them through design and construction. When the contract was awarded, Black & Veatch LEED personnel trained the general contractor's team on the LEED intent and process, and worked closely with all the engineering and construction disciplines to obtain and compile all necessary documentation for certification. When review feedback was received from USGBC, Black & Veatch LEED personnel worked with the engineering and construction disciplines to implement the additional requirements to obtain the LEED Certification. Notice of successful LEED certification from USGBC was issued to Black & Veatch for the building in 2009.

With early involvement of all stakeholders, we not only get the points necessary for certification, we ensure that the points pursued make sense and are the best fit for each unique project and client.

LEED® Integration into Renovation and Repair Projects

Black & Veatch can integrate the requirements of LEED for Existing Buildings: Operations & Maintenance and Energy Star programs into renovation and repair projects at existing facilities. Black & Veatch has a long history of providing services geared toward optimizing the performance of and extending the life of existing facilities.

Black & Veatch designs will be geared to optimizing the performance of and extending the lifespan of existing City facilities.

Black & Veatch LEED accredited professionals provided LEED-Existing Building (EB) consulting services to Athens-Clarke County Public Utilities Department in Georgia. The client desired obtaining LEED-EB certification for the Administration Building at the Middle Oconee Water Reclamation Facility. Black & Veatch LEED accredited personnel conducted a thorough on-site investigation and prepared a detailed report outlining the modifications and requirements needed to certify the building under LEED for Existing Buildings. Black & Veatch LEED personnel worked closely with the client's staff, providing education on the LEED rating system requirements and tailoring the LEED-EB recommendations to the needs of the stakeholders.

Energy Star is one of a number of energy analysis and optimization tools used by Black & Veatch professionals. The Green Lights program became part of Energy Star in the year 2000 and is included by reference to Energy Star.

Black & Veatch developed a Utility-Wide Strategic Energy Plan for the Philadelphia Water Department (PWD). As part of this work, Black & Veatch determined energy benchmarks for three water pollution control plants owned by PWD using the Energy Star Portfolio Manager tool. Black & Veatch compiled facility data to populate Portfolio Manager and analyzed the resulting Energy Star performance rating for the three plants. The Energy Star Portfolio Manager program benchmarks against data from a sample population of 257 U.S. wastewater treatment plants. A thorough understanding of the processes and facilities at these plants allowed Black & Veatch to interpret the results of the Energy Star rating to more accurately assess how the PWD plants compare to their operational peers. This understanding also allowed Black & Veatch to customize energy saving recommendations for renovation projects at the PWD facilities.

FDOT

Our subconsultant, **CRJ & Associates**, is certified in the following FDOT categories:

- FDOT CTQP Cert. Asphalt Level 1
- FDOT CTQP Earthwork Inspection Level 1

Required Forms

- Anti-Kickback Affidavit
- Public Entity Crimes Certification
- Equal Benefits for Domestic Partners Affidavit
- Certificate of Officer
- Acknowledgement of Addendum 1, dated July 19, 2012
- Insurance Certificate Sample
- Florida State License and Certificate of Status

ADDITIONAL INFORMATION PROVIDED

- 2012 Strategic Directions in the U.S. Water Utility Industry

ANTI-KICKBACK AFFIDAVIT

STATE OF MISSOURI)
: SS
COUNTY OF JACKSON)

I, the undersigned hereby duly sworn, depose and say that no portion of the sum herein bid will be paid to any employees of the City of Key West as a commission, kickback, reward or gift, directly or indirectly by me or any member of my firm or by an officer of the corporation.

By: _____
Brent M. Reuss, Vice President

Sworn and subscribed before me this

23rd day of JULY, 2012.

_____
NOTARY PUBLIC, State of MISSOURI

My Commission Expires: SEPTEMBER 26, 2014

ANTI-KICKBACK AFFIDAVIT

STATE OF FLORIDA)
: SS
COUNTY OF Broward)

I, the undersigned hereby duly sworn, depose and say that no portion of the sum herein bid will be paid to any employees of the City of Key West as a commission, kickback, reward or gift, directly or indirectly by me or any member of my firm or by an officer of the corporation.

By: _____
Marc A. Fermanian, MSCE, P.E. - President
CRJ & ASSOCIATES, INC. (FEIN 65-0969527)

Sworn and subscribed before me this

20th day of July, 2012.

Deborah Anne Powers
NOTARY PUBLIC, State of Florida at Large

DEBORAH ANNE POWERS
MY COMMISSION #DD906763
EXPIRES: JUL 12, 2013
Bonded through 1st State Insurance

My Commission Expires: _____

ANTI-KICKBACK AFFIDAVIT

STATE OF FLORIDA)
: SS
COUNTY OF Miami-Dade)

I, the undersigned hereby duly sworn, depose and say that no portion of the sum herein bid will be paid to any employees of the City of Key West as a commission, kickback, reward or gift, directly or indirectly by me or any member of my firm or by an officer of the corporation.

By: _____
Oracio Riccobono, P.E.
President (Geosol, Inc.)

Sworn and subscribed before me this

20th day of July, 20 12.

_____
NOTARY PUBLIC, State of Florida at Large

DENISE PEREZ
Notary Public - State of Florida
My Comm. Expires May 23, 2015
Commission # EE 96404

My Commission Expires: May 23, 2015

ANTI-KICKBACK AFFIDAVIT

STATE OF FLORIDA)
: SS
COUNTY OF Palm Beach)

I, the undersigned hereby duly sworn, depose and say that no portion of the sum herein bid will be paid to any employees of the City of Key West as a commission, kickback, reward or gift, directly or indirectly by me or any member of my firm or by an officer of the corporation.

By: _____
Michael D. Avirom
President
Avirom & Associates, Inc.

Sworn and subscribed before me this

27 day of July, 20 12.

_____
NOTARY PUBLIC, State of Florida at Large

My Commission Expires: _____

JANICE CHINA
MY COMMISSION # EE 037876
EXPIRES: November 7, 2014
Bonded Thru Notary Public Underwriters

SWORN STATEMENT UNDER SECTION 287.133(3)(a) FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICE AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Bid or Contract No. RFQ 12-005 for General Engineering Services

2. This sworn statement is submitted by Black & Veatch Corporation
(Name of entity submitting sworn statement)

whose business address is 1300 Concord Terrace, Suite 120, Sunrise, FL 33323

and (if applicable) its Federal Employer Identification Number (FEIN) is 43-1833073

(If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement.)

3. My name is Brent M. Reuss and my relationship to the entity named above is Vice President.
(Please print name of individual signing)

4. I understand that a "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 or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, material misrepresentation.

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

6. I understand that an "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 t 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 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.

7. I understand that a "person" as defined in Paragraph 287.133(1)(8), Florida Statutes, means any natural

person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which Bids or applies to Bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement, which 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 this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have 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 the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in 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, AND (Please indicate which additional statement applies.)

___ There has been a proceeding concerning the conviction before a hearing of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)

___ The person or affiliate was placed on the convicted vendor list. Them has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

___ The person or affiliate has not been put on the convicted vendor list. (Please describe any action taken by or pending with the Department of General Services.)

(Signature) Brent M. Reuss, Vice President

7/23/12
(Date)

STATE OF MISSOURI

COUNTY OF JACKSON

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

BRENT M. REUSS who, after first being sworn by me, affixed his/her signature in the
(Name of individual signing)

space provided above on this 23rd day of JULY, 20 12.

My commission expires: SEPTEMBER 26, 2014
NOTARY PUBLIC

Nancy J Shea

NANCY J SHEA
NOTARY SEAL
Commission # 10393740
Cass County
NOTARY PUBLIC
STATE OF MISSOURI
My Commsion Expires 09-26-2014

SWORN STATEMENT UNDER SECTION 287.133(3)(a) FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICE AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Bid or Contract No. RFQ No. 12-005 for City of Key West - General Engineering Services

2. This sworn statement is submitted by Marc A. Fermanian, MSCE, P.E. - President
(Name of entity submitting sworn statement)

whose business address is 2699 Stirling Road, Suite C-106, Ft. Lauderdale, Florida 33312 CRJ & ASSOCIATES, INC. and (if applicable) its Federal Employer Identification Number (FEIN) is 65-0969527 (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement.)

3. My name is Marc A. Fermanian, MSCE, P.E. and my relationship to
(Please print name of individual signing)

the entity named above is President / Owner.

4. I understand that a "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 or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, material misrepresentation.

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

6. I understand that an "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 t 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 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.

7. I understand that a "person" as defined in Paragraph 287.133(1)(8), Florida Statutes, means any natural

person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which Bids or applies to Bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement, which I have marked below, is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies.)

XX Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have 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 the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in 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, AND (Please indicate which additional statement applies.)

___There has been a proceeding concerning the conviction before a hearing of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)

___The person or affiliate was placed on the convicted vendor list. Them has been a subsequent proceeding before a hearing officer of the Sate of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

___The person or affiliate has not been put on the convicted vendor list. (Please describe any action taken by or pending with the Department of General Services.)

_____

(Signature) Marc A. Fermanian, MSCE, P.E. - President of CRJ

July 20th 2012

(Date)

STATE OF Florida

COUNTY OF Broward

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

Marc A. Fermanian, MSCE, P.E. who, after first being sworn by me, affixed his/her signature in the
(Name of individual signing)

space provided above on this 20th day of July, 20 12.

My commission expires:
NOTARY PUBLIC

DEBORAH ANNE POWERS
MY COMMISSION #DD906763
EXPIRES: JUL 12, 2013
Bonded through 1st State Insurance

SWORN STATEMENT UNDER SECTION 287.133(3)(a) FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICE AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Bid or Contract No. RFQ 12-005 for General Engineering Services

2. This sworn statement is submitted by Geosol, Inc.
(Name of entity submitting sworn statement)

whose business address is 5795-A NW 151st Street, Miami Lakes, FL 33014

and (if applicable) its Federal Employer Identification Number (FEIN) is 65-0997886 (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement.)

3. My name is Oracio Riccobono and my relationship to
(Please print name of individual signing)

the entity named above is President.

4. I understand that a "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 or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, material misrepresentation.

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

6. I understand that an "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 t 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 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.

7. I understand that a "person" as defined in Paragraph 287.133(1)(8), Florida Statutes, means any natural

person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which Bids or applies to Bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement, which 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 this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have 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 the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in 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, AND (Please indicate which additional statement applies.)

___ There has been a proceeding concerning the conviction before a hearing of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)

___ The person or affiliate was placed on the convicted vendor list. Them has been a subsequent proceeding before a hearing officer of the Sate of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

___ The person or affiliate has not been put on the convicted vendor list. (Please describe any action taken by or pending with the Department of General Services.)

(Signature) Oracio Riccobono

(Date) JULY 20, 2012

STATE OF FLORIDA

COUNTY OF MIAMI-DADE

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

Oracio Riccobono who, after first being sworn by me, affixed his/her signature in the
(Name of individual signing)

space provided above on this 20th day of July, 20 12

My commission expires: 5/23/15
NOTARY PUBLIC

DENISE PEREZ
Notary Public - State of Florida
My Comm. Expires May 23, 2015
Commission # EE 96404

SWORN STATEMENT UNDER SECTION 287.133(3)(a) FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICE AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Bid or Contract No. 12-005 for General Engineering Services

2. This sworn statement is submitted by Avirom & Associates, Inc.
(Name of entity submitting sworn statement)

whose business address is 402 Appelrouth Lane, Key West, Florida 33045

and (if applicable) its Federal Employer Identification Number (FEIN) is 59-2101822 (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement.)

3. My name is Michael D. Avirom and my relationship to
(Please print name of individual signing)

the entity named above is President.

4. I understand that a "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 or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, material misrepresentation.

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

6. I understand that an "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 t 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 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.

7. I understand that a "person" as defined in Paragraph 287.133(1)(8), Florida Statutes, means any natural

person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which Bids or applies to Bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement, which 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 this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have 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 the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in 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, AND (Please indicate which additional statement applies.)

___There has been a proceeding concerning the conviction before a hearing of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)

___The person or affiliate was placed on the convicted vendor list. Them has been a subsequent proceeding before a hearing officer of the Sate of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

___The person or affiliate has not been put on the convicted vendor list. (Please describe any action taken by or pending with the Department of General Services.)

Michael D Avirom
(Signature)

7/27/12
(Date)

STATE OF Florida

COUNTY OF Palm Beach

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

Michael D. Avirom who, after first being sworn by me, affixed his/her signature in the
(Name of individual signing)

space provided above on this 27 day of July, 20 12.

My commission expires:
NOTARY PUBLIC

Janice China

JANICE CHINA
MY COMMISSION # EE 037876
EXPIRES: November 7, 2014
Bonded Thru Notary Public Underwriters

EQUAL BENEFITS FOR DOMESTIC PARTNERS AFFIDAVIT

STATE OF MISSOURI)
: SS
COUNTY OF JACKSON)

I, the undersigned hereby duly sworn, depose and say that the firm of Black & Veatch Corporation provides benefits to domestic partners of its employees on the same basis as it provides benefits to employees' spouses per City of Key West Ordinance Sec. 2-799.

By: _____
Brent M. Reuss, Vice President

Sworn and subscribed before me this

23rd day of JULY, 20 12.

_____
NOTARY PUBLIC, State of MISSOURI

My Commission Expires: SEPTEMBER 26, 2014

EQUAL BENEFITS FOR DOMESTIC PARTNERS AFFIDAVIT

STATE OF FLORIDA)
: SS
COUNTY OF Broward)

I, the undersigned hereby duly sworn, depose and say that the firm of CRJ & ASSOCIATES, INC. provides benefits to domestic partners of its employees on the same basis as it provides benefits to employees' spouses per City of Key West Ordinance Sec. 2-799.

By: _____
Marc A. Fermanian, MSCE, P.E. - President
CRJ & ASSOCIATES, INC. (FEIN 65-0969527)

Sworn and subscribed before me this

20th day of July, 20 12.

Deborah Anne Powers
NOTARY PUBLIC, State of Florida at Large

My Commission Expires: _____

DEBORAH ANNE POWERS
MY COMMISSION #DD906763
EXPIRES: JUL 12, 2013
Bonded through 1st State Insurance

EQUAL BENEFITS FOR DOMESTIC PARTNERS AFFIDAVIT

STATE OF FLORIDA)
: SS
COUNTY OF Miami-Dade)

I, the undersigned hereby duly sworn, depose and say that the firm of _____ provides benefits to domestic partners of its employees on the same basis as it provides benefits to employees' spouses per City of Key West Ordinance Sec. 2-799.

By: _____
Oracio Riccobono, P.E.
President (Geosol, Inc.)

Sworn and subscribed before me this

20th day of July, 2012.

_____
NOTARY PUBLIC, State of Florida at Large

DENISE PEREZ
Notary Public - State of Florida
My Comm. Expires May 23, 2015
Commission # EE 96404

My Commission Expires: May 23, 2015

BLACK & VEATCH
Building a world of difference.

CERTIFICATE OF OFFICER

I, Peter D. Loftspring, the Senior Vice President and Assistant Secretary of BLACK & VEATCH CORPORATION, a corporation duly organized and existing under the laws of the State of Delaware, United States of America, certify that the following is a true excerpt of a certain resolution of said Board of Directors of BLACK & VEATCH CORPORATION, which resolution was duly adopted on March 10, 2003, and that said resolution has not been rescinded or modified, is in accordance with the charter and by-laws of the corporation, and is still in full force and effect.

> "RESOLVED, any note, mortgage, evidence of indebtedness, contract, share certificate, conveyance, power of attorney, or other instrument in writing and any assignment or endorsements thereof, or guarantee of any other entity's performance under any such executed document, entered into between this corporation and any other person or company shall be valid and binding on this corporation, when signed by either the Chairman of the Board, the President or any Vice President, and, if attestation is required, by either the Secretary, Assistant Secretary, Chief Financial Officer, Treasurer or any Assistant Treasurer of this corporation. Any such instruments may be signed by any other person or persons in such manner as from time to time shall be determined by the Board.

I further certify that **Brent M. Reuss** as Vice President is now qualified and acting as an officer of BLACK & VEATCH CORPORATION.

.

IN WITNESS WHEREOF, I have hereunto set my hand and attached the corporate seal of BLACK & VEATCH CORPORATION this 19th day of July, 2012.

Peter D. Loftspring
Senior Vice President and Assistant Secretary

STATE OF KANSAS)
)SS
COUNTY OF JOHNSON)

Subscribed and sworn to before me this 19th day of July, 2012 by Peter D. Loftspring as Senior Vice President & Assistant Secretary of Black & Veatch Corporation.

NOTARY PUBLIC

NOTARY PUBLIC STATE OF KANSAS SHERRY A. MILLER My Appt. Exp. 7/12/15

THE CITY OF KEY WEST

3140 Flagler Ave
Key West, FL 33040

ADDENDUM NO. 1
RFQ NO. 12-005: GENERAL ENGINEERING SERVICES
July 19, 2012

This addendum is issued as supplemental information to the RFQ package for clarification of certain matters of both a general and a technical nature. The referenced RFQ package is hereby addended in accordance with the following items:

1. Page 4 lists that a firm may submit for 1 or more of 5 the categories. Please confirm that we can submit for all 5 categories in one submittal package (2 copies + cds, etc), and we do not need to submit one package for each category (ie 5 sets of packages).

   Only one proposal package is to be submitted which identifies any one of, or all of the various disciplines listed in the RFQ that the Proposer is proposing services for.

2. Is submittal of an SF330 sufficient?

   Use of SF330 form is not required. Proposer shall submit a complete qualifications package in a format that contains all required elements.

3. Does the city have an MBE goal?

   No.

4. Are we to include subcontractors in our RFQ or can we add them based on the particular task order?

   Proposers shall identify each subconsultant that they are proposing using as part of this contract. City approval would be required if Proposer wishes to make changes or adds to the list of subconsultants once contract is issued. The qualifications of all members of a Proposer's team will be considered in the selection process.

5. On page 6 of the RFQ, License Requirements, it states that the winning respondent will also be required to obtain and maintain a City of Key West Business Tax Receipt. Could you please clarify if this means that the winning firm must have an office location in Key West?

Firms selected as part of this contract are not required to maintain an office in Key West.

6. Public Entity Crimes Certification was identified as being three (3) pages in length.

   Public Entity Crimes Certification is two (2) pages in length

7. Under the Submission Details section on page 5 reference is made to "Architect firms should submit a complete qualifications package that includes:"

   This should read "Engineering firms should submit a complete qualifications package that includes:"

8. Is a page limit for the submission information listed on page 5?

   No. However firms should limit their proposals to a reasonable number of pages.

9. Who are the current contract holders?

   The City does not track this information. Proposer can contact DemandStar by Onvia at www.demandstar.com/supplier or call toll-free 1-800-711-1712.

10. How much was spent under the current contract, and on what kind of projects?

    This information is unavailable. Proposers are reminded that no minimum amount of service or compensation will be assured to the retained firm(s).

11. The existing language under Qualifications Criteria:

    "Other certifications including LEED and LAP (Federal DOT) certified staff professionals"

    Shall be modified to read:

    "Other certifications including LEED and FDOT certified staff professionals"

12. Please clarify the submittal requirements for "Past five (5) years of specific relevant experience" under the Submission Detail section.

    The existing language

    Past five (5) years of specific relevant experience. The examples should include the name of client, client's representative, client's address and telephone number, key personnel involved in design phase services, design services fee, estimate of construction cost, name of contractor awarded project contract award amount, contractor's representative, contractor's address and telephone number.

Shall be modified to read:

Past five (5) years of specific relevant experience. The examples should include the project description, name of client, client's contact and telephone number, design services fee, identify if project was constructed or not and project cost, name of contractor awarded project, and contractor's representative and telephone number.

All Proposers shall acknowledge receipt and acceptance of this Addendum No. 1 by submitting the addendum with their proposal. Proposals submitted without acknowledgement or without this Addendum may be considered non-responsive.

Signature

Black & Veatch Corporation

Name of Business

CERTIFICATE OF LIABILITY INSURANCE 11/1/2012

DATE (MM/DD/YYYY) 7/25/2012

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

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

PRODUCER Lockton Companies, LLC-1 Kansas City 444 W. 47th Street, Suite 900 Kansas City MO 64112-1906 (816) 960-9000	CONTACT NAME: PHONE (A/C, No, Ext): FAX (A/C, No): E-MAIL ADDRESS:
	INSURER(S) AFFORDING COVERAGE — NAIC #
	INSURER A : ZURICH AMERICAN INSURANCE COMPANY
INSURED 1009074 BLACK & VEATCH CORP 11401 LAMAR OVERLAND PARK KS 66211 Frias, Rafael	INSURER B : Lexington Insurance Company 19437
	INSURER C :
	INSURER D :
	INSURER E :
	INSURER F :

COVERAGES BLAVE01 PJ **CERTIFICATE NUMBER:** 11933101 **REVISION NUMBER:** XXXXXXX

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

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X CONTRACTUAL X BFPD & C/O & XCU GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PRO-JECT LOC	N	N	GLO 4641358	11/1/2011	11/1/2012	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG 	$ 1,000,000 $ 300,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 1,000,000 $
A	AUTOMOBILE LIABILITY X ANY AUTO X ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS	N	N	BAP 4641355 (AOS)	11/1/2011	11/1/2012	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) 	$ 1,000,000 $ XXXXXXX $ XXXXXXX $ XXXXXXX $ XXXXXXX
B	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED RETENTION $	N	N	62785285	11/1/2011	11/1/2012	EACH OCCURRENCE AGGREGATE 	$ 2,000,000 $ 2,000,000 $ XXXXXXX
A A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	N	WC 4641353 (AOS) WC 4641354 (WI & MA)	11/1/2011 11/1/2011	11/1/2012 11/1/2012	X WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Proposal #M83516.0300 RFQ No.12-005 General Engineering Services. Upon award of contract, the City of Key West, all Depts, Agencies, Boards, Contractor & Commissions, its officers, servants and employees will be included as additional insured on General Liability, Auto Liability and Umbrella Liability as required by written contract. Upon award of contract, waiver of subrogation in favor of additional insured will apply as respects Workers Compensation/Employers Liability, General Liability and Auto Liabliity as required by written contract. FOR INFORMATIONAL PURPOSES ONLY

CERTIFICATE HOLDER

11933101

The City of Key West
1340 Flagler Ave
Key West FL 33040

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Ronald A Foster

ACORD® CERTIFICATE OF LIABILITY INSURANCE 11/1/2012

DATE (MM/DD/YYYY) 7/25/2012

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

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PRODUCER Lockton Companies, LLC-1 Kansas City 444 W. 47th Street, Suite 900 Kansas City MO 64112-1906 (816) 960-9000	CONTACT NAME: PHONE (A/C, No, Ext): FAX (A/C, No): E-MAIL ADDRESS:
	INSURER(S) AFFORDING COVERAGE — NAIC #
	INSURER A : Lexington Insurance Company — 19437
INSURED 1007194 BLACK & VEATCH CORP 11401 LAMAR OVERLAND PARK KS 66211 Frias, Rafael	INSURER B : INSURER C : INSURER D : INSURER E : INSURER F :

COVERAGES BLAVE01 PJ **CERTIFICATE NUMBER:** 11933131 **REVISION NUMBER:** XXXXXXX

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

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	GENERAL LIABILITY COMMERCIAL GENERAL LIABILITY CLAIMS-MADE OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PRO-JECT LOC			NOT APPLICABLE			EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG $	$ XXXXXXX $ XXXXXXX $ XXXXXXX $ XXXXXXX $ XXXXXXX $ XXXXXXX $
	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS			NOT APPLICABLE			COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) $	$ XXXXXXX $ XXXXXXX $ XXXXXXX $ XXXXXXX $ XXXXXXX
	UMBRELLA LIAB OCCUR EXCESS LIAB CLAIMS-MADE DED RETENTION $			NOT APPLICABLE			EACH OCCURRENCE AGGREGATE $	$ XXXXXXX $ XXXXXXX $ XXXXXXX
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		NOT APPLICABLE			WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ XXXXXXX $ XXXXXXX $ XXXXXXX
A	PROFESSIONAL LIABILITY	N	N	026030198	11/1/2011	11/1/2012	$1,000,000 EACH CLAIM AND IN THE AGGREGATE FOR ALL PROJECTS.	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)
Proposal #M83516.0300 RFQ No.12-005 General Engineering Services. FOR INFORMATIONAL PURPOSES ONLY

CERTIFICATE HOLDER

11933131
The City of Key West
1340 Flagler Ave
Key West FL 33040

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Ronald A. Easton

State of Florida

Department of State

I certify from the records of this office that BLACK & VEATCH CORPORATION is a corporation organized under the laws of Delaware, authorized to transact business in the State of Florida, qualified on December 22, 1998.

The document number of this corporation is F98000006965.

I further certify that said corporation has paid all fees due this office through December 31, 2011, that its most recent annual report was filed on May 13, 2011, and its status is active.

I further certify that said corporation has not filed a Certificate of Withdrawal.

Given under my hand and the Great Seal of Florida, at Tallahassee, the Capital, this the Nineteenth day of January, 2012

Secretary of State

Authentication ID: **100218977551-011912-F98000006965**

To authenticate this certificate, visit the following site, enter this ID, and then follow the instructions displayed.
https://efile.sunbiz.org/certauthver.html

State of Florida

Board of Professional Engineers

Black & Veatch Corporation

Is authorized under the provisions of Section 471.023, Florida Statutes, to offer engineering services to the public through a Professional Engineer, duly licensed under Chapter 471, Florida Statutes.

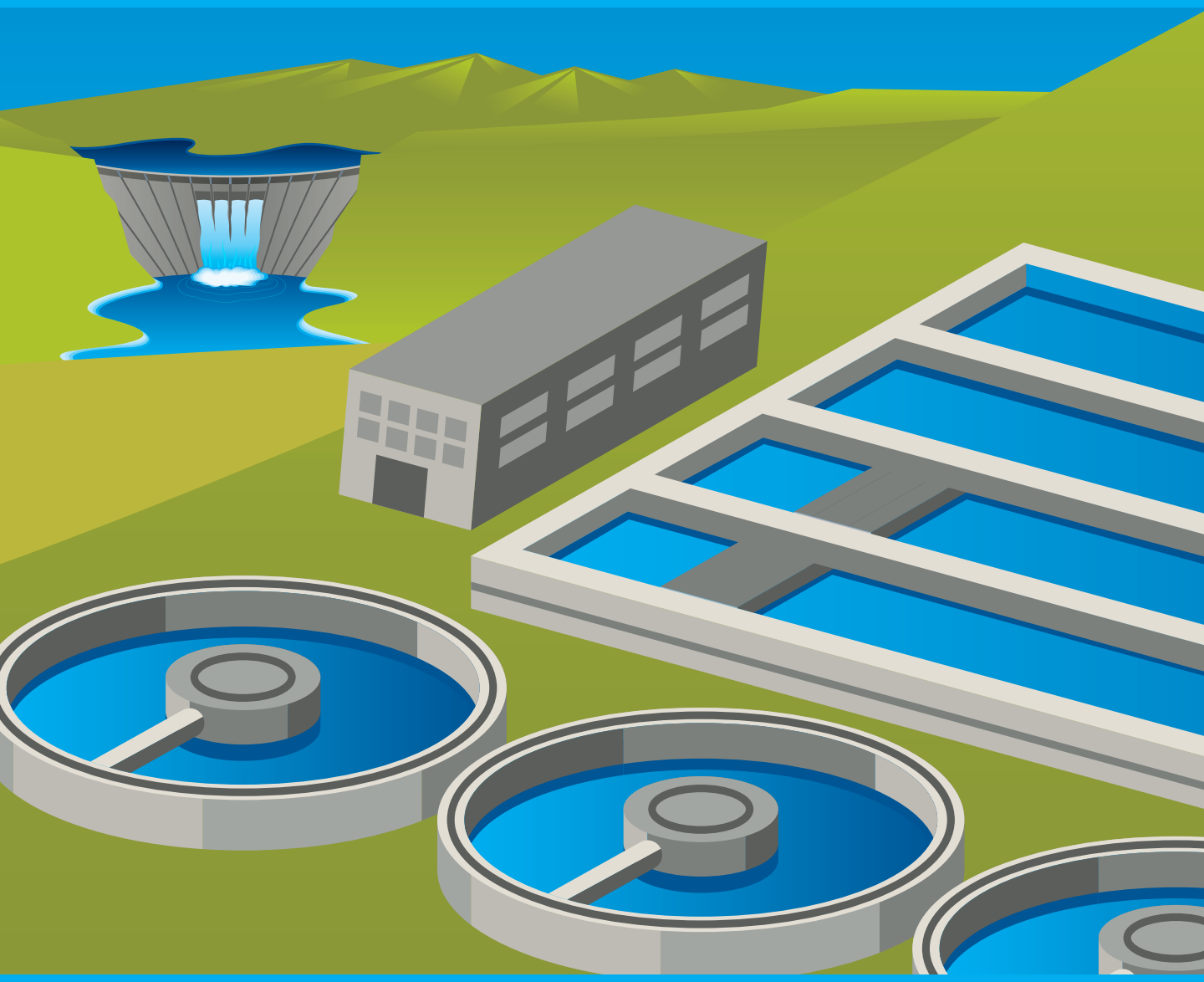
Certificate of Authorization

EXPIRATION: **2/28/2013**
AUDIT NO: **228201304402**

CA. LIC. NO: **8132**

2012 STRATEGIC DIRECTIONS IN THE U.S. WATER UTILITY INDUSTRY

A BLACK & VEATCH REPORT



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Building a world of difference.®


BLACK & VEATCH
Building a world of difference.

TABLE OF CONTENTS

INTRODUCTION

Welcome to the inaugural *Black & Veatch Strategic Directions in the U.S. Water Utility Industry Report*. This report serves to provide insights on the common challenges and opportunities facing the water and wastewater industry based on the analysis of survey responses from water utility leaders.

As we reviewed survey results and conducted subsequent analysis, common themes emerged that centered on financial issues, sustainability and optimized asset management practices. What is unique is that these are not stand-alone themes. Rather, each is intertwined with the others in terms of alleviating challenges or hindering future opportunity.

The survey results confirm that the financial needs of water utilities truly are the overarching challenge for the industry. Funding is grossly inadequate to upgrade infrastructure that, for the most part, is well past its useful lifespan. Sustainability and asset management are key solutions to the financial puzzle. By reducing energy needs, conserving water, prioritizing capital and implementing asset management frameworks, utilities can do more with less. The challenge is that all of these solutions still require funding and force the continuous cycle of "do what you can" prioritization.

New thinking is needed to break this cycle and boost infrastructure spending and invest in the future of our nation's infrastructure. This report not only demonstrates the current views of industry and utility leaders related to key issues but also provides recommendations and opportunities to propel the industry forward.

Black & Veatch is grateful to everyone who participated in our inaugural survey. We would also like to acknowledge the Black & Veatch professionals who contributed their insights and analysis for this report. To continuously improve our products for the industry, we welcome your questions and comments regarding this report and other items. You can reach us at **ConsultingInfo@bv.com.**

Sincerely,

CINDY WALLIS-LAGE | PRESIDENT
Black & Veatch's global water business

JOHN CHEVRETTE | PRESIDENT
Black & Veatch's management consulting division

This report is available electronically on the Black & Veatch website, **www.bv.com/survey**.

THE BLACK & VEATCH ANALYSIS TEAM

INDUSTRY OVERVIEW

Cindy Wallis-Lage is President of Black & Veatch's global water business and is a recognized thought leader within the industry. Throughout her 25-year career, Cindy has worked with water and wastewater utilities to develop sustainable water and wastewater solutions. She has been involved in industrial and municipal projects worldwide, and has authored more than 50 papers, 20 technical articles and 10 textbook chapters. In addition, Cindy is an active leader in numerous industry forums and associations.

SUSTAINABILITY OVERVIEW

Steve Tarallo is the North America Business Lead for Sustainable Water and Energy Solutions within Black & Veatch's global water business. Steve has more than 21 years of experience in municipal wastewater treatment research and development, design and project development. Steve works with utilities in assessing treatment deficiencies, developing process alternatives, energy optimization studies and sustainability assessments.

Bob Hulsey is the Director of Water Treatment Technology in Black & Veatch's global water business where he leads a group of Ph.D.- and Master's-level process engineers and scientists in implementing advanced treatment technologies such as desalination, micro-contaminant removal, high-rate sedimentation and flotation, membrane and biological filtration, ozone, and UV disinfection, among other solutions.

FINANCIAL OVERVIEW

John Kersten is a Vice President in Black & Veatch's management consulting division and has extensive consulting experience associated with municipal electric, natural gas, water, wastewater and reclaimed water utilities. His experience encompasses a full range of utility finance issues, including wholesale and retail ratemaking, revenue bond financial feasibility reports, valuations studies for acquisitions and mergers, capital financing analyses, economic feasibility studies, and strategic and business planning.

ASSET MANAGEMENT OVERVIEW

Will Williams is a Director within Black & Veatch's management consulting division where he leads and provides a full range of strategic and tactical asset management services for global water and power clients. Will has more than 21 years of experience in asset management planning, including asset failure analysis, risk assessment, performance benchmarking, maintenance optimization and business change management, among other areas.

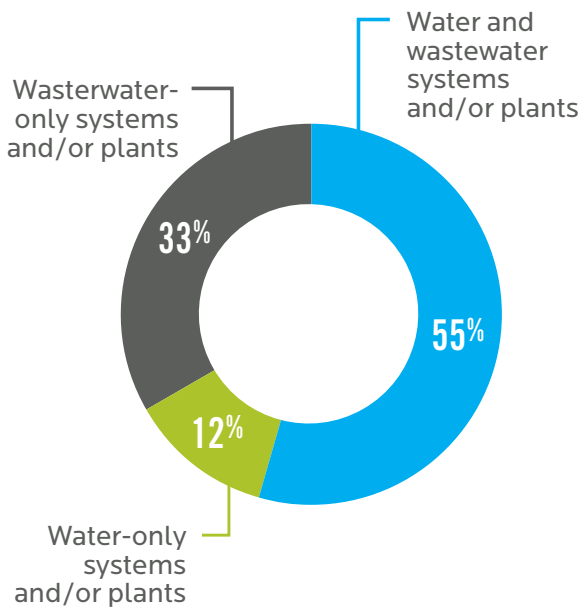
CONCLUDING THOUGHTS

John Chevrette is the President of Black & Veatch's management consulting division and leads the company's efforts to address key challenges affecting today's water, electric and gas utilities. Chevrette has more than 20 years of industry consulting experience, and has worked with domestic and international clients in the electric utility, energy technology, gas pipeline, telecommunications and water industries.

ABOUT THE 2012 SURVEY

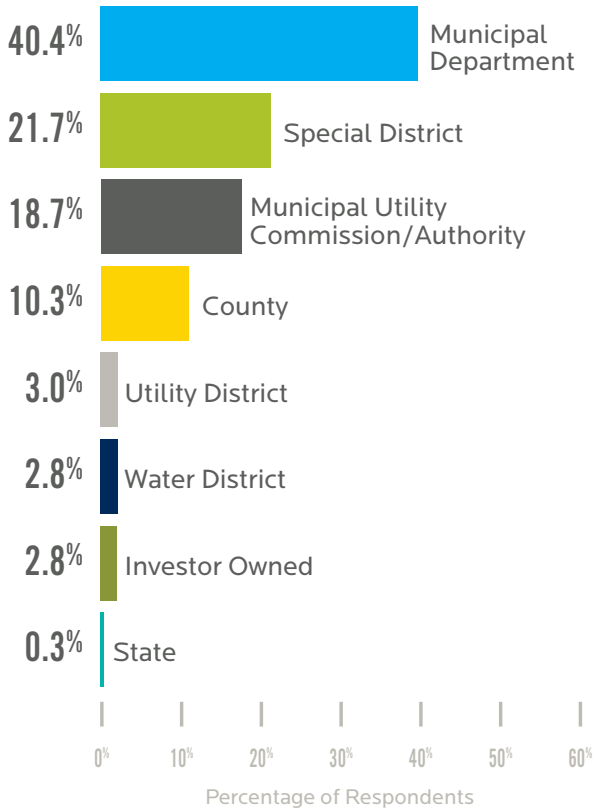
Black & Veatch's first water utility industry survey was conducted from 22 February through 13 March 2012. Analyzed survey responses are from qualified water utility industry participants. Statistical significance testing was conducted, and represented results have a 95 percent confidence level.

FIGURE 1
SURVEY PARTICIPANTS BY TYPE OF SYSTEMS/ASSETS MANAGED



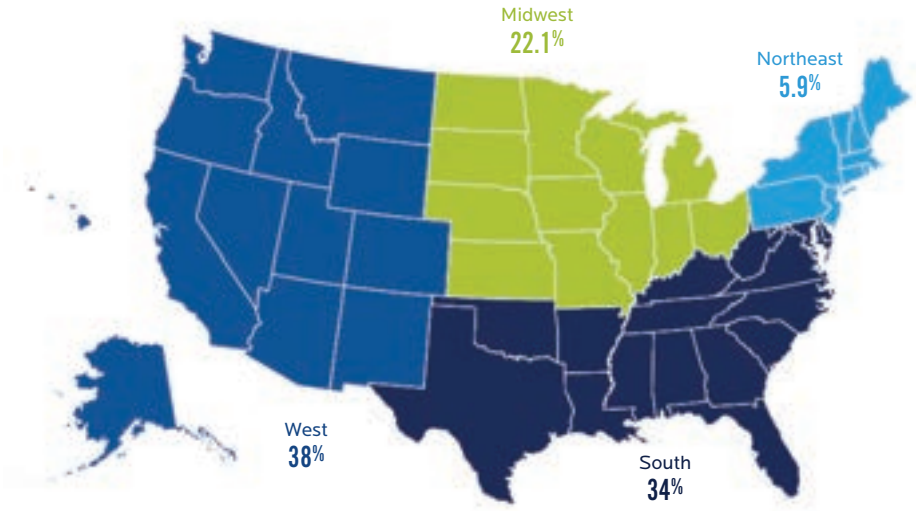
Source: Black & Veatch
Utility respondents represented a broad cross section of the industry and country. Responses represent utilities serving customers in 45 states and the District of Columbia.

FIGURE 2
SURVEY PARTICIPANTS BY ORGANIZATION TYPE



Source: Black & Veatch
Utilities that are municipal departments or special districts represented more than 60 percent of qualified respondents.

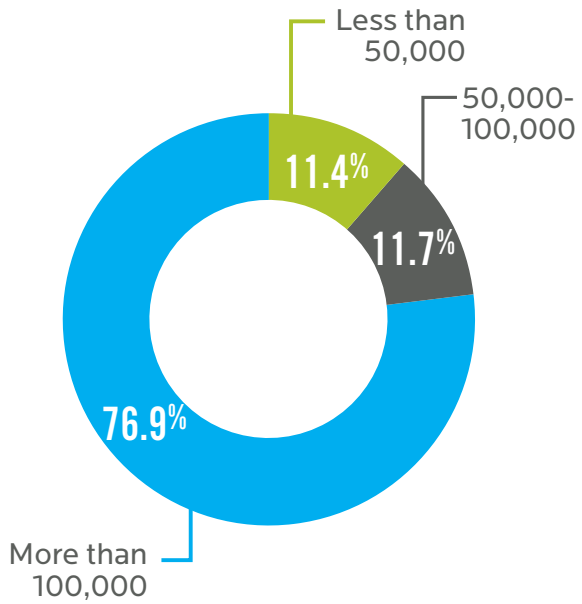
FIGURE 3
SURVEY PARTICIPANTS BY REGION



Source: Black & Veatch
Survey participants have also been classified by region. Where statistically valid and relevant, survey responses were analyzed for regional differences. Figure 3 provides an overview of how each region is classified and the percentage of respondents for each (based on the number of respondents who provided this information).

FIGURE 4
SURVEY PARTICIPANTS BY POPULATIONS SERVED

Source: Black & Veatch
Survey participants represented a broad range of populations served. Where statistically relevant, survey analysis provides insights on specific discrepancies or differences in results based on sizes of populations served.



INDUSTRY OVERVIEW

BY **CINDY WALLIS-LAGE**

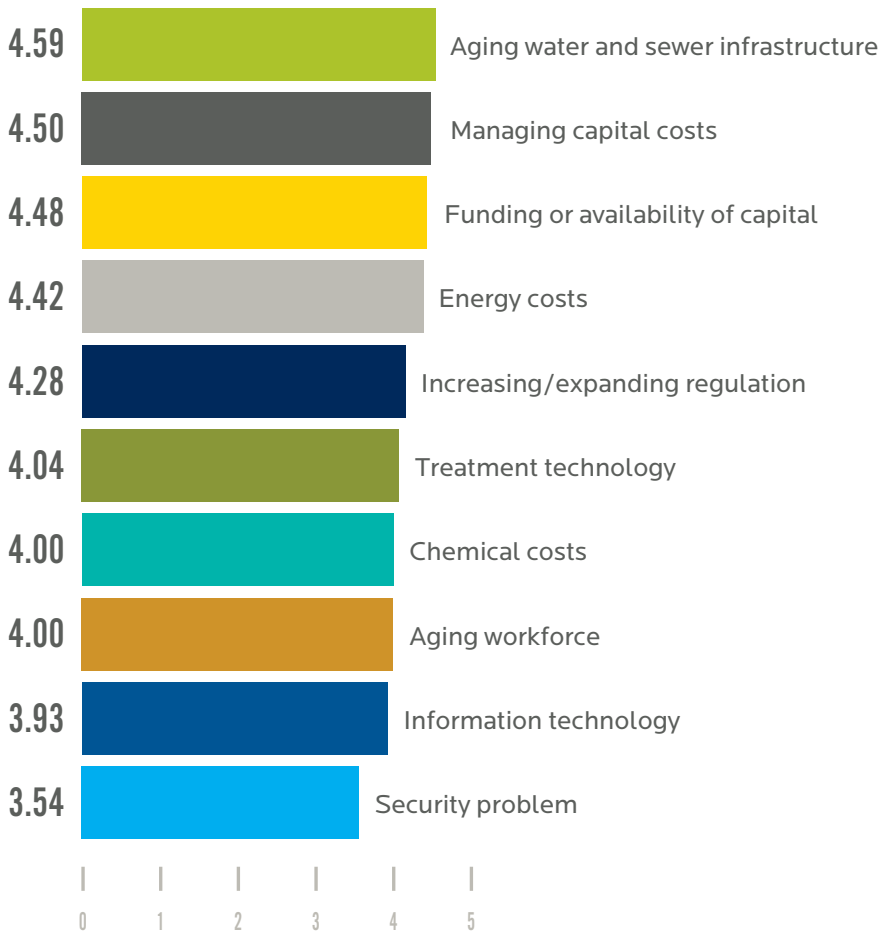
Black & Veatch's first water utility survey confirmed much of what the company's water industry leaders and specialists have seen unfolding over the past few years. In the following report, we've summarized the water industry survey findings and expanded the analysis to address the three overlapping mega-issues impacting utilities today: financial challenges, sustainability and asset management.

FINANCIAL CHALLENGES

First and foremost the survey confirms that financial issues, and all issues that drive investment or costs, are front and center with water utility leaders. When asked to rate the importance of major industry issues, survey respondents considered aging water and sewer infrastructure as the most important issue facing our industry, with managing capital costs, funding or availability of capital, and energy costs following closely behind. Increasing or expanding regulation, treatment technology, the aging work force and chemical costs are also comparatively important (Figure 5).

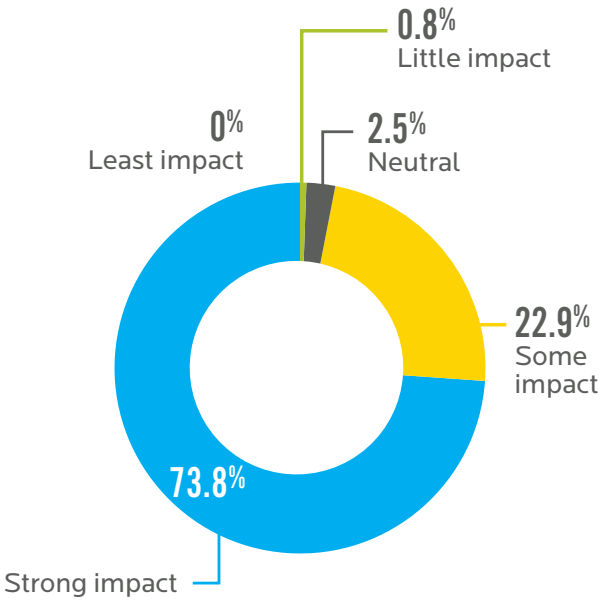
Considering the massive expansion of U.S. water systems in the immediate post-World War II era, followed by wastewater treatment projects spurred by the Clean Water Act in the 1970s, with comparatively limited investments since that time, it is not surprising that aging infrastructure is viewed by the industry as the top challenge. Nor is it surprising that aging infrastructure and associated replacement and rehabilitation demands have a strong impact on the financial health of water utilities (Figure 6 on page 8).

FIGURE 5
IMPORTANCE OF INDUSTRY ISSUES



Source: Black & Veatch
Survey participants were asked to rate the importance of each of the above referenced issues to the water industry based on a scale of 1 to 5, where 1 indicates "very unimportant" and 5 indicates "very important." The results above show the average response for each issue.

FIGURE 6
IMPACT OF INFRASTRUCTURE REPLACEMENT AND REHABILITATION ON FINANCIAL HEALTH



Source: Black & Veatch
Nearly three-fourths of all respondents stated infrastructure replacement and rehabilitation has a "strong impact" on the financial health of water utilities. This highlights the challenges of aging infrastructure and the investment needed to modernize critical water and wastewater systems.

This fact has not been overlooked by investors and credit rating agencies. In August 2011, Standard & Poor lowered the AAA ratings of thousands of municipal bonds tied to the federal government. Additionally, *The Wall Street Journal* reported more than 190 super downgrades on municipal bonds, where ratings were cut by more than three grades, have occurred since June 2010. According to *The Wall Street Journal*, "The rating firms say multi-notch downgrades are extremely rare and when they do happen they are often tied to bonds where investors already expect volatility, such as bonds that depend on property tax revenue at a time when the real estate market is depressed ("Downgrades Felt at Local Level." *The Wall Street Journal*. August 18, 2011)."

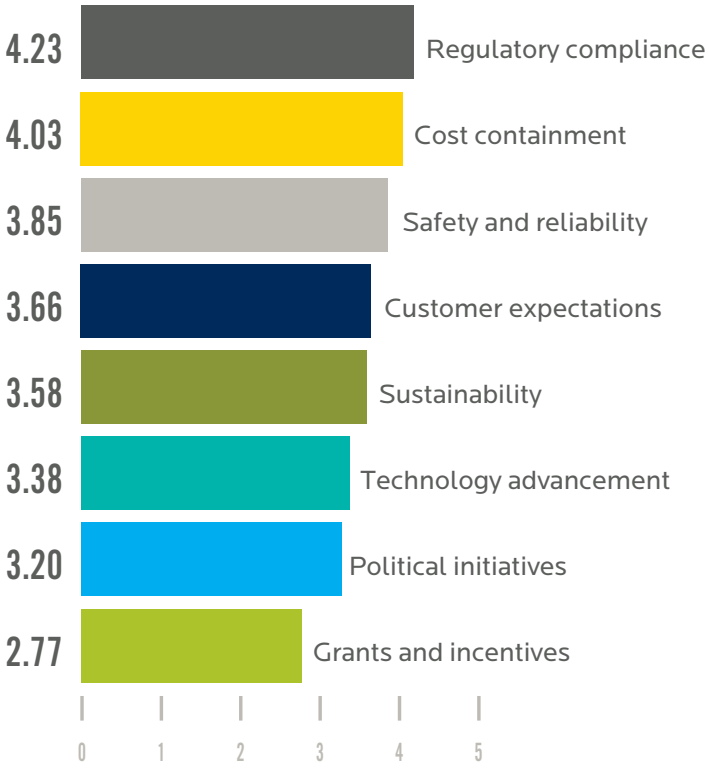
Little has changed with respect to drinking water, wastewater, and stormwater needs since the American Society of Civil Engineers assigned the nation's infrastructure nearly failing grades in its 2009 Report Card on America's Infrastructure (www.infrastructurereportcard.org). Except, of course, that the gap between system needs and funding has continued to expand since the economic downturn.

Public utilities have always been challenged to make the most of limited budgets without the benefit of being able to significantly raise rates, a situation truer today than just five years ago. The vast majority of survey respondents doubt the sufficiency of their future funding to manage and maintain their systems. (See Figure 12 on page 18).

THE GAP BETWEEN SYSTEM NEEDS AND FUNDING HAS CONTINUED TO EXPAND SINCE THE ECONOMIC DOWNTURN.

Prioritizing precious capital is essential for ensuring safe, clean and reliable water and wastewater services. When asked how specific issues are driving ongoing infrastructure investments, survey respondents indicated that regulatory compliance was by far the strongest driver, with cost containment emerging as the next strongest factor (Figure 7). Recently, due to increased wet weather, nutrient reduction and disinfection regulations, regulatory compliance issues most heavily impact utilities with wastewater responsibilities.

FIGURE 7
INFRASTRUCTURE INVESTMENT DRIVERS

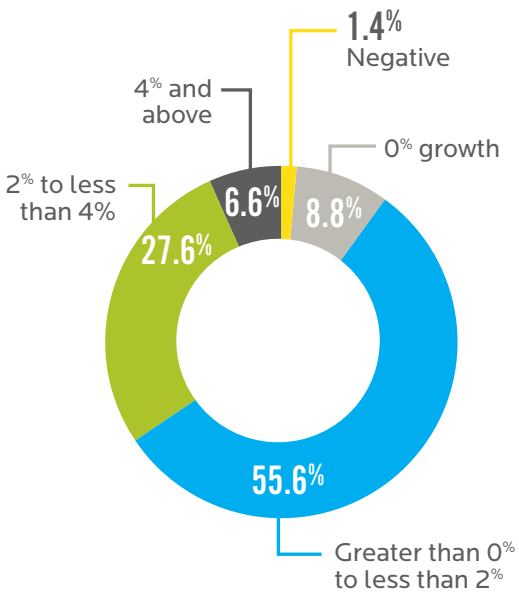


Source: Black & Veatch
Survey respondents were asked to rate on a scale of one to five how each of the identified issues drive ongoing infrastructure investment within their respective organizations, with 1 meaning "very weakly" and 5 meaning "very strongly." Figure 7 provides the average rating for each issue.

The expectation of some system growth by approximately nine of 10 respondents reflects economic optimism as well as anticipated population growth that could further stress existing systems (Figure 8 on the next page). The majority of respondents expect growth of less than 2 percent, which is in line with the average growth currently seen among Black & Veatch water and wastewater clients. Anticipated growth is less than the typical average growth of 2 to 4.5 percent prior to the 2008 economic meltdown but reflects a step up from the zero growth experienced in recent years.

According to the survey results, industry type and location particularly affect expected system growth. For example, more utilities in the Northeast expect no change in system size compared with utilities in other regions. The anticipated growth pattern within the United States is significantly different from the last several decades; for example, high-growth areas such as the West have seen a significant reduction in growth. Meanwhile, many cities, particularly those hardest hit by the Great Recession have experienced significant population loss. The challenge for all utilities is finding a financial solution to pay for the infrastructure investments outside growth- and use-based revenue models.

FIGURE 8
EXPECTED ANNUAL SYSTEM GROWTH



Source: Black & Veatch

SUSTAINABILITY

The Nexus of Water and Energy

Sustainability is important to the vast majority of survey respondents, and energy use is the overriding sustainability issue. The water-energy nexus affects water utilities in many ways; it takes a lot of energy to produce, move, treat and distribute water. Energy costs can account for as much as 30 percent of most utilities' operating budgets.

The effects of energy use and cost on the Triple Bottom Line (economic, environment, social/community) performance of water and wastewater utilities are impossible to ignore. Rising energy costs are putting additional pressure on utilities' finances. The economic impact on water and wastewater utilities is particularly stressful during challenging times when budgets are being squeezed through decreased revenues and funding constraints.

More than three-fourths of respondents' utilities have taken basic steps to reduce energy consumption through efficiency, optimization or similar planning and management measures (See Figure 17 on page 24). Some utilities strive to become energy neutral, and at least one has recently become a net energy producer by recovering more energy from the treatment process than what is needed to power facilities.

ENERGY COSTS CAN ACCOUNT FOR AS MUCH AS 30 PERCENT OF MOST UTILITIES' OPERATING BUDGETS.

Water is Water

Water conservation and water reuse present direct opportunities for achieving economic, environmental and social sustainability. Although there is some variation in survey responses based on specific utility functions, the overall analysis emphasizes that water is water. Water utilities are all essentially managing the same water resource, diverted from nature's one-and-only water cycle. In addition, utilities are increasingly finding it necessary to manage and balance other resources along with water. Sometimes the management of multiple resources is synergistic; sometimes it requires more complex planning or investment; and sometimes tradeoffs are necessary.

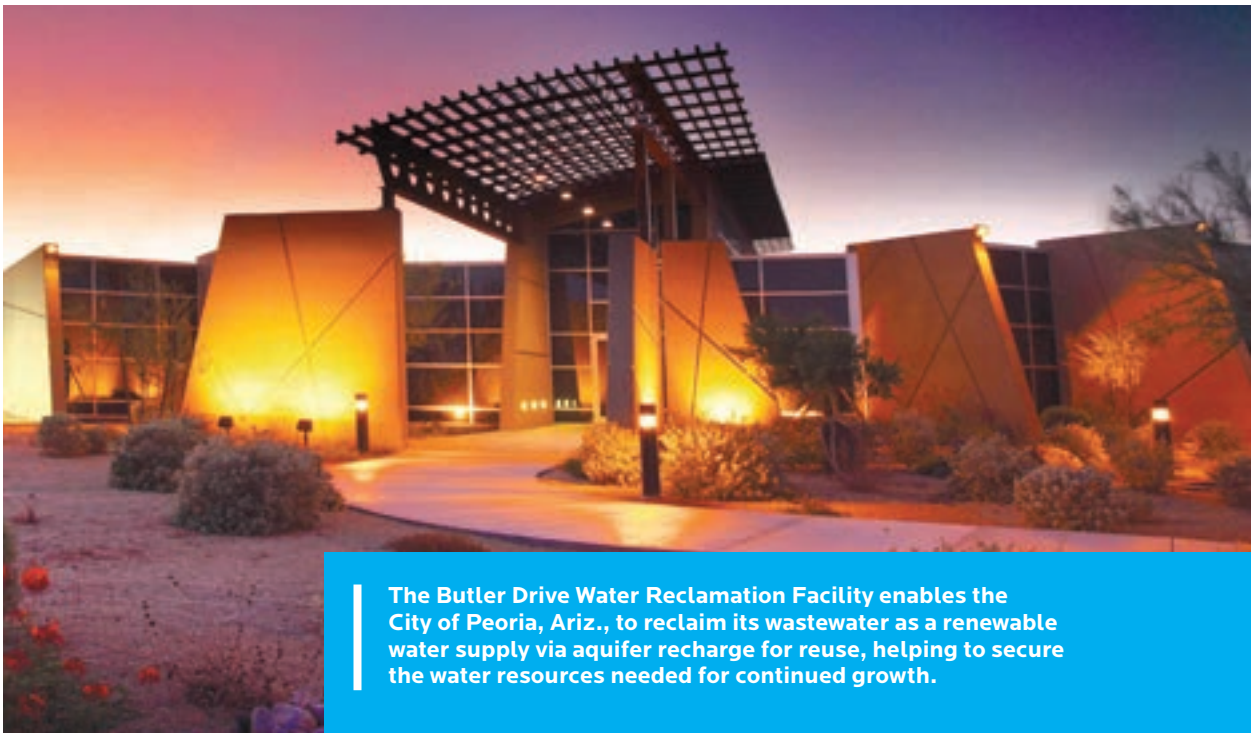
The ongoing practice of classifying water into different categories (i.e., potable, stormwater and wastewater) creates division about water value and its potential uses. These divisions also contribute to communications challenges with public and government entities that can confound capital projects and resource recovery efforts. Globally, organizations that integrate water and wastewater functions find it easier to balance their water portfolios and gain public and financial support for investment in water infrastructure.

One water qualification that must be eliminated from the water industry vernacular is "wastewater." It is time to shift our focus away from the elimination of something undesirable to the opportunity to recover valuable resources such as water, energy, nutrients and beneficial products. The planet's 7 billion-plus inhabitants—especially those in highly developed countries like the United States—need to adopt the mindset that continuous recycling of these resources will better serve future generations than delving deeper into dwindling supplies. Where economics support the decision to generate valuable products in conjunction with the cleanup of used water, wastewater treatment plants are poised to become resource recovery centers, producing not only recycled water and energy but also phosphorus-laden fertilizer and beneficial biosolids products.

Many utilities are already recovering water. According to the survey, water utilities in the West are more concerned about water availability/scarcity and place greater importance on conservation than their peers in other U.S. regions. Certainly, utilities in the West and parts of the South are leading the way in adding water reclamation and reuse to their water resources portfolios. Only one in four respondents told us that their customers wouldn't be accepting of gray water for non-potable use (See Sustainability section).

THE ONGOING PRACTICE OF CLASSIFYING WATER INTO DIFFERENT CATEGORIES CREATES DIVISION ABOUT WATER VALUE AND ITS POTENTIAL USES.

Where water is scarce or of impaired quality, discussion tends to focus less on overcoming the "yuck" factor and more on providing the flexibility to match water quality to a specific use. For example, water used to flush toilets or water lawns shouldn't require the same advanced treatment as water intended for aquifer recharge but does require third-pipe distribution and appropriate regulatory oversight.



The Butler Drive Water Reclamation Facility enables the City of Peoria, Ariz., to reclaim its wastewater as a renewable water supply via aquifer recharge for reuse, helping to secure the water resources needed for continued growth.

INDUSTRY OVERVIEW

ASSET MANAGEMENT

One activity that would significantly help utilities more efficiently manage water resources is the collection and analysis of real-time data through smart infrastructure/grid programs. Wireless communications offer the potential for greater efficiency as compared with system elements that operate independently. Immediate access to the right data moves decision-making closer to real-time and can greatly improve efficiency within the water industry.

Overall, integrated planning to most effectively manage all utility resources is becoming one of the most important activities for utilities moving forward. This requires a holistic evaluation of all assets and resources using life-cycle analysis to determine the economic impacts of potential energy reduction and resource recovery actions. Social and environmental objectives often must be considered along with financial factors.

Achieving this balance isn't easy. While beneficial results can be identified in isolation, the best balance is found through big-picture evaluation. For example, in many respects it is considered a success when a water management approach, such as a conservation program, results in decreased energy consumption for water production, recovered capacity within existing infrastructure, and less wear and tear on system assets. However, equally important is the recognition that such a program may have financial impacts for utility providers that typically have significant fixed costs, including decreased revenue. In other situations, there are tradeoffs between required water quality and operating impacts.

The capital costs to add new facilities or processes can be significant; meeting regulations and replacing critical infrastructure tends to take top priority when budgets are tight. This adds to the challenge of making holistic decisions that factor in all resources – energy, water, beneficial byproducts and optimization of existing assets. The Asset Management Section of this report shows approximately two-thirds of respondents have conducted assessments and/or are implementing improvement programs. This is a critical first step in developing comprehensive solutions for reducing costs and improving services related to reliability and regulatory concerns.

CONCLUDING THOUGHTS

The three mega-issues identified within this report have been companions of water utility leaders for decades. While these issues are not new, the gap between what we have and what we need continues to grow. Closing this gap will require innovation in financing, technology application and utility operations.

Traditionally, the U.S. water industry has relied on central government sourcing for funding water and wastewater infrastructure needs. While some funding relief may be on the horizon, the current fiscal and political environment suggests it will not be sufficient, or may not occur at all. Additionally, as noted earlier, many municipalities have challenges associated with credit rating downgrades that are increasing the cost of obtaining capital through traditional municipal bonds. As a result, water industry and municipal leaders will need to explore additional options.

Public-private partnerships provide an alternative means of bridging the gap between available capital and necessary capital expenditures. The availability of nearly $200 billion in private capital could enhance funding to accelerate infrastructure projects, yet, according to survey results, utility leaders – or perhaps their governing bodies – show little interest in pursuing private financing.

There is also much work to be done in educating consumers and government leaders on the value of water and the true costs associated with providing water and wastewater services. On a global level, industry and national leaders are recognizing the true significance of precious water resources. Secretary of State Hillary Clinton recently referred to water as "the new oil," casting water as the next great catalyst for future diplomatic tensions and possibly even military conflict.

At the local level, water and sanitation services are viewed as basic necessities, and elected officials are hesitant to raise rates or explore private involvement. Under these constraints, most utilities are searching for innovative solutions to support infrastructure funding needs along with new technologies that optimize existing assets and offset the high costs of producing safe drinking water and returning clean water to the environment. Fortunately, these technologies exist and are well proven. And, as survey results show, utilities are moving forward with implementing these cost-cutting measures.

When considering the significant system needs and fiduciary constraints, water utility leaders are to be commended for their consistency in delivering reliable and safe water and wastewater services to their customers. However, this consistency masks the underlying problems that our water and wastewater services are, in many areas, one event away from significant disruption. Water utility leaders and the local governments they serve must move forward with infrastructure rehabilitation and replacement. Consumers must understand the value of water and the true costs associated with delivering these services, and politicians must be willing to make the hard decisions related to financing and rate adjustments.

President Franklin Roosevelt once stated, "Confidence and courage are the essentials of success in carrying out our plan." Today's water utility leaders know the challenges and needs. Together with local, state and national leaders, we must push forward with confidence and courage to preserve and protect precious water resources, maximize energy efficiencies and seek out new ways to fund vital capital improvements. Failure today to move forward only places greater burden on future generations.

"CONFIDENCE AND COURAGE ARE THE ESSENTIALS OF SUCCESS IN CARRYING OUT OUR PLAN."

– FRANKLIN DELANO ROOSEVELT

FINANCIAL OVERVIEW

BY **JOHN KERSTEN**

To those who work in or around the water/wastewater industry, it is "old news" that there is a pent-up demand for the renewal and replacement of aging infrastructure. In fact, the need is so large as to represent a literal crisis in many communities across the country.

With cost estimates for required system investment ranging from the hundreds of billions of dollars to a trillion dollars by 2035, industry respondents ranked aging infrastructure as the single most important water industry issue today. Regardless of an exact dollar value, the bottom line is the potential for catastrophic failures in our water/wastewater infrastructure is a ticking time bomb waiting for a place to happen.

Responding to the growing surge of renewal and replacement needs will not be a one-time challenge. Most of our nation's utility infrastructure was built in the post-World War II era, starting with significant projects launched in the 1950s, and these aging assets are only the starting point. Once issues with 1950s assets are addressed there are projects from the 1960s and 1970s, and so on that will require extensive maintenance to comply with regulatory mandates, contain costs and improve system reliability and safety, and other key drivers of water utility investment. Simply put water utilities recognize that they will be dealing with the renewal and replacement of infrastructure for as long as people need water – forever.

The best way to confront this issue is to address the need immediately by analyzing system needs correctly, developing long-term management plans and finding funding sources thoughtfully. Perhaps most importantly, we will need to find the courage and political will to raise rates to fund these improvements appropriately. Patchwork and marginal actions today will only lead to even larger challenges tomorrow.

THE BOTTOM LINE IS THE POTENTIAL FOR CATASTROPHIC FAILURES ... IS A TICKING TIME BOMB WAITING FOR A PLACE TO HAPPEN.

Complicating the options for utility executives and municipal boards is that 85.4 percent of industry respondents believe that the average man or woman on the street has little to no understanding of the gap between the cost of producing safe water and the current rates paid by consumers (Figure 9 on page 16). In most cases, the public has virtually no concept of the value of water. This lack of awareness is clearly a "call to arms" for the water industry.

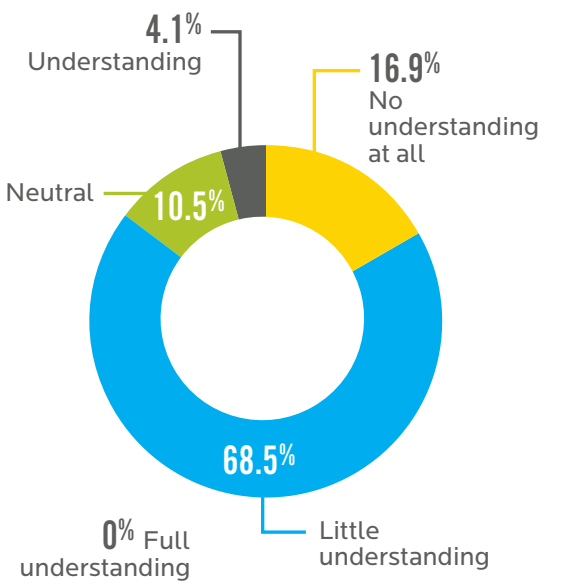
Rehabilitation and replacement of aging infrastructure has a significant impact on the financial health of utilities.

Interestingly, nearly 50 percent of these same respondents feel that customers will probably be willing to pay the higher rates needed to address pressing infrastructure needs (Figure 10). This finding suggests an inconsistency in the water industry's management of its relationships with its customers. Customers certainly won't enjoy seeing rates and charges rise, but we have no other option but to pay the full costs to provide this critical service. The near-term question is will local elected officials be willing to overcome the political pressures aligned against raising rates? The key to solving this problem is improving customers' understanding of the value of the water delivered to their homes.

The survey also gives a peek into the future of investment spending. There is no doubt that significant dollars will be needed to fund renewal and replacement. But what technologies will be there to support the industry in the future? Nearly 60 percent of responders said technology to increase efficiency and to manage assets more effectively will be the areas given the most emphasis in the future (Figure 11).

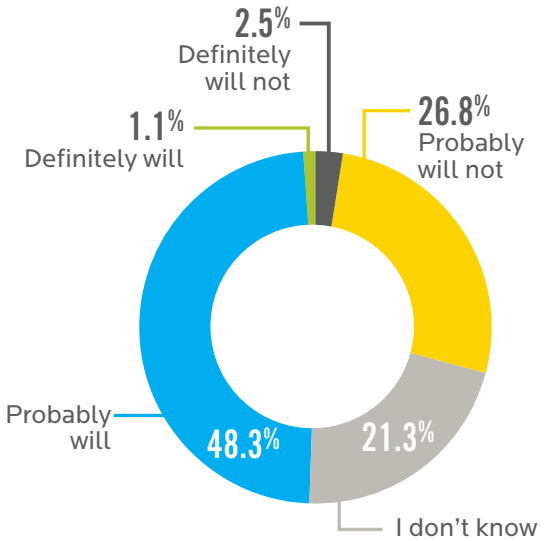
These technologies address current assets, doing more with what we have and finding ways to do it cheaper. Given this state of the industry, where will the money come from? Is it available? Can we access it? What's the catch? The catch is that it might not come from the same sources or as easily as it used to. Utilities can still access some grant monies and low interest rate government loans, but quantities are limited, so the bulk of this pent-up capital demand will have to come from somewhere else.

FIGURE 9
UNDERSTANDING THE GAP BETWEEN COSTS AND RATES



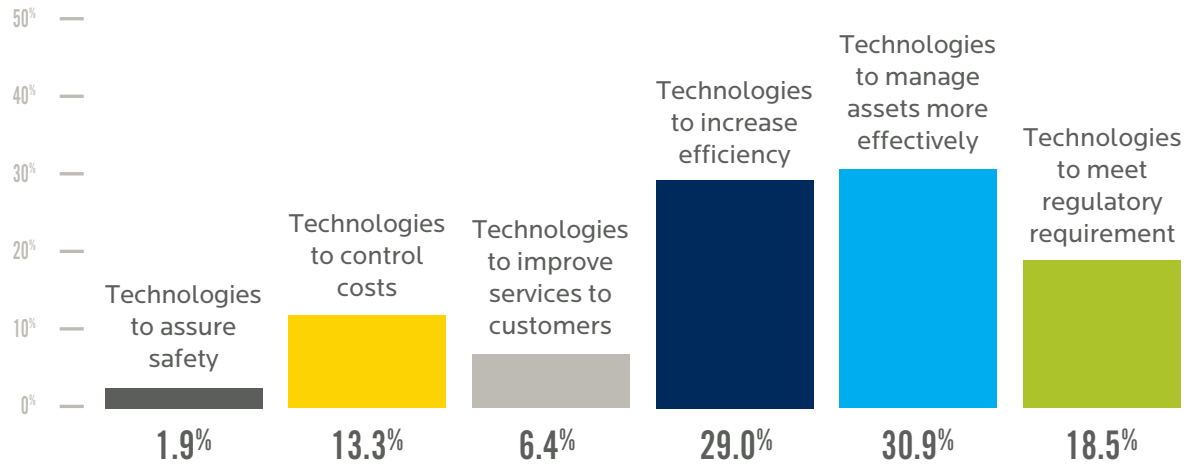
Source: Black & Veatch
Survey respondents were asked to rate how well customers understand the gap between the cost of producing and treating water and current rates. Nearly 85 percent of respondents indicated customers had little to no understanding.

FIGURE 10
WILLINGNESS TO PAY INCREASED RATES



Source: Black & Veatch
Survey respondents were asked if customers are willing to pay increased rates to support capital spending requirements.

FIGURE 11
NEW TECHNOLOGY EMPHASIS



Source: Black & Veatch
Survey participants were asked to select one of the above choices regarding technologies the industry should emphasize.

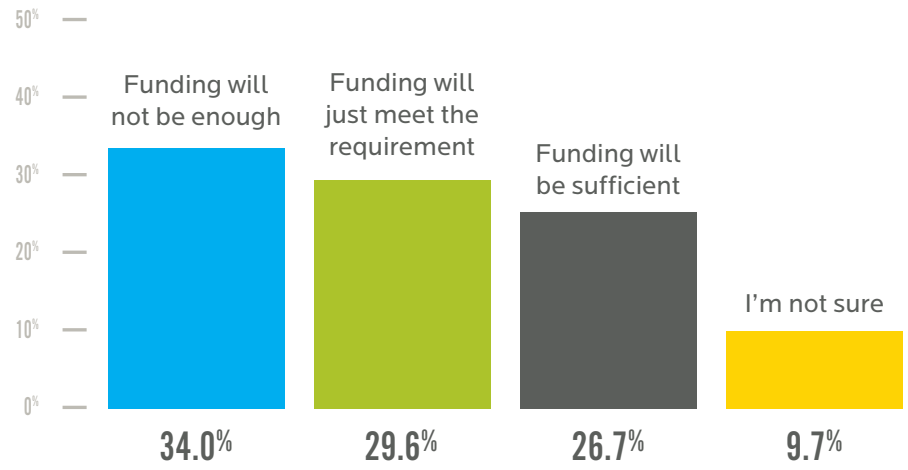
Nearly 74 percent of respondents feel that infrastructure renewal has a strong impact on the financial health of their utility. Physical assets are examined, deterioration rates are estimated, and in many cases, the operational impacts of aging infrastructure are analyzed and quantified. But finding the resources to respond to these needs continues to be difficult. According to respondents, only 27 percent believe that funding will be sufficient (Figure 12 on the next page).

Respondents suggest that the revenue bond market will be their primary financing vehicle, but post-2008 financial due diligence standards are significantly more stringent than before, making it unlikely that the market will support the vast quantity of bonds necessary to fund needed projects. Rating agencies and institutional investors expect significantly increased disclosure of operating and financial conditions, and solid reports on non-financial, regulatory, management and local economic conditions are required for municipalities to obtain favorable ratings and interest rates. For many water utilities and municipalities, this will require the search for alternative funding streams, many of which have not yet been examined (Figure 13 on the next page).

Numerous industry forecasts, reviews, outlooks and projections indicate that the capital requirements to solve the aging infrastructure problem are so large that the public sector will have to consider other sources beyond just traditional bond financing. Yet the respondents indicate very limited interest in any form of public-private partnerships. The hurdles are likely varied in different locations, and may reflect political resistance, management resistance, or perceptions regarding legal constraints or the costs and value of potential financial arrangements.

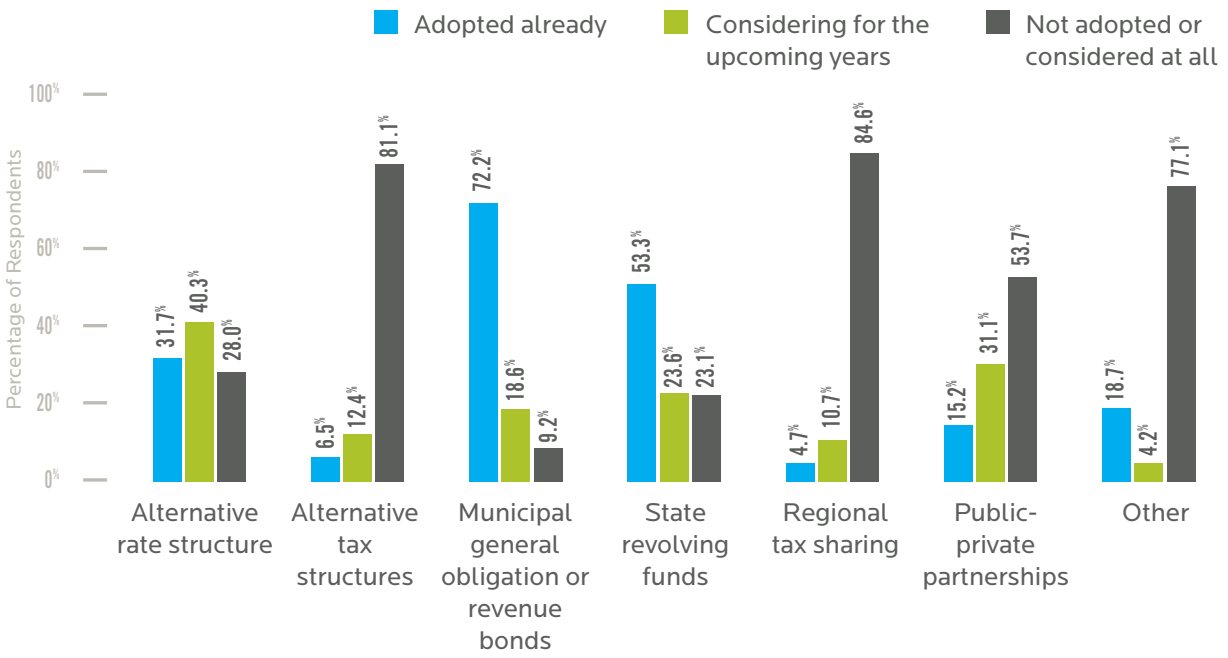
Privately managed infrastructure funds with billions of dollars available for investment in water/wastewater infrastructure should recognize that regardless of the reason, private investment in municipal water assets is still viewed with suspicion. Proponents of public-private partnerships have significant work ahead of them if they are to become a meaningful part of the answer to the water industry's thirst for capital, but those within the industry must recognize that the old ways of doing business have circled the drain.

FIGURE 12
FUNDING AVAILABILITY FOR CAPITAL INFRASTRUCTURE PROJECTS



Source: Black & Veatch
Survey participants were asked, "How available is funding for capital infrastructure projects for your utility during the next five to 10 years?" Just over one-fourth stated "Funding will be sufficient."

FIGURE 13
FINANCING METHODS ADOPTED OR CONSIDERED TO SUPPORT CAPITAL NEEDS



Source: Black & Veatch

SUSTAINABILITY AND THE WATER-ENERGY NEXUS

BY **STEVE TARALLO AND BOB HULSEY**

More than five years have passed since the concept of "sustainability" entered the mainstream of the water industry. "Exactly what does sustainability mean and how does it apply to my utility?" and "Is sustainability just a passing fad?" were recurring questions when the term originally surfaced.

Today, local and national association conferences, seminars, webinars and other water industry events, typically include elements devoted to all things "sustainable." Industry research organizations develop and support projects that investigate sustainability concepts and assessment methods and tools. In addition, a growing number of utilities are applying sustainability tools and methods to address significant operational challenges and capitalize on opportunities to advance strategic objectives.

The water industry generally now accepts that sustainability can mean different things to different utilities and that it is certainly not a passing fad. Rather, sustainability is now widely viewed as a utility management framework that can provide significant benefits. Evidence of this trend is reflected in the survey results: Nearly all of the respondents think sustainability is important, and more than half consider it to be a strategic focus for their utilities (Figure 14).

The issues and challenges that drive water utilities to seek sustainable solutions are as diverse as the industry itself. Although it is generally accepted that using less non-renewable energy, chemicals and water is environmentally sustainable and the right thing to do, many utilities historically have assigned more weight to practical, local economic and community/social issues when making decisions. These economic and community/social considerations are region- and utility-specific and often drive utility strategic planning activities. Meeting regulatory requirements and serving the community are generally paramount. In appraising the potential to invest in largely discretionary sustainability programs and projects, the industry has embraced, and many utilities have begun to apply, the Triple Bottom Line

(balancing environment, economics and social/ community considerations) framework for sustainability decision-making.

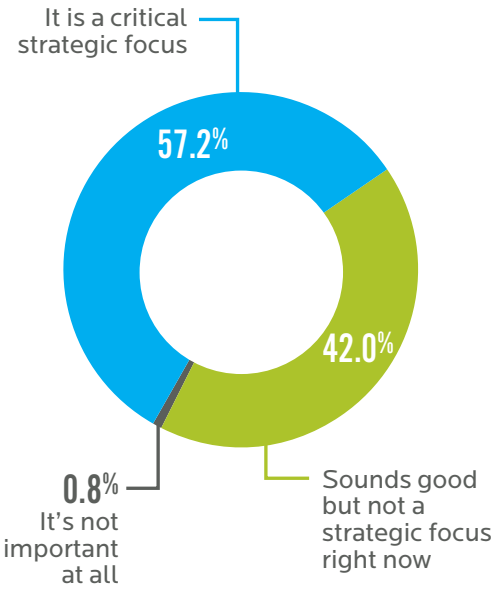
Survey participants were asked to select the most significant sustainability issue for their respective utilities. The results from this question are represented in Figures 15 (page 22) and 16 (page 23). Predictably, energy use is the overriding sustainability issue with nearly half of respondents choosing energy efficiency.

The effects of energy use and cost on the Triple Bottom Line performance of water and wastewater utilities are impossible to ignore. Energy costs are second only to labor in most utilities' operating budgets, and energy represents the largest controllable operational expenditure of most utilities. Energy costs are putting additional pressure on utilities' finances, making it more difficult to meet the substantial capital investment needs required to address aging infrastructure and more stringent regulations. Similarly, decreased capital limits utilities' ability to invest in "green" projects such as renewable energy development. The economic impact on water and wastewater utilities is particularly stressful during periods of economic pressure when budgets are squeezed by decreased revenues and funding constraints.

Water conservation and water scarcity responses, which totaled 39.1 percent, were disproportionately from the South and West regions where water scarcity has been a significant public policy concern for several years. Conserving precious water resources can reduce total energy and chemical use (when combined with management practices that capitalize on lower throughput to optimize treatment), as well as lower the amount of residuals that need to be disposed.

For areas dealing with water scarcity issues, water conservation also reduces the need to pump from far away supplies or rely on treatment of lower quality sources. Low quality water sources usually require more advanced treatment – which often requires additional energy use. With every 1,000 gallons of water produced and pumped from fresh water sources, approximately 1.5 to 2 kWh of energy is consumed. Utilities striving to maintain a

FIGURE 14
SUSTAINABILITY IN THE WATER INDUSTRY



Source: Black & Veatch
Survey participants were asked to select one item from the above choices that best represents their view on the importance of sustainability in the water industry.

THE EFFECTS OF ENERGY USE AND COST ON THE TRIPLE BOTTOM LINE PERFORMANCE OF WATER AND WASTEWATER UTILITIES ARE IMPOSSIBLE TO IGNORE.

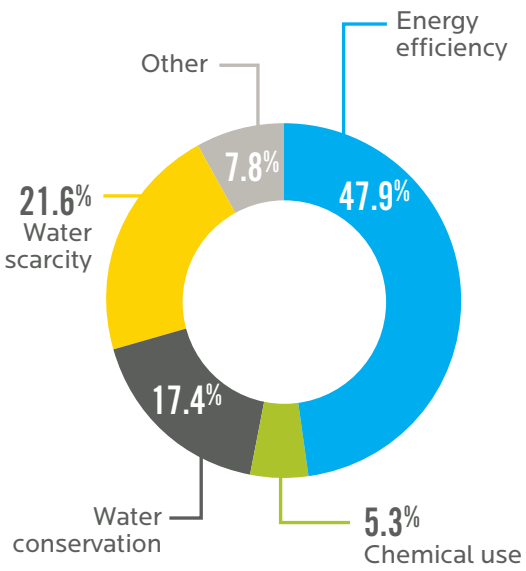
sustainable supply of potable water need to also consider the energy required to move water from its source to consumers' taps.

Where brackish water merits consideration as a primary or secondary source, energy is a major factor. An additional 1 to 4 kWh of electricity is required for every 1,000 gallons of produced potable water. Furthermore, inland systems face additional issues related to the disposal of the brine produced from desalting. Although research in this area is uncovering novel uses for the salt content of treated brine, including the production of salable fertilizer products, managing brine is still a significant challenge for utilities. Saving water means saving energy and chemicals, which in turn makes an important resource – capital – more available for other uses.

While research into more effective means of separating salt from seawater has reduced the energy needs of desalination, it is still more sustainable to treat water with lower dissolved solids – especially when, as the survey shows, an alternative source such as "gray water" reuse is an option. Reclaimed wastewater is of growing interest to utilities worldwide as a reliable, pathogen-free source for irrigation and other industrial uses. This holds true even when advanced treatment for nutrient removal is required, as using the water closest to the need, lowest in salinity and in plentiful supply can satisfy growing requirements for industrial, agricultural and other non-potable demands.

Of the nearly 8 percent of respondents who think "other" issues are most important, a large majority

FIGURE 15
MOST SIGNIFICANT SUSTAINABILITY ISSUES



Source: Black & Veatch
Survey participants were asked which of the above sustainability issues is the most significant for their water utility.

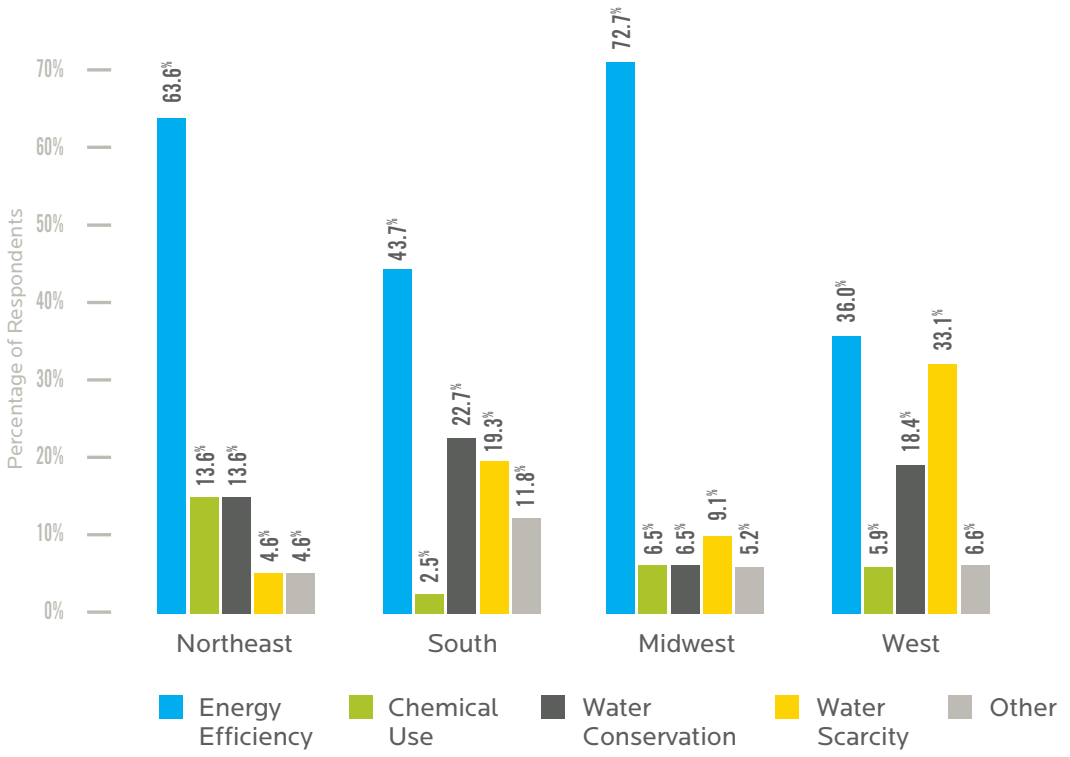
CONSERVING PRECIOUS WATER RESOURCES CAN REDUCE TOTAL ENERGY AND CHEMICAL USE, AS WELL AS LOWER THE AMOUNT OF RESIDUALS THAT NEED TO BE DISPOSED.

identified “aging infrastructure” and “fiscal sustainability/economics” as the most significant sustainability issues. These results reflect the generally strong connections in the minds of utility personnel among asset management, financial health and sustainability.

Sustainability is increasingly viewed within the water utility industry as a driver for investment and positive returns (a value mindset) as opposed to strictly an environmental concept. Asset management facilitates a positive feedback loop between investments in energy efficiency and aging infrastructure. A clear example of this loop is the repair/replacement of deteriorating pipes to reduce water loss/leakage from a water distribution system, which includes energy-intensive pumping within the cycle. Every day, approximately 7 billion gallons of precious potable water is lost through leaking pipes and mains. This represents a tremendous amount of energy that must be used to replace water losses within the system. By minimizing leaks, asset management activities reduce energy consumption, conserve water and reduce other negative environmental impacts, while extending the life and value of the water distribution assets. Wastewater utilities can reduce energy requirements and simultaneously improve effluent quality through process control automation and replacement of aged, oversized blowers and pumps with new, high-efficiency blowers and pumping systems.

Energy costs can account for as much as 30 percent of most utilities’ operating budgets and account for more than 85 percent of water utility greenhouse gas emissions. It is not surprising that the survey results indicate that

FIGURE 16
REGIONAL VIEW OF MOST SIGNIFICANT SUSTAINABILITY ISSUES

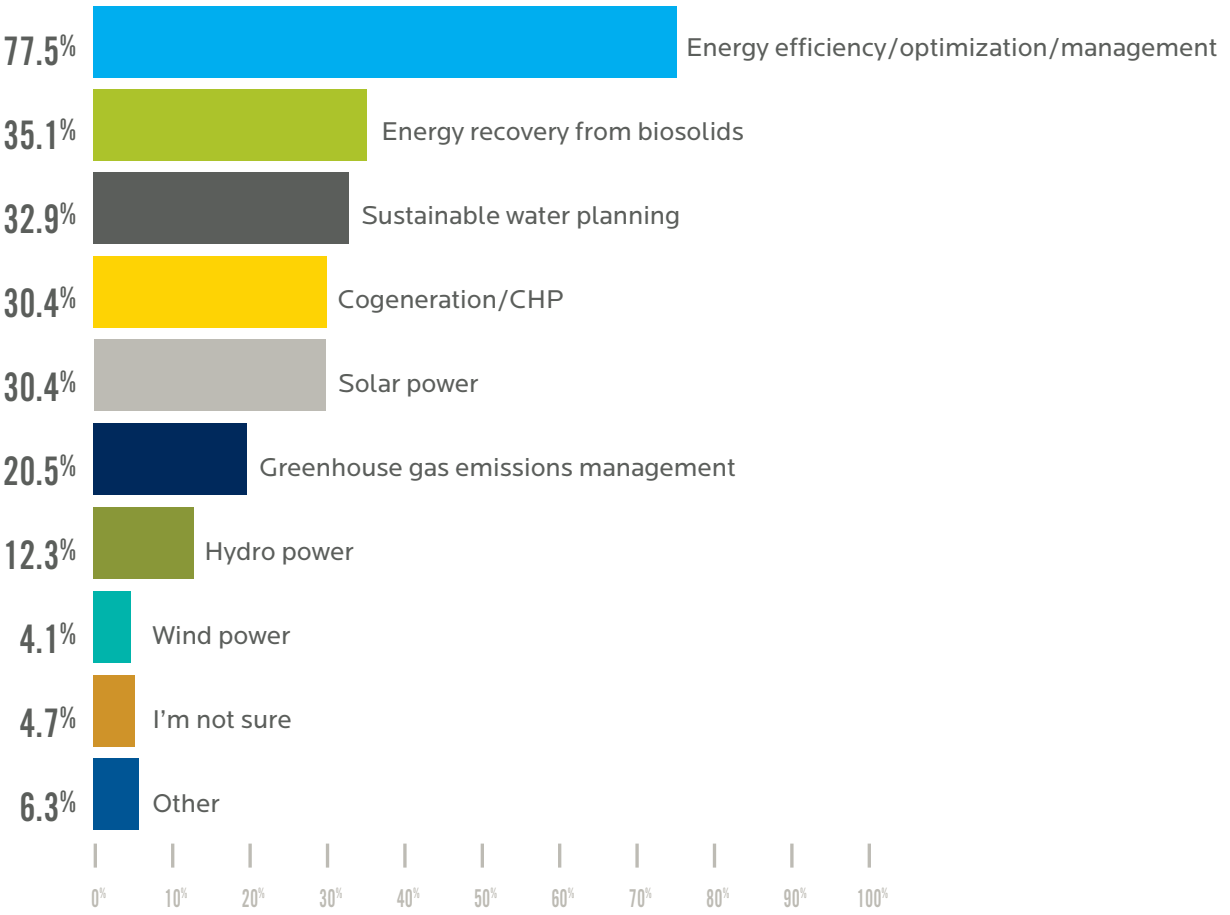


Source: Black & Veatch

the focus for sustainable energy management efforts is first on planning and "low-hanging fruit" solutions for energy efficiency/conservation, such as installing variable frequency drives and premium efficiency motors. More than 75 percent of the survey respondents said their utilities had undertaken "energy efficiency/optimization/management" for "water sustainability in relationship to energy" (Figure 17).

Energy management activities can range from reducing energy consumption through fragmentary application of energy efficiency measures, to becoming energy-neutral (generating as much energy as consumed) or even becoming net energy producers. Increasing automation of high energy-consuming processes and systems, such as aeration at wastewater treatment plants or distribution system pumping for water utilities, and making treatment plant operations more energy efficient are good starting points. This is especially true for smaller utilities that want to reduce energy use and save money but do not have the financial or staff resources to effectively implement larger-scale programs that involve major capital expenditures and higher risk tolerance.

FIGURE 17
ACTIONS UTILITIES HAVE TAKEN FOR WATER SUSTAINABILITY IN RELATION TO ENERGY



Source: Black & Veatch
Survey respondents were asked to select from all of the above actions they have taken in regards to energy use.

Orange County Water District Principal Engineer and GWRS Program Manager Mehul Patel (right) examines reverse osmosis connections in the District's Groundwater Replenishment System (GWRS). The system provides a high-quality source of water to recharge the county's groundwater basin.

Photo Credit: Orange County Water District

Although fossil fuels remain the predominant source of energy powering the water industry, the environmental and social issues associated with fossil fuels include impacts such as job creation/economic development, effects on water quality, energy supply reliability and air emissions. Conserving energy through efficiency measures and demand-side management can save money to invest in other essential projects with favorable financial returns and benefits to the environment and community.

SURVEY RESULTS CONFIRM THAT THE BIGGEST CHALLENGES FACING UTILITIES PURSUING SUSTAINABLE WATER AND ENERGY SOLUTIONS ARE ECONOMIC.

Leading utilities are also taking additional steps towards hedging future energy price rises and maximizing environmental benefits by investing in energy recovery, cogeneration/CHP and renewable-energy projects. These projects typically require large capital investments and can have longer (greater than five to 10 years) payback times than smaller-scale energy efficiency projects, but they often result in positive net present value as well as hundreds of thousands of dollars of recurring positive cash flow once the initial investment pays back. In most cases, capital-intensive energy recovery projects are implemented incrementally over time and in conjunction with energy efficiency improvements as part of a larger strategic energy management plan.

The survey results confirm that the biggest challenges facing utilities pursuing sustainable water and energy solutions are economic. Technologies are available and, in most cases, well-proven, so technological challenges are rarely this stumbling block. The non-economic benefits are clear and largely undisputed: What utility doesn't want clean air, clean and abundant water, and a satisfied community? Justifying financial investment in largely discretionary sustainability programs and projects to utility governing boards and political bodies while mitigating the risk of those investments, however, appears to be the largest challenge to widespread adoption of sustainable water and energy solutions for the foreseeable future. An important objective for water and wastewater utilities with a desire to advance sustainability strategic objectives will be to develop and implement new business processes, organizational change initiatives, and advanced project evaluation and risk analysis techniques geared towards honest justification and defense of sustainability program investments.

ASSET MANAGEMENT OVERVIEW

BY **WILL WILLIAMS**

Aging water and wastewater infrastructure was identified by the water utilities participating in the survey as one of the most important issues currently facing the industry, along with managing capital costs, energy costs and obtaining capital funding. The potential for system deterioration due to age is further compounded by expectations for growth (90 percent of survey participants indicated annual system growth was forecasted) that would further stress existing facilities.

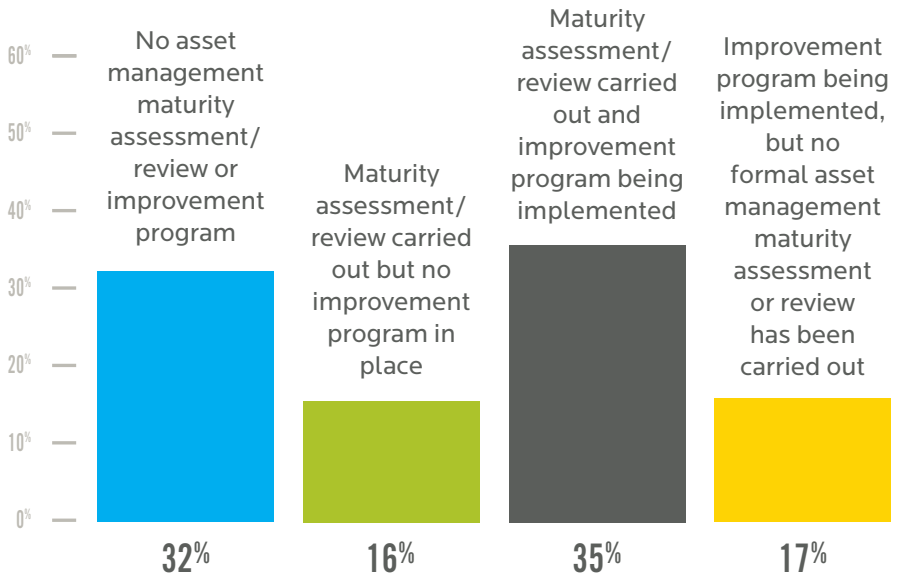
To deal with these issues, many water utilities are implementing asset management programs. However, in many respects, the United States is playing catch up to leading water utilities in the UK and Australia where asset management has been at the forefront of delivering high levels of service to customers and efficiencies within the industry for years. In those markets, regulation has been the main driver of water utility action and we note that survey respondents identified regulatory compliance as one of the main drivers for infrastructure investment here in the United States as well.

Less than 27 percent of survey participants believe that funding will be sufficient to meet future operating needs. Also noted was the need to do more with existing infrastructure. Good asset management practices represent a proven methodology for water and wastewater utilities to maximize ratepayers' ROI, extend asset life and reduce life-cycle costs. In plain terms, an asset management framework allows an organization to determine:

- What assets it owns.
- What condition its assets are in.
- How these assets are performing.
- What service it currently delivers and what it needs to deliver in the future
- What risks there are to the services
- What assets will cost over their planned life
- When assets need to be repaired or replaced and how.
- What may need to be done differently in the future

FIGURE 18

CURRENT STATUS OF ASSET MANAGEMENT PROGRAMS



Source: Black & Veatch

Survey participants were asked to select one of the above choices that best represents the status of asset management programs at their utilities.

In seeking to improve asset management within an organization, it is advisable to undertake an asset management maturity assessment or gap analysis and compare results against good practice. From this assessment an asset management improvement program can be developed. Survey participants were asked if their utility had carried out a gap analysis and/or were implementing an improvement program. Overall, roughly a third (32 percent) of respondents stated no asset management assessment or improvement programs were in place or ongoing (Figure 18).

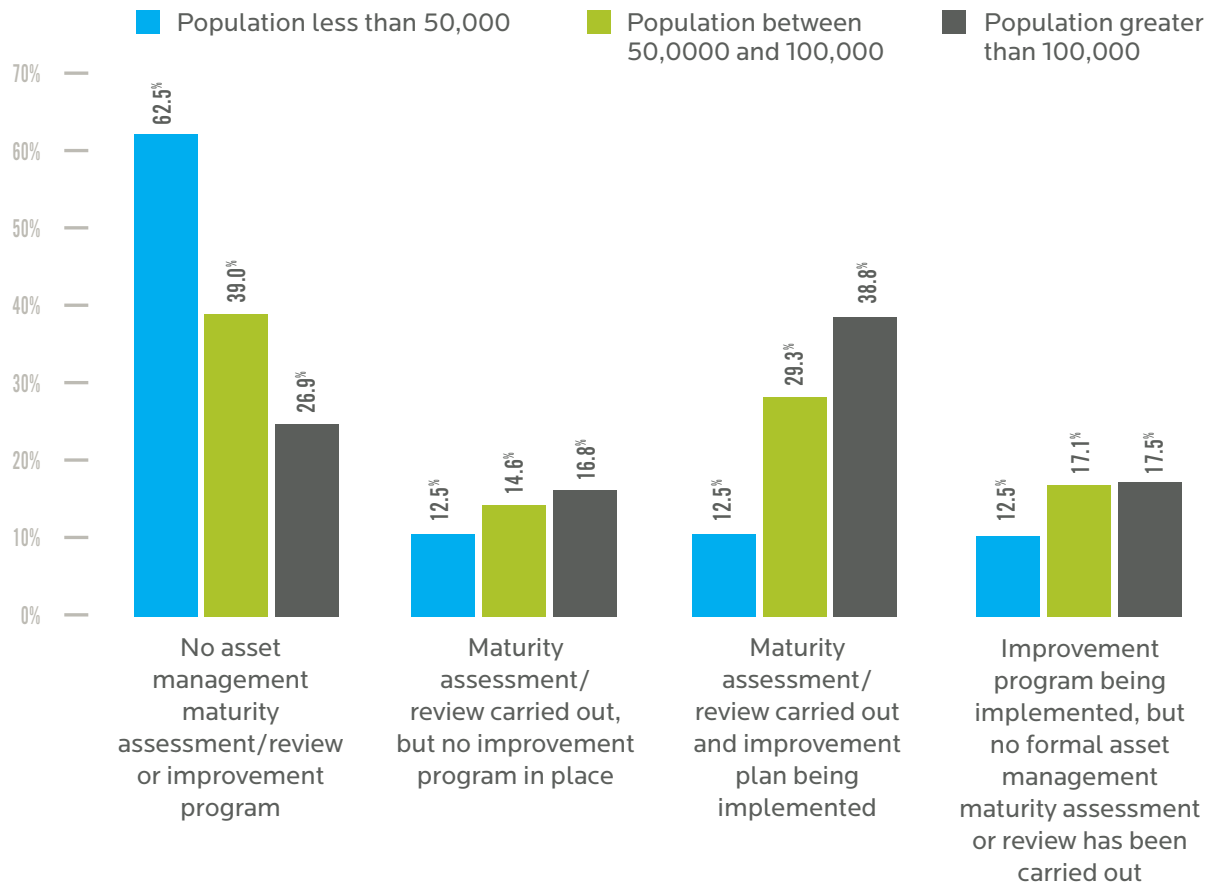
Interestingly, 17 percent of respondents were implementing an improvement program without having carried out an initial asset management assessment. It is difficult to implement an effective improvement program without first identifying what the existing gaps are and what the priorities are for improvement.

Black & Veatch always recommends undertaking some form of assessment before deploying capital. The highest proportion of utilities implementing an improvement plan without an assessment are located in the Northeast (36 percent).

There is a tremendous disparity among utilities serving smaller populations versus larger utilities when it comes to implementation of asset management programs. Nearly two-thirds (63 percent) of utilities serving populations less than 50,000 stated they had no asset management assessments or improvement program (Figure 19 on the next page). Here there is clearly room for improvement from the smaller organizations. Size is not a barrier to development of asset management programs and effective measures of service.

FIGURE 19

CURRENT STATUS OF ASSET MANAGEMENT ASSESSMENTS AND/OR IMPROVEMENT PROGRAMS BY SIZE OF POPULATION SERVED



Source: Black & Veatch

DATA QUALITY

High-quality data has the potential to transform a utility's operations through improved business processes and streamlined operations, as well as prioritize capital investments. However, success in maximizing efficiencies is directly determined by the quality of data received from the asset management systems. Survey participants were asked to rate the quality of their asset information. This information is depicted in Figure 20 on the next page and shows the percentage of respondents who chose "good" or "very good" when asked about the quality of specific asset data.

Nearly 70 percent of respondents believe their basic asset information, such as the number of assets, type, size, capacity and age, as noted in the "asset characteristic" section is largely viewed as good or very good (note: 77 percent of water-only utility participates selected good or very good). For other data, such as asset condition and performance as well as replacement costs and value, the percentage of respondents who select "good" or "very good" declines. Also noteworthy is that there is no significant difference between utilities that provide water only services, water and wastewater services, or wastewater only services, related to the quality of data in these areas, indicating this is an industry-wide challenge.

However, this still leaves nearly half of respondents who reported their data as being average, poor or very poor. This is an important area for improvement, as without good quality data, utility leaders will be hard-pressed to plan, prioritize and justify capital programs and improvements.

RISK MANAGEMENT

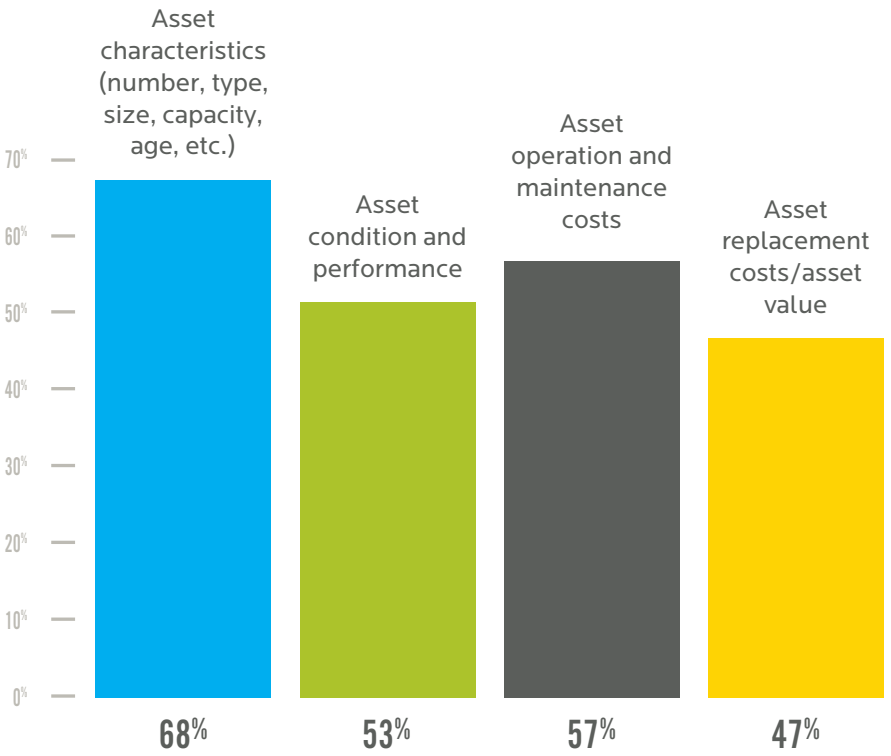
Risk management is a key component of effective asset management and can be described as achieving the optimal balance between cost, risk and performance (or levels of service). Again, data is the essential ingredient for managing and improving utility operations in this area.

Survey participants were asked how risk was managed within their utility. Responses to this question indicate the majority of respondents use risk management for some asset groups or the majority of their assets (Figure 21 on page 31). Most of the utilities that stated that risk assessment processes were in place for the majority of assets also answered "Yes - for the majority of the assets" to the other three questions on risk management.

Another valuable set of data for utilities is level of service indicators. Industry best practice calls for levels of service indicators to be based on stakeholder requirements in order to be most effective and meaningful. Examples of levels of service indicators include water quality compliance, number of main breaks per 100 miles, number of sanitary sewer overflows per 100 miles and wastewater treatment compliance. Service levels should be key drivers in asset management planning. With sufficient data and good models, impacts on levels of service can be analyzed for different investment scenarios.

THERE IS A TREMENDOUS DISPARITY AMONG UTILITIES SERVING SMALLER POPULATIONS VERSUS LARGER UTILITIES WHEN IT COMES TO IMPLEMENTATION OF ASSET MANAGEMENT PROGRAMS ... SIZE IS NOT A BARRIER TO DEVELOPMENT OF ASSET MANAGEMENT PROGRAMS AND EFFECTIVE MEASURES OF SERVICE.

FIGURE 20
QUALITY OF DATA ON UTILITY ASSETS RATED "GOOD" OR "VERY GOOD"



Source: Black & Veatch
Survey participants were asked to describe the quality of their information on the assets their utility owns and operates. The chart above provides total percentage of respondents who ranked data as "good" or "very good" for each area.

Survey participants were also asked how their organizations use levels of service indicators to measure service provided to customers and to inform their asset management planning. The results show that the majority (84 percent) of utilities monitor levels of service provided to customers. However, only 30 percent of respondents said that their levels of service indicators were influenced by stakeholder requirements (Figure 22 on page 32).

The following provides additional survey data related to level of service indicators:

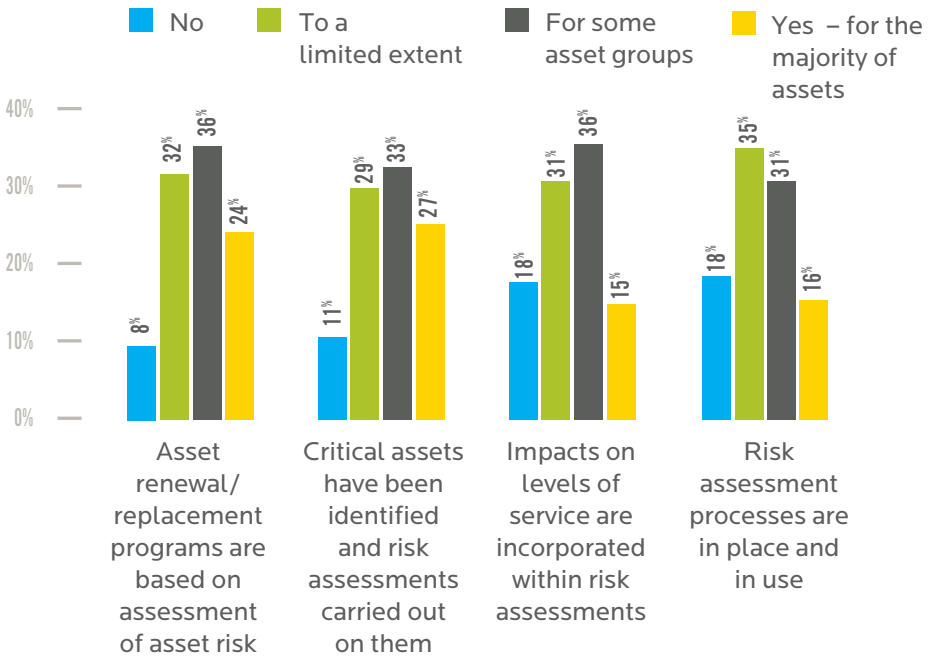
- Nearly half (49 percent) of respondents are incorporating levels of service in their asset management planning.
- A higher proportion of water-only utilities (57 percent) use levels of service in planning as compared with water and wastewater (49 percent) and wastewater-only utilities (47 percent).
- 38 percent of utilities serving a population of less than 50,000 do not use levels of service indicators. This is a significant difference when compared with utilities serving larger populations

CHALLENGES AND CONCLUSION

With nearly half of all survey participants indicating they have no assessment or asset management programs ongoing or in place, we now look at the challenges of implementing this essential tool for utility organizations. Survey participants were asked to identify the main challenge for implementing an asset management program at their utility and results of this question are highlighted in Figure 23 on page 33.

The majority of respondents identified developing the required systems and processes needed to improve asset

FIGURE 21
STATUS OF ASSET RISK MANAGEMENT PROGRAMS



Source: Black & Veatch
Survey respondents were asked to select the appropriate response for each of the above statements related to how asset risk is managed at their utility.

management as their main challenge. This appears to be more of a challenge for medium-sized utilities (100-499 employees), where 73 percent selected this answer. By comparison, 50 percent of small utilities (less than 100 employees) and 55 percent of large utilities (more than 500 employees) selected this response. The responses to this question came from a broad range of utilities that were at various stages of their asset management programs and therefore there was no bias, either from utilities that had not yet started their program or those that were already at an advanced stage of implementation.

There was no correlation between those utilities that selected lack of asset data as their main challenge and those that reported their asset data as being poor. In fact, a number reported their data was good or very good. This leads us to conclude that utilities do not have uniform coverage or quality of data across their complete asset stock and that data improvement is still a key challenge. In order to get the most out of their asset management programs, utilities need to be able to perform sophisticated analysis on the asset data, so its quality and quantity are important factors that require careful consideration and investment in long-term improvement plans.

Overall, the picture is one of a utility sector that is beginning to rise to the challenge of implementing asset management programs. The majority (68 percent) of respondents have started an asset management improvement program in some form. Decisions are being made based on asset data that is generally of good quality, with nearly half of utilities now basing their asset management decisions around levels of service.

Smaller utilities that serve populations less than 50,000 are lagging in this area, with nearly two-thirds having not conducted or planned an assessment or asset management program.

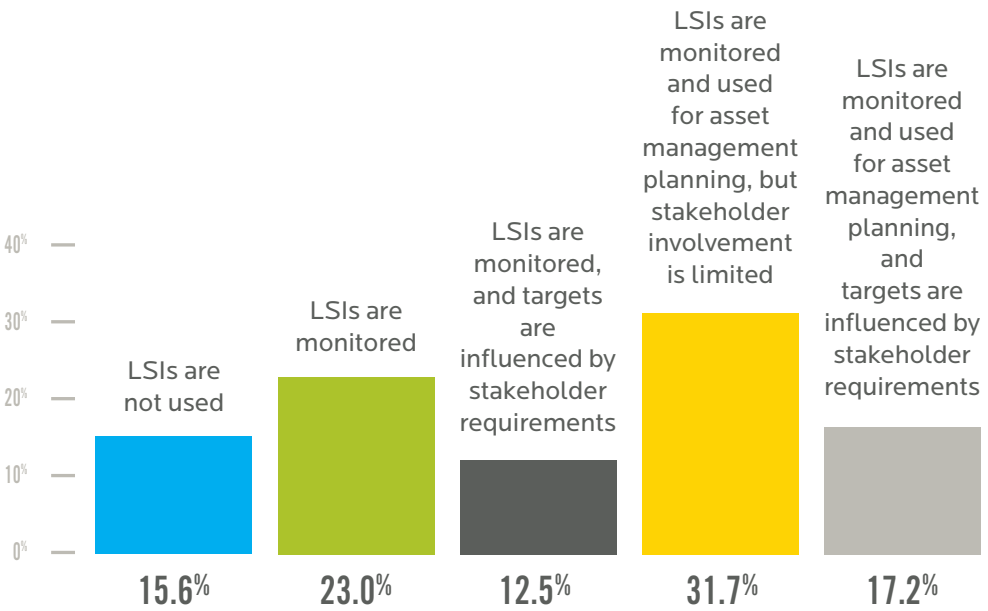
The biggest single challenge for implementing asset management programs appears to be the development and application of the necessary systems and process improvements needed to embed asset management into day-to-day business and operational tasks.

Risk-based planning approaches are starting to be applied and levels of service are starting to be used to prioritize investment, although there is still room for improvement. Just over half of survey respondents (53 percent) have no, or limited, risk assessment processes in place. As noted within the Financial section, utilities accessing capital through traditional bonds and other financing mechanisms will likely be subject to more stringent requirements related to risk management and asset management.

As the U.S. water industry works to overcome major issues associated with aging infrastructure and fiscal constraints, asset management provides a comprehensive solution for reducing costs and improving services. Proven methodologies used across the UK and Australia have already yielded tremendous results that can be replicated in U.S. utilities.

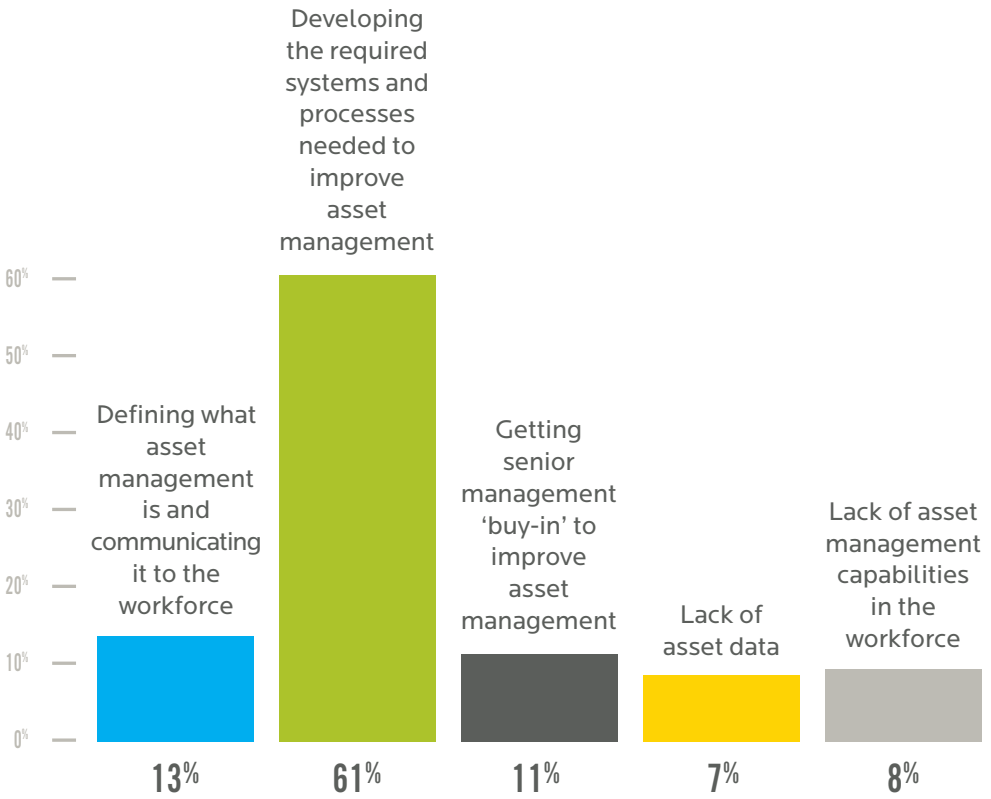
Good ideas work regardless of region or geography, and proven methodologies remove guess work and provide assurance of success. Asset management frameworks are proven to reduce capital and operational costs while improving performance. In fact, the Institute of Asset Management (IAM) has stated, "Good asset management is not about spending more—it's about spending more wisely. Life-cycle planning and management has been shown to reduce the overall cost of asset ownership by around 30 percent, and sometimes much more."

FIGURE 22
USE OF LEVELS OF SERVICE INDICATORS (LSI) TO MEASURE SERVICE



Source: Black & Veatch
Survey participants were asked how they use levels of service indicators to measure service to customers and to inform asset management planning.

FIGURE 23
CHALLENGES TO IMPLEMENTING ASSET MANAGEMENT FRAMEWORKS



Source: Black & Veatch
Survey participants were asked to choose which of the above items best represents the main challenges for improving asset management in their organization.

"GOOD ASSET MANAGEMENT IS NOT ABOUT SPENDING MORE—IT'S ABOUT SPENDING MORE WISELY. LIFE-CYCLE PLANNING AND MANAGEMENT HAS BEEN SHOWN TO REDUCE THE OVERALL COST OF ASSET OWNERSHIP BY AROUND 30 PERCENT, AND SOMETIMES MUCH MORE."

– INSTITUTE OF ASSET MANAGEMENT

A PATH FORWARD

BY **JOHN CHEVRETTE**

In the wake of the Great Recession many municipalities are managing their finances in a fashion similar to U.S. households in the pre-crisis days. Rather than focusing on strategic, long-term investments, municipalities are operating essentially paycheck-to-paycheck on a year-in and year-out cash budget. In response to falling property and sales tax revenues, municipalities are putting off essential items in order to pay for past spending, and just as it impacts individuals, this behavior ultimately affects the long-term financial health and livability of a community.

Unlike consumers, however, municipalities don't have the option of simply cutting back or going to discount stores and big-box retailers to help save on essential needs. Fixed costs, such as labor, pension obligations and infrastructure maintenance are heavy burdens on municipal finances that lag the overall economic recovery. As a result, cities are forced to make hard decisions related to spending in other areas, such as fire and police department budgets, parks and other essential services that make cities safe and desirable places to live.

The result of this cycle is to kick the proverbial can of capital improvements and maintenance of critical infrastructure down the road to the next year, and the year after that, for as far as the cycle and the condition of the assets will allow. Breaking the cycle requires a significant change in how utilities develop and implement strategic and capital plans. New and innovative thinking is required when it comes to rates, funding mechanisms, and the prioritization and implementation of capital. But, one lesson should be clear in the minds of all involved in the decision making process—it costs significantly less to maintain and enhance an existing system than it does to build or replace one.

MUNICIPALITIES DON'T HAVE THE OPTION OF SIMPLY CUTTING BACK ... TO HELP SAVE ON ESSENTIAL NEEDS. FIXED COSTS, SUCH AS LABOR, PENSION OBLIGATIONS AND INFRASTRUCTURE MAINTENANCE ARE HEAVY BURDENS ON MUNICIPAL FINANCES THAT LAG THE OVERALL ECONOMIC RECOVERY.

Moving ahead, the water industry needs to look at the rate structure and adjust how rates are determined to encourage utilities to promote conservation without creating additional financial hardship for municipalities. In source-rich, capital-intensive systems, conservation efforts and consumption-based revenue can be at loggerheads as decreased consumption denies providers of much needed funds. The deployment of new smart infrastructure technologies can help increase overall system efficiency and provide the critical data streams that would allow new approaches to pricing.

Further, consumers must come to the harsh reality and understand that water is not free. Consumers rely on the critical infrastructure services provided by municipalities to obtain and dispose of this precious resource. Water is a critical element of goods and services, and the systems must be paid for in an equitable and responsible manner. While many other goods and services—perhaps a latte at the local coffee shop or the latest electronic device—have immediate "can't live without" appeal, without water, that won't be an issue.

In addition to the new responsibilities of water utilities and consumers, municipal government leaders, namely city councils, mayors and city managers, must understand the fiscal realities of the post-financial crisis era. City leaders must look at all avenues for funding critical infrastructure improvements, including increased involvement with the private sector through public-private partnerships. Rather than focus on the issue of "who controls what," we must broaden the conversation to focus on the long-term benefits to the residents, ratepayers and the environment. Political will and courage must be drawn up in order to do what is right for the long term.

The good news associated with increasing rates and spending on critical water and wastewater infrastructure is the profound economic benefits this investment provides at a local, regional and national level. In 2009, the Clean Water Council published its report "Sudden Impact" that states, "Investment in water and wastewater infrastructure has immediate, substantial and far-reaching effects on the economy. At the national level, an investment of $1 billion almost triples in size as total demand for goods and services reaches an estimated $2.87 to $3.46 billion."

Investments at the local level supports construction and engineering jobs, promotes sales among local business for goods and services, and can act as a general jump start for struggling local economies. The need is there and so too are the opportunities to tap into a new water future.

ONE LESSON SHOULD BE CLEAR IN THE MINDS OF ALL INVOLVED IN THE DECISION MAKING PROCESS—IT COSTS SIGNIFICANTLY LESS TO MAINTAIN AND ENHANCE AN EXISTING SYSTEM THAN IT DOES TO BUILD OR REPLACE ONE.

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Table of Contents

Brent Reuss, P.E.

Brent is Vice President in the Charlotte office. He has extensive experience serving as project manager, project engineer, and resident engineer for the design and construction of both water and wastewater treatment plant and pipeline projects, including water quality sampling, modeling, and permitting.

PROJECT EXPERIENCE

Cape Fear Public Utility Authority | Raw Water Transmission Main Assessment and System Master Planning; Wilmington, NC

Principal-in-Charge. Conducting both a physical condition assessment and a hydraulic assessment of the raw water transmission mains connecting the CFPUA's raw water intake/pumping station and the Sweeney WTP. The aging raw water transmission system consists of 21.5 miles of 30-inch concrete cylinder piping, 2 miles of twin 24-inch cast iron piping, and 0.5 mile of twin 48-inch concrete cylinder piping. Also conducting a raw water system master plan of the Authority's overall supply system. Alternative facility layouts for new and/or expanded intakes, pumping stations, and transmission main systems are being developed and evaluated as capacity expansion options for the Authority's Kings Bluff supply. These alternatives are being evaluated in conjunction with alternatives for purchasing additional and future raw water from the Lower Cape Fear Water & Sewer Authority.

Charlotte-Mecklenburg Utilities | Water Distribution System Master Plan; Charlotte, NC

Principal-in-Charge. Study services to complete a comprehensive water distribution system Master Plan for the Charlotte-Mecklenburg Utilities distribution system. Project includes water demand projections, establishment of system performance and level of service criteria based on regulatory and industry standards, installation of flow monitoring at all system pumping station, extensive field testing (insitu pump testing, c-factor testing, hydrant flow testing and system demand testing), hydraulic model development and calibration of an existing InfoWater model and development of a detailed capital improvements program for three planning periods spanning 25 years.

Town of Mooresville | Water and Wastewater Master Plan Update; Mooresville, NC

Principal-in-Charge. Study services to complete a comprehensive water and wastewater system master plan for the Town of Mooresville. Project includes the development of a comprehensive sewer system model for all pipes 12" and larger using InfoWorks CS, development of a water distribution system model using MWHSoft Infowater, development of water and wastewater demand projections, system inventory updates, flow monitoring, model calibration, evaluation of existing sewer and water distribution systems and development of a detailed capital improvement plan for three future planning periods.

PROJECT DIRECTOR

Office Location
Charlotte, NC

Education
- MS, Civil Engineering, University of Missouri-Columbia, 1986
- BS, Civil Engineering, Bradley University, 1980

Professional Registration
PE - 1993, NC, 19518
PE - 1995, SC, 16511
PE - 1993, IL, 062-045937
PE - 1985, MO, E-21316
PE - 1995, VA, 026345

Professional Associations
- American Water Works Association
- Water Environmental Federation

Year Career Started
1980

Year Started with B&V
1980

Spartanburg Water System | Booster Pumping Station; Spartanburg, SC

Project Manager. Responsible for management and design of a 44-mgd in line booster pumping station. Two 22-mgd vertical turbine pumping units were installed in a new metal building pumping station. The design included two 42- by 36-inch taps, metering, and connection to the systems existing SCADA system.

City of Roanoke | Sewer TV Inspection and Condition Assessment; Roanoke, VA

Project Manager. Responsible for management of TV inspection and condition assessment of the existing 36- to 54-inch Roanoke River Interceptor. After the new sewer was placed into operation and most of the flow diverted from the existing sewer to the new sewer, detailed investigation and cleaning of the existing sewer was completed to determine its condition and estimate the cost to rehabilitate the sewer, and recommendations were summarized in a report.

Charlotte-Mecklenburg Utilities | McDowell Creek Drainage Basin Study; Charlotte, NC

Project Manager. This study includes evaluation of current and future land use plans in the McDowell Creek Basin, wastewater flow projections based on future land use scenarios, wastewater management options for projected flow, water quality modeling of the cove where McDowell Creek discharges into Mountain Island Lake, and a public information program to establish a stakeholders group to have input into the land use and wastewater management options considered. The water quality modeling will evaluate the impact of the land use scenarios on water quality in the cove and lake in the area of the cove. To develop this model, modeling of the watershed and McDowell Creek will also be included.

Charlotte-Mecklenburg Utilities | Mallard Creek WRF Reuse Project Pipeline; Charlotte, NC

Project Manager. Responsible for preliminary design, detailed design, and construction management services. Project included design and installation of a pumping station, sodium hypochlorite feed system, SCADA system, and approximately 29,000 feet of 16- and 24-inch pipeline to provide treated wastewater from the Mallard Creek WRF to the new Traditions Golf Course. Responsible for all aspects of permit and encroachment acquisition, preliminary design, environmental assessment, design, bidding of multiple contracts, coordination of multiple contractors, inspection, construction administration, state certification of the facilities, and all other associated tasks.

Rafael E. Frías III, P.E.

Mr. Frias serves as a Senior Project Manager and Client Director with the global water business of Black & Veatch Corporation and is responsible for the management of the Company's operations in Southeast Florida and Puerto Rico. Rafael specializes in the management of water resources projects, including water supply, water treatment, hydropower and stormwater planning and design. Mr. Frias is also experienced in incorporating sustainability principles into project designs and in the development of sustainable water planning technologies for the management of watersheds and ecosystems, water scarcity and wet-weather conditions. Rafael is an active member of the numerous professional associations for which he as published papers and delivered presentations on comprehensive water resources issues, including sustainable water planning, surface water management, water treatment technologies, aquifer storage and recovery (ASR) and small hydropower.

Some of Mr. Frias' key recent assignments and experience include:

- Project management for dam failure studies in Puerto Rico.
- Program Management/Construction Management for implementation of a $455 million Capital Improvement Program in Puerto Rico.
- Experience using of surface water and groundwater modeling applications including HEC-1, HEC-HMS, HEC-GeoHMS, HEC-RAS, HEC-GeoRAS, XP-SWMM, ICPR, TR-55, EPANET, Processing MODFLOW, PLUMES, ArcGIS and project scheduling applications, including Primavera P3e/c and Microsoft Office Project.

PROJECT EXPERIENCE

PRASA | Program Management/Construction Management Services; Puerto Rico

Program Manager/Client Service Manager. Currently assisting with the management of Black & Veatch's Program Management Consortium (PMC) for the Puerto Rico Aqueduct and Sewer Authority (PRASA) South Region. The main task of the PMC is to implement PRASA's five-year $455 million Capital Improvement Program (CIP) to improve the reliability of water and wastewater services; replace, expand or rehabilitate treatment facilities (either for compliance issues, changes in regulatory requirements or as a result of deterioration); and create value and sustainability in the water and wastewater systems of Puerto Rico. Responsible for the project management of planning projects, including evaluation and optimization of water supply systems, assessment of water and wastewater collection systems (pipeline conditions assessments), value engineering for the Rio Valenciano Dam Project, and implementation of renewable energy projects. In addition, responsible for client management and business development activities.

PROJECT MANAGER

Office Location
Sunrise, FL

Education
- Master of Civil Engineering, University of Kansas, December 2002
- BS, Biological Engineering, Louisiana State University, December 1997

Professional Registration
PE – 2004, FL, 61912
PE – 2011, PR, 24726
PE – 2003, KS, 17469

Specialization Certification and Awards:
- Designing for Effective Sediment and Erosion Control
- 10-hour OSHA Safety and Health Construction Certification
- AWRA A. Ivan Johnson Outstanding Young Professional Award – 2006
- Public Works Magazine 2007 Trendsetters List
- Member of the Board of Directors for AWRA – 2010
- Member of the Potable Reuse Committee for the WateReuse Association – Florida

Professional Associations
- American Water Resources Association
- Water Environmental Federation
- American Water Works Association
- WateReuse – Florida

Year Career Started
1997

Year Started with B&V
1999

Hillsborough County | South/Central Wastewater Service Area Wastewater Master Plan Update Report; Tampa, FL

Engineering Manager. Managed support services for the production of the South/Central Service Area Wastewater Master Plan Update Report for Hillsborough County. The updated report evaluates different configuration alternatives for a wastewater and reclaimed water system. Support services included technical and editorial review, quality control, cost evaluation and development of GIS schematics for each evaluated alternative.

South Florida Water Management District | L-63N Canal ASR System Reactivation for the Lower Plan; West Palm Beach, FL

Project Manager. Managed the Bench-scale and pilot-scale testing efforts for the L-63N Canal Aquifer Storage and Recovery (ASR) Reactivation project, as part of the Lake Okeechobee and Estuary Recovery (LOER) Plan developed by the South Florida Water Management District (SFWMD) and other state agencies. The objective of the project is to implement a 5 mgd water treatment system, expandable to 10 mgd, at the Taylor Creek/Nubbin Slough ASR site. The new system would use a combination of filtration and disinfection to meet primary drinking water standards, prior to storage. Bench-scale and pilot-scale testing was recommended to determine the best filter and disinfectant for reducing total coliforms to less than 4 cfu/100 mL and resulting in the absence of fecal coliforms. The testing project included a combination of the Gunderboom Marine Life Exclusion System (MLES) for filtration and ozone, UV, peracetic acid/UV, chlorine, and chlorine dioxide for disinfection.

Tampa Bay Water | Continued SWFWMD ERP Permitting Services – Inspection of Stormwater Treatment Facilities; Tampa, FL

Engineering Manager. Managed the completion of numerous inspections for all of Tampa Bay Water's stormwater treatment facilities to assure compliance with SWFWMD ERP requirements. The stormwater inspections involved qualitative evaluations of the facilities to assure proper operation and maintenance, based on specific permit requirements. Statements of Inspections for Proper Operation and Maintenance were submitted to the District for all facilities, together with detailed inspection reports, and all statements received District approval. Final deliverable to Tampa Bay Water included an inspection log identifying all stormwater facilities requiring inspection and the suggested time frame for the inspection to assist with proactive inspections of all facilities in the future.

PRASA | Optimization of the Lajas Valley Irrigation System; Puerto Rico

Engineering Manager. Managed the development of a Water Balance Model (WBM) for the optimization of the Lajas Valley Irrigation System (LVIS), located in the southwestern part of Puerto Rico. The LVIS includes 5 reservoirs, with a total drainage area of 65 square miles, located in 3 different watersheds and interconnected through a series of tunnels, totaling approximately 13 miles in length. Black & Veatch's WBM was used to estimate the yield of the LVIS and optimize its operations, while evaluating the impacts on streamflows, reservoir

levels and hydropower generation. A graphical user interface (GUI) was also developed as part of the model to make it more user-friendly. Numerous scenarios were analyzed for engineering feasibility and conceptual cost estimates for different alternatives were developed. A cost/benefit analysis, including the cost per acre-foot of additional storage, was performed for each alternative and the most cost-effective alternative was identified.

City of Lakeland | English Oaks Wastewater Booster Pump Station Project; Lakeland, FL

Engineering Manager. Managed the stormwater modeling, site grading and drainage facilities design, and ERP permitting efforts for the Drane Field and Air Park facilities. A Standard General ERP was completed for the Drane Field facility and a Noticed General ERP for the Air Park facility. Hydrologic and hydraulics calculations were performed for the Drane Field facility in ICPR. A wet detention system was designed to treat the stormwater runoff that would result from the site and attenuate the peak runoff flow, based on SWFWMD ERP requirements.

City of Ocala | Lake Tuscawilla and Old City Yard Watersheds Flood Analysis; Ocala, FL

Engineering Manager. Managed the evaluation of stormwater drainage systems modeled by the Federal Emergency Management Agency (FEMA) for the Flood Insurance Study (FIS) of Marion County, Florida, to compare with data modeled by the City of Ocala for the Lake Tuscawilla and Old City Yard watersheds. By using the previous XP-SWMM models developed for the City watersheds, project results showed that the additional drainage system details provided in the City models allow for lower BFEs, which may be used to update the FEMA FIRMs for the City.

City of Ocala | Consumptive Use Permit (CUP); Ocala, FL

Project Engineer. Assisted the City of Ocala with a response to a Request for Additional Information (RAI) from St. Johns River Water Management District (SJRWMD), regarding the City's application for renewal of its CUP. Processing MODFLOW and DRAWDOWN, a localized groundwater model, are being used to model aquifer drawdown and analyze the impacts to wetlands, springs, surface water bodies, and interference to existing legal users in the vicinity of the City's wellfields for projected groundwater withdrawals over the next 20 years. ArcView GIS is being used to develop drawdown contours for the Surficial and Upper Floridan Aquifer (UFA) to present impact results.

South Florida Water Management District | Everglades Agricultural Area (EAA) Reservoir A-1, Seepage and Borrow Canal Excavation; West Palm Beach, FL

Project Engineer. Assisted in the preparation of design drawings for the construction of a seepage collection canal and borrow canal. The seepage collection canal would control the seepage from the Everglades Agricultural

Area (EAA) Reservoir A-1 by collecting the flows that result at variable depths. The borrow canal would collect the low water within the reservoir. The soil volume excavated for the construction of the canals would be separated into 3 types of fill materials (rock fill, random fill, and raked random fill) and used for the construction of the 21-mile long reservoir embankment. The construction package included design drawings, specifications, schedule, and opinion of probable cost for the construction of both canals.

City of Ocala | Old City Yard Drainage Study and Detention Basins Design; Ocala, FL

Project Engineer. The Old City Yard watershed has a drainage area of approximately 150 acres. The project involves the completion of a drainage study that involves hydrologic and hydraulic modeling with XP-SWMM to determine the amount of runoff resulting from various rainfall events, including the 25-year 96-hour and 100-year 24-hour storms. The model will also be used to analyze and design improvements to the existing Old City Yard drainage retention area to increase its water quality and quantity storage volume. ArcView GIS is being used to determine specific hydrologic and hydraulic parameters and expedite the development of the model. This project is part of a Stormwater Master Plan that includes the Lake Tuscawilla, Thompson's Bowl, and Old City Yard watersheds, which Black & Veatch is developing for the City of Ocala as part of the City's Downtown Redevelopment Plan.

South Florida Waters Management District | Everglades Agricultural Area Reservoir A-1, Water Balance Model; West Palm Beach, FL

Project Engineer. As part of the design of the Everglades Agricultural Area (EAA) Reservoir A-1, a Water Balance Model (WBM) was developed to analyze and optimize the storage capacity and operations of the reservoir on a daily basis (time step), while evaluating the impacts on flows in the North New River Canal, Miami Canal, Holeyland Distribution Canal, and the STA 3/4 Supply Canal. The WBM was also used to evaluate pumping facility locations and the distribution of releases from the reservoir for agricultural irrigation and environmental purposes. To make the model more user-friendly, a graphical user interface (GUI) was created to allow the input of reservoir characteristics and display results. The model has the capabilities of evaluating numerous water balance scenarios, providing instant results, and optimizing water supply operations. The Water Balance Model was designed by Black & Veatch and may be tailored to other water balance projects.

Robert Chambers

Mr. Chambers is a Manager with extensive utility and consulting experience involving a variety of projects associated with electric, water and wastewater, both public and private, throughout the southeastern United States. His utility knowledge covers a wide range of utility finance issues, including capital financing analyses, valuation studies for acquisitions, revenue bonds, utility rates, utility regulatory processes, economic feasibility studies and cost-of-service studies.

In addition, Mr. Chambers has developed dynamic and interactive financial models for utility cost-of-service studies, rate studies, financial benchmarking, data retrieval and analysis, feasibility analyses, system expansion programs, capital acquisition alternatives, wholesale capacity transactions and utility regionalization scenarios. Mr. Chambers has spoken at national utility programs such as AWWA – Utility Management and the Southwest Florida Government Financial Officers Association conferences on topics such as demand management, program development, and financial planning, and he has earned a Masters of Business Administration with a concentration in Finance.

CLIENT SERVICE ADVOCATE

Office Location
Orlando, FL

Education
- B.S., Finance University of Central Florida, 2002
- B.A., Finance University of Central Florida, 2002
- M.B.A., Crummer Graduate School of Business, Rollins College, 2007

Year Career Started
2001

Year Started with B&V
2010

PROJECT EXPERIENCE

City of Key West, FL | Wastewater & Stormwater Utility Rate & Feasibility Analysis

Black & Veatch has been providing financial consulting services to the City of Key West as the City endeavors to complete over $50 million in wastewater construction projects required to enhance environmental protection in the Florida Keys. The City, which operates a wastewater collection and treatment system as well as a stormwater system, is responding to requirements of the Florida Department of Environmental Protection, as well as the desires of the citizenry. The construction program has been supported by the acquisition of Federal and State grant funds, and is being completed using retained revenues of the wastewater and stormwater enterprise funds. Black & Veatch has conducted annual rate study updates for the City's wastewater and stormwater system since the inception of the wastewater construction project. Mr. Chambers has served as the project manager for these engagements.

Broward County, FL | Water & Wastewater Rate Structure Review

Over the last fifty years, the South Florida region has experienced a total of nine periods of significant water scarcity. These drought conditions emanated from monthly rainfall deficits and a decline in water storage volumes which prompted the Water Management Authorities to issue drought management mandates.

As a result of the most recent drought condition (2007 – 2010 ongoing), the Water and Wastewater services of Broward County ("the County") has experienced significant reduction in total treated water which created difficulty in forecasting projected revenues. The County required water and sewer rate

structure review that simulated the County's revenue generation ability based on specific environmental, market, and regulatory conditions. Mr. Chambers lead the project team that performed an independent review of the assumptions and philosophical drivers that were taken into consideration prior to developing the County's existing rates and developed specific simulations of water and wastewater revenues utilizing price elasticity coefficients, simulating the impact of the South Florida Water Management District phased drought conditions, incorporated specific customer water usage characteristics in the South Florida region, whilst maintaining the original rate setting principles of revenue stability and water conservation during the process of simulating specific events.

Miami-Dade Water and Sewer Department | Common Cost Allocation Study; Miami-Dade County, FL

Miami-Dade Water and Sewer Department required a common cost allocation assessment to assess their common cost allocation procedures related to regional and local water and wastewater functions. The cost allocation assessment was performed utilizing the principles established in the Federal Office of Management and Budget Circular A-87, which established a dedicated procedure that governmental agencies must follow in calculating the direct and indirect cost that may be included for grant applications and other federally funded projects. Mr. Chambers served as the project manager on the project team that completed the assessment.

City of Venice, FL | Water & Wastewater Rate Study

The City of Venice required a comprehensive financial and rate analysis to determine its ability to meet the annual utility system obligations. The project team, in association with the appropriate city staff, developed a financial forecast for the period FY 2010 through FY 2014, which was designated as the forecast period. The financial forecast provided the city with the ability to understand the financial responsibilities, address and mitigate potential revenue requirement needs, determine a plan to fund annual renewal and replacement needs, and establish the revenue needs of the utility system over the forecast period.

In addition, the project team performed a cost service analysis, designed new water and sewer, and reviewed all the utility system rates charged by the City of Venice. Mr. Chambers served as the Project Manager of this engagement. At the completion of the analysis, Mr. Chambers presented the final results of the entire study to the appropriate City staff, the City Council, and other stakeholders as directed by the City. The project team was successful in retaining approval of the financial forecast and rate design from the City Council.

Mark E. Martin, P.E.

Mr. Martin has experience in a wide variety of projects, including water and wastewater treatment plants, pumping stations, and pipelines. His involvement in these projects has included feasibility studies, facility design and construction services. His position as an Engineering Manager has led to his involvement in many large treatment plant design projects with the task of managing multiple engineering design staff members.

UTILITY ENGINEERING TASK LEADER

Office Location
Tampa, FL

Education
- BS, Civil Engineering, Michigan Technological University, 1987

Professional Registration
PE – 1992, MI, 038222
PE – 2007, FL, 67272

Specialization Certification
OSHA Construction Safety & Health Course

Professional Associations
- American Water Works Association
- Water Environment Federation

Year Career Started
1987

Year Started with B&V
1987

PROJECT EXPERIENCE

City of Fort Myers | Wastewater Permit Renewal; Fort Myers, FL

Project Manager. Responsible for preparation of applications and documents to support the City in the renewal of the FDEP wastewater pemits for the 11 mgd Central AWWTP and the 12 mgd South AWWTP. Documents prepared included the permit applications, a capacity analysis report for the Central AWWTP and Operation & Maintenance Performance Reports for both facilities.

City of Fort Myers | Odor Control Improvements; Fort Myers, FL

Engineering Manager. Responsible for study of odors and design of odor control improvements at the 12 mgd South AWWTP and 11 mgd Central AWWTP. Odor control improvements at the South AWWTP include a bio-trickling filter, carbon scrubber, replacement of blowers and duct work and repairs to the headworks facility. Improvements at the Central AWWTP include replacement of the carbon media in the existing carbon scrubber. Final design of all facilities is currently ongoing.

City of Cape Coral | Reclaimed Water Transmission Main, Caloosahatchee River Crossing; Cape Coral, FL

Project Manager. Overall responsibility for feasibility study report to construct a reclaimed water transmission main, beneath the Caloosahatchee River, to provide reclaimed water to the City of Cape Coral from the City of Fort Myers South AWWTP. The feasibility study report included an evaluation of potential pipeline routes, pipeline construction methods, connection options to the existing reclaimed water system, an environmental assessment, a geotechnical investigation program and a review of applicable codes and permits.

City of Toronto | Ashbridges Bay Treatment Plant, M&T Pump Station Upgrades; Toronto, ON

Engineering Manager. Responsible for preliminary design tasks which include the inspection and condition assessment of gate valves, sluice gates, and conduits at the 818 MLD (216 mgd) M&T raw wastewater pump station. The condition of the gates and conduits will be used to set-up and calibrate the hydraulic model. Responsible for conceptual design of the proposed 519 MLD (137 mgd) wet weather flow pump station.

City of Cape Coral | Legislative Funding Services; Cape Coral, FL

Project Manager. Overall responsibility for development of legislative funding packages and typical package support letters for the North 1-8 Water First project and the Freshwater Storage project. These packages were prepared to help the City secure both Economic Stimulus funding and/or direct Congressional Earmark funding from the first session and second session of the 111th Congress. The North 1-8 Water First project is a $200M drinking water distribution system that provides potable water to 58,000 pre-platted parcels that have legal rights to wells and septic tanks. The Freshwater Storage project includes $8M in weir improvements for the City canal system to store 1 billion gallons/year of freshwater that is currently being lost to the Gulf of Mexico.

City of Kannapolis | Finished Water Pumps; Kannapolis, NC

Engineering Manager. Responsible for design documents for installation of 2 finished water pumps and piping improvements in the high service pumping station at the 13.15 mgd Kannapolis WTP.

Tampa Bay Water | Regional Facilities Site Repump Station; Brandon, FL

Project Engineer. Responsible for design of improvements at the repump station for the 66 mgd Regional Facilities Site. Improvements included piping and valve modifications to convert the repump station to a booster station to supply 66 mgd and greater flows from the C.W. Bill Young Regional Reservoir under a greater range of conditions.

Tampa Bay Water | Morris Bridge Water Treatment Plant; Tampa, FL

Project Engineer. Responsible for design of yard piping improvements at the Morris Bridge Water Treatment Plant. The yard piping improvements provided a bypass of the water treatment process and directly connected the plant influent pipe to the finished water pipe at the storage reservoirs.

Tampa Bay Water | Cypress Creek Water Treatment Plant; Pasco County, FL

Project Engineer. Responsible for design of upgrades to six pump assemblies at the existing high service pump station at the Cypress Creek Water Treatment Plant. Pump system upgrades included replacement of the suction butterfly valve, discharge butterfly valve, discharge check valve and discharge modulating ball valve.

Town of Mooresville | Presbyterian Road Pump Station, Bar Screen and Odor Control Modifications; Mooresville, NC

Engineering Manager. Responsible for design and preparation of construction documents for modifications to the 12.5 mgd Presbyterian Road Pump Station. Modifications include the addition of a mechanically cleaned bar screen in the splitter box and the addition of an odor control system for the splitter box and pump station wet well.

Alejandro Toro, P.E.

Mr. Toro is a Professional Engineer with extensive experience in the contract management, planning, design, construction management, and operation of water and wastewater infrastructure systems. Mr. Toro has managed projects in the United States, Mexico, Central America, and South America. He serves as project director for Black & Veatch's Miami office, serves a client principal, and provides scope development, technical direction, scheduling, and contract management for projects. Responsible for resource management and staff development and, oversees quality control and technical and financial reviews of projects.

PROJECT EXPERIENCE

South Florida Water Management District | General Engineering Services; West Palm Beach, FL

Principal. Provided water resources and environmental engineering services to the District ranging from studies and planning through full construction/ construction management and commissioning of facilities.

South Florida Water Management District | Northern Everglades and Estuary Restoration Project; West Palm Beach, FL

Principal. Two studies to assist the South Florida Water Management District with the Northern Everglades and Estuary Restoration Project. These two studies involve looking at alternative water storage that will help restore the ecological health of Lake Okeechobee and adjoining estuaries. One study involves data collection, hydraulic modeling, and development of alternatives for storing water on Nicodemus Slough. The second study involves evaluation of alternatives that will result in the appropriate restoration measures for the hydrology of Lakes Hicpochee, Bonnet and Flirt as nearly as possible to their condition prior to the construction of the C-43 canal,

South Florida Water Management District | Big Cypress Basin Watershed; Collier County, FL

Principal-in-Charge. Reconnaissance and Environmental Assessment of conditions as part of an on-call services contract and a larger effort to restore Florida's ecosystems, most notably the Everglades.

Miami-Dade County, FL | Program Management

Director. Four year program management for a 500-site infrastructure repair and rehabilitation project. Responsible for coordinating the efforts of designers, surveyors, and geotechnical consultants. Directed a 3 year construction management program to implement the repair and rehabilitation projects. Managed all the contractors' activities, schedules, payments, project completion, acceptance inspections, and final closing of the construction contracts.

ENVIRONMENTAL ENGINEERING TASK LEADER

Office Location
Miami, FL

Education
- M.S., Environmental Engineering, Northeastern University, 1992
- B.S., Civil Engineering, Northeastern University, 1984

Professional Registration
PE – 2002, FL, 59176
PE – 1990, MA, 35587
PE – 1990, ME, 6780
PE – 1990, VT, 5805

Professional Associations
- Inter-American Association of Sanitary Engineering and Environmental Sciences
- American Water Works Association
- Water Environment Federation

Year Career Started
1985

Year Started with B&V
2008

Puerto Rico Aqueduct and Sewer Authority; Puerto Rico

Deputy Technical Director. Management and contract operation of the water and wastewater systems operated by the Puerto Rico Aqueduct and Sewer Authority. Managed the resolution of technical and compliance issues for 130 water filtration plants, 400 drinking water wells, 70 wastewater treatment facilities, and more than 1,000 pumping stations. Coordinated the interaction of the engineering and operations divisions, conducted preliminary evaluations of the impact of future regulations on existing infrastructure, identified necessary capital improvements, and coordinated the technical review of all design projects. Assisted in the identification and preparation of the priority list of projects candidates for federal funding and managed the development of budgets for projects to be conducted under a special projects program.

- Negotiated among PRASA, the U.S. Environmental Protection Agency (USEPA), and the United States Department of Justice (USDOJ) concerning compliance with federal regulations.
- Main coordinator between the Puerto Rico Aqueduct and Sewer Authority and the Puerto Rico Infrastructure Finance Authority, the government authority responsible for developing and implementing water and wastewater infrastructure improvements and expansions.
- Managed negotiation of the consent decree for violations of the Surface Water Treatment Rule of the 1986 Safe Drinking Water Act in 21 surface water systems and violations of the Clean Water Act in 22 water filtration plants in Puerto Rico. Managed the negotiation of a consent decree for CWA violations at various wastewater pumping stations.
- Directed the finalization of the disinfection profiling and benchmarking at 41 facilities throughout Puerto Rico in accordance with the Interim Enhanced Surface Water Treatment Rule and the implementation of the monitoring and sampling program required by the Stage 1 Disinfectants/Disinfection By-products Rule at 74 facilities throughout the island.
- Directed the development and implementation of three microfiltration systems in Puerto Rico for treating surface water supplies to bring them into compliance with the Surface Water Treatment Rule under tight consent decree schedules. Oversaw a one-year validation study of the first use of the membrane process in Puerto Rico to meet Department of Heath requirements for new technologies. Implemented the program on a fast-track design-build mode. Coordinated all activities to bring the remaining 18 systems into compliance, some of which required disconnecting the surface water supply and connecting to an existing filtered water system, while others required the design and construction of new filtration plants.

Bradley Vanlandingham, P.E.

Bradley has extensive experience designing a variety of projects including water and wastewater treatment plants, solid waste transfer stations, laboratories, and power stations.

CIVIL ENGINEERING TASK LEADER / STRUCTURAL

Office Location
Orlando, FL

Education
- BS, Civil Engineering, Rose-Hulman Institute of Technology, 1985

Professional Registration
PE-1991, FL, 44795

Professional Associations
- American Water Works Association
- Water Environmental Federation

Year Career Started
1986

Year Started with B&V
1986

PROJECT EXPERIENCE

New Smyrna Beach Utilities Commission | Smith Street and Glencoe WTP Pumping Station Improvements & 20-inch Pipeline; New Smyrna Beach, FL

Project Engineer. Responsible for providing the construction phase services for two potable water pumping stations, yard piping modifications and over 3 miles of 20-inch pipeline through an urban setting. Total installed pumping station capacity is 12 mgd. The Smith Street pumping station includes a complete site design, environmental resource permitting, demolition of existing facilities and a new building to house the new pumping station and engine generator. The 20-inch pipeline connects the two pumping stations and includes both jack-and-bore and directional drill trenchless crossing. A routing study was performed to identify the optimum route for this pipeline as it is installed in an urban setting.

Orange County | Orangewood and Hunters Creek Water Supply Facilities; Orlando, FL

Project Engineer. Responsible for the design and permitting of modifications at two existing water plants. Modifications at Orangewood include replacing the entire electrical and control systems, a new engine generator, constructing a well house around one of the existing wells, new roof on the High Service Pump Building, new flow meter for finished water, and demolition and removal of old high service pumps and discharge piping. Modification at Hunters Creek include adding a high service pump, adding a cascade tray aerator on top of an existing ground storage tank, and increasing the size of the piping between the two ground storage tanks to decrease head loss.

City of St. Petersburg | Oberly and Washington Terrace Pumping Station Improvements; St. Petersburg, FL

Structural Engineer. Performed detailed structural design and construction phase services for improvements to the City's 80 mgd Oberly P.S. and 45 mgd Washington Terrace P.S. to accommodate improvements that included addition of pump VFDs, replacement of emergency engine-generators, and replacement of pump switchgear.

Tampa Bay Water | System Engineer; Clearwater, FL

Project Engineer. Contributed to numerous projects as part of a $600 million expansion program for Tampa Bay Water which includes a desalination plant, a surface water treatment plant, pumping stations, and pipelines. Brad was the Project Engineer for the System Enhancements Contract 1 project at the Regional Facilities Site which included the addition of a booster pump station, sodium hypochlorite and ammonia feed systems, engine generator, and variable

frequency drive for a high service pump. Brad also assisted in evaluating chemical feed improvements at the Regional Facilities Site and designed a canopy to cover the lime mixing basins in accordance with FDEP regulations concerning CT. He also designed cleaning solution storage tank at the Desal Plant and evaluated structural concerns at the Cypress Creek Pump Station.

Tampa Bay Water | Water Pipeline; Clearwater, FL

Structural Engineer. Designed anchorage for a line stop in a 72-inch PCCP water line. Design included steel sheet piling and massive concrete placement to restrain a temporary plug inserted in the pipeline under pressure.

City of St. Petersburg | Cosme WTP; St. Petersburg, FL

Structural Engineer. Designed electrical building including foundation, masonry walls, and concrete roof.

Orlando Utilities Commission | Pine Hills WTP; Orlando, FL

Structural Engineer. Designed operations building foundation, steel frame with masonry walls, and a 2-mg cast-in-place reservoir.

Manatee County | Stilling Basin Wall Instigation; Bradenton, FL

Structural Engineer. Conducted a study of tall retaining walls downstream of the gated spillway of the Lake Manatee Dam to determine cause of movement and recommend remedial actions. Tasks included specifying surveying work, design of movement indicators, reviewing field data, performing structural calculations, and writing a report summarizing the work.

Manatee County | Lake Manatee Dam Annual Inspection Report; Bradenton, FL

Civil/Structural Engineer. Assessed the condition of civil/structure aspects of an earthen dam and its gated service spillway, emergency spillway, intake structures, and embankments. Determined the cause of deficiencies and recommended repairs.

Sarasota County | Wastewater Collection System, Lift Station SCADA System; Sarasota, FL

Structural Engineer. Design of supports for control panels, RTU's and telemetry antennas. Design wind speed was 150 mph and materials were limited to aluminum and stainless steel.

JEA | Westside Service Center, Bushing Building Modifications; Jacksonville, FL

Structural Engineer. Designed steel framing and foundations to add a bridge crane in an existing pre-engineered metal building. The design required that a separate frame be constructed inside of the existing frame due to inability of the existing framing to support the added loading.

Robert (Bobby) Burchett, P.E.

Mr. Burchett has experience providing engineering services to municipal clients for a variety of water, wastewater and reclaimed water projects. His experience includes water and wastewater system planning; and detailed design, permitting and construction phase services for water and wastewater system infrastructure. He has extensive experience with water and wastewater system master planning studies, energy efficiency and management, hydraulic modeling, water quality modeling and pump station analysis and design.

HYDRAULIC MODELING & PUMP / LIFT STATIONS

Office Location
Tampa, FL

Education
- BS, Civil Engineering, Georgia Institute of Technology, 2000

Professional Registration
PE – 2006, Florida, 64762

Professional Associations
- American Water Works Association

Year Career Started
2000

Year Started with B&V
2000

PROJECT EXPERIENCE

City of Marco Island | Water System Modeling; Marco Island, FL

Project Manager. Responsible for performing numerous evaluations to determine improvements that would enhance the operations and reliability of the City's water distribution system. Tasks included: updating and calibrating the existing water system model, hydraulic analysis of current and projected future operating scenarios, system expansion planning, emergency scenario planning, fire flow analysis, fire hydrant spacing analysis, and water age/water trace analyses. Black & Veatch also assisted the City with prioritizing the recommended system improvements for CIP planning purposes.

City of St. Petersburg | Oberly and Washington Terrace Pumping Station Improvements; St. Petersburg, FL

Project Engineer. Basis of Design Report for improvements at two high service pumping stations. Engineering tasks included: existing facility assessment, field pump testing, hydraulic modeling, defining recommended improvements, and development of a Basis of Design Report.

Tampa Bay Water | Morris Bridge Booster Station Expansion; Tampa, FL

Project Manager. Responsible for planning, permitting, design, and construction phase services for improvements to an existing 45 mgd pump station and groundwater treatment facility. Improvements include the addition of a 1000 HP vertical turbine pump, and numerous upgrades to the electrical, instrumentation and controls, and chemical feed systems.

JEA | Oakwood Villa Septic Tank Phase-Out; Jacksonville, FL

Project Engineer. Developed preliminary plans for a gravity sewer system to replace septic tanks in an existing neighborhood. Tasks included SewerCAD modeling, developing a preliminary gravity collection system layout, and sizing of gravity pipelines, forcemains, and lift stations.

Tampa Bay Water | US-41 Booster Station; Pasco, FL

Design Engineer. Responsible for planning, permitting, design, and construction phase services for an expansion to 5 mgd booster pump station facility. Pump station improvements involve the addition of a new horizontal

centrifugal pump with variable frequency drive and associated electrical improvements.

City of Hollywood | Energy Efficiency Master Plan; Hollywood, FL

Energy Management Team Lead. Responsible for leading technical evaluations of energy efficiency improvement alternatives as part of the development of a comprehensive energy efficiency master plan for the City's Water, Wastewater, and Reclaimed Water Systems and Facilities. The master planning effort includes: electric utility rate analyses; industry benchmarking; development and use of an energy project decision cash flow model; energy assessments of facilities, equipment and infrastructure; renewable energy generation feasibility assessment; and business case evaluations to define and support recommended energy efficiency projects.

Tampa Bay Water | System Configuration II Program; Pinellas, Pasco and Hillsborough Counties, FL

Project Engineer. Participated in a variety of planning, engineering analyses and program management support activities for the development and implementation of the System Configuration II Program. The System Configuration II Program includes ten projects that will provide Tampa Bay Water with an estimated 25 mgd of additional supply capacity during a median year. Five of these projects will increase the yield from Tampa Bay Water's existing Enhanced Surface Water System, and the other 5 projects involve improvements to increase the hydraulic capacity of Tampa Bay Water's transmission system.

Tampa Bay Water | Long-Term Water Supply Plan; Pinellas, Pasco and Hillsborough Counties, FL

Project Engineer. Responsible for evaluating hydraulic and water quality impacts that potential future water supply options would have on a wholesale water supply and transmission system that provides water to approximately 250,000 customers in the tri-county Tampa area. The long term water supply planning process included the identification of water supply project alternatives, the formation of a planning advisory panel, and the development of a public involvement effort to gather public input on various water supply concepts. The alternatives were screened and a short-list of project was investigated in more detail, including the development of order of magnitude project costs. The short-list was evaluated, and a number of potential projects were recommended for further detailed evaluation.

City of Clearwater| P.S. 65 Forcemain Extension; Clearwater, FL

Project Engineer. Completed hydraulic analyses for the design of a 1.5 mile raw water forcemain needed to divert flow to an alternate collection basin feeding the City's Northeast WRF.

Allen W. Dethloff, P.E.

Allen attended the University of Florida, graduating with honors with a Bachelors of Science in Civil Engineering in December 2001. Since graduating, Allen has gained a variety of experience in civil engineering, process mechanical engineering, permitting and construction management. Projects have included water disposal facility design, chemical feed system layout, pumping station design/improvements, stormwater management design, and pipeline design.

While gaining engineering experience, Allen has also developed professional contacts within Black & Veatch and with clients, other consultants, contractors, equipment manufacturers and vendors, as well as staff at various state and local government agencies.

SANITARY / STORM SEWERS

Office Location
Tampa, FL

Education
- B.S., Chemical Engineering, University of Florida, 2001

Professional Registration
PE – 2007, FL, 66382

Professional Associations
- American Water Works Association
- Florida Water Environmental Federation

Year Career Started
2001

Year Started with B&V
2002

PROJECT EXPERIENCE

Tampa Bay Water | Carrollwood Collection Main; Clearwater, FL

Design Engineer. Coordinated permitting, assisted in design, and performed construction phase services for a 21,000-ft raw water collection main. Much of the pipeline route is in a densely-populated residential area, posing many challenges, including multiple directional drill installations. The required permits included Environmental Resource Permit (SWFWMD), Right-of-Way Use (Hillsborough County Right-of-Way Management), Utility Permit (Florida DOT), Site Development Review (Hillsborough County Planning & Growth Management), Drinking Water Construction Permit (FDEP).

Williams Rd Water Transmission Main, South Extension; Hillsborough County, FL

Engineering Manager. Leading design and permitting for a 6,500-ft water transmission main for Hillsborough County Public Utilities Department. Project consists of approximately 6,500 linear feet of 12-inch ductile iron and fusible PVC water main that provide redundant drinking water supply for a portion of the distribution system. The water main will be installed in public rights-of-way and will involve several horizontal directional drill installations under critical intersections and surface features, including two casings, which will be installed under Interstate 4. The project also includes bid-phase and construction-phase services.

Northwest Regional Biosolids Management Facility Odor Control Assessment; Hillsborough County, FL

Engineering Manager. Coordinating team of local staff and technical experts in the evaluation of existing odor control systems at the County's Biosolids Management Facility and co-located Northwest Regional Water Reclamation Facility. In addition to the assessment of existing systems, recommendations will be made by which more effective odor control could be provided.

Nature's Way Wastewater Pumping Station Upgrade; Hillsborough County, FL

Project Engineer. Led design, permitting and construction of an expansion to an existing wastewater pump station. The project included the addition of a new wetwell, installation of six new pumps (and variable frequency drives), and various electrical/I&C improvements. The project also includes bid-phase and construction-phase services.

Utility Relocation | Gunn Highway Improvements; Hillsborough County, FL

Project Engineer. Coordinating site inspection, maintenance of as-built mark-ups (as well as other forms of construction documentation), and record drawing development for utility relocations associated with a road widening project.

Hamilton Pump Station Upgrade; Hillsborough County, FL

Engineering Manager. Leading design and permitting of an expansion to an existing wastewater pump station. The project includes the construction of a new facility, including wetwell, submersible pumps, and electrical and I&C improvements. The project also includes bid-phase and construction-phase services.

City of Clearwater | Pump Station 65 Force Main Extension; Clearwater, FL

Project Engineer. Leading design and permitting for a 7,000-ft sewer force main for the City of Clearwater. Project consists of approximately 7,000 of 12-inch PVC / HDPE force main that will reroute wastewater from one collection basin to another. The force main will be installed in public rights-of-way and will involve several directional drill installations under critical intersections / surface features.

Low Pressure Pump Station Pump Shop; Hillsborough County, FL

Project Engineer. Led preliminary design and permitting for a building rehabilitation project at an existing wastewater treatment plant site. The rehabilitation will include architectural, structural, electrical, and building mechanical modifications to an abandoned pump station building to facilitate its use as a work shop/hurricane shelter for staff.

Tampa Bay Water | System Enhancements-Contract 1; Clearwater, FL

Design Engineer. Performed civil and mechanical design and coordinated acquisition of required County and State permits to modify/upgrade various facilities at the Regional Water Treatment Plant Site. Modifications included addition of aqua ammonia storage/feed system, a domestic/process water booster pumping station and a sodium hypochlorite storage/feed system. Responsibilities included development of specifications, piping layout, preparation of addenda, and final design drawings for equipment in sodium hypochlorite storage/feed building.

Robert J. Moresi, P.G.

Mr. Moresi is a Senior Hydrogeologist with more than 35 years of planning, design, assessment, and management experience encompassing all elements of surface and groundwater resources projects. His experience ranges from providing technical support for the acquisition of permits, to water resources assessment and development. Mr. Moresi worked for Florida's Water Management Districts for 10 years where he was instrumental in early development of their rules and regulations, as well as Director of Water Use Permitting for two Districts. Mr. Moresi has spent the past 25 years in water resources consulting.

His project experience includes studies of regional wellfields, dredging, solid waste, watershed management, emergency response, spring development, groundwater remediation, and well construction for most all purposes. His experience has included water supply planning for sustainability and conjunctive uses, wellfield protection, and water supply development. Mr. Moresi is Past President of the American Water Resources Association.

CIVIL ENGINEERING TASK LEADER / STRUCTURAL

Office Location
Tampa, FL

Education
- Bachelors, Natural Sciences, University of South Florida, 1969
- Bachelors, Geology, University of South Florida, 1972
- Graduate Studies, Water Resources Engineering/Hydrogeology, University of South Florida, 1972

Professional Registration
PG – Florida, 281
PG – Virginia, 642

Professional Associations
- American Water Resources Association

Year Career Started
1969

Year Started with B&V
2003

PROJECT EXPERIENCE

Heartland Water Alliance, Central Florida

Senior Hydrogeologist. Providing oversight and technical support to the assessment of water resources and development of alternative water supplies for 4 central Florida counties. The study was to develop supplies to meet 2030 water supply demands.

St. Johns River Water Management District, FL

Technical Consultant. Provided technical oversight and maintained client relationships on a costing analysis study that resulted in a computer based tool for estimating the costs of various facilities such as water treatment plants, desalination facilities, pipelines, ASR systems, injection wells, and support facilities.

Tampa Bay Water, FL

Technical Consultant. Provided technical support and quality assurance review of a water supply plan report that assessed future water supplies, sustainability, water source availability, and regulations.

Everglades Agricultural Area EAA A-1 Reservoir, SFWMD, FL

Client Manager. As part of the design of the Everglades Agricultural Area (EAA) EAA Reservoir A-1, a Water Balance Model (WBM) was developed to analyze and optimize the storage capacity and operations of the reservoir on a daily basis (time step), while evaluating the impacts on flows in the North New River Canal, Miami Canal, Holeyland Distribution Canal, and the STA 3/4 Supply Canal. In addition, the project is part of the Comprehensive Everglades Environmental

Restoration project, and includes a 190,000 Acre-foot storage capacity reservoir. In-field test cells, and facility design was also part of the project.

Wellfield Assessment and Relocation, Ocala, FL

Senior Hydrogeologist. Assessed the location of the City of Ocala's wellfield and the need to relocate well #6. The assessment included developing a well testing program, reviewing well locations relative to a probably cause of bacteria contamination, and recommendations on wellfield and water treatment facility design to protect the well and manage the wellfield.

Water Supply Plan, Ocala, FL

Senior Hydrogeologist. Assisted in the hydrogeologic study to develop an alternative water supply to meet future potable demands for the City of Ocala. The assessment concentrated on groundwater options and wellfield designs in the Upper and Lower Floridan aquifers.

Wellfield Site Assessment, SRWMD, FL

Project Manager. The project included the assessment of potential wellfield sites for the City of Madison. The assessment included considerations of land use and size, their location, existing municipal facilities, the potential for contamination and long term productivity, and hydrogeologic factors for groundwater protection and production rates. The assessment required ranking the sites and proposing the best possible site for a wellfield.

General Services Contract – Water Supply Planning, St. Johns River Water Management District

Project Manager. The project was a general services contract to assist the SJRWMD in water supply planning services. Work orders were received with the following scopes of work: provide technical support to East Central Florida Water Supply Planning group by maintaining meeting minutes and reports on Group activity; Assess the potential for using the Ocklawaha River near Palatka as a potable water source and calculate preliminary costs to implement a plan; and assess the SJRWMD's permitting data base and assist them in designing the e-permitting program.

US Environmental Protection Agency, FL

Senior Hydrogeologist. Conducted data review on hydrogeologic conditions at a superfund site concerning solvents. The assessment included data review, well construction recommendations, and hydrogeologic interpretation.

City of Ocala, Florida

Senior Hydrogeologist. Conducted an assessment on the occurrence of elevated nitrates in a waste water spray field. The assessment included geologic data, water quality analyses, aerial photography, and a site visit. The assessment developed a theory on Nitrate origin, and proposed a solution for corrective action.

Stephen Tarallo

Mr. Tarallo has over 20 years experience in municipal wastewater treatment R&D, design, and project development. He has been involved in a wide variety of environmental engineering solutions, from collection system odor/corrosion control to advanced wastewater process design to biosolids processing and disposal evaluations. His responsibilities have included assessment of treatment deficiencies, development and selection of wastewater treatment process alternatives, energy optimization studies, renewable energy alternative evaluations, greenhouse gas emissions inventories, life cycle analyses, life cycle cost estimating, and sustainability assessments.

Mr. Tarallo has extensive experience with the evaluation, design, procurement, and operation of a variety of innovative technologies, including biological aerated filtration (BAF), ballasted flocculation, integrated fixed-film activated sludge (IFAS), and moving bed bioreactors (MBBR). He has extensive experience with biological nutrient removal (BNR) and chemically enhanced primary clarification (CEPT). As a former product manager for a major process equipment supplier and having been responsible for numerous multi-million dollar system supply bids, Mr. Tarallo is keenly aware of the strategies and risks process suppliers pursue in preparing competitive offerings. This clear understanding allows him to effectively sift through process and procurement alternatives while mitigating client risk.

SUSTAINABILITY / ENERGY EFFICIENCY

Office Location
Gaithersburg, MD

Education
- MBA, College of William and Mary, 1999
- BS, Mechanical Engineering, Villanova University, 1989

Professional Associations
- Water Environment Federation
- WEF Sustainability Community of Practice
- International Water Association
- Chesapeake Water Environment Association
- Virginia Water Environment Association
- New York Water Environment Association

Year Career Started
1989

Year Started with B&V
2006

PROJECT EXPERIENCE

Water Environment Research Foundation | Energy Management Challenge Technical Support; Alexandria, VA

Technical Consultant for Energy Management Research Challenge Exploratory Team. The stated objective of the research challenge is to provide research that will develop new approaches that will allow wastewater treatment plants to be energy neutral and thus able to operate solely on the energy embedded in the water and wastes they treat. Conducted literature review and provided analysis of energy management in the wastewater industry, including use benchmarking, content in wastewater, conversion technologies, planning, and impact of developments in the energy industry.

Philadelphia Water Department | Utility Wide Energy Plan; Philadelphia, PA

Task Leader for Wastewater Treatment Process Energy Optimization. Conducted benchmark analysis of energy consumption at each facility using EPA's Portfolio Manager tool. Identified opportunities for reducing energy consumption and operating expenses at three (3) wastewater treatment facilities. Conducted preliminary screening and prioritization of energy conservation opportunities based on initial capital cost estimate, payback period, and impact on plant operations.

Task Leader for Greenhouse Gas Emissions Inventory. Performed utility-wide greenhouse gas emissions inventory utilizing ICLEI Local Government Operations Protocol.

Task Leader for Triple Bottom Line Sustainability Assessment. Performed triple bottom line (economic, environmental, social/community) impact assessment of energy conservation measures identified as part of the strategic energy plan.

Defense Threat Reduction Agency (U.S. Dept. of Defense) | Sustainment and Transition Plan-Biological Threat Reduction Integrating Contract

Task Leader for Life Cycle Cost Estimate (LCCE) and Life Cycle Assessment (LCA). Prepared life cycle cost estimates and oversaw preparation of life cycle analyses of two health surveillance and reporting systems for the Government of Ukraine Ministry of Health. Used the results of the LCCE and LCA to evaluate the affordability and incremental life cycle environmental impacts, respectively, of the modern Threat Agent Detection and Response system that will replace the existing Sanitary Epidemiological Station system.

Town of Leesburg | Energy Performance Contract; Leesburg, VA

Wastewater Process Lead. Responsible for wastewater process analysis, identification, development, and economic evaluation of wastewater process-related energy conservation measures (ECMs) for inclusion in a portfolio of ECMs under an energy performance contract.

Upper Occoquan Service Authority | Energy Performance Contract; Centreville, VA

Wastewater Process Lead. Responsible for wastewater process analysis, identification, development, and economic evaluation of wastewater process-related energy conservation measures (ECMs) for inclusion in a portfolio of ECMs under an energy performance contract.

City of Henderson DUS | Renewable Energy Development; Henderson, NV

Task Leader for Greenhouse Gas Inventory. Performed a greenhouse gas inventory for City of Henderson Department of Utility Services (DUS) utilizing ICLEI Local Government Operations Protocol. Identified projects that can reduce DUS' overall greenhouse gas emissions. Specific tasks included: identification of DUS' organizational boundaries, categorization of the emissions of DUS' facilities, examination of DUS' greenhouse gas emitting activities and analysis of the impact of national and state proposed carbon emission caps on DUS; preliminary identification of the potential reduction and removal opportunities based on the modeling; identification of measures for greenhouse gas emissions reduction and removal, energy audits, and/or process evaluations to reduce emissions for further in-depth study as part of a future scope of work.

Daralene Pondo, P.M.P., R.E.M.

Ms. Pondo is currently employed as a Project Manager in the Federal Services Division of Black & Veatch Corporation in Tampa, Florida. She also serves as a Deputy Service Area Manager in the Environmental Services Sector, involved in marketing efforts and proposal development. With more than 24 years of environmental experience, Ms. Pondo has been involved in the management and execution of hundreds of multi-task order environmental projects, including all phases of investigative and remedial projects. Her environmental experience focuses on soil, sediment and groundwater site assessment, design and remediation. Her clients have included the US EPA Region 4, the State of Florida, the United States Air Force, US Army Corp of Engineers, and other commercial and industrial clients. She served as the Program Manager for a state hazardous waste cleanup program. She is familiar the CERCLA, RCRA processes and the state of Florida's environmental regulations. She has managed both projects and personnel. She has extensive experience in client management and business development. Ms. Pondo is the office lead for the Federal Services Division in the Tampa office.

PROJECT EXPERIENCE

United States Environmental Protection Agency (USEPA) Region 4 | Remedial Investigation/Feasibility Study, ACW Pensacola Superfund Site OU3; Pensacola, FL

Project Manager. Ms. Pondo's task order duties are directing and executing a Remedial Investigation/Feasibility Study (RI/FS) on a former wood treating site contaminated with creosote and dioxins. Ms. Pondo developed the work plans and cost estimates. She managed the budget and schedule changes that developed as the data was collected and evaluated. She managed a staff of over 8 people on this project. She is the primary client contact for the project. She has interfaced and negotiated milestones will all the stakeholders; EPA, State of Florida, or contractors working on the site, and the community. She developed and maintained her project schedule. She is ultimately responsible for the document quality and managing the uncertainties on the project. Over 150 sample locations have been sampled and analyzed. The field work has been completed in four different events with the use of several subcontractors. Black & Veatch proposed to EPA to combine the OUs to enable a more cost effective and efficient remedy selection in the FS. Our proposal was accepted in December 2010 and EPA terminated the operating NAPL recovery system and issued a task order to Black & Veatch to include the groundwater component into the FS and issue a Site-wide FS. The Site-wide FS is under preparation and a Record of Decision (ROD) is expected to be signed at the of 2012. The RI/FS is under budget and on schedule at this time. Client CPAR ratings have been "Very Good" in all categories for 2007 - 2010. Black & Veatch is also providing technical support to the EPA at community meetings. Project Value: $1.2M

ENVIRONMENTAL / CONTAMINATION ASSESSMENTS

Office Location
Tampa, FL

Education
- BA, Liberal Arts (Anthropology), SUNY Oswego, 1977

Professional Registration
- Project Management Professional (PMP) – 2012 #1516961
- Registered Environmental Manager (REM) – 2002, #11270

Training
- 40-Hour OSHA HAZWOPER
- 8-Hour HAZWOPER Annual Refresher
- 24-Hour OSHA Supervisor
- Sales & Marketing Training
- Sustainability 101
- Value Based Management
- Engineering Principles of Sustainability
- Ethics & Compliance Program

Professional Associations
- Society of American Military Engineers
- National Registry of Environmental Professionals
- Project Management Institute

Year Career Started
1988

Year Started with B&V
2002

USEPA Region 4 | Remedial Design, Sapp Battery Superfund Site OU2; Marianna, FL

Project Manager. Ms. Pondo's task order duties included directing and executing the Remedial Design (RD) effort for the groundwater contamination at the former battery recycling facility. The groundwater is contaminated with metals (primarily lead) and sulfuric acid. Ms. Pondo prepared the work plans and cost estimates and managed the change orders and scope changes driven by the project data. She planned and directed several supplemental site investigations in several phases to delineate the dissolved inorganics and low pH concentrations in the groundwater from 2005 to 2008. This was accomplished directing of staff of five people and several subcontractors. She subcontracted a bench scale treatability study and full-scale field pilot study to evaluate the effect of pH adjustment for treatment of the inorganics. Several remedial alternatives were been screened and evaluated. Based on the results of the testing and the development of alternative risk-based cleanup goals, an Amendment to the ROD was signed that declared Monitored Natural Attenuation (MNA) as the selected remedy in the 2011 Amended Record of Decision (AROD) in lieu of a full design saving the EPA over $100,000. The project is nearing construction completion, expected in September 2012 and is currently on schedule and under budget. Black & Veatch will continue to support EPA with the MNA sampling effort in 2013. This project has received "Very Good" or "Exceeds Expectations" ratings from the USEPA for several periods. Ms. Pondo is mentoring a junior task order manager on this project as part of career development. Total Project Value = $1.1M

USEPA Region 4 | Remedial Investigation/Feasibility Study Oversight, Orlando Gasification Superfund Site; Orlando, FL

Project Manager. Directing and managing the cost, schedule budget and staff associated with the Remedial Investigation/Feasibility Study (RI/FS) oversight of the potentially responsible parties' (PRPs') contractor to ensure compliance with US EPA protocols and standard operating procedures, responsible for oversight of deep well installation, soil sampling, ground water sampling. Black & Veatch has performed reviews of the draft RI and Baseline Risk Assessment reports and the Remedial Alternatives Screening memorandum and provided technical comments. Received "Meets Expectations" reviews from the USEPA. The FS oversight is ongoing. Total Project Value: $273,000

AFCEE | Remedial Investigation, Site LF005; Tyndall Air Force Base, FL

Task Manager. Directed a remedial investigation on the metals contamination in the groundwater at a former landfill site, including a baseline ecological risk assessment Project was regulated under CERCLA as part of a National Priorities List (NPL) base. Participated in the Tyndall Air Force Partnering Team. Task Order was a time and materials order under the AFCEE 3PAE contract. The Draft RI Report was completed on time and under budget. Project Value: $125,000

Dr. Ralph E. Brooks

Dr. Brooks is assigned to the Environmental Health and Safety group in the Energy, Engineering and Construction Division of Black & Veatch. He has more than 15 years of experience in managing and coordinating environmental studies or permitting processes to assure compliance with applicable federal, state or local environmental regulations, especially Clean Water Act permitting (wetlands), FERC and NEPA compliance, the Endangered Species Act, and the National Historic Preservation Act. Dr. Brooks often assists in the conducting environmental studies as he has extensive training and more than 20 years of professional experience in the areas of wetlands, threatened and endangered species, plant ecology, wetlands, botany, and environmental permitting prior to joining Black & Veatch. He has experience in planning public use, interpretive, and recreational facilities; siting and permitting facilities such as water intakes, pipelines, roads, and various structures; and working with habitat improvement projects, including bank stabilization and riparian and wetland habitat enhancement. In addition, he has designed and implemented monitoring activities associated with environmental assessments and mitigation plans as needed to meet project requirements. Dr. Brooks is an experienced client to agency consultant that has had the added benefit of nearly 20 years of employment with regulatory agencies. He has provided testimony as an expert witness on several occasions.

Since joining Black & Veatch, Dr. Brooks has provided terrestrial and wetland biological and permitting expertise for siting studies, field surveys, report and permit preparation, and agency consultation for permitting a wide range of infrastructure projects throughout the United States, including Oregon. Dr. Brooks has coordinated and/or assisted in the preparation of environmental assessments (EA) and conducted numerous natural resources studies (vegetation and habitat assessments, wetlands, protected species) on projects throughout the United States, including Washington and Oregon. He has coordinated Special Use Permits and has prepared EAs and biological assessments (BAs) for the Bureau of Land Management and U.S . Forest Service. In addition, he has participated in numerous projects subject to Federal Energy Regulatory Commission (FERC) and National Environmental Policy Act (NEPA) compliance.

WETLANDS MITIGATION / PERMITTING

Office Location
Portland, OR

Education
- PhD, Botany, University of Kansas, 1989
- MA, Biology/Botany, University of Kansas, 1974
- BA, Biology, Kansas State Teachers College, 1972

Professional Registration
N/A

Certification
Wetland Delineation Specialist (WTI, Seattle)

Professional Associations
- American Society of Plant Taxonomists
- Great Plains Flora Association
- Society of Wetland Scientists
- North American Flora Association

Year Career Started
1974

Year Started with B&V
1991

PROJECT EXPERIENCE

Clean Water Treatment Plant Expansion, Wetland Delineation, Mitigation, Construction and Monitoring

A wetland delineation was conducted per state and Corps of Engineers wetlands permitting requirements to facilitate the expansion of an existing water treatment plant along the Grand River in southern Michigan. The delineation results were used to determine the extent of impacts the project would cause to wetlands. To mitigate for the wetland loss a 3 acre wetland was created in an abandoned sand and gravel pit at the project site. The site included open and

forest wetland areas. A monitoring plan to demonstrate the success of the wetland mitigation was prepare and will be implemented at the completion of the construction phase of the wetland mitigation.

Public Works Department | Minto-Brown Park Wetland Rehabilitation; Salem, OR

Wetland Specialist. As mitigation for filling a jurisdictional wetland, a 2-acre wetland was created in Minto-Brown Park by another environmental firm. Due to a number of factors the constructed wetland did not comply with the issued permit. Black & Veatch was retained to evaluate the situation and develop an alternative solution. The result was to delineate the constructed wetland, evaluate the immediate vegetative surroundings, and then re-design and re-construct the failed portions of the mitigation site.

City of Salem | Downtown Interceptor Project; Salem, OR

Preparation of environmental review for the construction of a buried water conveyance. Investigations centered on protected species, fisheries, vegetation, and wetlands to satisfy state and federal environmental regulations.

Southwestern Power Administration | Environmental Compliance Review; Tulsa, OK

An administration-wide (Missouri, Arkansas, and Oklahoma) environmental compliance review was conducted to determine the effectiveness and efficiency by which SWPA managed environmental issues as a course of business. The primary areas of concern centered on maintenance and operations activities relating to potential impacts to threatened and endangered species and wetlands and the handling of hazardous waste.

Morgan Stanley | New Generation Water Pipeline; AL

Field studies, agency consultation, mitigation and document preparation were performed to secure federal and state permits for the construction of a new 22 mile pipeline to provide cooling water for a new power generation facility near Roanoke, Alabama.

Upper Peninsula Transmission Line Environmental Assessment, Escanaba, MI

Coordination of preparation of EA and BA for 75 miles of new transmission corridor through National Forest land in Michigan to support Special Use Permit Applications submitted to the U.S. Forest Service. The studies and documents followed guidelines for NEPA compliance.

Curt E. Smith, P.E.

Mr. Smith has been involved in all phases of site development: from site selection and feasibility studies, through municipal and environmental permitting, to final engineering design. He has performed all aspects of site design for parcels ranging in size from less than one acre to over 1,300 acres. Design activities include grading, storm water management systems, water distribution and sanitary sewer collection systems, roadway design, as well as structural analysis and foundation design.

Curt has extensive experience acquiring storm water, environmental, utility, and site permits from government regulatory agencies. He has prepared permit packages to meet the requirements of cities, counties, and states throughout the southeastern U.S., as well as Federal Agencies such as the Army Corps of Engineers and the Department of Environmental Resources.

PROJECT EXPERIENCE

City of Lakeland | Northeast Water Treatment Plant; Lakeland, FL

Permitting Lead and Design Engineer. Responsible for all aspects of site development for 20-acre site including grading, stormwater system, water distribution, sanitary collection system, flood study, environmental evaluation and permitting.

Orlando Utilities Commission | Taft-Lakeland 230 kV Transmission Line Rerating; Central Florida

Civil Engineer. Responsible for providing civil engineering design and regulatory permitting services for flood plane mitigation. Served as expert witness in land acquisition hearings.

Kissimmee Utility Authority | Pleasant Hill Road 69 kV Substation; Kissimmee, FL

Design and Permitting. Responsible for managing and performing grading and drainage systems design, site layout, and structural design.

Georgia Transmission Corporation | McCall Road Substation; Georgia

Engineering Management and Civil/Structural Design. Responsible for managing civil/ structural engineering, and performing grading and drainage systems design, site layout, and structural design.

Orlando Utilities Commission | Convention Center Substation; Orlando, FL

Permitting Lead and Project Engineer. Responsible for site grading and drainage design, environmental evaluation, and permitting at local and state levels. Performed site layout, foundation design, and control building design.

CIVIL/SITE

Office Location
Orlando, FL

Education
- AS, Electrical Engineering Technology, Worcester Industrial Technical Institute, 1978
- BS, Civil Engineering, University of Central Florida, 1988

Professional Registration
- PE – Florida #46707, Georgia, Louisiana, Tennessee, North Carolina, South Carolina, Texas

Professional Associations
- American Society of Civil Engineers
- National Society of Professional Engineers
- Florida Engineering Society
- Engineering Ministries International

Year Career Started
1988

Year Started with B&V
1988

Kissimmee Utility Authority | Wall/Employee/Meadow Woods 69 kV Transmission Line; Kissimmee, FL

Permitting Lead and Design Engineer. Responsible for route alignment and foundation design, environmental evaluation, and permitting at local, state and federal levels.

Beaches Energy Services | SPCC Plans; Jacksonville Beach, FL

Project Manager. Responsible for developing SPCC plans to meet EPA requirements for 10 substations and an Operations Center. Pre-qualified emergency clean-up contractors.

Kissimmee Utility Authority | Employee 69 kV Substation; Kissimmee, FL

Design and Permitting. Responsible for managing and performing grading and drainage systems design, site layout, and structural design.

Kissimmee Utility Authority | SPCC Plans; Kissimmee, FL

Project Engineer. Responsible for developing SPCC plans to meet EPA requirements for 8 substations. Pre-qualified emergency clean-up contractors.

Orlando Utilities Commission | Unit A of the Stanton Energy Center; Orlando, FL

Compliance Auditor. Responsible for ensuring compliance with the licensing conditions imposed by local, state, and federal regulators for the construction of Unit A of the Stanton Energy Center.

Fort Pierce Utilities Authority | Oil Containment Design; Fort Pierce, FL

Project Engineer. Responsible for providing detailed plans and cost estimates for oil containment at existing transformers.

Georgia Transmission Corporation | Various Substations; throughout Georgia

Design Engineer and Permitting. Responsible for managing and performing grading and drainage systems design, site layout, and structural design.

United States Sugar Corporation | Clewiston Substation; Clewiston, FL

Design Engineer. Responsible for the design of site grading, foundations, structures, and control building for new 138 kV substation. Material procurement and construction coordination.

Powertel PCS, Inc. | PCS Buildout of 600+ Sites; in Florida, Georgia, Alabama, and Tennessee

Project Engineer. Responsible for site engineering, project scheduling and materials procurement. Zoning and permitting, including providing expert testimony in public hearings. Coordination of site acquisition and survey contractors. Facilitated management of project by tracking status of engineering and construction for all sites.

Terry A. Thomas, P.E.

Mr. Thomas serves as Project Engineer for Black & Veatch's Federal Services Division Transportation Engineering Department. He is primarily responsible for the design of roadway, highway, sitework, and storm drainage projects.

TRANSPORTATION / ROADS

Office Location
Overland Park, KS

Education
- B.S., Civil Engineering, University of Missouri-Kansas City, 1991

Professional Registration
- PE – Missouri

Year Career Started
1991

Year Started with B&V
1991

PROJECT EXPERIENCE

BVCORP Water Division and Power Division | Pavement Design and Consultation

Pavement Designer/Consultant. Provided pavement design and pavement design consultation for multiple water and wastewater treatment plant and Power Plant facilities expansion projects. Design and design support involved pavement section structural design, material layer selection and material and construction specifications preparation.

Electronic Systems Center (ESC) ESC/HSIK | Space Fence Program

Civil Engineer. Responsible for the design of exterior site features for the Radar Facilities. Design involved site layout, site grading, storm drainage design, site and access roadway design and parking lot layout, pavement design and utilities route location.

Kansas Department of Transportation | US-166 Improvements; Cherokee County, KS

Project Engineer. Responsible for design and drawing preparation of 5 miles of rural two-lane highway being improved to KDOT's 3R Standards. This project is part of the Southeast Kansas Corridor.

Kansas City District USACE | Fort Riley MATOC Facility

Lead Civil Engineer. Responsible for the design of exterior site features for the Vehicle Maintenance and Company Operations Facilities. Design involved site layout, site grading, storm drainage design, access roadway layout and parking lot design, pavement design and utilities route location.

Kansas City District USACE | Fort Riley Custer Hill Beddown Facility; KS

Lead Civil Engineer. Responsible for the design of exterior site features for the Headquarters Building, Vehicle Maintenance and Company Operations Facilities. Design involved site layout, site grading, storm drainage design, access roadway layout and parking lot design, pavement design and utilities route location.

Kansas Department of Transportation | U.S .Hwy 50; Finney County, KS

Design Engineer. Responsible for grading and drainage design. Drainage design involved hydrologic and hydraulic capacity analysis for roadside drainage ditches and crossroad culverts.

Missouri Department of Transportation | Route MM; Lafayette County, MO

Project Engineer. Responsible for design and plan preparation for Route MM roadway improvements in association with bridge replacement at Tabo Creek

crossing. Improvements consisted of vertical reprofiling of the roadway to match the new bridge elevation and roadside drainage ditch design.

Cities of Mission and Roeland Park, Kansas | Johnson Drive/Roe Avenue Interchange; Mission, KS

Project Engineer. Responsible for grading and drainage design. Drainage design involved capacity analysis and alignment of proposed enclosed storm sewer system.

3M Company | 3M Facility Expansion; Nevada, MO

Project Engineer. Responsible for site grading and drainage design, geometric and structural design of exterior concrete pavements, and coordination of utility relocations.

Kansas Department of Transportation | K-96 Highway; Rush County, KS

Design Engineer. Performed drainage design and improvements on 13.5 miles of roadway. Design and improvements involved the extension of existing RCB and pipe culverts to meet clear zone requirements, hydrologic watershed delineation to determine flow quantities for roadway ditches and reinforced concrete structures, and the redesign of adjacent roadway ditches.

Kansas Department of Transportation | U.S. Highway 75; Jackson and Brown Counties, KS

Design Engineer. Performed the drainage design and improvements on 15.7 miles of roadway. Design and improvements involved the extension of existing RCB and pipe culverts in accordance with KDOT 3R standards, in addition to the analysis, reconfiguration, and realignment of the adjacent roadway ditches.

American Electric Power | South Access Road and Bridge over Norfolk Southern and Wheeling – Lake Eerie Railroads; Brilliant, OH

Project Engineer. Responsible for pavement design and roadway geometric layout. Design involved setting vertical alignment to meet longitudinal grade and railroad clearance requirements, design of horizontal alignment, intersection layout, storm sewer and drainage ditch design, roadside grading and guardrail layout and utilities route location.

Baltimore District USACE | Buckley AFB NSAC MILCON Mountainview

Quality Control Engineer. Performed QA/QC check and assisted in the detailed design of exterior site features for the new Operations Building and support facilities. Design involved site layout, site grading, storm drainage design, access roadway layout and parking lot design, pavement design and utilities route location.

Marc A. Fermanian, MSCE, P.E.

Mr. Fermanian serves as a project drainage engineer and project manager for several transportation and land development projects. He is responsible for both large and small- scale stormwater designs and permitting for these projects. Marc has provided stormwater designs, calculations, and master drainage plans for: airports, ports / harbors, roadway projects, university campuses, and a diverse of miscellaneous civil site projects. In addition, he has a diverse background in both civil engineering and construction; Marc has worked on FDOT Projects in: District 1, 3, 4, 6, and 7over his 19-year career in Florida. His initial start in working in Florida was roadway design per FDOT Design Standards and Specifications.

Mr. Fermanian is skilled in developing civil site/ land development construction plans, as well as roadway design plans utilizing FDOT plans preparation standards and indexes. Mr. Fermanian was the author of several airport and roadway drainage preliminary/final reports. He has also provided detail drainage calculations and construction plans for the Palm Beach County Department of Airports (PBC-DOA) that have acquired construction permits from SFWMD, FDEP, the ACOE, and the EPA. Mr. Fermanian has also assisted in the development of the University of South Florida Master Drainage Plan and the Tampa Port Authority's Master Drainage Plan. Marc's stormwater abilities have been recognized by several constituents, technocrats, and colleagues to allow him to be an accepted and active member of SFWMD's Peer Review Committee.

He has served as a Construction Engineer Inspector (CEI) Project Manager responsible for construction administration and overall project schedule control in which he coordinated and reviewed requests for further information (RFI's) and material invoices from the contractor; reviewed, prepared and processed job estimates that included material and labor costs; recorded the progress of construction activities; Davis-Bacon employee wage rates; and participated in on-site inspections.

TRANSPORTATION / ROADS

Office Location
Parkland, FL (CRJ)

Education
- BSCE, University of Massachusetts-Lowell (1992)
- MSCE, University of South Florida (1997) (GPA 3.8 Cum Laude)

Professional Registration
- Professional Engineer
- #0052626 (Florida), February 1998
- Member of NSPE/FES, 1995
- FSA Member
- SFWMD Peer Review Committee

Year Career Started
1993

Year Started with CRJ
2001

PROJECT EXPERIENCE

City of Parkland, FL | General Consulting Services

Within the past 1 ½ Years in working with the City of Parkland, CRJ has conducted close to thirty (30) tasks for the City. Work efforts have included: roadway design, Construction Inspection / Construction Management, recreational pathways, Special Inspection / Threshold Inspections, NPDES compliance inspections for the City's MS4 Program, City Planning and utility design.

Florida Department of Transportation, District 1 | Interstate 4/S.R. 400 - Design Section Six

Responsibilities included preparation of FDOT construction plans, alignment justification reports, lane closure analysis, pond siting report, evaluation of

"Two Critter" crossings (low level bridges) for state wildlife criteria within the Green Swamp Region of Polk County, Florida. Prepared design calculations for both swale and wet detention ponds for roadway stormwater treatment system

Florida Department of Transportation District 4 | Roadway Improvements / Sidewalk & Bikelane Development; Deerfield Beach, FL

Prepared design plans for Quiet Water Park and Tradewinds Park.

Florida Department of Transportation, Office of Tolls (OTO) | Crosstown Expressway - West Plaza Administration Building Renovations

Construction Inspection Manager and Civil Design. Project consisted of a complete rehabilitation of the existing structure including: complete rework of all electrical systems including toll collection, security and fire alarm; elevator installation within existing structure constituting foundation shoring; architectural interior/exterior renovations; asbestos removal; and civil site rehabilitation for maintaining toll services through construction phasing, and parking facilities design.

Florida Department of Transportation, District 7 | Ulmerton Road (State Road 688), Vicinity of 34th Street and Interstate 275; Clearwater, FL

The proposed roadway improvements were to modify the existing four- lane rural roadway to a six-lane rural typical section from 34th Street eastward to the I-275 interchange. Marc was a design engineer on this 1.6 Mile roadway widening that involved jurisdictional wetlands identified by both the ACOE and SWFWMD along Roosevelt Creek; a saltwater marsh.

Florida Department of Transportation, District 7 | S.R. 50 (Barnett Road) Roadway Design Engineer and Stormwater Designer for Urban

Roadway section widening. Marc was responsible for grading and stormwater culvert design and coordination with FDOT for compliance with MUTCD striping standards and Maintenance of Traffic.

Florida Department of Transportation, District 7 | S.R. 54 (FDOT Project No. 14570-3521) Watersheds 'B', 'D' & 'E'

Design Engineer and Stormwater Designer for 0.75 miles of 6-lane median divided rural roadway within sensitive wetland areas. Marc worked on: grading, establishing roadway grades, swale sizes and roadway geometry.

Florida Department of Transportation, District 3 | S.R. 261 (Capital Circle)

The proposed roadway improvements were to develop the ultimate six-lane divided rural configuration and make modifications to the intersection of S.R. 20. Marc worked on: grading, establishing roadway grades, swale sizes and roadway geometry. Marc also conducted the Pond Site Report for the south segment of the Project.

Carlos E. Ortega, E.I.

Mr. Ortega is a staff engineer at CRJ & Associates, Inc. He specializes in the design and permitting of: civil site projects, transportation-related development, stormwater pipe networks / ICPR modeling, roadway design, and utility projects.

In addition, Mr. Ortega has served as a Field Inspector providing CEI Services during project construction activities involving roadway projects. His efforts included: Coordination of Engineering Construction / Inspection Activities, Scheduling Field Inspections, processing Shop Drawings, documenting weekly construction meetings, tracking and monitoring of Project Schedules, Invoices, and Work Orders.

PROJECT EXPERIENCE

City of Parkland | University Drive and Holmberg Road Mill and Overlay Improvements; Parkland, FL

CRJ & ASSOCIATES, INC was selected by the City to provide CEI services for the Mill & Resurfacing of roughly 3-miles of City Roadway. CRJ & Associates, Inc. assisted the City with Construction Engineering Inspection (CEI) Services to monitor the Construction Activities for the Duration of Work.

City of Parkland | Mecca Road Mill and Overlay Improvements; Parkland, FL

For this effort, CRJ provided the City Limited Construction Phase Services for the Mill & Resurfacing of Mecca Road (NW 74 Place) from W. Hillsboro Blvd. to S.R. 7 / US 441 (roughly 0.5 miles). This project was considered by the City of Parkland as a Maintenance Effort to remedy the roadway segment. The Project warranted neither widening nor modifications to the roadway geometry. In addition, there was re-striping (i.e., thermoplastic) and reflective pavement markings (RPMs) effort after the installation of the new asphalt lift.CRJ & Associates, Inc. assisted the City with Construction Engineering Inspection (CEI) Services to monitor the Construction Activities for the Duration of Work.

City of Parkland | Loxahatchee Road Sidewalk; Parkland, FL

CRJ's design staff is familiar with the design of systems for bicycle lanes/paths and pedestrian sidewalks. The Project Scope was created to assist Parkland in attaining goals established under F.S. 335.065(1)(a), which warrant full consideration of sidewalks in the planning and development of transportation facilities. This project has been considered by the City of Parkland as an amenity to remedy pedestrian safety along roadway segments that will undergo a widening effort. The sidewalk effort warrants neither widening nor modifications to the roadway geometry; it was a requested safety provision negotiated between City of Parkland and local residents desiring pedestrian access. Roadway modification, which the City has already completed design, was roadway widening and concrete curbing provided by "others" involving the Chabad of Parkland (a place of worship). Hence, the roadway conditions have

TRANSPORTATION / ROADS

Office Location
Parkland, FL (CRJ)

Education
- BSCE- Environmental Engineering, 2001-2005, Florida International University, Miami, Florida

Professional Registration
- Engineer Intern No. 1100012069 (FL),2005
- M.O.T. Intermediate Certification, 2006
- CTQP Final Estimates Level 1, 2006
- FSA Stormwater
- Operator Level 2, 2009
- CTQP Quality Control Manager, 2009
- CTQP Earthwork Construction Inspection Level 1, 2010
- CTQP Earthwork Construction Inspection Level 2, 2010
- CTQP Asphalt Paving Level 1, 2011

Year Career Started
2004

Year Started with CRJ
2005

been viewed as "existing conditions" by CRJ during our design efforts. CRJ's major efforts are to produce design documents in accordance with: City of Parkland, Broward Co. Traffic Engineering Dept. (BCTED) and Florida Department of Transportation Standards (FDOT Index 304 & 310).

City of Coconut Creek | City Hall Structural Improvements; Coconut Creek, FL

The Project was a facility improvement effort to the existing structural steel of City Hall. The Project also consisted of renovating the existing glass windows to hurricane resistant glass. The structural improvements for the City of Coconut Creek included the following areas of the City: (1) City Hall; (2) Police Station; (3) Commission Chambers; and (4) Commissioner's Office. CRJ conducted thirty-one (31) threshold inspections from September 2011 through December 2011 on a daily basis to inspect the construction efforts of the structural steel framework and installation of the reinforced glass windows.

City of Parkland | Holmberg Road Improvements Project; Parkland, FL

Civil Site Engineering Design, Permitting, and Construction Administration Services provided to the City of Parkland, design and permitting efforts included: Drainage Calculations and Environmental Resource Permit per SFWMD Standards for MES extension and Single- Barrel Concrete Flumes for areas adjacent to Broward County Wetland Preserve; Asphalt Pavement Design for two (2) 1.95-mile 4-foot bike lanes from University Drive to Parkside Drive; installation of ±4000 LF 12-inch Water Main Extension running from Riverside Drive to Parkside Drive and seven (7) fire hydrants; pavement marking and signage including the removal of existing striping, restriping activities for inclusion of bike lanes from University Drive to Parkside Drive, and milling & resurfacing of existing pavement from Riverside Drive to Parkside Drive.

Permitting efforts included the following: Coconut Creek Utilities Department Permitting for the new Water Main Extension; Broward County Health Department and Broward County Water & Wastewater Services for the FDEP Water Main Extension Permitting; Broward County Traffic Engineering Division for Pavement Marking & Signage; South Florida Water Management District for MES extension and installation of flumes; and all warranted permitting services. Construction Administration Services included required site visits for inquiries from the Contractor, Inspections with Owner and / or Permitting Agencies, preparation of RFI's, review of Shop Drawings, and Project Close- Out(s).

Louis E. Nemeth, R.A., NCARB, LEED AP

Mr. Nemeth is well versed in all phases of architectural services; including building design, construction document production, specification writing and constructability reviews. His experience includes work on water and wastewater treatment facilities as well as participating in value engineering studies.

Mr. Nemeth has served as an architect on projects located in Saudi Arabia, Kuwait and the United Arab Emirates. The international and cultural experience, along with a variety of project types, guarantees the client a successful project.

PROJECT EXPERIENCE

Public Utilities Department | Middle Oconee Water Reclamation Facility LEED Study; Athens-Clarke County, GA

Project Architect. Responsible for the architectural portion of a LEED feasibility study on the existing administration building, including production of the study report that described the LEED process and recommended modifications to achieve LEED for existing buildings certification.

Cobb County Water System | Northwest Cobb WRF Expansion; Kennesaw, GA

Project Architect. Designed an influent pump station, primary sludge pump station, primary screening building, aeration basin blower building, ultra violet disinfection building, switchgear building, and maintenance building. Buildings featured brick veneer with brick accent bands and flat roofs.

City of Durham | Administration Building, Brown Water Treatment Plant; Durham, NC

Architect/LEED Specialist. Facilitated LEED charrette workshop with client staff and design team to determine LEED strategies to best fit the needs of the stakeholders. Continued collaboration through design documents to ensure LEED strategies incorporated into building design.

City of Westminster | Influent Pump Station; Westminster, CO

Project Architect. Currently designing load bearing masonry pump Station. The building exterior will features split face masonry to match existing plant buildings along with a clay tile mansard roof system.

Winston-Salem/Forsyth County Utility Commission | R. A. Thomas Water Treatment Plant LEED Evaluation; Winston-Salem, NC

Architect/LEED Specialist. Collaborated on review of design documents for the new water treatment plant to determine how the 90% complete design compared to the LEED rating system for sustainable/green design and provided recommendations for reasonable additions to the project scope to increase the level of sustainability. Co-authored report documenting findings in terms of LEED point comparison.

ARCHITECTURAL

Office Location
Kansas City, MO

Education
- Master of Regional and Community Planning, Kansas State University, 1986
- Bachelor of Architecture, Kansas State University, 1983
- Associate of General Education, Northampton Community College, 1979

Professional Registration
R.A.- Colorado, Connecticut, Florida, Kansas, Maine, Maryland, Missouri, Montana, Nevada, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Virginia

NCARB Certified

LEED Accredited Professional Building Design + Construction

Professional Associations
USGBC-Central Plains Chapter

Year Career Started
1986

Year Started with B&V
1989

Orange Water and Sewer Authority | I-40 Pumping Station; Durham, NC

Design Architect. Designed a pumping station that was architecturally compatible with adjacent residential neighborhood.

City of Idaho Falls | Booster Pump Station; Idaho Falls, ID

Project Architect. Currently designing a pump station featuring load bearing masonry walls and a flat roof system.

City of Bloomington Utilities | Monroe Water Treatment Plant Improvement; Bloomington, IN

Project Architect. Designed chemical and maintenance buildings. Spaces included chemical storage areas, offices, storage areas, and maintenance shop. The buildings featured limestone veneer which was compatible with local building materials and included a sloped standing seam metal roof and flat roof.

South Adams County Water and Sanitation District | Laboratory Renovation Project; Commerce City, CO

Project Architect. Provided interior design and functional layout for the renovation of an existing laboratory, including material and color selections.

Southern Nevada Water Authority | Mechanic Maintenance Shop, Alfred Merritt Smith Water Treatment Facility; Las Vegas, NV

Project Architect. Provided architectural design and detailing for a 16,000 square foot building that included office area, break room, training room, mechanic and welding shops. The building featured a steel frame structure with precast concrete wall panels and flat roof system.

City of Midwest City | Pollution Control Facility Improvements; Midwest City, OK

Project Architect. Currently designing the following buildings: Headworks, MBBR Blower Building, UV Disinfection, and Biosolids Pumping Complex. The building exteriors will feature masonry veneer to match existing plant buildings. Also, “green materials” will be specified including the use of natural daylighting.

Metro Wastewater Reclamation District | Primary Treatment Improvements; Denver, CO

Project Architect. Provided architectural design and detailing for gravity thickeners building, pump station, and an electrical building. The building exterior featured brick veneer to match existing plant buildings.

City of West Jordan | Biosolids Thermal Drying Project, South Valley Water Reclamation Facility; West Jordan, UT

Project Architect. Provided architectural design and detailing for a new drying building located adjacent to an existing dewatering building. The building features exterior brick veneer to match existing plant buildings, steel frame structure, and a flat roof system.

James D. Sullivan, RA

Mr. Sullivan's responsibilities include developing LEED checklist, architectural design, developing architectural presentations, preparation of contract documents, estimating, project procurement, value engineering, construction administrative, and historical preservation. He interfaces with clients and has experience as project manager, project architect, architectural and engineering coordinator for design/build projects, assistant contract administrator, and assistant construction manager. Mr. Sullivan stays abreast with new revisions to LEED new construction, building codes, military handbooks, and the American's with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines.

Mr. Sullivan has been involved with design/build projects from the conceptual design phase through construction. His responsibilities in construction included estimating, pre-qualifying subcontractors, bidding, contract administration, project procurement, and purchasing.

Mr. Sullivan has been trained to perform preservation analysis by the National Park Service at the National Center for Preservation Technology and Training in Natchitoches, LA. Training covered historical and building pathology, diagnostics methodology, and treatment strategies for preserving historical landmarks. The program was focused on a practical approach to engineering for older and historical buildings. A summary of buildings reviewed for the National Park Service included structures along the Cane River Creole National Historical Park (approximate age of structures: 300 years). His knowledge also includes experience with the National Historical Preservation Act (NHPA) and Historical American Building Survey (HABS).

Mr. Sullivan completed building deficiency assessments and developed new spreadsheets for the National Parks Service for historical fort sites, which included Fort Moultrie and Sumter located in Charleston, SC. In Pensacola, Florida, historical forts and batteries inspected included Fort Pickens, Fort Barrancas, Battery 234, Battery Langdon, Battery Worth, Battery Pensacola, and Battery Van Swearingen. Task included developing methods to document material loss rates that could be recorded onto spreadsheets; define terminology unique to the fort; and listing and breaking down building components into manageable parts based on function that would be used as a tool for estimating repairs. Mr. Sullivan has inspected and reviewed projects for adaptive reuse that included Washington National Monuments and Memorials, Visitor Center in Stehekin, WA., American and British Camp in San Juan Island, WA, and Townsend Hall (Battle Seminar Facility) at Fort Leavenworth, KS.

HISTORIC BUILDING PRESERVATION

Office Location
Overland Park, KS

Education
- Bachelor of Architecture, Kansas State University, 1985
- BS, Construction Science, Kansas State University, 1985
- Associate of Architecture Technology, Northampton County Area Community College, 1979

Professional Registration
RA – 1998, KS
RA – 2003, TX
NCARB – 2001

Professional Associations
- National Trust of Historic Preservation

Training
- LEED Training Course
- Physical Protections Systems Training Course by Security Analysis Corporation, Security Engineering by Protection Design Center, USACE Omaha District
- Historic Preservation Training from the National Park Service in Natchitoches, LA (training covered historic and building pathology, and diagnostics methodology and treatment strategies)
- State & Federal Accessibility Course by United Spinal Association (covering ICC ANSI A117.1, ADA/ABA Guidelines, and IBC
- Certificate in Architectural and Mechanical Drafting
- Certificate in Value Engineering

Year Career Started
1985

Year Started with B&V
1989

PROJECT EXPERIENCE

National Park Service | U.S. Department of the Interior | Fort Pickens Historical Preservation Assessment | Pensacola, FL

Architectural Historical Preservationist. Mr. Sullivan is performing a comprehensive historical preservation assessment for the National Park Service (NPS) at Fort Pickens. Fort Pickens is pentagonal United States military fort constructed in 1834 and made of brick. Areas of the fort to be inspected will included the sallyport, quarters, casements, mine battery rooms, mine chambers, powder magazines, scrap walls, bastions, cisterns, reverse arches that support the casement walls, parade grounds, and artillery. All areas of the fort will be inspected, documented, and incorporated into spreadsheets uniquely developed between Black & Veatch and the NPS that will be inputted in a data base. The new data base will include templates specifically designed to allow the NPS to have a uniform system approach to gather preservation information on historical forts throughout the United States.

National Park Service | U.S. Department of the Interior | Fort Moultrie Historical Preservation Assessment | Charleston, SC

Architectural Historical Preservationist. Mr. Sullivan has performed a comprehensive historical preservation assessment for the National Park Service (NPS) at Fort Moultrie, which is on the National Register of Historic Places. Fort Moultrie military site consist of multiple additions that were constructed due to technological improvements in artillery design to protect the United State Coast Line. Additions ranged from 1803 through 1944. A summary of areas assessed included barracks foundation ruins (built: 1809), brick scrap walls (built: 1809-1874), battery additions (built: 1903-1899), gun positions (built: 1874), and ship observation additions (built: 1944). Within each area building materials and artillery were inspected for material loss, physical condition of structural components, and differences between original and replaced materials that "matched in kind." Each portion of the fort was analyzed individually based on its construction date and materials used during that period of time.

National Park Service | U.S. Department of the Interior | Fort Sumter Historical Preservation Assessment | Charleston, SC

Architectural Historical Preservationist. Mr. Sullivan has performed a comprehensive historical preservation assessment for the National Park Service (NPS) at Fort Sumter, which is on the National Register of Historic Places. Fort Sumter military site has gone through many changes since the Revolutionary War. The main structure that exist today was built in 1829 with brick gorge walls, sally port entrance, officer's quarters, eight magazines, and open gun platforms. After the Civil War, Battery Isaac Huger, concrete structure, was built in the center of Fort Sumter. Building materials and artillery were inspected for material loss, physical condition of structural components, and differences between original and replaced materials that "matched in kind."

Keith Chee-A-Tow, P.L.S.

Mr. Chee-A-Tow has over 38 years of land surveying experience. Mr. Chee-A-Tow is experienced in boundary, topographic, hydrographic and GPS surveys, jurisdictional wetlands, aerial mapping and expert witness testimony.

PROJECT EXPERIENCE

Ocean Key House, City of Key West

Prepared submerged land lease survey in accord with the Florida Department of Environmental Protection SLER 0950 Survey Requirements procedure for the resort's "Variable Floating Docks Configuration" comprised of 20,245 square feet of sovereign lands.

Little Palm Island, Hawk Channel

Established boundaries for beach re-nourishment and relinquishing of uplands based on Florida Department of Environmental Protection Disclaimer on lands lost to avulsion. Prepared exhibit to revise the limits of lands to be relinquished to the State of Florida, and to acquire formerly submerged lands to our client based on a historical mean high water line.

Rockland Key, Monroe County

Boundary and topographic survey including establishment of a monumented witness line for mean high water meander line including jurisdictional wetlands mapping to facilitate mitigation on a 34 acre site. The legal description was a complex combination of various parent tracts less-outs and add-ins, with the Project Surveyor providing a review of the title commitment's description and adding encumbrances to the survey.

Summerland Key, Cudjoe Key, Upper and Lower Sugarloaf Key, Ramrod Key, Little Torch Key, Big Pine Key and No Name Key (all right-of-ways)

Aerial mapping and topographic route survey for Florida Keys Aqueduct Authority. Design of sewer and water systems. Easements for excess property submitted to FDOT District 6.

Wisteria Island, Key West

Established witness monuments by use of GPS for mean high water survey; mapped areas of mangrove wetlands; upland topographic survey (1' contours) on a 23 acre island and hydrographic survey of 125 acre submerged land lease (2' contours).

Bahama Village, Key West

Topographic route-of-line survey throughout Bahama Village from Duval Street southerly to Front Street, including the Truman Annex. Elevations were based on NGVD 1929, with benchmarks established at every intersection and mid-point of blocks. Sufficient boundary evidence was recovered to spatially place the right-of-way and platted lot lines within the digital AutoCAD file.

SURVEYING

Office Location
Key West, FL

Education
- University of South Florida
  BA, Marketing, 1974

Professional Registration
PLS – FL

Professional Associations
- Florida Society of Professional
- Land Surveyors
- National Society of Professional Land Surveyors
- National Society of Geographic and Land Information Systems

Total Years Experience
38

Monroe County Airport Marathon (MTH)

Establish horizontal coordinates, relative to the North American Datum of 1983 (NAD 83) and vertical elevations, relative to the North American Vertical Datum of 1988 (NAVD 88) at the thresholds of Runway 7 and Runway 25 and also the lens face of the two sets of the Precision Approach Path Indicator (PAPI) lights at both ends of the runways.

Monroe County Watson Boulevard Bridge

Boundary and Topographic route-of-line survey for the restoration of the existing bridge along Watson Boulevard, a County road with drawings submitted and reviewed by FDOT District 6.

Monroe County Animal Shelter

Prepared sketch and descriptions for acquisition of excess lands for submittal to FDOT District 6.

Atlantis, Paradise Island, Bahamas

Bathymetric survey of lagoon, channel, and ocean profiles; topographic survey of Paradise Island Resort (former hotel) for current design of Atlantis. Topographic route-of-line survey throughout Paradise Island, including the Ocean Club, old airport, sewer treatment plant, Club Land'or and Pirates' Cove.

Oracio Riccobono, P.E.

Mr. Riccobono has over 26 years of experience in geotechnical engineering for numerous transportation projects including roadways, highways, railroads, marine, underground, and airport facilities. Experience includes interpretation of subsurface conditions, planning and execution of laboratory testing programs, geotechnical analysis and design of foundation elements of structures, management of geotechnical projects and preparation of numerous geotechnical reports providing conclusions and recommendations. Most recently, he has executed and served as project geotechnical manager for numerous FDOT projects for Districts 1, 4, 5, 6, 7 and Turnpike as well as MDX. His representative FDOT District 6 and MDX experience is listed below.

GEOTECHNICAL / TESTING

Office Location
Miami Lakes, FL (GEOSOL)

Education
- 1999 to 2000: Master in Business Administration, Florida International University
- 1985 to 1987: Master of Science in Civil Engineering, Geotechnical Specialization, Louisiana State University
- 1982 to 1985: Bachelor of Science in Civil Engineering, Louisiana State University

Professional Registration
Florida P.E. # 49324

Year Career Started
1986

Year Started with GEOSOL
2000

PROJECT EXPERIENCE

Districtwide Geotechnical and Materials Testing Contracts, From Monroe to Osceola Counties, FDOT Districts 4 & 6

Senior Geotechnical Engineer responsible for executing over 150 work orders for projects located in FDOT Districts 4 & 6 for PD&E, final design and construction phases. The approximate length of roadway coverage on this contract is about 300 miles from Monroe to Osceola Counties. Recent performance grade was 95%. Client: FDOT

SR 826 Section 2 Design-Build, from Sunset Drive to Bird Road, Miami-Dade County, FDOT District 6

Senior Geotechnical Engineer of Record responsible for planning and executing the field exploration and laboratory testing programs, interpreting the test results, performing foundation analyses and design for 2.5 miles of roadway improvements including 8 bridges, embankments, MSE walls, noise walls and sign structures. Client: FDOT

SR-5/US 1 Widening Design Build, From Monroe/Dade County Line to MP 3.56 Miami-Dade County, FDOT D6

Geotechnical engineer during the final design phase. Responsible for design and implementation of the project's geotechnical programs. Prepared geotechnical reports for bridge and roadway widening. Client: FDOT

SR 5 Milling and Resurfacing, MM 27.4 - 29.4, Monroe County, FDOT District 6

Senior Geotechnical Engineer responsible for planning and executing the field exploration and laboratory testing programs, interpreting the test results, performing foundation analyses, roadway embankment improvements, drainage and pavement condition report. Client: FDOT

SR 5 Milling and Resurfacing, MM 53 - 57.5, Monroe County, FDOT District 6

Senior Geotechnical Engineer responsible for planning and executing the field exploration and laboratory testing programs, interpreting the test results,

performing foundation analyses, roadway embankment improvements, drainage and pavement condition report. Client: FDOT

SR 5 V-Pier Bearing Replacement - Vicinity of MM 65, Long Key, Monroe County FL, FDOT District 6

Senior Geotechnical Engineer responsible for planning and executing the field exploration and laboratory testing programs, interpreting the test results, performing foundation analyses and design for temporary platforms for use during V-Pier bearing replacement. Client: FDOT

NW 57th Avenue/Red Road/SR 823 Widening from Okeechobee Road (SR 25) To West 21st Street, Hialeah, FDOT District 6

Senior Geotechnical Engineer of Record for roadway widening of existing roadway. He was responsible for design and implementation of field exploration and laboratory testing programs, geotechnical engineering analyses and design for ¾-mile of roadway widening, including a pedestrian bridge over SR 25 and sheet pile walls along the Red Road Canal. Client: FDOT

NW 87th Avenue Widening from NW 58th to NW 74th Street, Miami-Dade County, FDOT District 6

Geotechnical Engineer of Record for 1 mile of roadway widening of existing roadway from 2 and 4 lanes to 6 lanes. He was responsible for design and implementation of field exploration and laboratory testing programs, geotechnical engineering analyses and design for the proposed roadway widening. Client: FDOT

SR 826/Palmetto Expressway PD&E Study, Miami, Florida

Senior Geotechnical Engineer responsible for planning and executing the field exploration and laboratory testing programs, interpreting the test results, performing geotechnical analyses for operational and safety improvements for SR 826, which includes lane additions, major interchange modifications, and special use lanes along 9 miles of SR 826 from SR 836 to I-95. Client: FDOT D6

SR-836/I-95 Interchange Improvements, Miami-Dade County, FDOT D6

Senior Geotechnical Engineer responsible for planning and executing the field exploration and laboratory testing programs, interpreting the test results, performing foundation analyses and design for 2.5 miles of roadway improvements including several bridges, approach embankments, MSE walls, and signalization improvements. Client: FDOT

Swing Bridge Replacement over Tamiami Canal, PD&E and Final Design, FDOT D6 and Miami-Dade County Department of Public Works

Senior Geotechnical Engineer responsible for planning and executing the field exploration and laboratory testing programs, interpreting the test results, performing foundation analyses and design of proposed bridge, seawalls and ½ mile of roadway improvements.

Steven King, E.I.

Mr. King earned his Bachelor's degree in Chemical Engineering from the University of South Florida in Tampa, Florida, in 1998. Mr. King has gained a variety of experience in Civil Engineering and Project Management since graduating. Projects have included project management, utility investigation, water supply, regulatory compliance and permit review.

REGULATORY REVIEW AND PERMITTING

Office Location
Tampa, FL

Education
- Bachelors of Science in Chemical Engineering, University of South Florida, 1998

Professional Registration
E.I. – 2006, Florida, 1100011354

Professional Associations
- American Water Works Association

Year Career Started
1999

Year Started with B&V
2007

PROJECT EXPERIENCE

Hillsborough County | Nature's Way Pump Station Upgrade; Hillsborough County, FL

Staff Engineer. The project involves the expansion of an existing wastewater pumping station. The expansion will take place while the existing pump station remains in service. Responsibilities include shop drawing review and comment. Additionally, review coordination by other staff members. Also, Request for Information follow-up, research and letter drafting. Schedule and budget follow up with Project Manager.

Tampa Bay Water | Brandon Transmission Main; Hillsborough County, FL

Staff Engineer. This project involves a water main extension on an existing water plant site. Duties include shop drawing review and comment. Also, coordination with two other engineering firms who are involved with the project (i.e. getting them to review shop drawings and Requests for Information). Additional duties include coordinate progress meetings, record minutes at meetings, Request for Information follow-up, research and letter drafting, correspondence with the contractor and his sub-contractors and site visits.

Tampa Bay Water | Wellfield Assessment Update; Multiple Counties, FL

Staff Engineer. The updated summary report for 2010 is an update of action items and remediation activities that were presented in the 2009 report. This 2010 report presents updated information on the progress of action items with revised tables and a discussion of each remediation project's status. The duties included review of the 2009 report, gathering updated data on the sites identified in the 2009 report from state databases and a file review office visit to Hillsborough County's Environmental Protection Commission office. Duties also included writing the report, interpreting groundwater and soil sample data, updating the tables and appendices and formatting the report for delivery to the client.

Withlacoochee Regional Water Supply Authority | Engineering Evaluation for the Charles A. Back Wellfields and Water Treatment Facilities; Brooksville, FL

Staff Engineer. Project involved the evaluation of the Charles A. Black Wellfields and Water Treatment Facilities. The evaluation included site investigation and evaluation of site conditions, gathering site specific data (including chemical,

bacteriological, site flow demand data and maintenance records; all for the January 2006 through July 2009 time period). Also, all existing permits for the facility had to be obtained and evaluated. Duties also included interpretation of all of the data for inclusion in the final report and drafting of the report. Additionally, the project involved presenting the report as a PowerPoint presentation to the Board of the Authority. This included creating the PowerPoint presentation, attending the Board meeting and giving the presentation at the meeting.

Hillsborough County Public Works | Project Management; Tampa, FL

Staff Engineer. Responsible for project management and providing technical assistance, to Hillsborough County Public Works, for sediment management, sediment processing and waste processing facility permitting required by the Florida Department of Environmental Protection for four county public works facilities. Including preliminary design and cost estimation, groundwater monitoring oversight/quality assurance review, beneficial use evaluation, waste processing facility permit application preparation, contract review and stormwater environmental resource permit review. Duties also include, final design of sediment containment structures, various agency permitting and management of an Interim Sediment Management Plan. This plan includes processes to allow the County to process new sediment while still removing the existing stockpiles. These processes include building a temporary storage area, berm, lined with plastic for storage of new sediment. Mr. King also conducts field visits and investigates new beneficial use options for the sediment. Additionally duties include subcontractor coordination, report writing and construction coordination.

Suwannee River Water Management District | Wellfield Siting; Live Oak, FL

Staff Engineer. Assisted Staff Geologist in performing wellfield siting assessments for 12 towns throughout the Suwannee River Water Management District (District) on behalf of the District. Geographic, hydrogeologic, and man-made factors were assessed in order to identify potential wellfield sites (or parcels). Duties included gathering and reviewing existing flow data for the 12 towns and calculating future water demands for five year increments until 2025. Also, reviewing existing population data, calculating population growth rates and calculating projected populations for five year increments until 2025. Conducted site visits to two of the towns and to District office for information gathering.

Thomas A. Cummings, P.E.

Mr. Cummings has over 30 years of experience in the development and design of water and wastewater conveyance and treatment facilities and solid waste facilities. Activities within these areas include facility planning, permitting, preparation of drawings and specifications, and construction contract administration. Mr. Cummings serves as Chief Civil Engineer for B&V Water. In that capacity, he works with all offices and departments in America to promote engineering excellence enforce QA/QC policies and procedures, share lessons learned, support the development of new engineering tools and facilitate training in technical areas. Mr. Cummings also managed numerous design/build projects "at risk" for Black & Veatch.

PROJECT EXPERIENCE

Florida Keys Aqueduct Authority | Key Largo Transmission Pipeline Replacement; Key West, FL

Project Manager. Performed pipe material analysis, route selection, design, permitting, and construction phase services for 5 miles of 36-inch steel pipe transmission main, which includes an impressed current cathodic corrosion protection system.

Florida Keys Aqueduct Authority | Cudjoe Key WWTP; Key West, FL

Project Manager. Providing preliminary design, permitting, and bidding services associated with a new 2 mgd advanced biological nutrient removal wastewater treatment plant. The new plant will include a 5-stage Bardenpho treatment process followed by effluent filters, disinfection, and shallow well disposal

Miami-Dade Water and Sewer Department | SW 137 Avenue Wastewater, Transmission System; Miami, FL

Engineering Manager. Performed route selection, design, permitting, and construction phase services for 11 miles of 36- to 72-inch PCCP force main.

South Florida Water Management District | Storm Water Pumping - Pumping Station G-270; Everglades, FL

Engineering Manager. Prepared conceptual and preliminary design including layout, equipment selection and technical specifications for low head, horizontal pumping equipment for a 5,000 cfs storm drainage pumping station. Pumping station to be part of the Everglades Restoration Project.

City of Lakeland | Drane Field Road and Airpark Wastewater Pumping Stations; Lakeland, FL

Engineering Manager. Responsible for the preliminary design and final design documents for two wastewater pumping stations. The Drane Field Road facility is a 14-mgd in-line wastewater booster pumping station designed to eliminate the wetwell and associated odors in a residential neighborhood. The Air Park

MECHANICAL

Office Location
Chicago, IL

Education
- B.S., Civil Engineering, Purdue University, 1979
- Masters Coursework, Civil Engineering, University of Missouri

Professional Registration
PE – 1989, FL, 43476
PE – 1984, KS, 9822
PE - 2011, Illinois, 062.062968

Professional Associations
- American Water Works Association,
- Florida Section AWWA
- Florida Water Environment Association
- Water Reuse Committee

Year Career Started
1980

Year Started with B&V
1980

facility is a 6 mgd, triplex submersible pumping station with variable frequency drives. Design services included engine generator design, site and stormwater design for undeveloped sites and all permitting activities including ERP applications.

City of New Smyrna Beach Utilities Commission | Smith St. Pumping Station and Glencoe Water Treatment Facility Improvements; New Smyrna Beach, FL

Engineering Manager. Provided design, permitting and construction phase services for a new high service potable water pumping station at the existing Smith Street plant and a retrofitted transfer pumping station located at the Glencoe Water Treatment Facility. Project also included a new 3.2-mile pipeline to transfer 9 MGD of treated water between the two facilities.

Orlando Utilities Commission | Metro West Booster Pumping Station; Orlando, FL

Project Manager. Under a design/build contract, provided design, procurement, and construction of a 10-mgd booster pumping station.

Hillsborough County | Bloomingdale Pumping Station and Force Main; Tampa, FL

Engineering Manager. Performed design and construction phase services for a 10-mgd in-line booster type wastewater pumping station and 12 miles of force main. Project includes booster station feasibility study, odor control, alternative pipe material study, and public acceptance meetings.

Hillsborough County | Brushy Creek Pumping Station; Tampa, FL

Engineering Manager. Designed 10-mgd raw wastewater pumping station. The aboveground wetwell/dry pit layout included variable speed pumps, flow metering, and odor control.

Hillsborough County | Falkenburg Reclaimed Water Main; Brandon, FL

Engineering Manager. Performed design and construction services of nine miles of 24-inch reclaimed water main including final route selection, hydraulic analysis, and instrumentation.

Gwinnett County DPU | North Water Pumping Station and Storage Facility; Gwinnett County, GA

Project Technical Specialist/QA. Preliminary engineering, design, and permitting for a 20-mgd pumping station and 10-MG prestressed concrete storage tank. The pumping station and site were laid out to accommodate a doubling in pumping and storage capacity. Services included distribution system modeling, hydraulic surge analysis, design, and quality assurance/quality control.

Richard D. Taylor, P.E.

Mr. Taylor has 32 years of experience in project management, design and implementation of process automation and control systems in water, wastewater, oil and gas, citrus, pulp and paper and petrochemical industries.

ELECTRICAL

Office Location
Tampa, FL

Education
- BS, Electrical Engineering, Georgia Tech, 1976

Professional Registration
PE – 1983, FL, 33376
PE – 1981, GA, 13031

Professional Associations
- National Society of Professional Engineers

Year Career Started
1976

Year Started with B&V
2001

PROJECT EXPERIENCE

City of Lakeland | Wastewater Collection SCADA System; Lakeland, FL

System Integrator. Designed and implemented PLC-based SCADA system for City of Lakeland using microprocessor-based packet-radios operating in a user configurable data repeating configuration to provide 250 sq. miles coverage with 2 watt radios and 20 foot antenna heights. System provides 100% RF coverage in spite of elevation changes of over eighty feet.

City of Lakeland | T. B. Williams Treatment Plant and Well Field; Lakeland, FL

Design Engineer. Design of a replacement process automation system for an existing 25 mgd water treatment facility including remote well field pumps and booster pump stations. The project includes updating the process control strategies coupled with fiber optic communications network to remote well fields and booster pump stations. Prepared specifications and drawings, review of contractor submittals, supervision of contractor-performed construction and system integration services.

Tampa Bay Water | System Enhancements, Regional Water Supply Facilities; Tampa, FL

Design Engineer. Water treatment facility modifications to electrical equipment, controls and automation. The project included the design of diesel fueled engine-generators, medium voltage electrical switchgear modifications, conversion of an existing 2000 hp high service pump from fixed speed to variable frequency speed control, a water booster pump system, aqua ammonia chemical feed system, PLC-based process controls for additional process and electrical systems and expansion of Tampa Bay Water's SCADA system to accommodate facility improvements. Prepared specifications and drawings, review of contractor submittals, supervision of contractor-performed installation and system integration services.

City of Lakeland | Wayne Combee Water Treatment Plant and Well Field; Lakeland, FL

Design Engineer. New water treatment facility including remote well field pumps and pipeline, lime softening pre-treatment, filter basins, chemical disinfection, 5 MG storage tank, and high service pump facilities. The project included the design of distributed control system, electrical and instrumentation systems for entire facility (diesel fueled engine-generators, electrical switchgear, variable frequency speed controlled high service pumps, fluoride, dry polymer, and lime chemical feed systems, and fiber optic communications network to

remote well field. Prepared specifications and drawings, review of contractor submittals, supervision of contractor-performed construction and system integration services.

City of St. Petersburg | Process and Electrical Improvements to Water Pumping Stations, Oberly Pump Station and Washington Terrace Pump Station; St. Petersburg, FL

Design Engineer. Water distribution pump station facility upgrades to electrical equipment, pump controls, emergency power systems and process automation. The project included the development of basis of design documents for replacement diesel fueled engine-generators, medium voltage electrical switchgear replacement, conversion of existing high service pumps from fixed speed to variable frequency speed control, PLC-based controls for additional electrical systems and modifications to City of St. Petersburg Water SCADA system to accommodate facility improvements. Performed research of existing facility conditions and equipment capabilities, prepared preliminary budget of engineering and construction costs, developed basis of design report for facility improvements.

Orange County Utilities | Eastern Regional WTP; Orlando, FL

System Integrator. Water treatment facility controls and automation. The project included the design of PLC-based process controls for wells, transfer pumps, chemical feed system (CO2, chlorine, NaOH) and High Service Pump operation. Supervised design of computer-based operator interface system for facility, performed field start-up and system tuning, prepared conformed to construction records, and developed O&M manuals.

Design Engineer. Water treatment facility electrical, controls and automation expansion. The project includes the plant expansion including PLC-based process controls for additional wells, transfer pumps, expanded and new chemical feed systems and High Service Pump operations. Prepared specifications and drawings, performed contractor bid and submittal reviews, and performed field construction services.

Orange County Utilities | Orange County Water Distribution SCADA System; Orlando, FL

System Integrator. Designed and implemented system-wide radio communication network for regional water treatment and distribution pumping stations. Performed radio path studies and planned facility construction, including antenna and tower design and placement. Designed SCADA system software to allow monitoring and control of remote facilities across multiple communication medium.

Lawrence Brouillette, P.E.

Mr. Brouillette is a senior I&C engineer responsible for the process design and development of various wastewater, reclamation, and potable water, facilities. He has participated in a wide range of project activities including feasibility studies, alternative technologies review, design, construction services, final commissioning and training.

INSTRUMENTATION & CONTROLS

Office Location
Orlando, FL

Education
- BS, Electrical Engineering, University of Central Florida, 1990

Professional Registration
PE – 2002, FL, 57973

Professional Associations
- International Society of Automation
- Water Environmental Federation

Year Career Started
1983

Year Started with B&V
2007

PROJECT EXPERIENCE

Florida Keys Aqueduct Authority | Cudjoe Key Advanced Wastewater Treatment Plant; Cudjoe Key, FL

Design Engineer. Supplied design services in the development of contract drawings and specifications for the Cudjoe Key Advanced Wastewater Treatment Plant. The project included P&ID development, the design of PLC-based process controls systems and a fiber optic communications network,

Orange County Utilities | Master Waste Water Pump Station Improvements Group A; Orlando, FL

Design Engineer. Supplied design services in the development of contract drawings and specifications for the Master Waste Water Pump Station Improvements, Group A. The project included P&ID development, the design of PLC-based process controls utilizing Siemens PLCs and implementation of communications over a MAS radio system.

City of Lakeland | English Oaks Accommodations Phase II; Lakeland, FL

Design Engineer. Supplied design services in the development of contract drawings and specifications for the English Oaks Accommodations Phase II SCADA system. The project included P&ID development, the design of PLC-based process controls utilizing Modicon Quantum PLCs and implementation of communications over a fiber optic WAN with radio as backup.

Hillsborough County Water Resource Services | South County Reclaimed Pump Station; Tampa, FL

Communications Troubleshooting . Supplied troubleshooting services for communications problems with the PLC radio network. Captured and analyzed network communications to resolve communications errors.

Hillsborough County Water Resource Services | Falkenburg Reclaimed Pump Station; Tampa, FL

PLC Programming. Supplied programming services for reprogramming of the existing PLC to correct deficiencies in the original program.

City of Tallahassee | Well 26/28 Upgrade; Tallahassee, FL | 2006

System Integrator. The project included the design of PLC-based process controls for wells, design review, submittal production, PLC programming and communications protocol conversion.

Kissimmee Water Resources Department | North Bermuda Water Plant SCADA System Project; Kissimmee, FL

Instrumentation and Controls Engineer. Performed design review in the development of contract drawings and specifications for the plant control system of the City's 7-MGD water plant. Provided support for start-up and site testing of the Allen Bradley PLC/PC based control system. Debugged PLC control strategies, and facilitated problem resolutions with the City's systems integrator.

Kissimmee Water Resources Department | Lift Station and Imperial Rapid Infiltration Basin; Kissimmee, FL

Instrumentation and Controls Engineer. Performed instrumentation and controls assessment and supplied design services in the development of design modifications to the existing control system of the City's effluent pump station and remote ponds. This modification supported the remote control of these sites. Designed, fabricated, installed and tested the interface panel for the RTUs at the pump station and remote sites. Coordinated the upgrade of the old technology central RTU to an upgraded RTU for the lift station monitoring system. Performed display screen integration, report generation, local area network setup, and installed and integrated the alarm dial out software to allow paging of operators during off-hours.

Public Services Department | GTL WWTP Control System Upgrade; Fort Lauderdale, FL

Design Engineer. Performed a control system needs/requirements assessment and supplied design services in the development of contract drawings and specifications for the Public Services Department's control system upgrade. The control system incorporates elements of a SCADA system, as well as upgrades to both plant control systems at the G. T. Lohmeyer Regional Wastewater and Fiveash Regional Water Plants. Performed a needs assessment and supplied design/construction services in the development of contract drawings and specifications for an Interim SCADA System for the City's 70-MGD Water Plant Well Field. This project utilizes PC based, non-proprietary system that utilizes a PLC/Spread Spectrum RTU and an open architecture. Performed an assessment of the City's sewage and stormwater pump stations. This assessment documented the individual control elementary diagrams and provided a tabulated list of deficient items affecting the installation of the new SCADA system.

Utilities Commission of New Smyrna Beach | Water Facilities Improvements; New Smyrna Beach, FL

Design Engineer. Supplied design services in the development of contract drawings and specifications for the Water Facilities Improvements project. The project included P&ID development, the design of PLC-based process controls systems for two pump stations, a 3 mile long fiber optic network between the plants and construction services in the commissioning of both facilities.

Arthur J. Miller

Mr. Miller has 26 years of experience in the water and wastewater drafting / engineering field.

PROJECT EXPERIENCE

JEA | Oakwood Villa Septic Tank Phase Out; Jacksonville, FL

Designer and CAD Drafter. Performed multiple design tasks, generation of Plan and Profile drawings for several Phases of work including gravity sewer lines and vacuum sewer lines, construction cost estimating.

JEA | Buckman Water Reclamation Facility; Jacksonville, FL

CAD Drafter. Provided CAD drafting of construction drawings.

Orange County | Master Wastewater Pump Stations Improvements – Group A; Orange County, FL

Designer and CAD Drafter. Coordinated the production of drawings for improvements to existing pump stations. Provided design tasks including CAD drafting of construction drawings, coordination of survey data.

City of Lakeland | Drane Field Booster Pump Station; City of Lakeland, Polk County, FL

Designer and CAD Drafter. Performed miscellaneous design tasks, CAD drafted construction drawings, field data surveying, and construction cost estimating.

City of Lakeland | Northeast Water Treatment Plant; Lakeland, FL

Designer and CAD Drafter. Performing design and managing drawing production for a new 8-mgd expandable to 24-mgd water treatment plant. The plant will include groundwater wells, lime softening, dual media filtration, storage, and high service pumping.

Seminole County | Consumers WTP; Seminole County, FL

Designer and CAD Drafter. Performed miscellaneous design tasks including CAD drafting of construction drawings.

City of Fort Myers | East Fort Myers Water Reclamation Campus; Fort Myers, FL

Designer and CAD Drafter. Performed miscellaneous design tasks including CAD Drafting of construction drawings.

GIS/CAD DESIGN

Office Location
Orlando, FL

Education
- A.A., Valencia Community College
- A.S., Drafting and Design Technology, Valencia Community College

Year Career Started
1984

Year Started with B&V
1984

Paul G. Ginther, GISP

Mr. Ginther manages the Geographic Information System / Information Management (GIS/IM) Department that supports Black & Veatch's Water and Energy Divisions. He has 30 years of project management, consulting and implementation experience on projects for engineering, pipeline, utilities and government agencies. He specializes in defining user requirements, system specifications, economic feasibility options, and workflow processes. He has supported a variety of asset management integrations, master plan developments, demand analysis, and information solutions.

He was responsible for the GIS-based SharePoint Web Portal for Black & Veatch: the internal web portal development for spatial analysis of cell tower sites & projects.

GIS / CAD DESIGN

Office Location
Kansas City, MO

Education
- M.S. Geology, Washington State University, 1981
- B.S. Geology, State University of New York at Albany, 1978

Professional Registration
GISP (Certified GIS Professional by the GIS Certification Institute)

Year Career Started
1981

Year Started with B&V
2006

PROJECT EXPERIENCE

Suwannee River Water Management District | GIS-based Suitability Analysis for Wellfields, FL

Used environmental and land use data to perform a GIS-based suitability analysis for the location of well fields for the freshwater supply for 12 towns.

Puerto Rico Electric Power Authority | Dam Failure & Flood Inundation Study at Carite & Lago Coamo Dams; Puerto Rico

GIS support on hydraulic & hydrologic analysis of potential dam failures.

San Antonio Water System (SAWS) | Program Management Services on Gonzales County Carrizo Aquifer Project; San Antonio, TX

Primary GIS Consultant to develop overall information management strategy including GIS development plan, defining database design / data delivery standards, etc. Related task included analysis of potential pipeline routes for proximity to archeological sites, environmental hazards, electric transmission, number of parcels affected, etc.

Woodruff-Roebuck Water District | GIS-Based Reservoir Siting Assessment; Spartanburg County, SC:

Primary GIS Consultant evaluating potential raw water storage reservoir alternatives within a 5-mile radius of the treatment plant. Assessed over 2,600 potential catchment basins for: catchment basin size and depth; proximity and relative elevation compared to the plant; presence and number of major highways, buildings, wetlands, land parcels, etc.

City of Santa Ana| Sanitary Sewer & Water Financial Plan; Santa Ana, CA

Primary GIS Consultant on GIS-based asset management, comprehensive capital improvement plan and master plan for the City's sewer & water systems. Identify at-risk assets for Probability and Consequence of Failure, and Business Risk scores.

City of Baltimore | Sewershed Improvements; Baltimore, MD

Assisted in development of a GIS to manage stormwater / sewer applications to provide spatial analysis ability and decision support through use of a centralized geodatabase. GIS will provide the City with the ability to display all collection system components, maintain a continuously-updated inventory, track inspections and rehabilitation, and maintain monitoring data to increase collection system capacity, eliminate overflow structures, and complete sewer system upgrades.

Union County, NC | Water Master Plan; Union County, NC

Worked with team to develop distribution system geometric networks, topology, and network datasets using GIS water main data with skeletalized hydraulic model nodes. Manipulated features and attributes to create connectivity for network tracing throughout an all-pipes model, but to limited skeletal model nodes. Allocated consumption data to the skeletal model nodes.

City of Bloomington | Water Master Plan; Bloomington, MN

Team updated data for proposed water master plan including: population distribution studies, maximum day usage (MDU) studies, consumption demand, and design demand for customer categories, service zones, and TAZ boundaries. Constructed a nearly all-pipes model using the GIS mainline data with the skeletal model nodes using error correction routines to confirm connectivity. Created workflow to allocate average day demands from geo-referenced metered sales data to updated skeletal model nodes. Allocated future annual average demands to the associated model nodes deemed to be demand nodes. Developed CIP Master Plan diagrams.

BC Transmission Corporation | Enterprise GIS Improvement; Vancouver, BC Canada

GIS Manager and Lead Consultant for tasks including GIS database and data migration planning; ESRI/Smallworld system integration and architecture planning; data management specifications best practices; web-based application planning.

Clark County Water Reclamation District | Paradise-Whitney Sewer Interceptor; Las Vegas, NV

GIS support for the design/construction of 11 miles of 48-inch and 2 miles of 15-18-inch relief sewer lines through a congested part of Las Vegas. Tasks include: establishing a GIS repository, route selection/optimization, alignment sheet generation, parcel map sheet generation, ongoing support for land acquisition, permitting, hydraulic modeling, etc.

George L. Lattin

Mr. Lattin is a construction inspector and resident project representative in Black & Veatch's Water Division. He has been responsible for onsite observation and contract administration of construction of water treatment plants, wastewater treatment plants, installation of supervisory control and data acquisition (SCADA) systems, water lines, sewer lines, pump stations, low water dams, and an elevated water storage tank.

CONSTRUCTION INSPECTION AND MANAGEMENT

Office Location
Orlando, FL

Education
BS, Industrial Technology, 1971

Year Career Started
1972

Year Started with B&V
1972

PROJECT EXPERIENCE

Tampa Bay Water | Regional Surface Water Plant Expansion; Tampa FL

Resident Project Representative. Onsite observation of the Design-Build performance of Veolia Water during the expansion of the plant from 66 mgd to 120 mgd. The work includes installation of two additional trains of High Rate Flocculation/Sedimentation Basins, Pre-ozone Lime Mixing Tanks, Ozone Contact Basins, Post Ozone lime Mixing Tanks. Six additional Dual Media Filters, two additional Clear Wells with three new Backwash Water Pumps, two Chlorine Contact Basins, a New Plant Electrical Feed and Electrical Building, addition of two Emergency Generators and Fuel Storage Tanks, additional building housing new Ozone Generation Equipment, additional Lox Storage Tanks, additional Chemical Feed Storage and Feed Facilities, a new Solids Clarifier, an additional Sludge Gravity Thickener, additional Solids Processing and Loading Facilities, and construction of a new Sludge Drying Bed Facility.

Tampa Bay Water and City of Tampa | Regional Facilities Site Repump Station, Piping Modifications and Points of Connections; Tampa, FL

Resident Project Representative. Onsite observation (QA-QC) for valve and piping modifications to 36-inch through 84-inch diameter pipelines. In addition, construction of two Points of Connection at the Tampa Bay Water Regional Facilities Site that will serve the City of Tampa and Hillsborough County.

Tampa Bay Water | Carrollwood Collection Main Contract 2; Hillsborough County, FL

Resident Project Representative. Onsite observation (QA-QC) for 10-inch and 12-inch diameter water mains. Numerous directional drill sites.

Tampa Bay Water | DeSal Pressurization and Transient Control; Hillsborough County, FL

Resident Project Representative. Onsite observation (QA-QC) for installation of 42-inch and 30-inch diameter ductile iron piping, butterfly valves, and control valves.

Tampa Bay Water | Regional Facility Site Chemical Feed Systems Modifications; Hillsborough County, FL

Resident Project Representative. Onsite observation (QA-QC) for installation of sodium hypochlorite metering pumps and injection points. Also the installation of pH and chlorine sample instrumentation.

City of Tampa and Tampa Bay Water | Morris Bridge WTP Yard Piping Improvement; Hillsborough County, FL

Resident Project Representative. Onsite observation (QA-QC) for installation of 36-inch diameter ductile iron pipe and chemical mixers.

Tampa Bay Water | Regional Facility Site Cover for Lime Mixing Basin; Hillsborough County, FL

Resident Project Representative. Onsite observation (QA-QC) for installation overhead canopy protection for lime mixing equipment.

Tampa Bay Water | Cypress Creek Pumping Station Valve Removal; Pasco County, FL

Resident Project Representative. Onsite observation (QA-QC) for removal of numerous high service pump discharge valves and piping modifications.

Tampa Bay Water | Cypress Creek Electrical Room HVAC Improvements; Pasco County, FL

Resident Project Representative. Onsite observation (QA-QC) for installation of three condensing units and three air handling units for air conditioning of high service pumping electrical room. Also miscellaneous architectural modifications to insulate and seal the building.

Tampa Bay Water | Cosme WTP Yard Improvements; Hillsborough County, FL

Resident Project Representative. Onsite observation (QA-QC) for modifications to above ground ductile iron piping and concrete block screen walls.

Tampa Bay Water and Pasco County| Well Field Generator Relocation; South Pasco, FL

Resident Project Representative. Onsite observation (QA-QC) for installation of an existing engine generator on new concrete slabs, removal of pole mounted transformers, and installation of an existing pad mounted transformer.

City of Lakeland | Northwest Water Treatment Plant Well 6 Installation; Lakeland, FL

Resident Project Representative. Onsite observation (QA-QC) for relocation and installation of an existing well pump with new softstart starter and associated PLC control panel in a new precast electrical building.

Tami Ray, GS

Ms. Ray has a wide variety of grant and loan experience with a strong emphasis on federal and state program development and multi-discipline project funding and management. Her experience and knowledge come from a diverse background including working for city and county government, serving design firms as a program development specialist, owning and operating a multifaceted Florida-based corporation, and serving as Director of Program Development for a Design/Build-CM@Risk Firm.

Ms. Ray has proven her ability to provide a comprehensive approach utilizing numerous funding programs to realize the total project potential. Her experience in planning, administration, permitting, engineering, and construction has given her the ability to provide flexibility to local governments working within the boundaries of promulgated rules and requirements.

Over the past three years, Ms. Ray has created financial initiative plans that provide alternative financial resources for programs exceeding $1.6B in Florida. Since 2005, she has secured in excess of $330M from the FDEP SRF program; $176M Energy; $100M USDA; and others. Ms. Ray's services have reached throughout the nation to include 10 states including multiple financial planning programs. Our team expects to receive in excess of $30M in related professional services to programs sold within these states.

FUNDING

Office Location
Tallahassee, FL

Education
- Riley Business College Graduate, 1988

Year Career Started
1988

Year Started with B&V
2010

PROJECT EXPERIENCE

Malcolm Pirnie | Infrastructure Funding Services Director

Leader of the Malcolm Pirnie Program Development Division located in Tallahassee, Florida. Related duties include coordinating between the various funding agencies and the client; performing historical financial review, preparing supporting documentation, developing a forecast of operating revenues and projected expenditures, and summarizing a five-year cash flow statement in accordance with the applicable funding agency. Coordinates all agency paperwork and hosts various public hearings and County Commission meetings, including drafting ordinances for adoption. Drafts and files Florida Department of Environmental Protection (FDEP) request for information (RFI) applications and funding agreements and files the facilities plan with state clearinghouse. Coordinates with the engineer to identify applicable pledge revenue noted in the capital finance plan, including review of user charges. Processes all funding applications and administers the grant/loan programs on behalf of the client.

The Haskell Company | Program Development Director

As Director of Program Development, Ms. Ray oversaw infrastructure improvements during construction and helped communities to meet their funding needs. Haskell is Florida's largest corporately based Design/Build-CM@Risk firm serving Florida for the past 40 years. Haskell currently performs in excess of $600,000,000 a year in Florida.

Eutaw Utilities, Inc. | Owner/President

Eutaw Utilities, Inc. was a private firm with corporate offices in Tallahassee, Florida. As owner of Eutaw Utilities, Ms. Ray served as President of this fast-growing, multi- discipline design firm. She provided comprehensive funding solutions resulting in immediate success. Assisted communities throughout the state in securing grant and low-interest loan funded projects that ranged from $2,000,000 to $23,000,000 in total project cost.

Baskerville-Donovan | Grant Specialist

Baskerville-Donovan a private engineering firm with corporate offices in Pensacola, Florida. While serving as Grants Specialist, Ms. Ray served communities from Brevard County to Escambia County with grantsmanship and comprehensive funding packages. She achieved numerous successes for both Baskerville- Donovan and its municipal client base. As example, the City of Chipley received $28,000,000+ in grant funding from multiple funding agencies. Ms. Ray provided program development services that earned clients in excess of $100,000,000 in grant monies for infrastructure needs.