STATEMENT OF QUALIFICATIONS FOR
SMITH MOUNTAIN LAKE WTP AND LAKES TO FOREST WATERLINE EXTENSION PROJECT
PROGRESSIVE DESIGN-BUILD PROJECT

Bedford Regional Water Authority

29 August 2013
29 August 2013

Rhonda B. English, P.E.
Engineering Manager
Bedford Regional Water Authority
1723 Falling Creek Road
Bedford, Virginia 24523

Subject: Statement of Qualifications for Smith Mountain Lake WTP and Lakes to Forest Waterline Extension Progressive Design-Build Project (SMLWTP)

Dear Ms. English,

We are excited about the opportunity to partner with the Authority on the SMLWTP project. We understand the necessity of options for stakeholder consideration in this highly visible project and our professionals are prepared to help you achieve the right balance between economical, technical, public and schedule priorities. Listening to you, we have gained perspective and understanding of your project’s goals and drivers. Through our experience we can deliver this project.

We heard through meetings with Brian Key and Rhonda English that the Authority wants a partner who understands your objectives, can be creative to offer a number of alternatives, and will deliver as many priorities as possible. We met with Gary Robertson and Bob Benninger and appreciate their immediate DBP concerns and interest in interconnection between separate systems in Franklin County. Based on our meeting with Dennis Wood, we developed some unique approaches to manage potential water quality issues facing the Town when the SMLWTP is brought on-line. We appreciate Elmer Hodge’s desire to gain consensus between BRWA and outside stakeholders through an effective public communications program. Bob Flynn’s concerns for cost certainty and maximizing efficiencies are also key considerations. In meeting with Megan Rapp, we understand the Authority’s perspective to utilize a team that will support and supplement the on-going public communications outreach. All of these discussions helped us gain a clear view of your priorities and are reflected in our team and overarching approach.

Black & Veatch is one of the prominent engineering and construction companies in the world in the area of water treatment and conveyance facilities. Our expertise in the delivery of design-build projects has been recognized with several awards from the Design-Build Institute of America (DBIA). We are complimented by our primary subconsultant, CHA Consultants, who will make significant contributions and add value to the project. The key benefits our team offers include competitive pricing through transparent bidding process, assuring water quality that conforms with regulations, informed stakeholders, and a project delivered on time and within budget.
Our well-rounded team will seek to strike a balance of your priorities. We have the team and approach to analyze the issues, collaborate with the Authority, and help you deliver the right message to stakeholders — all so you can undertake your project with confidence.

Please find the following certificates, included in Attachment B of the RFQ. Signed copies are included in the appendix of this SOQ:

- Certification of Compliance with Prohibition of Political Contributions and Gifts During Procurement Process
- Submittal Certification

Our signatory for this contract is: Mark A. Prenni, Overland Contracting Inc. Managing Director/Vice President
587 Sigman Road, NE, Conyers, GA 30013
(913) 458-4122 –phone, PrenniMA@overlandcontracting.com

We submit this proposal as a personal statement of our team’s commitment to advance your project from concept through construction. We look forward to discussing our approach in more detail with you. Please direct all correspondence to Dave Kinchen using the contact information at the top of this letterhead.

Very truly yours,

Black & Veatch Corporation

David E. Kinchen, II
Project Manager

Stephen M. Steele, P.E.
Local Project Coordinator
Table of Contents
Part 1. Executive Summary ................................................................. 1-1
Part 2. Design-Builder Profile ................................................................. 2-1
Part 3. Project Team ........................................................................... 3-1
Part 4. Experience .............................................................................. 4-1
Part 5. Project Understanding & Approach ............................................. 5-1
Part 6. Cost Factors ........................................................................... 6-1

Appendices
A. Resumes
B. Forms for Affirmation of Compliance
C. Contract Form Comments
D. Financial Statements (Separate Envelope)
E. Experience
F. BRWA/WVWA DBP Evaluation

LIST OF TABLES
Table 3-1. List of Team Members Roles .................................................. 3-1
Table 4-1. Relevance to BRWA’s Project ............................................... 4-3
Table 4-2. Reference Project Descriptions ............................................. 4-4
Table 4-3. Relevant Membrane Experience of Black & Veatch’s Virginia Based Team Members ......................................................... 4-7
Table 4-4. EMR Rate, and Lost Time Incidents and Total Recordable Incident Rates ........................................................................... 4-9
Table 5-1. Response Summary of RFQ Items ........................................... 5-3
Table 5-2. Proposed Workshops .............................................................. 5-7
Table 5-3. Approach to Water Treatment Plant Capacity and Benefits ...... 5-14
Table 5-4. Potential Design Strategies for the Authority Membrane System ......................................................................................... 5-16
Table 5-5. List of Endangered Species ..................................................... 5-20
Table 5-6. Intake Approach and Benefits ................................................. 5-21
Table 6-1. Rates .................................................................................. 6-4
Table 6-2. General Task Summary .......................................................... 6-5
Part 1. Executive Summary

Bedford Regional Water Authority (Authority) is embarking on a project that will change the face of water supply in the region. The Black & Veatch team has worked closely with the Authority over the last eight months asking questions and listening carefully to gain your perspective and a greater understanding of your issues and priorities so that we could assemble the right team and prepare the right approach for you.

The Black & Veatch team is a single entity design-builder with an approach that balances your the economical, technical, public and schedule priorities associated with this project.

<table>
<thead>
<tr>
<th>Summary of Priorities</th>
<th>Black &amp; Veatch Approach</th>
<th>Benefit to BRWA</th>
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</table>
| **ECONOMICAL**        | • Design & Construction managed by the same company  
                         • Pursue alternative financing opportunities  
                         • Bid ALL major equipment and construction packages  
                         • “Design-to-Budget” | • Cohesive transition between design and construction minimize post-GMP changes  
                         • Competitive pricing through transparent bidding process  
                         • Minimal contingencies carried in GMP maximizes Authority’s priority “wish list” |
| **TECHNICAL**         | • Eliminate DBP issue immediately  
                         • Optimize membrane performance  
                         • Consider operating costs and other non-capital factors  
                         • Pipeline sizing and alignment optimization | • Assured regulatory compliance  
                         • Reliable and proven treatment technologies  
                         • Future phasing plan  
                         • Consideration of alternative sites to meet project and budgetary needs |
| **PUBLIC**            | • Support your Public Communications Plan  
                         • Offer key personal with public outreach experience to support the Authority  
                         • Offer tools to present alternatives and issues | • Community acceptance of selected option  
                         • Informed stakeholders  
                         • Endorsement from regulators |
| **SCHEDULE**          | • Offer a team with expertise in design-build of intakes, treatment and distribution systems  
                         • Collaborative decision-making workshops | • Meet Consolidation Agreement Requirements  
                         • Optimize Authority’s time commitment |

Black & Veatch is complemented by specialty subconsultants that enhance our team in the areas of pipeline design, geotechnical, public communication and DBP process expertise. A key team member is CHA Consulting, who will serve as a specialist in local coordination, laboratory services and develop pipeline design and discipline support for other facilities.

Even more importantly, we are providing a team that is deep and experienced specifically in the areas of intakes, membrane treatment, and pipeline design and construction. Our membrane design team is Virginia based and has been responsible for many successful operating membrane plants, including the Western Virginia Water Authority Award-Winning Crystal Spring Water Treatment Plant.
As one of the most experienced design-build companies in the industry, we have delivered more than $1 billion in projects in the U.S. over the last 5 years. This includes projects similar to SMLWTP, like NE Bakersfield, which features the same membrane system being considered by the Authority. We have also delivered projects in the budget range of this project, like Hummelstown WTP in PA, a 4 MGD direct-feed membrane plant with intake and raw water pipeline which was designed and built for $14 million.

Applying our knowledge and experience from similar projects and considering the priorities of this project, we developed an approach centered on partnership. This involves a series of decision-making workshops which will result in fast-track GMP development, competitive pricing, and delivers a project that meets the Authority's objectives.

During Phase One, our approach is focused on collaboration to reach consensus toward solutions for each element of your project. A menu of options is offered for each of the major elements, and we will use decision-making workshops to move forward with conceptual designs and GMP development. By offering a menu of options—for each of the project priorities and elements—through the workshop process, the Authority will have realistic assessments of the options, including factors such as cost, permitting, operational ease, reliability and aesthetics. A menu of options also provides an ability to assess the non-capital cost factors to determine the most viable option.

Further, based on sampling of SML raw water and laboratory analyses at the CHA Laboratory in Blacksburg, we have a plan to immediately address the existing DBP issues in Franklin County as well as offer long-term DBP compliance treatment alternatives. This is critical as selection of the DBP control method can impact the design of the membrane system.

We also will offer cost saving ideas to optimize the membrane design regardless of the chosen supplier. We have experience negotiating with Pall Corporation or we can conduct a competitive procurement and subsequent piloting with other membrane system suppliers if necessary. Either approach fits your schedule requirements.

We have also identified ways to address the water softening issue for Town of Bedford industries, minimize the railroad crossing challenge associated with the pipeline, and explore alternative funding to stretch the Authority's budget.

Holistically, our approach considers the value of Authority staff time, while still soliciting input and ensuring the end product meets your short and long-term objectives.
During Phase Two, our goal is to provide the greatest value for the Authority. While we may self-perform certain portions of the work, we are committed to operating in transparent manner by bidding our construction services against the local market in the development of our GMP. This assures the Authority gets the most competitive pricing possible and is not restricted to a budget set by a contractor without validation. This approach also limits the required contingency, thereby maximizing the Authority’s investment.

In summary, over the past eight months we have been hard at work gaining understanding of your priorities, needs, and objectives so that we could offer an experienced team and collaborative approach to achieve the right balance between economic, technical, public and schedule imperatives. Our approach lays out a plan to consider stakeholder perspective while driving toward consensus-based decisions. We are confident our approach will result in a project that meets your short-term objectives as it establishes a vision for the future water system.
Part 2. Design-Builder Profile

GENERAL
Founded in 1915 and headquartered in Kansas City, Black & Veatch provides consulting, design, procurement, and construction services for public and private clients, specializing in Energy, Water, Telecommunications, Federal and Management Consulting markets. We have a workforce of approximately 10,000 professionals located in 100 countries with over 1,500 professionals specializing in construction.

Because we are employee owned; when we take on a project, every professional has a stake in its success. Our professionals purchase stock in the company through the Black & Veatch Employee Stock Ownership Program. The stock value is set by an independent valuation company and is based on the company’s profitability, assets, liabilities, and market position. This ownership represents a strong investment and commitment to the success of the Smith Mountain Lake Water Treatment Plant and Lakes to Forest Waterline Extension Progressive Design-Build Project (SMLWTP).

A copy of the Virginia General Contractor and Engineering licenses is provided in Appendix A along with the Forms for Affirmation of Compliance.

LEGAL STRUCTURE
Black & Veatch Holding Company is the parent company of Overland Contracting, Inc (OCI) and Black & Veatch Corporation. For licensing purposes and to apply our competitive non-union construction resources Bedford Regional Water Authority (Authority) will enter into a contract with OCI.

PROJECT OFFICE LOCATION
We are pleased to offer a Virginia based team to perform a significant portion of the work. The design effort will be managed and performed from our Virginia Beach office.

FINANCIAL CONDITION
Black & Veatch has performed exceptionally, with continued revenue, profit growth, and $3.4 billion in backlog. Given the estimated construction value of $30 million and the strong alignment of our technical capabilities with the scope of the SMLWTP Project, Black & Veatch is confident in our expertise and financial capacity to deliver your project. Audited financials are provided in Appendix D (separate sealed envelope).
BONDS AND INSURANCE
Black & Veatch has a bonding capacity of $1 billion. We provide a letter from our surety verifying our ability to bond at least $25-$50M for the SMLWTP Project. We maintain an appropriate insurance level for a design-build company of comparable size. A letter from our surety and Certificates of Insurance are included in Appendix B.

ADDITIONAL INFORMATION

- **Material adverse changes in financial position.** With 98 years of service, Black & Veatch has developed an enviable financial record. No Black & Veatch entity has declared bankruptcy or filed a petition for relief, or had a petition filed against it with respect to any bankruptcy or insolvency proceeding.

- **Legal proceedings and judgments.** Black & Veatch is a large firm operating in an environment of increasing claims and lawsuits, but due to our aggressive effort to maintain a high professional standard these are infrequent occurrences. We carry insurance to protect against claims.

- **Completion of contracts.** No contractual agreements have impaired or will impair our ability to provide the performance or guarantees required by any other contract.

- **Violation of laws.** There have been no convictions for criminal conduct or violation of federal, state or local statute, regulation or court order concerning antitrust, public contracting, employment discrimination or prevailing wages within the past 10 years. Product quality and personal integrity remains its cornerstone.

- **Debarred from bidding.** There has been no debarment in the firm’s history, nor is it under consideration for debarment, on public contracts by the federal government or by any state.
Part 3. Project Team

The composition, organization and management of the team are critical to the Authority achieving its objectives for the SMLWTP Project. You need a team that is organized for efficient delivery and is composed of experts who will partner with your staff to develop solutions for many complex and diverse issues while reaching a decision on the Authority’s true priorities (must-haves vs. options to be incorporated in a future project).

Using this knowledge as the guiding principle, we assembled a team with the experience and skill to deliver the project. A team that understands the necessity of options for stakeholder consideration in this highly visible project and we are prepared to help you achieve a balance between technical, economic, public and schedule priorities, so you get a project that is in the best interest of all stakeholders.

DESIGN-Builder/Other FIRMS

Black & Veatch is the Designer and the Builder for the SMLWTP. As an integrated engineering and construction team, the Authority will benefit from a single entity responsible for the project; this alleviates coordination issues, reduces potential delays, mitigates cost overruns and improves the expediency of the Progressive Design-Build (PDB) experience.

Black & Veatch is responsible for delivering the project; this includes the management of timely, quality deliverables in Phase One and Phase Two. We will lead and perform design of each facility with the exception of the pipeline, which will be designed by CHA. Black & Veatch will oversee all technical development and construction performance, with quality control on every task.

During Phase Two, Black & Veatch will lead and manage all construction activities and may self perform construction for critical aspects of the project, as proved we are low bidder on those aspects, including process mechanical, electrical, instrumentation, commissioning and automation. Our construction management professionals will manage local craft labor on the portions of the work that we will not self perform.

Team Member Firms

In assembling the team, we considered our client-centered culture and looked for partners who complement Black & Veatch’s capabilities, with a strong dedication and focus on building client relationships along with demonstrated ability to deliver quality projects.

Table 3-1. List of Team Members Roles

<table>
<thead>
<tr>
<th>ENTITY</th>
<th>ROLE</th>
<th>SCOPE SUMMARY</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Phase One</td>
<td>Phase Two</td>
<td></td>
</tr>
<tr>
<td>Black &amp; Veatch/OCI</td>
<td>Designer and Builder</td>
<td>Overall leadership and technical direction during design</td>
<td>Overall leadership and direction during construction</td>
<td></td>
</tr>
<tr>
<td>CHA Companies</td>
<td>Project Coordination Pipeline Design and Engineering Support</td>
<td>Design, Traffic control, Lab services, Public Communication</td>
<td>Construction coordination, construction administration</td>
<td></td>
</tr>
<tr>
<td>Schnabel Engineering</td>
<td>Geotechnical Engineering</td>
<td>Ground characterization, GBR, Borings, Testing</td>
<td>Material testing</td>
<td></td>
</tr>
<tr>
<td>Carolina PR</td>
<td>Public Communication</td>
<td>Input on approach and strategies to gain support</td>
<td></td>
<td>Input on approach and strategies to gain support as needed.</td>
</tr>
<tr>
<td>Dr. Bill Knocke, VA Tech</td>
<td>DBP/Process Expert</td>
<td>Technical Advisor, as needed</td>
<td>Technical Advisor, as needed</td>
<td></td>
</tr>
<tr>
<td>Dr. Dave Reckhow</td>
<td>DBP/Process Expert</td>
<td>Technical Advisor, as needed</td>
<td>Technical Advisor, as needed</td>
<td></td>
</tr>
</tbody>
</table>
CHA is a key partner. They offer key staff who have an extensive working relationship with the Authority, including the Preliminary Engineering Report (PER) and other engineering activities that are the basis of this project. Given this knowledge and dedication to you, we have assigned them to lead major components of the work. CHA provides local leadership coordination, laboratory services, pipeline and traffic control design, permitting, and public communication support.

Schnabel Engineering is the most respected geotechnical firm serving Virginia. Schnabel will provide geotechnical services for the entire project. Their understanding of the local geology and its associated risks is critical to decisions that will be made during this project. Black & Veatch and Schnabel have a strong history of collaboration, including a major pipeline project for the City of Roanoke.

Carolina PR is a firm we have partnered with on several projects with nearly identical public communication and stakeholder participation objectives. Their experts will consult with our team and the Authority to assist in developing public education strategies, share successful approaches used by others, and provide general support to ensure effective and accurate information is communicated in a timely manner to gain full acceptance of the project.

In addition, we have the exclusive assistance of two renowned professors known for their expertise in DBPs and water treatment processes. They will serve as technical advisors to the Authority and the team: Dr. Bill Knocke of Virginia Tech and Dr. Dave Reckhow of University of Massachusetts.

**Reporting Relationships**

Rather than two organization charts and separate teams, we propose an integrated team of engineering and construction professionals to ensure smooth transition through the phases from engineering to construction, startup and commissioning. A single organization chart reflects the interconnectedness of the activities from concept through completion.

The following organization chart generally illustrates the reporting relationships of all team members. The technical and construction teams have designated leaders who will facilitate and coordinate the work activities and they will serve as the manager for the tasks within the scope of their respective areas. Team leaders will work in a highly collaborative fashion to ensure consensus of decisions and resolution of issues. Each team leader has been chosen for his management and technical expertise to adequately function in the assigned role. Team leaders will keep the project management team apprised of all work activities and will use the project management team to understand the needs of the Authority. The project management team will direct the entire team such that everyone clearly understands their role such that accurate information about progress is conveyed and coordinated with the Authority.
Management Approach of Team/Firms

Our team has an efficient structure to promote a high degree of collaboration that is aimed at ensuring knowledge of the design intent is carried through construction and commissioning. With Black & Veatch as the single entity responsible for delivering the project, many of the management issues that can arise on joint venture teams are avoided. All subconsultant partners report to Dave Kinchen, our Project Manager, and Paul Delphos, the Design Delivery Leader.

Successful projects start with a well conceived Project Management Plan (PMP). This manual contains specific project details that will allow team members to acclimate quickly. It will be amended as appropriate for the project’s duration, and will be stored on the project web portal so it is accessible by all. Information will include all BWRA specified content and some additional information, including a general project description, team member contact information, reporting protocol establishing the rules associated with both external and internal communications, and proposed conduct of the work including scope by task description, workflow plan, schedule, phase numbers and budgets, and list of deliverables. The PMP will also address document control including the project file system, document distribution, and...
expectations regarding document storage. A Microsoft SharePoint web portal will be created for the project, as is standard for all Black & Veatch projects, to allow team members, including BWRA staff, to access up-to-date information and exchange working files and concepts.

The project management team will conduct weekly team meetings to review progress, define resource needs, and remind team members of expectations and commitments. As part of our plan for a true business partnership, all interested BRWA staff members are invited to participate. Discussions will be documented by the project manager in meeting minutes that will be distributed to attendees and affected parties and will define action items to form the basis for the successive progress meeting. The meetings will be accessible by conference for those who are unable to attend, and participation will vary according to topic and need.

As the project transitions to construction, and subcontractors and suppliers are engaged, they will be managed by Roger Smith our Construction Delivery Manager. A construction execution plan will be developed and the schedule enhanced to include all construction activities.

**KEY PERSONNEL**

**Dave Kinchen, Project Manager** will provide overall leadership and direction for the project. He will be responsible for managing cost and schedule, facilitating meetings, and assure conformance with the Authority’s objectives. Supporting Dave is **Stevie Steele, Local Project Coordinator**. Stevie will assist Dave with day-to-day coordination, applying his planning and design experience to monitor progress and proactively address concerns. Stevie will also lead the design of the pipeline, collaborating with Paul Delphos and other design team members.

**Paul Delphos** will serve as the **Design Delivery Manager**; his responsibility is to manage all technical aspects of the project. He will develop work plans, oversee project activities, manage design deliverables, and facilitate technical workshops and the decision process to help the Authority focus on what’s important. He will work with Dave Kinchen, Steve Steele and Roger Smith for appropriate coordination between design and construction activities to ensure simultaneous activities are proceeding and aligned with budget and schedule.

Paul has broad experience managing intake, membrane, and pipeline projects in the Southeast. He led the membrane design and procurement of the Crystal Spring Membrane WTP for the City of Roanoke. He has developed innovative approaches with unique phasing and scheduling plans that were effective at maximizing use of existing facilities to meet limited budgets. Paul has
investigated the DBP issue and has a strategy to quickly implement improvements to address immediate needs.

**Roger Smith** is the **Construction Delivery Manager** with responsibility for control and execution of all construction, startup and commissioning activities. These duties include construction schedule development, site supervision, subcontractor management, procurement, safety, and staging and coordination, followed by component checks and operational demonstration during startup. Roger and Paul will work as a team, with Roger providing constructability input and developing cost estimates during Phase One to ensure seamless transition between design and construction, which also helps eliminate construction phase risks by giving them appropriate consideration during design.

**Pete Baskette** and **David Harris** will serve as **WTP and Intake Design Leads**. Pete is one of our lead designers of water treatment facilities in Virginia. He and Paul Delphos have worked together for 10 years delivering similar membrane WTP projects around the region. David is a designer who specializes in engineering for the delivery of design-build projects. He will assist in putting together work packages that minimize scope gaps and result in the most competitive cost.

**Chris Hogsed** is a **Senior Construction Superintendent** with Black & Veatch; he is experienced in heavy civil construction management with extensive experience in underground construction. The application of his skills includes onsite construction supervision, contractor coordination, and construction schedule and budget monitoring.

Dave and his management team have done significant work to date including conceptualizing layouts and analyzing data to find short and long-term resolution to the DBP issues. Together, the experience of our team and the pre-work to date places us in a position of superior knowledge of the issues and options to help you achieve a balance between economical, technical, public and schedule priorities. The following summarizes our key personnel, their firm affiliation, responsibilities and qualifications. Resumes for all team members are located in Appendix B.
Key Personnel, Role and Commitment for Phase I & II

**Dave Kinchen, Black & Veatch**
- Project Manager
- **Overall Project Leadership and Conformance with BRWA objectives**

- Similar experience includes:
  - T-Bar Well Field Development and Progressive D-B Project; Midland, TX
  - Southwest Ozone Generator Replacement; Orlando, FL
  - Bay County WTP Expansion; Panama City, FL
  - Tussahaw WTP & Pump Station; GA
  - DC Water DB Combined Heating & Power Project; Washington, DC
  - Frame Press Replacement Project; Fairfax, VA

  **Phase I Commitment:** 30%
  **Phase II Commitment:** 30%

**Stephen Steele, PE**
- CHA Companies
- **Local Project Coordinator**
- Registered Virginia PE; providing local project coordination and lead design of the pipeline

- Similar experience includes:
  - Principal-in-Charge, Glen Heather Farm's Waterline Project; Roanoke County, VA
  - Principal-in-Charge, Reclaimed Water Management Project; Bedford, VA
  - Project Manager, Water System Improvements; Newport, VA
  - Project Manager, Water System Improvements; Narrows, VA

  **Phase I Commitment:** 75%
  **Phase II Commitment:** 60%

**Paul Delphos, PE**
- Black & Veatch
- **Design Delivery Manager**
- Registered Virginia PE; leading all technical aspects of the work

- Similar experience includes:
  - Conestoga and Susquehanna WTPs; Lancaster, PA
  - Vinnicum WTP; Swansea, MA
  - Crystal Spring WTP; Roanoke, VA
  - Brandywine WTP; Wilmington, DE
  - Hummelstown WTP; Harrisburg, PA
  - Wadesboro WTP; Wadesboro, NC

  **Phase I Commitment:** 75%
  **Phase II Commitment:** 30%

**Roger Smith**
- Black & Veatch
- **Construction, Commissioning and Startup Manager**

- Management and oversight of all procurement and construction activities

- Similar experience includes:
  - Construction Manager, Southwest Ozone Generator Replacement; Orlando, FL
  - DB Manager, BioKyowa WWTP, Cape Girardeau, MO
  - DB Manager, St. Simons Island WWTP, Glynn Co, GA
  - Construction Manager, F. Wayne Hill WRF, Gwinnett Co, GA

  **Phase I Commitment:** 30%
  **Phase II Commitment:** 75%

**Pete Baskette, PE**
- Black & Veatch
- **WTP Plant Design**
- Registered Virginia PE; leading design of the WTP

- Similar experience includes:
  - Conestoga and Susquehanna WTPs; Lancaster, PA
  - Charles Town WTP; Charles Town, WV
  - Motts Run WTP, Spotsylvania County, VA

  **Phase I Commitment:** 90%
  **Phase II Commitment:** 40%

**David Harris, PE**
- Black & Veatch
- **Specialized Designer for Design-Build**

- Lead facilities designer

- Similar experience includes:
  - Seawater Desalination Project; Santiago, Chile
  - Changi NEWater Plant DBBO Project; Singapore
  - Bundamba Advanced WTP D-B Project; Australia

  **Phase I Commitment:** 90%
  **Phase II Commitment:** 40%

**Chris Hogsed**
- Black & Veatch
- **Construction Superintendent**

- Site supervision and contractor coordination

- Similar experience includes:
  - T-Bar Well Field Development & Delivery; Midland, TX
  - Various Pumping Stations/Piping; Cobb County, GA
  - Chattahoochee WTP; Atlanta, GA
  - Shoal Creek Filter Plant; Buford, GA

  **Phase I Commitment:** 15%
  **Phase II Commitment:** 100%
MANAGEMENT OF KEY PERSONNEL

Delegate Responsibility and Accountability

We have assembled a remarkable team, one that is suited to address the needs of this project. Each key team member was selected for their experience and expertise in their respective area.

Each are responsible and accountable managers. While the key personnel will provide the primary point of contact with the Authority; to ensure that the project stays on schedule and within budget, we will delegate responsibility and accountability within the team and rely on them to delivery their respective tasks. We will start each week with an internal progress meeting between management and the team leaders to review issues, project progress, action items, and expectations. The meeting will be attended by various technical experts as appropriate according to the issues under discussion. The management team will then relate any updates to the Authority. To enhance collaboration, your project manager will have an open invitation to attend the weekly meetings should she prefer a firsthand account of the discussion.

Bring the Team Together to Work as One

This project requires special expertise that no one in the local engineering/construction community is able to provide under one roof. The combination of technical expertise needed along with construction will require a good communication network. We are fortunate that we live and work in a world in which global communication has been made easy through a number of electronic tools—email, cell phones, the web—and all of those tools will be utilized on this project.

With CHA situated nearby, our team has a local office, so personal interactions and frequent collaborative sessions will be made easy. Additionally, the project will require frequent visits by team leaders and specialists, so that team members will have the opportunity to meet face to face. Combined with our communication tools, this personal interaction will help mold a team with a singular goal in mind – the successful completion of your project.
Part 4. Experience

Critical to the success of the Smith Mountain Lake Water Treatment Plant and Lakes to Forest Waterline Extension Progressive Design-Build Project (SMLWTP Project) is securing an experienced team that will strike the right balance between technical, economic, public, political and schedule factors to achieve the project objectives while managing these key impact areas. This requires a team that has design-build experience and practical knowledge that can be applied in a way that respects the Authority's desire for a “seamless” team that operates in a highly collaborative and partnering fashion.

Black & Veatch has significant design-build experience on projects where partnering and collaborative decision-making were instrumental to successful delivery, as exampled by the N.E. Bakersfield Water Treatment Plant.

A Project Like BRWA’s SMLWTP – 10 Years of Proven Success

N.E. Bakersfield Water Treatment Plant
Bakersfield, California

On this $30M Progressive Design-Build project, Black & Veatch designed a new 20 mgd surface water treatment plant for California Water Service. The plant treats water from the Kern River with an integrated membrane system that includes coagulation (ferric addition), flocculation, sedimentation, 400-micron backwashable screening, microfiltration using Pall Corporation’s PVDF membranes, and chlorine disinfection. The Kern River is typically not a “flashy” source; however, the turbidity can increase from 15 to 1200 NTU during spring rains. The membrane system was preselected in a competitive bidding process based on a life cycle cost analysis before proceeding with the design. This approach was employed to cost effectively focus on the detailed engineering effort. California Water Services and Black & Veatch worked together in a series of workshops to make cost effective decisions on equipment selection, arrangement, overall design, aesthetics, and planning for the future. We then developed a GMP and proceeded with detailed design that was accomplished in 12 months, and the plant was in service at 24 months. Periodic site tours during construction to observe the buried infrastructure and understand how the plant was constructed. These efforts resulted in a final facility that is easy to operate and maintain and provides a safe and secure working environment for plant personnel and visitors.

Black & Veatch has delivered more than $1 Billion in Progressive Design-Build projects in the U.S. over the last 5 years, specifically for water and wastewater facilities. We offer fully integrated design-build capabilities and understand all aspects of delivery from concept to completion including nuances like, how to develop packages for maximum competition and small business inclusion. Globally, Black & Veatch has delivered more than $30 billion in Construction Management At-Risk projects around the world.

Black & Veatch is a Leader in Design-Build Delivery

As a design-build leader, several of our relevant projects have received recognition from Design-Build Institute of America (DBIA). These projects, in
particularly, demonstrate how Black & Veatch carefully listens to clients needs and collaborates to meet or exceed the objectives.

- Black & Veatch will be honored with the 2013 Merit Award by DBIA in November for the T-Bar Well Field Development and Delivery Project in Midland, TX.
- For the Charnock Well Field Restoration Project in Santa Monica, CA we received the 2012 Merit Award from DBIA. Gil Borboa, Water Resources Manager characterizes the relationship [with Black & Veatch] as one built on trust, which is a key ingredient for success.
- Lake Pleasant WTP in Phoenix, AZ was the recipient of two distinguished awards: 2009 Excellence in Public/Private Partnership, Outstanding Achievement Award by the Mayors Business Council U.S. Conference of Mayors; and 2009 Marvin M. Black Excellence in Partnering Awards, by the Associated General Contractors of America.

REFERENCE PROJECTS

The extensive design-build experience of Black & Veatch belongs directly to the members of our team who offer their expertise to the Authority for the SMLWTP Project. The experience described in this section demonstrates their experience and capabilities in design and construction of intakes, membrane WTPs, and pipelines. The following matrix summarizes many projects similar to SMLWTP that have been performed throughout the U.S.

Project descriptions for select projects, identified with green shading, follow the matrix. The descriptions provide details about the project, its components, including cost and schedule information along with references. We have staffed your project with some of the same professionals who achieved the positive results on the reference projects and invite you to call our references to hear their perspective.

“Because of the experience that we have with Black & Veatch, our relationship can be characterized as one of trust. We trust that the expertise is there. We trust that the project is going to be done right. We trust that the project is ultimately going to meet the needs and the expectations that we have. When we hire Black & Veatch, we know the job can get done.”

Gil Borboa, Water Resources Manager
City of Santa Monica, CA
Table 4-1. Relevance to BRWA’s Project

<table>
<thead>
<tr>
<th>BRWA CRITERIA</th>
<th>PROJECT NAME &amp; LOCATION *Indicates Award Winning Project</th>
<th>PROJECT ELEMENTS</th>
<th>TEAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROGRESSIVE  D-B</td>
<td>T-Bar Well Field Development and Delivery PDB Project; Midland, TX</td>
<td>INTAKE</td>
<td>David Kinchen, Bill Ernst, Chris Hogsden, James Greenyer, TJ Moore, Rick Campbell, Scott Stockam, Ted Stolinski</td>
</tr>
<tr>
<td>DESIGN</td>
<td>*Charnock Well Field Restoration Progressive Design-Build Project; Santa Monica, CA</td>
<td>PUMP STATION</td>
<td>Scott Freeman, Bill Ernst, Scott Stockam, Gabriel Bistue, TJ Moore, Chris Hogsden</td>
</tr>
<tr>
<td>CONSTRUCTION</td>
<td>Central Feeder Groundwater Banking/Conjunctive Use Design-Build Project San Bernardino, CA</td>
<td>PERMITTING</td>
<td>Ted Stolinski, Scott Stockam, Gabriel Bistue</td>
</tr>
<tr>
<td></td>
<td>*Lake Pleasant Water Treatment Plant DBO Phoenix, Arizona</td>
<td></td>
<td>Rick Campbell, Scott Freeman, Scott Stockam, Gabriel Bistue, Ted Stolinski, Geroge Budd, Bill Knocke</td>
</tr>
<tr>
<td></td>
<td>Hummelstown Advanced Membrane Water Treatment Plant Design-Build Project Harrisburg, PA</td>
<td></td>
<td>Paul Delphos, Alan Edwards, Brent Reuss, Scott Freeman</td>
</tr>
<tr>
<td></td>
<td>Row River Microfiltration Membrane WTP Expansion and Distribution Pipeline Cottage Grove, OR</td>
<td></td>
<td>Scott Freeman, Gabriel Bistue</td>
</tr>
<tr>
<td></td>
<td>Stone Canyon Pumping and Filtration Plant Los Angeles, CA</td>
<td></td>
<td>Scott Freeman</td>
</tr>
<tr>
<td></td>
<td>Northeast Bakersfield WTP Design-Build Project; Bakersfield, CA</td>
<td></td>
<td>Scott Freeman, Rick Campbell, Scott Stockam,</td>
</tr>
<tr>
<td></td>
<td>Conestoga Water Treatment Plant Lancaster, PA</td>
<td></td>
<td>Paul Delphos, Pete Baskette, Alan Edwards, Doug Brinkman, Brent Reuss</td>
</tr>
<tr>
<td></td>
<td>Susquehanna Water Treatment Plant Lancaster, PA</td>
<td></td>
<td>Paul Delphos, Pete Baskette, Alan Edwards, Doug Brinkman, Brent Reuss</td>
</tr>
<tr>
<td></td>
<td>East Chicago WTP Design East Chicago, Indiana</td>
<td></td>
<td>Paul Delphos, Alan Edwards, Scott Freeman, Brent Reuss</td>
</tr>
<tr>
<td></td>
<td>SJWD Water Treatment Plant Lyman, SC</td>
<td></td>
<td>Paul Delphos, George Budd, Brent Reuss, Scott Freeman</td>
</tr>
<tr>
<td></td>
<td>Water System Improvements* City of Covington, VA</td>
<td></td>
<td>Stevie Steele, Shawn Veltman, Gregory Schultz, Lawrence Hoffman</td>
</tr>
<tr>
<td></td>
<td>Water System Upgrades John Flannagan Water Authority, VA</td>
<td></td>
<td>Shawn Veltman, Douglas Hudgins, Gregory Schultz</td>
</tr>
<tr>
<td></td>
<td>Water Treatment Plant/Intake Washington County Service Authority, VA</td>
<td></td>
<td>Douglas Hudgins, Shawn Veltman, Gregory Schultz, Lawrence Hoffman</td>
</tr>
<tr>
<td></td>
<td>Phase I-6 Water System Improvements City of War, VA</td>
<td></td>
<td>Douglas Hudgins, Gregory Schultz, Lawrence Hoffman</td>
</tr>
<tr>
<td></td>
<td>Philpott Water Treatment Plant Expansion Henry County Public Service Authority, VA</td>
<td></td>
<td>Douglas Hudgins, Shawn Veltman, Lawrence Hoffman</td>
</tr>
</tbody>
</table>
Table 4-2. Reference Project Descriptions

<table>
<thead>
<tr>
<th>Description</th>
<th>Project</th>
<th>Role</th>
<th>Contract Value</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Feeder and Foothill Pump Station</td>
<td>San Bernardino, CA</td>
<td>Prime of a Progressive Design- Build</td>
<td>$58,054,260 – Original GMP $58,054,260 – Final Contract</td>
<td>October 2005 to November 2008</td>
</tr>
</tbody>
</table>

*Prime of a Progressive Design- Build*

Jose Cuevas, President
Midland County Fresh Water Supply District #1
901 S. Mopac Expwy, Bldg II, Suite 225
Austin, TX | 512-306-0024

Gil Borboa, Director Water Resources
City of Santa Monica
1212 Fifth Street, 3rd Floor
Santa Monica, CA 90401
310-458-8230 | gil.borboa@smgov.net

Samuel H. Fuller, Chief Engineer
San Bernardino Valley MWD
380 East Vanderbilt Way
San Bernardino, CA 92408
909-387-9250 | samf@svwmwd.com

“Given the challenges facing the city, Black & Veatch developed a fully integrated, design-build delivery plan that could be completed in less than 12 months,” said Todd Larson, Project Manager, B&V Water. “Using experience we gained from previous fast-track drought work in North America and Australia, this project will meet the water needs of the area for years to come.”

The project included two treatment facilities at separate sites: 6 mgd Charnock Well Field and the 10 mgd Arcadia WTP. Water from the well field, which was contaminated with MTBE, is treated with greensand filtration for iron and manganese removal and activated carbon for MTBE removal. The treated water is blended with water from other wells, and delivered via an existing pipeline to the new membrane softening Arcadia WTP. A multi-barrier treatment approach was implemented. At the well field, biologically active granular activated carbon is provided for MTBE and TBA removal. The treated water from the well field is then conveyed to the City’s WTP and blended with other groundwater wells. Greensand filters, reverse osmosis (RO) membrane softening, air stripping (for TCE removal), fluoridation, and chloramination are provided at the WTP.

The overall Central Feeder project expands the San Bernardino Valley Water Management District’s systems water capacity and includes 332 cfs pump facilities, 78-inch diameter water conveyance pipeline, 10 MG reservoir, groundwater wells, and a new water treatment plant. The project was delivered under a phased approach (stepped increase) to expand the water pumping capacity from 50 cfs to the ultimate capacity of 332 cfs.

Scope included a new pumping plant of about 32 mgd, 5 miles of 78-inch diameter conveyance pipeline that connected to an existing 144-inch Inland Feeder Pipeline and a 2.5 million gallon reservoir. A dechlorination facility was designed to treat the full amount of water that is stored in the reservoir.
**Lake Pleasant D-B-O**  
Phoenix, AZ

Troy Hayes, Design Project Manager  
200 West Washington, 8th Floor  
Phoenix, AZ 85003-1611  
(602) 262-4961  
troy.hayes@phoenix.gov

The team maneuvered skillfully among state agencies while delivering the highest level of client service.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Role</th>
<th>Dates</th>
<th>Description</th>
<th>Contract Value</th>
</tr>
</thead>
</table>
| Troy Hayes, Design Project Manager | Prime of a Progressive Design- Build | August 2003 to August 2007 | The Lake Pleasant Surface Water Treatment Plant is an 80 mgd (120 ultimate capacity) that incorporates the latest in modern water treatment technology and automation. Treatment includes an innovative ballasted flocculation process for high-rate sedimentation, ozonation, deep-bed monomedia filters, post-filtration granular activated carbon contactors and ultraviolet disinfection. These processes control taste and odor, eliminate harmful bacteria and other substances, and provide a reliable supply of high-quality drinking water. The project also included a raw water intake and pump station, 2.0 miles of 92-inch diameter pipeline, on-site storage and pumping of finished water, and on-site carbon regeneration facilities. | $215,096,373 – Original GMP  
$215,430,373 – Final Contract |

<table>
<thead>
<tr>
<th>Reference</th>
<th>Role</th>
<th>Dates</th>
<th>Description</th>
<th>Contract Value</th>
</tr>
</thead>
</table>
| Art Saunders, PE  
United Water PA  
4211 East Park Circle  
Harrisburg, PA 17111  
(717) 561-1103  
art.saunders@unitedwater.com | Prime of a Progressive Design- Build | December 2005 to December 2006 | Black & Veatch served as the Design-Builder for the new Hummelstown Advanced Membrane WTP. United Water decided to construct a new WTP in Hummelstown to replace the existing aging and flood prone plant, in conjunction with increasing water quality, capacity, and efficiency and to ensure future compliance with the EPA Surface Water and Disinfection Byproduct Rules. The water source, Swatara Creek, includes rapidly changing surface water characteristics. Primary challenges were high peak turbidity, high peak TOC, low water temperature and low minimum alkalinity. Water is now treated by utilizing advanced membrane filtration technology consisting of immersed hollow fiber ultrafiltration membranes supplied by Zenon. | $14,950,000 – Original GMP  
$14,400,000 – Final Contract |

<table>
<thead>
<tr>
<th>Reference</th>
<th>Role</th>
<th>Dates</th>
<th>Description</th>
<th>Contract Value</th>
</tr>
</thead>
</table>
| Jack Munsey, Jr.  
Director of Public Works  
City Hall, 333 Locust Street  
Covington, VA 24426  
(540) 965-6321  
jmunsey@covington.va.us | Design by CHA | 2013 to Present | This project involved a 6 MGD conventional treatment plant with intake on Jackson River. CHA completed water model and overall water system evaluation and recommended $5.5 M in improvements. The design of the system improvements is underway and construction is planned for early 2015. The new facilities will include a new intake screen, new filter controls, a continuous sludge withdrawal system, a plant and system-wide SCADA system to automate operations and improve control. Distribution system improvements will include over 40,000 feet of new water transmission and distribution piping throughout the City, new pressure regulating stations, and a new water booster pump station. | $5,500,000 – Original Estimate  
TBD (Ongoing) – Final Cost |

**Hummelstown Advanced Membrane WTP**  
Harrisburg, PA

**Water System Improvements**  
Covington, VA

- Intake  
- Pipeline  
- Pump Station  
- Permitting  
- Intake  
- Pipeline  
- Pump Station  
- Membrane  
- Intake  
- Pipeline  
- Pump Station  
- Permitting  
- Design  
- Inspection

**Lake Pleasant D-B-O**  
Phoenix, AZ

**Hummelstown Advanced Membrane WTP**  
Harrisburg, PA

**Water System Improvements**  
Covington, VA

- Intake  
- Pipeline  
- Pump Station  
- Permitting  
- Intake  
- Pipeline  
- Pump Station  
- Permitting  
- Design  
- Inspection
#### SMITH MOUNTAIN LAKE WTP AND LAKES TO FOREST WATERLINE EXTENSION PROJECT | Bedford Regional Water Authority

<table>
<thead>
<tr>
<th>Project</th>
<th>Team</th>
<th>Team</th>
<th>Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conestoga WTP</td>
<td>Rick Campbell, Scott Freeman, Scott Stockam, Gabriel Bistue, Ted Stolinski, George Budd, Bill Knocke</td>
<td>Paul Delphos, Alan Edwards, Brent Reuss, Scott Freeman</td>
<td>Stevie Steele, Shawn Veltman, Gregory Schultz, Lawrence Hoffman</td>
</tr>
<tr>
<td>Susquehanna WTP</td>
<td>Ms. Charlotte Katzenmoyer Director of Public Works City of Lancaster 120 N Duke Street Lancaster, PA 17602 (717) 291-4738</td>
<td>Ms. Charlotte Katzenmoyer Director of Public Works City of Lancaster 120 N Duke Street Lancaster, PA 17602 (717) 291-4738</td>
<td>Mr. Brian Marciniak Water Filtration Dept Head City of East Chicago 3330 Aldis Street East Chicago, IN 46312 (219) 391-8487</td>
</tr>
<tr>
<td>East Chicago WTP</td>
<td>Ms. Charlotte Katzenmoyer Director of Public Works City of Lancaster 120 N Duke Street Lancaster, PA 17602 (717) 291-4738</td>
<td>Ms. Charlotte Katzenmoyer Director of Public Works City of Lancaster 120 N Duke Street Lancaster, PA 17602 (717) 291-4738</td>
<td>Ms. Charlotte Katzenmoyer Director of Public Works City of Lancaster 120 N Duke Street Lancaster, PA 17602 (717) 291-4738</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reference</th>
<th>Role</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conestoga WTP Lancaster, PA</td>
<td>Prime Design Firm for construction phase services. Key B&amp;V staff led the design phase.</td>
<td>July 2007 to December 2010</td>
</tr>
<tr>
<td>Susquehanna WTP Lancaster, PA</td>
<td>Prime Design Firm for construction phase services. Key B&amp;V staff led the design phase.</td>
<td>July 2007 to December 2010</td>
</tr>
<tr>
<td>East Chicago WTP East Chicago, IN</td>
<td>Subconsultant responsible for membrane and WTP design and construction phase services.</td>
<td>December 2007 to December 2011</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Contract Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 MGD/2010 GE-Zenon Retrofit of an aging conventional WTP. Involved direct feed of river water with PACI and powdered activated carbon pretreatment. First backwash recovery followed by UV disinfection to clearwell facility in the USA. Conducted comprehensive pilot study (5 systems) followed by competitive procurement.</td>
<td>Capital Cost: $28.4 M B&amp;V Fee: $1.9 M Sub Fees: $0.7 M</td>
</tr>
<tr>
<td>24 MGD/2010 GE-Zenon Retrofit of an aging conventional WTP. Involved direct feed of river water with PACI pretreatment. Determined that process enhanced thickening followed by centrifuges was best dewatering combination for membrane reject water. Included both raw and finished water pumping improvements. Conducted comprehensive pilot study (5 systems) followed by competitive procurement.</td>
<td>Capital Cost: $48.2 M B&amp;V Fee: $3.1 M Sub Fees: $1.0 M</td>
</tr>
<tr>
<td>16 MGD Siemens/Memcor New 16 MGD summer/10 MGD winter membrane facility to replace aging conventional facility. Project included seasonal design criteria utilizing Lake Michigan water supply. Involved competitive procurement followed by a “pilot-to-prove”. Project included value engineering of original preliminary design report by others as well as SCADA ine</td>
<td>Engineering Fees Design Estimated: $3.3 M Design Actual: $3.3 M Const. Estimated: $2.1 M Const. Actual: $2.1 M</td>
</tr>
</tbody>
</table>

**Development and permitted treatment of 2nd stage membrane permeate with UV disinfection to send directly to distribution. This saved over $5 million in 1st stage membranes and sewer system improvements.**

**Project is the largest direct-feed membrane plant in Pennsylvania. Involved extensive coordination with existing facilities which resulted in a smooth start-up and transition.**

**Black & Veatch was able to reduce the cost of the project significantly (over $10 million) from the original budget prepared by others by effectively designing the facility for different winter and summer capacities.**

<table>
<thead>
<tr>
<th>Relevancy</th>
<th>Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct-feed membrane with coagulant</td>
<td>Paul Delphos, Pete Baskette, Alan Edwards, Doug Brinkman, Brent Reuss</td>
</tr>
<tr>
<td>BW Recovery System with UV to Clearwell (99% recovery)</td>
<td>Paul Delphos, Pete Baskette, Alan Edwards, Doug Brinkman, Brent Reuss</td>
</tr>
<tr>
<td>Pilot Study</td>
<td>Paul Delphos, Pete Baskette, Alan Edwards, Doug Brinkman, Brent Reuss</td>
</tr>
<tr>
<td>Competitive Procurement</td>
<td>Paul Delphos, Alan Edwards, Scott Freeman, Brent Reuss</td>
</tr>
<tr>
<td>Grant Funding</td>
<td>Paul Delphos, Alan Edwards, Scott Freeman, Brent Reuss</td>
</tr>
<tr>
<td>Retrofit that remained operational throughout construction</td>
<td>Paul Delphos, Alan Edwards, Scott Freeman, Brent Reuss</td>
</tr>
</tbody>
</table>
Our Leadership Team Brings Extensive Virginia Specific Experience

The following map presents the many similar projects our leadership team members of Dave Kinchen, Steve Steele, Paul Delphos and Roger Smith have delivered in Virginia.

Membrane Expertise Offered to BRWA is Virginia-Based

Our team is providing our membrane and water treatment expertise directly from our Virginia Beach based office. Our team has led a number of similar projects that have resulted in successfully operating membrane water treatment plants, not just conceptual studies, as highlighted in Table 4-3 below. The Authority will benefit directly from have this vast experience located in-state by offering experienced-based recommendations to assist in your decision making.

Table 4-3. Relevant Membrane Experience of Black & Veatch’s Virginia Based Team Members

<table>
<thead>
<tr>
<th>PROJECT NAME/DESCRIPTION</th>
<th>SUMMARY</th>
<th>RELEVANCE TO BRWA</th>
<th>KEY TEAM MEMBERS</th>
</tr>
</thead>
</table>
| Crystal Spring WTP      | As a subconsultant to Wiley & Wilson, members of our team were responsible for the first membrane system in the state. This included procurement, piloting (pilot-to-prove), and design of this award-winning WTP. | • VDH Permitting  
• Competitive procurement  
• Pilot-to-Prove  
• System design | • Paul Delphos  
• Alan Edwards |
| Vinnicum WTP            | Replaced an existing iron and manganese removal groundwater plant. Facility included aeration and NaMnO4 pretreatment. Membrane system included a “swing” rack that was the redundant rack for this and the Palmer WTP facility saving the Owner from purchasing two redundant membrane racks. | • Direct feed Pall membrane system  
• Iron and manganese removal  
• Competitive procurement  
• Pilot-to-Prove  
• Zero-liquid discharge facility | • Paul Delphos  
• Alan Edwards |
| Palmer River WTP        | This is the second surface water brackish/desalination facility in the Eastern US. Membrane system included a “swing” rack that was the | • Direct feed Pall membrane system w/ alum-ferric blend  
• Surface water source | • Paul Delphos  
• Alan Edwards |
between technical, economic, public, and schedule factors and general
corporate, in the area of membrane water treatment, construction
projects throughout Virginia and the U.S. Collectively, our experience,
both Virginia and the first in the US to evaluate MIEX pretreatment. Project was cancelled
due to lack of construction funding, but represents the ingenuity and creativity of our team members over
14 years ago with membranes and MIEX.

### Relevance of Experience to BRWA’s Project

This section has demonstrated Black & Veatch and CHA’s capability to deliver design, design-build, and
collection projects throughout Virginia and the U.S. Collectively, our experience, both Virginia-based and
corporate, in the area of membrane water treatment, distribution pipelines, intake structures and pumping and
general construction is unmatched by any other team. We know what it takes to deliver a project of this magnitude and complexity and understand your imperative for a collaborative partnership. We will apply knowledge from our extensive experience on similar projects to efficiently assist the Authority with decision making and delivering solutions. Ours is the only team that will help you strike the right balance between technical, economic, public, and schedule factors.
SAFETY

TARGETING ZERO INCIDENTS

Corporate Safety Statistics
Black & Veatch has a long history of outstanding safety and health performance. Our industry leading statistical data is just one example of how Black & Veatch continually provides safe and healthful working environments for our professionals, contractors, partners and vendors but is also a representation of how we delivers enhanced value to our clients.

Table 4-4. EMR Rate, and Lost Time Incidents and Total Recordable Incident Rates

<table>
<thead>
<tr>
<th>YEAR</th>
<th>EXPERIENCE MODIFICATION RATE</th>
<th>US Bureau of Labor (Construction Industry)</th>
<th>Construction Industry Institute (CII) Target</th>
<th>Black &amp; Veatch (Global w/Subs)</th>
<th>TOTAL RECORDABLE INCIDENT RATES (TRIR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>0.45</td>
<td>1.5</td>
<td>0.07</td>
<td>0.04</td>
<td>3.9</td>
</tr>
<tr>
<td>2011</td>
<td>0.48</td>
<td>1.5</td>
<td>0.07</td>
<td>0.04</td>
<td>3.9</td>
</tr>
<tr>
<td>2010</td>
<td>0.44</td>
<td>1.5</td>
<td>0.07</td>
<td>0.08</td>
<td>4.0</td>
</tr>
<tr>
<td>2009</td>
<td>0.52</td>
<td>1.6</td>
<td>0.06</td>
<td>0.10</td>
<td>4.3</td>
</tr>
<tr>
<td>2008</td>
<td>0.42</td>
<td>1.7</td>
<td>0.07</td>
<td>0.06</td>
<td>4.7</td>
</tr>
</tbody>
</table>

Our ISO 14001 complaint standards and the culture of safety have paid off by contributing to Our 2012 EMR of 0.45, which is 60% better than our industry peers. Black & Veatch’s Recordable Injury Rate for 2012 was just 0.27 compared to an industry average of 4.0 and Lost Time Incident Rate of 0.04 compared to an industry average of 1.5.

Corporate Safety Program
Our corporate safety manual, Focus on Safety and Health, is the cornerstone of consistent implementation of safety management. “Focus” is not a static document; it is regularly updated to reflect developing trends, new legislation, and technological advancements while maintaining consistency with the safety policy established by Black & Veatch. It contains a commitment to safety, the policy, roles and responsibilities, training requirements, emergency planning, incident investigation procedures, an explanation of OSHA, an enforcement procedure, and an explanation of Black & Veatch policy regarding every provision of the Construction Safety Standard, 29 CFR 1926. A copy of the “Focus on Safety and Health” will be provided upon request.

STOP. LISTEN. COLLABORATE.
Our team does not only understand the nature of operating a plant, but we also understand that the operators have unique perspective of the day-to-day operations and know the plant better than anyone. This is why we stop, listen, and collaborate. By doing so, we can consider the operators challenges in the design effort to produce a safer, easier to use facility. An example is the work Black & Veatch is doing on DC Water’s ENR North and Filtrate Projects, where our design team collaborated extensively with operations, construction and engineering in a point-to-point workshop focused on ease of operations and life safety during every phase of the project. Because of the tremendous success of that workshop it has become the standard for future DC Water projects.

We have received more than 125 safety awards on design/build projects, these accomplishments show how serious we are about safety.
Project Specific Safety Manuals
Black & Veatch establishes a project specific safety manual for each project. This manual includes appropriate segments of the Authority's safety program as well as B&V Safety Guidelines and Forms. It is the responsibility of the Construction Manager, Roger Smith, to ensure that the workforce implements the safety program in accordance with the established standards. Roger will ensure that safety is considered in the planning of the work and that the work is safely executed. Roger will be responsible for thoroughly instructing operating personnel in the safety practices applicable to the operations that they are performing, as well as enforcing the observance of all safety requirements governing the activity.

The implementation of Black & Veatch's field safety and health program begins prior to the start of employment and construction activities at the jobsite. Contact is made with our insurance representative in the area, to assist in identifying local physicians, nearby hospitals and clinics, the closest fire department station, ambulance services, and other emergency services. Contact is also made with local safety officials to determine specific regulations governing the vicinity of the jobsite. Preconstruction meetings held with the Authority's Construction Coordinator or designated Safety Coordinator are designed to assure compliance with all applicable rules and regulations.

Other elements of our safety program include:

- **Orientation & Training.** Black & Veatch new employee orientation and safety training programs include instruction on the following: safety policy; safety rules; safety meeting attendance; company safety record; hazard recognition and reporting; personal protective equipment; respiratory protection; fire protection; housekeeping; toxic substances; electrical safety; driving safety; confined space entry; safe work practices; first aid; and emergency procedures. Additional training for supervisors includes instruction on safety supervision and incident reporting.

- **Subcontractor Safety.** Black & Veatch takes all reasonable measures to properly protect all persons in proximity of the jobsite from risk of incident and danger to health and to properly protect property from damage or loss. Before any subcontractor is hired for a job, they must complete and return the Black & Veatch “Contractor Safety Questionnaire”, which supplies in-depth information on the subcontractor's safety history and safety philosophy to ensure that the Black & Veatch safety program is complementary with theirs.

- **Inspections.** The Safety Manager conducts in-depth inspections, with a follow-up written report submitted to the resident Construction Manager and to the Black & Veatch Home Office Construction Department. Inspections can be formal, periodic, scheduled inspections or they can be special inspections relating to equipment installation, revision of operations, initiation of new procedures, or after an incident. Inspections may also be unannounced if deemed necessary.

- **Drug & Alcohol Program.** Black & Veatch administers a Drug and Alcohol Program which provides for testing before employment, after an incident, for cause, and on a random basis. Black & Veatch has a low tolerance for employees who are under the influence of drugs or alcohol during work hours.

- **Client Controlled Insurance Programs.** Black & Veatch has managed several client controlled insurance programs. The insurance programs included workers’ compensation, general liability, and builder's risk insurance.
Proprietary Information

The information in this section is considered proprietary. Volume 2 contains our response to this section.
Appendices

A. Resumes
B. Forms for Affirmation of Compliance
C. Contract Form Comments
D. Financial Statements (Separate Envelope)
E. Experience
F. BRWA/WVWA DBP Evaluation
# Appendix A. Resumes

<table>
<thead>
<tr>
<th>Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>David E. Kinchen</td>
<td>1</td>
</tr>
<tr>
<td>Stephen M. Steele, P.E.</td>
<td>3</td>
</tr>
<tr>
<td>Paul J. Delphos, P.E.</td>
<td>5</td>
</tr>
<tr>
<td>Roger A. Smith</td>
<td>7</td>
</tr>
<tr>
<td>William Roland Knocke, Ph.D. P.E.</td>
<td>9</td>
</tr>
<tr>
<td>Dr. Dave Reckhow</td>
<td>11</td>
</tr>
<tr>
<td>Louise C. Dixon, APR</td>
<td>13</td>
</tr>
<tr>
<td>Tami Ray, GS</td>
<td>15</td>
</tr>
<tr>
<td>George Budd, PhD, P.E.</td>
<td>17</td>
</tr>
<tr>
<td>Shawn H. Veltman, PhD, P.E.</td>
<td>19</td>
</tr>
<tr>
<td>Jonathan M. (Matt) Goodman</td>
<td>21</td>
</tr>
<tr>
<td>Peter Baskette, P.E.</td>
<td>23</td>
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<tr>
<td>David L. Harris, P.E.</td>
<td>25</td>
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<tr>
<td>Douglas G. Brinkman, P.E.</td>
<td>27</td>
</tr>
<tr>
<td>Alan Edwards, P.E.</td>
<td>29</td>
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<tr>
<td>Theodore J. Stolinski, Jr., P.E.</td>
<td>31</td>
</tr>
<tr>
<td>Scott D. N. Freeman, P.E.</td>
<td>33</td>
</tr>
<tr>
<td>Lawrence Hoffman (CHA)</td>
<td>35</td>
</tr>
<tr>
<td>William B. (Brent) Ferren, P.E.</td>
<td>37</td>
</tr>
<tr>
<td>Dennis Trupka, RA, NCARB</td>
<td>39</td>
</tr>
<tr>
<td>Douglas B. Hudgins, P.E.</td>
<td>41</td>
</tr>
<tr>
<td>Thomas P. Karis, P.E.</td>
<td>43</td>
</tr>
<tr>
<td>William (Bill) Ernst, P.E.</td>
<td>45</td>
</tr>
<tr>
<td>Scott D. Stockam, P.E.</td>
<td>47</td>
</tr>
<tr>
<td>Mark E. Wright</td>
<td>49</td>
</tr>
<tr>
<td>Gabriel Bistue, P.E.</td>
<td>51</td>
</tr>
<tr>
<td>Gregory T. Schultz, P.E.</td>
<td>53</td>
</tr>
<tr>
<td>Rick Campbell</td>
<td>55</td>
</tr>
<tr>
<td>James Greenyer</td>
<td>57</td>
</tr>
<tr>
<td>Jeff L. McKee</td>
<td>59</td>
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<tr>
<td>T.J. Moore</td>
<td>61</td>
</tr>
<tr>
<td>Chris Hogsed</td>
<td>63</td>
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David E. Kinchen

Mr. Kinchen currently serves as Associate Vice President for Black & Veatch Water, and currently manages the development and business oversight of the alternative delivery, design-build and construction opportunities in North America and the Caribbean. As part of his responsibilities, Mr. Kinchen is responsible for business development, management oversight of strategic team relationships, proposal strategy development, conceptual design development review, sustainable design strategy and evaluation, oversight of design management, construction and design-build execution oversight, and operational support. He has served as Project Executive over operations on multiple design-build projects for both Municipal and Federal construction projects. Based in Black & Veatch’s Atlanta, Georgia office, he has over 25 years of progressively increasing responsibility and experience. He has proven leadership skills with responsibilities at the directorship level, including profit and loss accountability, corporate strategic development and execution of initiatives, development of strategic partnerships, business development, and overall operations management. His professional assignments have included alternative delivery, design-build, hard bid and cost plus projects in the municipal water and wastewater, federal, heavy civil, heavy industrial, commercial, institutional, and transportation areas of construction.

PROJECT EXPERIENCE

T-Bar Well Field Development and Delivery Progressive Design-Build Project; Midland, Texas (MCFWSD#1)

Project Executive/JV Management Committee. This $162M Progressive Design build delivery of this DBOF project included approximately 50 deep groundwater supply wells, high service pump station, storage tanks, chlorination facility, terminus facility and approximately 56 miles of 48” water transmission main in West Texas. Because of the severe drought conditions in this area of the country, schedule and quality were high priorities, and the project was delivered utilizing the progressive design-build model in 14 months from contract through water delivery from the wellfield site to the City of Midland, Texas within the established budget.

DC Water, Washington, DC | DCW DB Combined Heating & Power Project

Project Director Preconstruction. As part of DCW’s overall plant expansion program, the CHP project was developed to generate heat and power from the digester gas supply created from the main process train as a sustainable energy source at the Blue Plains Advanced Wastewater Treatment Plant. In a partnership with Pepco Energy Services as the operator and prime, with our contracting partner Ulliman Schutte Construction, the project will be delivered utilizing the fixed price DB delivery. The $80M project will consist of three turbine generators, siloxane facility, and other balance of plant processes to accommodate approximately 5MW of power generation from on-site sources to be utilized by the Blue Plains Cambi process.
**Orlando Utilities Commission | Southwest Ozone Generator Replacement Project; Orlando, FL**

**Project Director.** This CM-at-risk project consisted of removal of three obsolete ozone generators and LOX system and replacement with new Ozonia generators and new LOX system. The project includes a preconstruction phase to provide capital cost development, constructability reviews and feedback to the Owner’s design team, with construction initiated in March 2013 following agreement of the final GMP. The overall project cost is budgeted at approximately $10M.

**Upper Occoquan Service Authority | Frame Press Replacement Project; Fairfax, VA**

**Project Director.** The existing solids handling facility at UOSA’s Water Reclamation Facility in Fairfax, Virginia has been operating at a significantly reduced capacity because of antiquated, 1970’s vintage frame presses. The project consists of replacing the three frame presses, including all new power and electrical service to increase reliability of the system, as well as replace existing chemical feed service to the frame presses to increase solids recovery and improve reliability for this element of UOSA’s operations. The $7.0 million project is being delivered under the progressive design-build model as part of the State of Virginia’s PPEA legislation. In partnership with a local contracting partner, our team will provide full design and all electrical and I&C upgrades for the new process.

**Bay County Water Department | Bay County WTP Expansion**

**Project Director.** The expansion of the Bay County Water Treatment Plant included the complete decommissioning a traditional flocculation & sedimentation process to a ballasted flocculation process with a capacity of 45 MGD. The $18 MM expansion included the addition of the Actiflo process basins and equipment, design/build of 6 new declining gravity filters, new filter press building and sludge handling tanks for biosolids handling as a result of the increased sludge volume as a result of the new Actiflo process. Additionally, new HV electrical facilities, new process instrumentation and control systems, new filter gallery piping and backwash control panels, and all new FW piping was installed and or retrofitted to the existing system to accommodate the increased plant efficiency and resulting capacity. Delivery included traditional DBB with design-build for filter expansion, filter press building and SCADA expansion.

**Henry County Water Authority | Tussahaw WTP & Pump Station; Georgia**

**Project Director.** The new $24MM, 13 MGD water treatment plant included an 120’ deep RW intake structure with two 2500 HP turbine RW pumps, associated 36”-54” DIP RW, BW & FW piping, 4 sedimentation trains, 4 declining gravity filter trains, MIOX disinfection, various chemical feed systems, new SCADA system, Pre-stressed FW tanks, sludge tanks and decant ponds for sludge removal. The uniquely designed facility also included a 50,000 sf administration facility with office, administration, laboratory, chemical feed, control and filter gallery under one roof. Design-build was employed for SCADA and multi-level cast-in-place building structure.
Stephen M. Steele, P.E.

Mr. Steele is a highly skilled professional with several years of experience in both the technical and managerial aspects of the civil engineering consulting business.

PROJECT EXPERIENCE

City of Bedford | Reclaimed Water Management; Bedford, VA.
Officer-in-Charge. In February of 2008, the City of Bedford began the process of requesting permission to take advantage of the reclaimed water from the wastewater treatment plant (WWTP) by working with Mr. Steele to prepare a Water Reclamation and Reuse Addendum to the City discharge permit. The initial reuse plan included provisions to use the reclaimed water for irrigation at various sites within the City limits. The appearance of the Virginia Department of Environmental Quality (DEQ) stimulus funding program opened additional opportunities for the reclaimed water and the City was successful in obtaining stimulus funding for the construction of an approximately 2,400 linear foot non-potable waterline to the BFG, Inc. facility for cooling purposes. This effort began the evolution process by the City to maximize the valuable water resources that they had and reduce the amount of potable water that was wasted on process applications. Due to regulatory requirements, the City elected not to use the water for irrigation. *ACEC 2011 Honor Award

Bedford County Public Service Authority | Lakes to Forest Water System
PER; Bedford, VA
Officer-in-Charge. Development of preliminary engineering report (PER) to evaluate the technical and financial aspects of connecting the Lakes and Forest water systems operated by the Bedford County PSA. The primary purpose of this study was to develop a planning tool to determine an alternative source of water for the Forest Central system, and to evaluate the feasibility of providing a redundant source of water to the City of Bedford. Three options were evaluated based on the level of hydraulic and financial benefit that could be provided.

Bedford County Public Service Authority | Water & Sewer GIS
Development; Bedford, VA
Officer-in-Charge. Initial work included the development of a geodatabase skeleton with several layers useful to the PSA such as waterlines, customer meters, fire hydrants, tanks, valves, pumps, treatment plants, manholes, gravity lines, forcemains, pump stations, cleanouts etc. Following a pilot study to fine tune the geodatabase, approximately 10,000 water and sewer point features and approximately 230 miles of water and sewer lines were digitized using all available record plans, survey files, and GPS data collected by the PSA. The final geodatabase was combined with the Bedford County’s GIS and shared across a network for improved communication and data management between County departments.
Town of Christiansburg | Water Tank Rehabilitation; Christiansburg, VA

Officer-in-Charge. Provided design services for rehabilitation of the 500,000 gallon Hills Water Storage Tank located in Christiansburg, Virginia. Services included inspection, analysis, providing recommendations, and construction phase services. In addition, Mr. Steele worked with sub-consultant, S&ME, who inspected and tested the rehabilitated tank. Hydraulic modeling was performed to document impact of the out of service tank on the water system. This allowed the Town the opportunity to alert emergency services of the changed conditions. A structural evaluation was also performed and recommendations provided due to the lack of foundation anchor supports on the tank. In addition, the presence of appurtenances in the form of antennae and supports was addressed prior to the bidding process.

City of Galax | Waterline Design & Reservoir Removal; Galax, VA

Officer-in-Charge. Provided funding assistance for needed water improvements in the City of Galax. Funding was successfully provided by Mount Rogers Planning District Commission (MRPDC) for the design portion of this work. Services included surveying and the preparation of design plans, technical specifications, and contract documents for two projects. The Fries Road waterline improvements project consisted of approximately 3,350 feet of 6-inch waterline along City View Street, Fries Road, Highland Avenue and 8-inch waterline along Waugh Drive. The Spivey Reservoir Abandonment project consisted of the demolition of the existing Spivey Reservoir and relocating an existing county owned and operated pump station away from its current location at the Spivey Reservoir.

Augusta County Service Authority | Harriston Water System Improvements; Harriston, VA

Project Manager. Environmental assessment, design and construction phase services for a new 300,000 gallon, 150 foot tall water tank. Final design included subsurface investigation, piping, electrical, erosion and sediment control narrative, design, and specifications.

Town of Pearisburg | Pearisburg Water System Improvements; Pearisburg, VA

Project Manager. Preparation of a water system PER to evaluate the existing water distribution system and recommend improvements. The Town had numerous 1, 2 and 4 inch waterlines that needed to be replaced with 6 inch waterline to improve available flow and pressure issues. In addition, this report outlined the measures that had been taken to reduce water loss and improve accountability in an effort to meet the EPA driven 30% water loss regulation. Services included completing the PER which included preparation of mapping, hydraulic analysis, system pressure evaluation, system effective storage evaluation, and a leak detection study of the existing Town water system. The Town was successful in obtaining funding for this water system PER through a Virginia Department of Health (VDH) Planning Grant. Mr. Steele helped with the application process for this grant and continued to pursue additional funding for the water system improvement project costs.
Paul J. Delphos, P.E.

Mr. Delphos is the East Region Water and Membrane Practice Leader for Black and Veatch. He has 22 years of experience in the water and wastewater industry and is a recognized expert in the area of membrane treatment. He has membrane related project experience on over 25 different facilities totaling over 400 mgd and he has been published and presented at all major conferences and is a co-author in key design manuals. Mr. Delphos has experience with all of the major membrane system suppliers and has worked on membrane projects ranging from groundwater membrane treatment to surface water desalination facilities. He has been an invited speaker on membrane technology at a number of national, state and local conferences/workshops, including being a regular speaker on membranes at the Annual Virginia Senior Water Operator’s Forum in Charlottesville.

RELEVANT PROJECT EXPERIENCE

**United Water PA/DE | Hummelstown Membrane Pilot Study; Hummelstown, PA**

**Project Manager and Engineer.** Responsible for the evaluation and conceptual design of a new 4-mgd membrane filtration plant for UWPA’s Hummelstown WTP. Project components included side-by-side piloting of 3 different membrane systems, membrane system procurement, and overall system conceptual design to develop a GMP.

**SJWD | Membrane Filtration Upgrade, SJWD WTP; Jasper, SC**

**Membrane Procurement and Design.** Conceptual design and piloting of a 7.5 mgd Pall membrane facility for the SJWD WTP. Project included the evaluation of membrane technology as compared to expanding with existing conventional water treatment technology.

**East Chicago | Membrane Filtration Upgrade, East Chicago WTP; East Chicago, IN**

**QA/QC.** Served in a QA/QC role for the procurement and design of a 24-mgd direct feed membrane plant on Lake Michigan. Facility included updated raw water pumping station, chemical feed and membrane facilities on an existing facility footprint. Membrane design capacity varied between winter and summer conditions to reduce overall project costs.

**City of Lancaster | Susquehanna and Conestoga WTP Membrane Upgrade; Lancaster, PA**

**Project Director.** Responsible for the evaluation and design of a 24 and 12-mgd direct feed membrane filtration plants. Project components included side-by-side piloting of five different membrane systems, membrane system procurement, and overall system design. Unique characteristics of this effort included incorporating the membrane system in an existing WTP, high-rate clarification as part of the solids handling system, secondary membrane system recovery with UV disinfection, as well as obtaining federal grant funding.

**Skyco WTP Process Optimization Study, Dare County, NC**

**Process Engineer.** Evaluation to identify strategies to optimize the existing GAC system for TOC removal and disinfection byproduct precursor reduction.

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**DESIGN DELIVERY MANAGER**

**Specialization:**
Advanced Water and Membrane Treatment

**Office Location:**
Virginia Beach, VA

**Education**
- MS, Environmental Engineering, Georgia Institute of Technology, 1994
- BS, Civil Engineering with Highest Honors, Georgia Institute of Technology, 1990

**Professional Registration**
PE – VA, PA

**Professional Associations**
- American Water Works Association, Membrane Process Committee, Emerging Issues Committee
- Water Environment Federation
- International Desalting Association

**Year Career Started**
1991

**Year Started with B&V**
2007

**HANDBOOKS**
City of Wilmington | Membrane Filtration Upgrade, Brandywine WTP; Wilmington, DE
Project Manager and Lead Engineer. Conceptual design, piloting and procurement for the 10 mgd Brandywine WTP utilizing Pall membranes. Project included the evaluation of different pretreatment technologies, submerged and pressure membranes, as well as consideration for future desalination treatment as well as federal grants.

Town of Swansea | Water District Desalination Project; Swansea, MA
Project Manager. Project involved the evaluation and design of a 2.5-mgd desalination water treatment facility using Pall membranes. Project components included environmental permitting, bench-scale studies, membrane system piloting and procurement, and final design.

City of Roanoke | Crystal Spring Membrane Filtration WTP; Roanoke, VA
Project Manager. Responsible for the procurement, piloting and design of a 5-mgd microfiltration membrane WTP. Project resulted in more than $450K through the procurement process. Project was awarded the 2003 AWPA Project of the Year.

City of Chesapeake | Ion Exchange Pilot Study; Chesapeake, VA
Project Manager and Engineer. Responsible for the evaluation and pilot study of the MIEX ion exchange resin to improve organics removal and DBP compliance a 10-mgd water treatment plant. Project included developing piloting protocol, regulatory coordination and negotiation, and preliminary system life cycle cost comparisons.

City of Wadesboro | Membrane Plant Expansion Evaluation; Wadesboro, NC
Senior Project Engineer. Responsible for the design of a 2.5-mgd ultrafiltration membrane water treatment plant. Project included piloting of both submerged and pressure membrane with MIEX and coagulation pretreatment.

City of Chesapeake | Lake Gaston WTP, Raw Water Delivery System Design, Chesapeake, VA
Senior Engineer. Responsible for the design of a 20-mgd raw water delivery system for the City of Chesapeake. Project included more than 12 miles of 36-inch water transmission main, 1-million-gallon ground storage tank, and two floating raw water pumping stations and intakes.

Union County | 1 MG Northwest Elevated Storage Tank; Union County, NC
Project Manager. Responsible for the design and construction administration for a 1-million-gallon elevated storage tank for Union County, North Carolina. Design included three different styles of elevated storage tank (hydropillar, pedestal and composite), as well as modifying the original location of the tank to better serve County customers.
Roger A. Smith

Mr. Smith is a safety-focused project manager with over 25 years of experience in project management, specializing in water treatment/reclamation facilities. Mr. Smith has extensive experience in all facets of the project life cycle from project estimate, subcontracting, material procurement, formwork selection, crew coordination, and equipment selection to ensure compliance with project safety, quality, scheduling and budgetary requirements.

Mr. Smith has successfully completed many types of projects under traditional design-bid-build and design-build delivery methods. His expertise lies in the implementation of safe work practices; project planning, budgeting and cost control; subcontractor/vendor management; adherence to quality standards; client and employee relations; and presentation and communication skills.

PROJECT EXPERIENCE

City of Augusta | 15 MGD Tobacco Road WTP; Augusta, GA

Project Manager. Included a 30 MGD raw water pump station at an off-site location and cast-in-place concrete structures, mechanical piping and process equipment installation at the plant. Process train included chemical treatment facilities, anaerobic and anoxic mixing zones, inclined plate settlers and activated carbon filtration.

Rockdale County Water Resources Board | Water Treatment Plant; Rockdale County, GA

Project Manager. Included a process train consisting of chemical pre-treatment facilities, two “Superpulsator” contact clarifiers, two ozone contactors, four deep bed sand and GAC filters, chemical post-treatment facilities, two pre-stressed concrete storage tanks, and a high service pump station. Installed over 10,000 feet of interconnecting ductile iron pipe. A SCADA system with a new operations center was provided to control and monitor plant operations.

Upper Oconee Water Authority | River Intake and Pump Station at the Bear Creek Water Treatment Plant; Bogart, GA

Project Manager. Included the construction a cast-in-place river intake, raw water piping, and a pump station utilizing three vertical turbine pumps. The challenges of construction in the Oconee River were overcome with a combination of non-invasive cofferdams techniques and lots of pumping. The project finished six months ahead of schedule in spite of high river elevations during the first half of the schedule.

San Diego Water Authority | San Pasqual Aquatic Treatment Facilities; Escondido, CA

Assistant Project Manager. Involved construction of the two million gallon per day pilot tertiary treatment facility. Innovative approaches to treating secondary effluent constructed on this site included the use of water hyacinths for the removal of organics from the treated wastewater, reverse osmosis treatment and ultraviolet disinfection equipment.
**Southern Company Nuclear | Hot Water Intake Structure for Plant Vogtle Units 3&4 Cooling Towers; Waynesboro, GA**

**Project Manager.** Included cast-in-place concrete inlets to two new cooling towers to be constructed at Plant Vogtle. Over 6,000 yards of concrete was placed using Doka formwork.

**Southern Company | Gypsum Stackout Mechanical/Electrical at Georgia Power’s Plant Scherer; Juliette, GA**

**Project Manager.** The project included the installation of over 50,000 lf of HDPE pipe, three concrete pump stations and two electrical buildings. The HDPE piping conveyed gypsum slurry and reclaimed water through 8”, 12” and 16” single and double wall systems.

**Georgia Power | Plant Scherer Miscellaneous Projects; Georgia**

**Project Manager.** Leverage working relationships with Southern Company to procure miscellaneous projects at the Plant Scherer Power Plant. Projects include underground utilities, electrical ductbanks, cast-in-place concrete, structural steel erection, process equipment installation, emergency repairs, plant start-up assistance.

**Gwinnett County | North Advanced Water Reclamation Facility (F. Wayne Hill WRF); Gwinnett County, GA**

**Project Manager.** Process systems included primary and secondary clarification, bio-reactive removal of organics, high lime chemical clarification, re-carbonation clarification, deep-bed filtration, GAC filtration, ozonation contactors for disinfection, and sludge processing. Other facilities included in the project were three pump stations, aeration blower building, pre-stressed concrete equalization tanks, egg-shaped digesters, two chemical feed buildings, a plant operations building, water quality testing laboratory building, and a SCADA system for plant operation and monitoring.

**City of Atlanta | Clear Creek Combined Sewer Overflow Improvements; Atlanta, GA**

**Project Manager.** The project included the construction of 1000 feet of four-barrel reinforced concrete box culvert, sanitary and storm sewers, concrete and stone channels, and landscaping improvements. Project located in the highly visible and much-used Piedmont Park in Atlanta.

**Columbus Water Works | Southern Conveyance Segment of the Combined Sewer Overflow Improvements; Columbus, GA**

**Project Manager.** Project located on the Chattahoochee River in the Historic District of Columbus and included laying over 5,800 lf of 84” and larger reinforced concrete pipe, 3,650 lf of sheet piling/mechanically stabilized controlled backfill wall, two reinforced concrete diversion structures, tunneling, associated piping, landscaping and appurtenances.
William Roland Knocke, Ph.D. P.E.

Dr. Knocke has served for nearly 30 years as a technical consultant and/or provided technical guidance to numerous engineering firms as well as water related agencies and municipalities in the United States, Canada, Bolivia, and Australia. He specializes in analyzing water quality issues related to manganese control and water discoloration, offering expertise related to process modifications that will improve removal efficiencies for both soluble and particulate manganese species. Dr. Knocke has extensive experience in working with both surface and groundwater treatment situations. He has developed successful methodologies for identification of all sources of manganese into drinking water (e.g., evaluations of source water and in-plant sources as well), provided expert guidance on proper selection of appropriate oxidants for manganese control, and developed efficient methods for solid-liquid separation of the manganese oxides formed via oxidation methods. The integration of manganese control strategies within broader water treatment objectives (e.g., disinfection, disinfectant by-product (DBP) control, enhanced coagulation for organics separation, etc.) is one of his specialty consulting areas.

PROFESSIONAL POSITIONS

- Associate Vice President for Research Programs, Virginia Tech | 6/2010-Present
- Interim Head, Department of Civil Engineering, Virginia Tech | 8/1994-3/1995
- W. Curtis English Professor of Civil Engineering, Virginia Tech | 9/1992-Present
- Professor of Civil Engineering, Virginia Tech | 9/1987-8/1992
- Visiting Professor, Civil Engineering Department University of Massachusetts Amherst | 9/1987-7/1988
- Associate Professor of Civil Engineering, Virginia Tech | 9/1984-8/1987
- Assistant Professor of Civil Engineering, Virginia Tech | 1/1979-8/1984

SELECTED RESEARCH SUPPORT RECEIVED RELATED TO MANGANESE CONTROL


Principal Investigator, "Use of Ozone and Chlorine Dioxide in Controlling Organics and Dissolved Manganese Problems in Water Treatment Plants", City of Stafford, VA, and National Science Foundation, 5/85 7/86, $18,000.

Co Principal Investigator, "An Evaluation of Ozone and Chlorine Dioxide as Preoxidants at the Abel Lake Water Treatment Plant", City of Stafford, VA, 5/85 7/86, $23,948.
Principal Investigator, "The Use of Various Oxidants for the Control of Iron and Manganese in Water Treatment Facilities", AWWA Research Foundation and National Science Foundation, 9/87 8/89, $114,000.


SELECTED SCHOLARLY PUBLICATIONS RELATED TO MANGANESE CONTROL


Dr. Dave Reckhow

Dr. Reckhow is a recognized expert in DBP control and has numerous publications to his name. He has worked as a subconsultant to CHA Consulting on other projects in southwestern Virginia, and, as such, a good understanding of the DBP issues facing BRWA. He has served for nearly 30 years as a technical consultant and/or provided technical guidance to numerous engineering firms as well as water related agencies and municipalities in the United States and China, amongst others. He specializes in analyzing the formation and control of disinfection by-products in drinking water as well as the ozonation of both drinking water and wastewater treatment. He is currently a Professor of Civil & Environmental Engineering at the University of Massachusetts.

SELECTED PUBLICATIONS


Louise C. Dixon, APR

Louise Dixon is vice president and a principal of Carolina Public Relations/Marketing, Inc., a full-service public relations firm headquartered in Charlotte, North Carolina.

During her 25-year public relations consulting career, Louise has planned and managed local, regional and national public relations programs for clients in the private and public sectors.

For local governments she has planned and directed public involvement and information programs addressing a variety of issues. For the Charlotte-Mecklenburg Utilities Department, she has led the public involvement and communication programs to support route alignment and construction phases for some of the city's largest major water and sewer main projects, including the South water main, the 54" crosstown water main, the Southwest water main and the Briar Creek relief sewer main.

For the Lancaster County (S.C.) Water and Sewer District and Union County, N.C., she led the communications to build support for a new water storage reservoir to be built along the Catawba River as a drought buffer. She worked with Mecklenburg County, N.C. and the City of Charlotte to successfully introduce a new storm water management utility and monthly service fee. She also developed storm water utility public involvement programs for Florence, S.C., Greenville, S.C., Columbia, S.C., Lexington, Ky., and Wilson, N.C. The public involvement programs have included building awareness and consensus among business and industry, citizen activists, neighborhood groups and elected officials.

Louise has also developed a variety of communications programs addressing solid waste management facilities and programs as well as for major capital improvement projects. Her work with Mecklenburg County's recycling program earned national recognition as a model for building public support. She helped Greenville County, S.C., successfully site a new landfill as well as win a statewide recycling recognition award for its county-wide office paper recycling program. She also counseled the City of Rock Hill on effective communications to support a new yard waste collection system.

She has served a wide variety of clients including municipalities, major manufacturers, international consumer products and pharmaceuticals companies, paper and aluminum packaging companies, automotive companies, engineering firms and others. Louise brings expertise in community relations, strategic communication planning, and public education and information campaigns, and media relations.
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.

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.

**PROJECT EXPERIENCE**

**Rio Grande Regional Water Authority | Regional Water Supply Plan; Weslaco, TX**

*Grant Funding Specialist.* Black & Veatch is developing a 50 year Regional Water Supply Plan for the southern portion of Texas. Project elements include: evaluating brackish and ocean supply to supplement the depleting Rio Grande and an Aquifer Storage and Recovery (ASR) facility; and identifying up to $1 million of state and federal grants available for the Feasibility Phase.

**City of St. Augustine and St. Johns County | Central Wastewater Collection System; St. Augustine, FL**

*Funding Specialist.* The City of St. Augustine and St. Johns County worked together to fund and implement a central wastewater collection system within a disadvantage community located partly within the city limits and partly within the unincorporated county limits. The project will convert 1,250 homes on private septic system to the City's central sewer. The estimate value of this project is $24M. Services include development of the funding application, administrative duties and facilities planning.

**City of North Miami | Drinking Water and Wastewater System Improvements; North Miami, Florida**

*Funding Specialist.* Assisting the City of North Miami in funding drinking water and wastewater system improvement. This includes treatment, distribution and collection system rehabilitation. The estimated value of these projects $30M.

**City of Tavares | Infrastructure Replacement/Rehabilitation; Tavares, FL**

*Grant/Funding Specialist.* The City of Tavares in an older community with ageing infrastructure (water, wastewater, storm water and roadway) that must be replaced or upgraded. This project included engaging the United Stated

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**ALTERNATIVE FUNDING**

*Specialization: Water and Wastewater Grant and Funding*

*Office Location* Tallahassee, FL

*Education* 
- Riley Business College Graduate, 1988

*Year Career Started* 1988

*Year Started with B&V* 2010
Department of Agriculture, Rural Development (USDA-RD) to fund the $27,000,000 project in phases. The project includes grant and low interest loan funding and interim financing.

**Hernando County | County Wide Regionalization; Hernando County, FL**

**Funding Specialist.** The project includes countywide regionalization of wastewater treatment facilities. The first phase of the regionalization was $45,000,000 for improvements, which include modifications to one of seven WWTP in Hernando, the Glen. A second project also included upgrading a second WWTP at a cost of $109,000,000 as part of the regional objective. Funding sources also included FDEP-SRF and Legislative support.

**Wastewater Treatment Upgrade; Alachua, FL**

**Funding Specialist.** Program Development services included funding a wastewater treatment upgrade through the FDEP State Revolving Fund (SRF) Program and State Legislative Funding to include a facility upgrade. The project cost $27,000,000 for a 3.0 MGD AWT installation. Funding sources also included FDEP-SRF and Legislative support.

**Malcolm Pirnie | Program Development; Tallahassee, FL**

**Infrastructure Funding Services Director.** 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.

**Eutaw Utilities, Inc.; Tallahassee, FL**

**Owner/President.** As owner of Eutaw Utilities, served as President of this fast-growing, multi-discipline design firm. 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; Pensacola, FL**

**Grant Specialist.** Served communities from Brevard County to Escambia County with grantsmanship and comprehensive funding packages. 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. Provided program development services that earned clients in excess of $100,000,000 in grant monies for infrastructure needs.
George Budd, PhD, P.E.

Dr. Budd has 40 years of experience in planning, design and implementation of water and wastewater technologies. He has a background in analysis and design of conventional water treatment systems and for new technologies that are applicable for forthcoming regulations and improved process economy.

Some of Dr. Budd’s key recent assignments have included:

- Evaluations involving optimization and best use of existing facilities for compliance with existing and proposed treatment goals, state-of-the-art treatment processes, organic contaminants, disinfection, disinfection byproducts, source quality and management, management of residuals, water quality in distribution systems and corrosion control.
- Projects have involved a range of bench, pilot and full-scale testing as appropriate for project needs.
- He is also a co-author of a book that deals with issues related to control of microbial quality and disinfection byproducts, Disinfection Alternatives for Safe Drinking Water, that was prepared as a 4-year effort that included review and input by an international group of experts.
- The process design, and/or commissioning and optimization of over 80 water treatment plants.

PROJECT EXPERIENCE

SJWD | Membrane Filtration Upgrade, SJWD WTP; Jasper, SC
Senior Process Engineer. Conceptual design and piloting of a 7.5 mgd Pall membrane facility for the SJWD WTP. Project included the evaluation of membrane technology as compared to expanding with existing conventional water treatment technology.

City of Durham | Brown WTP and Distribution System, Regulatory Compliance Evaluation; Durham, NC
Treatment Specialist. Bench and pilot testing to assess treatment alternatives for plant modifications to meet future water quality goals. Testing includes optimization of coagulation and alternative coagulants, chlorine dioxide, ozone, biological filtration, and magnetized ion exchange.

Fairfax Water | Frederick P. Griffith, Jr., WTP; Fairfax, VA
Treatment Specialist. Coagulation optimization during plant startup and troubleshooting to resolve a significant manganese event and implement biological filtration.

Stafford County | Rocky Pen Run WTP, Membrane Filtration Study; Stafford, VA
Treatment Specialist. Planning evaluation of alternative technologies for future treatment at the Rocky Pen Run Water Treatment Plant. Evaluations included analysis of the applicability of membrane and granular media filtration alternatives along with a full range of clarification and disinfection options. Pilot testing was performed to plan for the implementation of membrane filtration as a component of the plant.
SMITH MOUNTAIN LAKE WTP AND LAKES TO FOREST WATERLINE EXTENSION PROJECT | Bedford Regional Water Authority

County of Chesterfield | Swift Creek WTP; Chesterfield, VA
**Project Manager.** SDWA planning study, plant optimization analyses, bench and pilot testing of alternative disinfection technologies for forthcoming microbial and disinfection by-product regulations, assessments alternative ammonia feed facilities for chloramine. Evaluations of microbial quality in the distribution system, filter optimization analyses with subsequent preparation of specification and construction services, and coagulation optimization analyses.

United Water New Jersey | Haworth WTP; Haworth, NJ
**Treatment Specialist.** Planning for facility modifications to incorporate high rate dissolved air flotation into an 180 mgd ozone direct filtration plant to provide for greater treatment reliability and expansion of capacity.

United Water Pennsylvania | Sixth Street WTP; Harrisburg, PA
**Treatment Specialist.** Planning for facility modifications to incorporate high rate Densadeg solids clarification process into a 12 mgd water treatment plant to treat new source water conditions.

AWWA Research Foundation
**Principal Investigator.** Management of project to examine the application of a magnetized ion exchange (MIEX) process for removing naturally occurring organic matter from water. The process will reduce the formation of disinfection byproducts and result in significant reductions in coagulant demand associated with these organics. An important component of this process is the optimization of an integrated MIEX/coagulation treatment sequence.

Town of Leesburg | Kenneth B. Rollins WFP; Leesburg, VA
**Testing/Process Design.** Bench scale coagulant testing to establish options for compliance with future disinfection byproduct regulations and pilot testing of alternative filter media to provide flexibility for deeper media configurations for possible use in conjunction with ozone. Evaluation of alternative treatment processes, including high rate clarification and membrane options for expansion of the plant from 5 to 10 mgd. Design includes tube settlers to facilitate an increase in sedimentation capacity and the integration of a new filter box configuration that will allow higher empty bed contact times when used in conjunction with existing filters for meeting possible future goals for biological filtration.

City of Manassas | Water Treatment Plant Expansion; Manassas, VA
**Process Specialist.** Plant is being expanded from 12 to 16 mgd. Evaluation of existing treatment facilities to establish best use for in the expansion and assessment of needs for rehabilitation to meet new drinking water quality criteria. The expanded plant makes use of older conventional treatment trains that are integrated with newer superpulsator trains that are presently under construction. Special considerations included needs to improve plant performance for both manganese and turbidity removal.

Fairfax County Water Authority | Lorton/Occoquan WTP; Fairfax, VA
**Process Review.** Plant is being expanded on a new site to provide a capacity of 160 mgd. Project involved pilot study of alternative technologies for a year. Technologies included ozone and membrane alternatives (microfiltration, ultrafiltration, and nanofiltration). Review of process selection and treatment configuration, which includes an ozone/biofiltration treatment sequence.
Shawn H. Veltman, PhD, P.E.

Dr. Veltman has over 30 years of process development and design experience in water treatment. He has prepared numerous studies and has managed the design and construction of a wide array of environmental engineering projects. His professional experience includes the development of many novel and innovative treatment solutions for industrial and municipal clients. He has an extensive background in aquatic chemistry and has directed or performed a wide range of laboratory, bench, and pilot tests to evaluate the control of contaminants in drinking water supplies.

City of Covington | Capital Improvement Plan; Covington, VA

Treatment Specialist. Responsible for the development of a Capital Improvement Plan (CIP) to address short term and long term improvement needs for a 6 MGD surface water treatment plant with a water withdrawal on the Jackson River.

Washington County Service Authority | Water Treatment Plant/Intake; Covington, VA

Process Engineer. Responsible for bench and pilot testing of source waters from the Middle Fork and South Fork of the Holston River to establish the process selection for a 12 MGD (expandable to 18 MGD) surface water treatment plant. Work included oxidant studies to evaluate and control disinfection by-product formation, simulated distribution system (SDS) tests to assess rates of DBP formation, jar testing to assess the benefits of enhanced coagulation, pilot plant design and construction, and pilot testing. The final process selection included pre-sedimentation, adsorption clarification, high rate deep bed filtration, and chlorination. Sodium permanganate addition to the raw water, chlorine dioxide addition, and water age management were components of the solution.

Henry County Public Service Authority | Philpott Water Treatment Plant Expansion; Collinsville, VA

Process Engineer. Provided process consulting for expansion of a 4 MGD surface water treatment plant to 6 MGD capacity. Aided in the evaluation of expanded source permitting of water withdrawals from groundwater, the Smith River, or the Philpot Reservoir.

City of Salem | Disinfection-by-Product Evaluation; Salem, VA

Process Manager. Project Manager for study designed to evaluate water treatment plant and distribution system operation effects upon disinfectant by-product products.

City of War | Preliminary Engineering Design; War, WV

Process Manager. Project Manager and lead process engineer for the preliminary engineering design of a $7 million dollar project to replace aging water supply infrastructure. Work included piloting and preliminary engineering design of groundwater treatment systems to remove iron and manganese from the source water.
Town of Front Royal | Development of Treatment Plant for DBP Compliance; Front Royal, VA

**Process Manager.** Project Manager responsible for the development of a treatment plan to address both DBP compliance issues and a source within BIN 2 associated with a 6 MGD surface water treatment plant with a water withdrawal from the Shenandoah River.
Jonathan M. (Matt) Goodman

Matt is experienced in providing water and wastewater treatment engineering services, stormwater management services, as well as sewer conveyance needs assessment services. His water experience includes pumping system calculations; rapid sand filtration design; coagulation chemistry analysis; direct filtration system study; traditional coagulation, flocculation, sedimentation treatment design; swimming pool design and water treatment system design; cryptosporidium removal by coagulation and rapid sand filtration in swimming pool applications. Representative project experience includes:

Town of Front Royal | D/DBPR & LT2ESWTR; Front Royal, VA
Water Engineer. Developed and carried out a testing plan to determine the extent of the impact the Town’s raw water reservoir had on the source water quality. Developed and carried out a bench scale testing plan to analyze sample source water for various treatment strategies to reduce DBPs in the water distribution system. Analyzed tracer study data to determine the water age at various DBP compliance sampling locations within the distribution system. Developed PER to help assist the Town in evaluating its potential disinfection and disinfection by-products compliance issues and identify a path for compliance that will result in the least possible cost and disruption of the Town’s water treatment operations. Also performed testing to support treatment alternatives to provide an additional 1.0 log removal credit for Cryptosporidium.

John Flannagan Water Authority | Determination of Alternative Minimum TOC Removal; Haysi, VA
Water Engineer. Performed bench scale testing to simulate the existing conditions of the treatment plant and determine that enhanced coagulation was not a viable alternative for meeting the TOC removal requirements. This testing identified an alternate removal requirement for the plant as well as collected data to show that several of the Step 2 compliance criteria were viable alternatives for meeting the TOC removal requirements.

Henry County Public Service Authority | HCPSA Piedmont Lagoon Evaluation; Collinsville, VA
Water Engineer. Performed an economic analysis of four separate design alternatives of the tertiary sand filters to lower the plant’s effluent BOD and TSS concentrations. Drafted a letter report to the Henry County Public Service Authority outlining the project scope, summary of each design alternative, economic analysis of each alternative, other advantages and disadvantages of each alternative, and gave HCPSA a design recommendation based on capitol cost, operating costs and performance.

Western Virginia Water Authority | Engineering Services for 2011 Collection System Improvements Projects; Roanoke, VA
Wastewater Engineer. Performed rehabilitation assessments of manholes in the WVWA sewer shed. Specific rehabilitation needs for each manhole were determined by visual inspection allowing for a quick and accurate assessment of manhole repair needs within the sewer system.
Blacksburg VPI Sanitation Authority | UV Disinfection, and Sludge Thickening Systems; Blacksburg, VA

Wastewater Engineer. Performed an evaluated bid to select the most cost effective and operator friendly UV disinfection system to be installed for the conversion of the BVPI effluent disinfection from chlorine gas to UV. Performed hydraulic and other design calculations and developed plans and specifications for the UV system to be installed within the existing chlorine contact tanks. Designed the replacement of the existing DAF thickening system with a rotary drum thickener and a sludge blending system to provide a consistent blend of primary and secondary sludge to the thickener.
Peter Baskette, P.E.

Mr. Baskette is a professional engineer specializing in the project management, planning, design, permitting, and construction administration services for pumping stations, pipelines, and water and wastewater treatment facilities. His water design experience includes membrane and conventional filtration systems, pump stations and transmission lines, UV disinfection systems, clearwells, and various chemical storage and feed facilities. Mr. Baskette has also performed hydraulic evaluations on various pumping systems, as well as on entire treatment plants.

PROJECT EXPERIENCE

City of Lancaster | Susquehanna and Conestoga WTP Membrane Upgrade; Lancaster, PA

Project Manager. Upgrade of a 24 mgd water treatment plant and a 12 mgd water treatment plant. Design included installation of low pressure membrane systems, UV disinfection system, chemical storage and feed facilities, high-rate solids clarifier, and upgrades to existing pump stations and clearwells.
Charlotte-Mecklenburg Utilities | Sardis Rd Pump Station Modifications; Charlotte, NC

Charles Town Utility Board | WTP Phase 1 Membrane Upgrade; Charles Town, WV

Project Manager. Pilot study and preliminary design services for the upgrade of the existing 2.8 mgd facility to incorporate membrane treatment and expand the capacity to 3.5 mgd.

City of Durham | Water Treatment Regulatory Compliance; Durham NC

Project Manager. Study phase services for the evaluation of alternative treatment processes to ensure compliance with existing and pending drinking water regulations. Evaluation included the bench scale and pilot testing of ferric sulfate, chlorine dioxide, ozone, MIEX, and UV disinfection.

Queensland Government | Bundamba AWTP Phase 1B; Brisbane, Australia

QA/QC Reviewer. 21 mgd membrane treatment system and low-pressure high-output ultraviolet disinfection system for a new advanced wastewater treatment facility. The membrane system consisted of microfiltration membranes followed by a two pass reverse osmosis membrane system.

City of Wilmington | Brandywine WTP, Membrane Filtration Upgrade; Wilmington, DE

Lead Design Engineer. Conceptual design and procurement for the 10 mgd Brandywine WTP. Project included the evaluation of different pretreatment technologies, submerged and pressure membranes, as well as consideration for future desalination treatment. New membrane facilities were incorporated into the existing facility such that no new buildings were constructed for this project.

Birmingham Water Works Brd. | Putnam Clearwell Addition; Birmingham, AL

Project Manager/Lead Design Engineer. Design of two 1.8 MG clearwells, a
City of Suffolk | Suffolk EDR and Reids Ferry Well Pump Modifications; Suffolk, VA

Lead Design Engineer. Modifications of two well pump facilities included replacement of existing 4 mgd pumps and motors, construction of a new well house, modifications to existing pump foundations, installation of approximately 4,000 linear feet of 16” raw water transmission main, and various valves and control systems.

Town of Cary | Raw Water Transmission Main; Cary, NC

Lead Design Engineer. Design of a 33,000 linear foot 48” water line to supply raw water to the Cary/Apex Water Treatment Facility. Design included air release valves, large diameter plug valves, boring and jacking, and tunneling.

Town of Cary | Raw Water Reservoir and Pump Stations; Cary, NC

Worked on the preliminary design of a 145 million gallon pump storage reservoir, 40 mgd transfer pump station, and upgrade of an existing intake pump station. Reservoir design included earthwork, flow control structures, and storm water diversion system.

PUBLICATIONS/PRESENTATIONS

Peter B. Baskette, “Maximizing Water Resources – The Design of a 99% Efficient Membrane System”, Poster, AWWA Annual Conference and Exposition, Chicago, IL, 2010

Peter B. Baskette, “Membranes Piloted, So It’s All Downhill from Here ... NOT!”, American Membrane Technology Association (AMTA) Conference, Las Vegas, NV, 2007
David L. Harris, P.E.

Mr. Harris is an Engineering Manager for water and wastewater projects in Black & Veatch’s Water Division. Mr. Harris’ experience includes managing multidiscipline project teams through detail design of water and wastewater treatment plant. Design experience includes hydraulic systems; pumping stations; biosolids incineration and drying facilities; biosolids digesters and gas heating and utilization systems; steam systems; heat recovery boiler systems; advanced water treatment systems; desalination water treatment; reuse water systems; aeration and backwash blower systems. In addition, Mr. Harris has experience in hydraulic and transient analysis studies.

PROJECT EXPERIENCE

**SembCorp. | Changi NEWater Plant Design-Build-Own-Operate Project; Singapore**

**Engineering Manager:** Led multidiscipline design teams located in Black & Veatch engineering offices (Singapore, Mumbai, Bangkok, US and UK) to carry out the detailed design of a 228 MLD (60 mgd) reuse water plant in Singapore. The Changi NEWater Project will be the fifth and largest reuse facility in Singapore with a plant capacity of 228 Ml/d (60 mgd) of NEWater. The process outline is MF/UF, RO and UV.

The project is a Design, Build, Own and Operate (DBOO) project executed through a NEWater Agreement with a 25 year concession period.

**Water Secure | Bundamba Advanced Water Treatment Plant Design-Build Project; Ipswitch, Australia**

**Engineering Manager:** Led multidiscipline design teams located in Black & Veatch engineering offices (US, Singapore, Mumbai and Bangkok) to carry out the detailed design and procurement activities for the 66 MLD (17 mgd) advanced wastewater treatment plant. This fast-track project involved a joint venture alliance with the Government of Queensland and Theiss Construction, and completed the construction of the first 20 MLD (5 mgd) in only 10 months. The plant design included a raw water pump station, raw water storage, micro-filtration, reverse osmosis, UV disinfection, finished water storage, high service pumping and residuals treatment. Designs were coordinated with local Australian project staff that provided client interface and local preference guidance.

**Confidential Mining Client | Desaladora Project (Seawater Desalination Project-Definition Phase); Santiago, Chile**

**Package 1 Design Manager:** Responsible for managing multidiscipline engineering team in the U.S. in the design of a 3,200 L/s (approximately 75 mgd) Seawater Reverse Osmosis Plant. As a result of expansion of mining activities and reduction of available water supplies, the Client determined it needed a new desalination plant. B&V was retained to prepare the Definition Phase Study (DPS) for the Desaladora (Desalination Plant) Project. The Project will consist of a seawater reverse osmosis-based desalination plant (Package 1), a water transportation system consisting of pipeline and pump stations (Package 2), a high voltage transmission system expansion (Package 3), and a 7-day storage reservoir (Package 4). Recommendations developed during the DPS form the
basis for the Execution Phase of the Project. Package 1 U.S. engineering team scope of design work consisted of a seawater reverse osmosis plant, filtrate pump station, cartridge filters, and post treatment stabilization and storage.

Eskom | Kusile Power Station Design-Build Project; Mpumalanga, South Africa

**Contract Discipline Manager.** The Kusile Power Station is a new coal-fired power station that will consist of six units, each rated at approximately 800 MW installed capacity, giving a total of 4800 MW. It will be one of the largest coal-fired power stations in the world, once finished. As part of the Construction Management team located at the Kusile site, David was responsible for commercial oversight and execution of contracts valued at $250,000,000 related to the balance of plant and the onsite water/wastewater treatment. He managed a team of the Client's personnel and provided skills and knowledge transfer to those that were responsible for the commercial execution of contracts. David also coordinated contract execution with the assigned Construction Manager for the packages. He was responsible for all commercial correspondence with the contractors, processing change orders, coordinating field engineer, cost reporting, risk management, and implementing the contract requirements for South Africa's Accelerated and Shared Growth (ASGI-SA) initiative.

Zone 7 Water Agency | Altamont Water Treatment Plant; Livermore, CA

**Design Lead.** Zone 7 Water Agency is expanding their supply with the construction of the new Altamont Water Treatment Plant. Selected major processes include submerged membrane filtration, ozone for disinfection and taste and odor control, biologically active contactors, and centrifuge dewatering. Chemical feed building, treated water storage and pump building design lead.

Placer County Water Agency | Ophir Water Treatment Plant; Auburn, CA

**Engineering Manager.** Lead the detail design effort for the 30 MGD (expandable to 120 MGD), advanced water treatment design-bid project. The project involves a submerged membrane treatment system under siphon.

City of Ft. Leavenworth | Water Treatment Plant Modernization; Ft. Leavenworth Kansas

**Process Engineer.** Design air backwash system for existing facility.

Town of Danville | Danville Transient Analysis; Danville, California

**Mechanical Engineer.** Use computer program LIQT 6.2 to perform transient analysis on 28 miles of water distribution piping with a maximum flow rate of 115 MGD.
Douglas G. Brinkman, P. E.

With over 40 years of experience, Mr. Brinkman has served as project manager and project engineer on a wide variety of water and wastewater engineering projects. His responsibilities have included project management, client coordination, and supervision of technical staff in the production of feasibility studies, detailed designs, and preparation of drawings, specifications and contract documents. He has directed construction administration services related to many of these design projects.

PROJECT EXPERIENCE

City of Lancaster | Susquehanna and Conestoga WTP Membrane Upgrade; Lancaster, PA

QA/QC. Responsible for the quality control of a 24 and 12-mgd direct feed membrane filtration plants. Project components included side-by-side piloting of five different membrane systems, membrane system procurement, and overall system design. Unique characteristics of this effort included incorporating the membrane system in an existing WTP, high-rate clarification as part of the solids handling system, secondary membrane system recovery with UV disinfection, as well as obtaining federal grant funding.

Loudoun Water | Central Water Supply Plan; Ashburn, VA

Project Manager. Study of water supply alternatives for the next 40 mgd increment of capacity serving customers in the Central Water Supply area in eastern Loudoun County, VA. Alternatives included two water treatment plant options and two options for purchasing additional treated water from neighboring Fairfax Water. Study included concept of “water banking” in quarries, sizing and conceptual design of facilities, pipeline alignments, cost estimating, scheduling, regulatory, permitting and stakeholder outreach. Final recommendation was to implement a new river intake and pumping station, raw water storage in a quarry, and a new 40 mgd WTP to be construct in two phases. Follow-up work consisted of preparation of a Joint Permit Application, covering a new water withdrawal permit, intake construction, and facilities construction, along with supporting documentation and environmental and cultural field studies for submittal to VMRC, Virginia DEQ, USACE, and other regulatory agencies.

Stafford County | Rocky Pen Run River Intake and Pumping Stations; Stafford, VA

Project Manager. Study and detailed design of a new river intake and raw water pumping station on the Rappahannock River to transfer up to 40 mgd of raw water to the proposed Rocky Pen Run Reservoir. Intake consists of submerged cylindrical screens with air-burst cleaning system, an in-ground pumping station with submersible pumps and a mechanical/electrical building. Coordinated with County and permitting agencies to meet permitting requirements and address fish protection and aesthetic concerns. The selected design will minimize visual impact from the river, a Virginia Scenic River. Preliminary design of the reservoir pumping station to transfer up to 10 mgd (future 30 mgd) of raw water from the proposed Rocky Pen Run Reservoir to
the future Rocky Pen Run Water Treatment Plant. Design consists of a pumping station with variable-speed horizontal split-case centrifugal pumps.

**Loudoun Water | Potomac Water Supply Program; Ashburn, VA**  
**Project Manager.** Phase 1 Study of water supply alternatives for the next 40 mgd increment of capacity serving customers in the Central Water Supply area in eastern Loudoun County, VA. Alternatives included two water treatment plant options and two options for purchasing additional treated water from neighboring Fairfax Water. Study included concept of “water banking” in quarries, sizing and conceptual design of facilities, pipeline alignments, cost estimating, scheduling, regulatory, permitting and stakeholder outreach. Final recommendation was to implement a new river intake intake and raw water pumping station, raw water pipelines, storage in a quarry, and a new 40 mgd WTP to be construct in two phases.

**Washington Suburban Sanitary Commission | South Potomac Water Supply Main; Prince George’s County, MD**  
**Project Manager.** Alternatives analysis, preliminary engineering and final design for replacement of the Henson Creek water supply main in Prince George’s County, MD. This existing water transmission main consists of 10,600 feet of 42-inch diameter prestressed concrete cylinder pipe (PCCP), which had failed and was taken out of service. However, recent development in the southern part of the County, including the 300 acre multi-use National Harbor development on the shores of the Potomac River, required that this main be placed back into service. Various services were provided through multiple subcontracts including surveys, geotechnical and test pitting, CCTV and laser profiling, and environmental surveys, consisting of wetlands, stream crossings, Forest Stand Delineation, tree survey, and Natural Resource Inventory. Permitting was coordinated with a number of agencies. Evaluated a number of alternatives for sliplining or replacing the existing pipeline using various materials. WSSC selected ductile iron pipe material with open-cut construction. Completed preliminary engineering and final design of the new 42-inch diameter DIP with road crossings, creek crossings, and pressuring reducing valve vaults.

**Washington Suburban Sanitary Commission | Bi-County Water Supply Tunnel; Montgomery County, MD**  
**Project Manager.** Alignment study, detailed design and construction administration for an 84-inch diameter finished water supply tunnel in Montgomery County, MD. Project consists of 100 to 250 ft deep lined tunnel spanning 5.5 miles along I-270 and the Capital Beltway to convey treated water to Prince George’s County in suburban Maryland. Project included geotechnical investigations, corrosion protection investigations and detailed design of the selected tunnel alternative, followed by bidding assistance and construction administration over a 4-year construction period.
Alan Edwards, P.E.

Mr. Edwards is a professional engineer with 17 years of experience in water, wastewater and stormwater study and design. His water design experience includes membrane and conventional filtration systems, raw and finished water pump stations and transmission lines, clearwells, and various chemical storage and feed facilities. His wastewater design experience includes large and small diameter piping system design, replacement and rehabilitation, wet well and pump station design and rehabilitation.

PROJECT EXPERIENCE

United Water PA/DE | Hummelstown Membrane Pilot Study; Hummelstown, PA

**Engineering Manager.** Responsible for the evaluation and conceptual design of a new 4-mgd membrane filtration plant for UWPA's Hummelstown WTP. Project components included side-by-side piloting of 3 different membrane systems, membrane system procurement, and overall system conceptual design to develop a GMP.

Susquehanna Water Treatment Plant Membrane Upgrade, City of Lancaster, PA

**Project Engineer.** Involved with the evaluation and design of a 24-mgd membrane filtration plant at the City's Susquehanna WTP. Plant design included installation of low pressure membrane systems, UV disinfection system, chemical storage and feed facilities, highrate solids clarifier, and upgrades to existing pump station (36 mgd) and clearwells, air/water backwash capabilities, media, surface wash system, and troughs. Project also included rehabilitation of filter boxes and replacement of various piping. Unique characteristics of this effort included incorporating the membrane system in an existing WTP, high-rate clarification as part of the solids handling system.

Conestoga Water Treatment Plant Membrane Upgrade, City of Lancaster, PA

**Lead Design Engineer.** Responsible for the evaluation and design of a 12-mgd membrane filtration plant at the City's Conestoga WTP. Unique characteristics of this effort included incorporating the membrane system in an existing WTP, secondary membrane system recovery, as well as obtaining federal grant funding.

City of East Chicago | Membrane WTP; East Chicago, IN

**Lead Design Engineer.** Lead the design of the 17.3 mgd (30 mgd Future) Micro-Filtration water treatment plant, under and accelerated schedule. Project components included raw water pumping station, Strainer Facility, Pressure membrane filtration systems, Chemical storage and feed systems, UV disinfection, membrane residuals treatment (Package plate settlers), Clear well and high service pumping station.

Swansea Water District | Desalination Project; Swansea, MA

**Technical Project Manager Lead Engineer.** Lead design of the Swansea Water District's 2.18 mgd Micro-Filtration (MF) and Reverse Osmosis (RO) water treatment plant. The project focused on the design of a combined MF / RO filtration Plant with dual water sources, one source being ground water and the
other being a salt water estuary. The project also included the study and design of a raw water pump station, multiple large above ground storage tanks (up to 1.2 million gallons) and improvements to an existing well field and chemical addition facility.

**Crystal Spring Membrane Filtration Water Treatment Plant, Roanoke, VA**  
*Lead Project Engineer.* Design of a 5-mgd microfiltration membrane water treatment plant. Project included the fast-track design and procurement of the microfilters and process piping. Project incorporated a membrane procurement package that resulted in more than $450,000 in savings to the City as well as an extended pilot study to ensure conformance with the procurement documents. Project was awarded the 2003 AWPA Project of the Year.

**Motts Run WTP High Service Pump Upgrades; Spotsylvania County, VA**  
*Engineering Manager.* Lead the design of the 12 mgd High Service Pumping Station upgrade at the Motts Run WTP. Project components included new vertical turbine high service pumps, VFDs, piping and associated controls and HVAC improvements.

**City of Durham | Williams and Brown WTP Upgrades; Durham NC**  
*Design Engineer.* Upgrades to the WTPs to meet current regulatory design standards. Upgrades include modifications and replacement of under drains, filter piping and valves, installation of new chemical storage and feed equipment, modifications to the existing clearwell to increase CT, and installation of instrumentation and controls to automate the facility.

**Charlotte-Mecklenburg Utilities | Sardis Road Pump Station Modifications; Charlotte, NC**  
*Engineering Manager.* Design of modifications to a 10 MGD booster pump station. Modifications consisted of replacement of horizontal split-case pumps, motors, and associated valves, piping and electrical gear. Project included assisting City with the procurement of the pumps, motors, motor control centers and bypass pumping system.

**Manila Bay Desalination WTP Study; Manila, Philippines**  
*Lead Engineer.* Lead the early phase design and study of the 37 mgd (74 mgd Future) Ocean Water Micro-Filtration (MF) and Reverse Osmosis (RO) water treatment plant. Project included 30% design of intake and outfall facilities, raw water pumping and strainer facilities, Phased multi-story treatment buildings. Components within the buildings include grit removal systems, DAF units, clearwell, chemical storage and feed systems, office and lab facilities. All components required to fit into very small urban site location.
Theodore J. Stolinski, Jr., P.E.

Mr. Stolinski is Black & Veatch’s expert in the area of pump selection and design as well as surge analysis. His responsibilities include performing detailed analyses crucial to selecting the appropriate pump type, number, and configuration to meet the project goals. During his 35 years with Black & Veatch, he has selected or approved pumps for over 2000 pump stations.

Mr. Stolinski’s assignments have been associated with pumping equipment and pump applications in water and wastewater systems. His duties have included water and wastewater pumping station design, hydraulic design of pumping systems, pump selection and specifications, review of pumping system design, witnessing of shop tests, and field testing and inspection.

PROJECT EXPERIENCE

City of San Bernardino | San Bernardino Valley Municipal Water District, Central Feeder Pumping Station

Hydraulic Engineer: Design-build of a new ground water pumping station requiring. Central Feeder project expanded the District’s system-wide water capacity and includes 332 cfs pump facilities, 78-inch diameter water conveyance pipeline, 10 MG reservoir, groundwater wells, and a new water treatment plant.

WaterOne of Johnson County | Water Transmission; Johnson County, KS

Project Engineer: Performed analysis of a new 30 mgd high service pumping station and 17 miles of 60 inch transmission main. System will be expanded to 180 mgd in the future. Based on transient analysis, transient pressures were controlled using air chambers at the pumping station plus a one way surge tank along the transmission main.

Aurora Water | Piney Creek Lift Station; Aurora, CO

Hydraulic Engineer: Responsible for transient analysis of the 12 mgd Piney Creek Lift Station and transmission main. Purpose of the analysis was to determine the cause for repeated failure of PVC pipe due to cyclic stresses. Used transient analysis to determine extent of weakened PVC pipe and to recommend corrective measures in pump station operation and determined quantity of force main replacement.

Tampa Bay Water | Brandon Urban Dispersed Wellfield Transmission Main and Brandon, South-Central Connector; Clearwater, FL

Hydraulic Engineer: Responsible for transient analysis of the Brandon Urban Dispersed Wellfield Transmission Main. Transmission main system analyzed extended from the Regional Facilities Site to the South Central Hillsborough Regional Wellfield. Data collection, including pipeline lengths, diameter, materials, and elevations; valve types, locations and closure speeds; pump information; delivery point information. The evaluation included identification of scenarios with potential to violate acceptance criteria, model development, system analyses, development of transient controls and recommendations, and preparation of final report. Subsequently performed transient analysis of the Brandon South-Central Connector.
Tampa Bay Water | Tampa Bypass Canal Pumping Station and Transmission Main; Clearwater, FL

**Hydraulic Engineer.** Responsible for transient analysis of the Tampa Bypass Canal Pumping Station and Transmission Main. Transmission main system analyzed extended from the pumping station to the SWTP raw water tank. Data collection, including pipeline lengths, diameter, materials, and elevations; valve types, locations and closure speeds; pump information; delivery point information. The evaluation included identification of scenarios with potential to violate acceptance criteria, model development, system analyses, development of transient controls and recommendations, and preparation of final report.

San Diego Water Authority | San Vicente Water Pumping Station; CA

**Pump Specialist.** Pump selection, specifications, shop drawing review, QC review, and hydraulic consultant on a new raw water pumping station. The pumping station is part of an emergency plan to respond to major damage to the Southern California Aqueducts. The project provided 440 cfs of emergency pumping from the San Vicente Lake using three 6,000 hp pumps.

Southern Nevada Water System | Water Pumping; Las Vegas, NE

**Pump Specialist.** Upgraded a 400 mgd low lift pumping station, increased the capacity of 200 mgd booster station, and provided a new 60 mgd pumping station. In a follow-up project analyzed pumping system to determine corrective measures required to permit the pumping station to continue operation at reduced Lake Mead water levels due to the extended Western Drought. As a result of the analysis, selected new pumping equipment, prepared specifications, and verified shop testing of replacement pumping equipment.

Homestake Project | Otero Pumping Station; Buena Vista, CO

**Pump Specialist.** Upgraded an existing 90 mgd booster pumping station and 80 mile raw water transmission main that provides Western Slope water to Aurora and Colorado Springs, CO. Evaluated system hydraulic and transient controls to boost the capacity of the pumping and transmission system to 118 mgd. Selected pumps prepared specifications, provided layout assistance, field inspection, and witnessed shop testing of replacement pump equipment.

Cape Fear Public Utility Authority | Sweeney WTP Expansion; Wilmington, NC

**Pump Specialist.** Designed pumping system and provided equipment specifications for new 50 mgd finished water pump station.

Lincoln Water System | Water Treatment; Lincoln, NE

**Pump Specialist.** Mr. Stolinski has been involved with numerous projects for Lincoln Water System which includes pumping station design and transient analysis. As our in-house expert, every pump that is specified for water and wastewater projects, are reviewed and approved by him. He has participated in work performed on every major water pumping facility currently in service for the City of Lincoln.

City of Garland | Water Pumping; Garland, TX

**Pump Specialist.** Investigation into excessive pump vibration in vertical barrel type pumping units for causes and solutions.
Scott D. N. Freeman, P.E.

Mr. Freeman, a chemical engineer in B&V’s Water Technology Group, has been responsible for numerous designs and reports on water and wastewater treatment. He specializes in desalination and the application of membranes to a wide variety of waters, wastewaters, and chemical processes. These treatment processes include microfiltration (MF), ultrafiltration (UF), electrodialysis, nanofiltration (NF), reverse osmosis (RO), distillation (i.e., MSF, MED, VC), and ion exchange. He has over 25 years of experience with these processes.

He has helped more than 150 clients evaluate or implement solutions, including the design of more than 30 facilities. In addition to designing systems, he has started up and operated systems at field sites. He has written many papers and made dozens of presentations at public meetings and national/international conferences. He also holds a membrane process patent.

Some of Mr. Freeman’s special honors have included:

- William Rudolfs Medal, 2000 from the Water Environment Federation (WEF) "For Outstanding Contribution in Industrial Waste Control," awarded for applied research at the wastewater reuse/recycling project in Chandler, Arizona that uses MF and RO membranes and other process steps to reclaim water from semiconductor industry wastewater.
- Chair of AWWA Membrane Standards Committee.
- Board of Directors, American Membrane Technology Association (AMTA), elected in 2011.
- “Outstanding Paper” award at the American Desalting Association conference in August 1998 in Williamsburg, VA.
- Invited member of AwwaRF Project Advisory Committees for Proj #2876, “Integrating Membrane Treatment in Large Water Utilities,” and for Proj #2647, “Integrated Water Treatment: Softening and Ultrafiltration.”
- Invited speaker, various workshops, seminars, and web casts for AWWA and other organizations.

PROJECT EXPERIENCE

City of Santa Monica | Charnock Well Field Restoration Project; Santa Monica, CA

Process Engineer. Design and construct groundwater treatment facilities to restore its contaminated (MTBE) groundwater supply. A GAC treatment system will be provided at the Charnock Well Field for MTBE removal and an RO softening system will be constructed at the City’s Arcadia WTP. Responsibilities included: lead process engineer in conducting pilot tests to optimize chlorine preoxidant dose, greensand filters for iron and manganese removal, and RO
membrane softening of contaminated groundwater; developed and evaluated various concentrate management strategies; assisted in permitting efforts, and provided process engineering assistance during plant start-up for the 5.4 mgd well head treatment facility and 8.0 mgd RO softening facility.

**City of Phoenix | Lake Pleasant Water Treatment Plant Design-Build-Operate, Phoenix, AZ**

**Process Engineer.** Joint venture design, build, and operate 80 mgd water treatment plant using primary filters, Ozonation, GAC Contactor, and UV reactor technology. Designed and constructed a small 69Kv substation on the property for power distribution to the plant.

**California Water Service Company | Bakersfield Water Treatment Plant; Bakersfield, CA**

**Lead Process Engineer.** Assisted with pilot program, regulatory design, and cost evaluation for new 20 mgd WTP treating surface water from canal applying coagulation, plate settler, UF, UV/H2O2 post-treatment, and disinfection. Special aspects included conducing pilot and economic comparison for cutting-edge ceramic membrane and a site-specific membrane warranty.

**City of East Chicago | East Chicago MF/UF Membrane Water Treatment Plant; East Chicago, IN**

**Lead Process Engineer.** Assisted with pilot program, regulatory approval, design, and cost evaluation for new 20 mgd WTP treating surface water from Lake Michigan applying coagulation, in-line flocculation, UF, and disinfection. Special aspects included piloting and verification of capacity during cold season.

**City of Cottage Grove | – Row River WTP, Design-Build Project; Cottage Grove, OR**

**Lead Process Engineer.** Responsible for process engineering for the $10M membrane water treatment plant upgrade project. The Row River WTP capacity was increased from 2 to 4 mgd. The treatment process was converted from conventional granular media filtration to pressurized microfiltration membranes. The treatment building expansion was sized to allow for a future expansion to 8 mgd within the building by adding additional membrane module trains.

**City of Lubbock | MF/UF Membrane Water Treatment Plant; Lubbock, TX**

**Lead Process Engineer.** Assisted with pilot program, regulatory approval, cost evaluation, design and implementation for new 15 mgd WTP treating surface water from Lake Alan Henry applying coagulation, plate setters, UF, and disinfection. Special aspects included acceptance by local regulatory agency of high-rate pretreatment and waste handling at site without a sewer.

**WaterOne | Wolcott MF/UF Membrane Water Treatment Plant; Johnson County, KS**

**Membrane Process Engineer.** Assisted with pilot program, design, and cost evaluation for new 30 mgd (expandable to 150 mgd) WTP treating collector well water from applying lime softening and coagulation, MF membrane, and disinfection. Special aspects included special cleaning needs verified during the piloting and operator training.
Lawrence Hoffman (CHA)

Mr. Hoffman has 26 years’ experience with NPDES permitting and regulatory compliance. He conducts/ participates in negotiations with regulatory agencies, manages the design, regulatory approval, and performance of advanced or specialized environmental studies. Other responsibilities include the development and implementation of environmental management systems (ISO 14001), collection system CMOM programs, and environmental compliance planning and reporting programs. Representative project experience includes:

Henry County Public Service Authority | Philpott Water Treatment Plant Upgrade; Covington, VA
Permitting Specialist. Permitting for expansion of a 4 MGD surface water treatment plant to 6 MGD capacity. Aided in the evaluation of expanded source permitting of water withdrawals from groundwater, the Smith River, or the Philpot Reservoir.

Town of Abingdon | West Interceptor Replacement; Abingdon, VA
Permitting Specialist. Prepared a Joint Permit Application (JPA) for rehabilitation of an existing sewer interceptor. Project included evaluation of endangered species, identification of archeological and historic resources, preparation of the joint permit application, and acquisition of Corps of Engineers, Department of Environmental Quality and Virginia Marine Resources Commission permits for multiple stream crossings and work in Wolfe Creek.

Town of Christiansburg | Outfall Relocation Permit Application; Christiansburg, VA
Permitting Specialist. Prepared the Joint Permit Application (JPA) for the relocation of the outfall line for a 3-8 (future expansion) MGD municipal wastewater treatment plant. Project included wetlands identification for outfall line siting, threatened and endangered species evaluations, and preparation of the joint permit application for multiple stream crossings and the construction of an effluent diffuser.

City of Covington | Environmental Permitting; Covington, VA
Permitting Specialist. Prepared a Joint Permit Application (JPA) for rehabilitation of an existing sewer lines and interceptor, the rehabilitation of pump station, and the replacement of a force main. Project included evaluation of endangered species, identification of archeological and historic resources, preparation of the joint permit application, and acquisition of Corps of Engineers, Department of Environmental Quality and Virginia Marine Resources Commission permits for multiple stream crossings and work in Jackson River and its tributaries.

Western Virginia Water Authority | Collection System Improvements; Covington, VA
Permitting Specialist. Prepared a categorical exclusion request and obtained the requested categorical exclusion for NEPA compliance. Prepared a Joint Permit Application (JPA) for rehabilitation of an existing sewer interceptor to correct chronic overflow problems. Project included the evaluation of endangered and threatened species, identification of archeological and historic resources, and acquisition of Corps of Engineers, Department of Environmental Quality and Virginia Marine Resources Commission permits for multiple stream crossings and work in Jackson River and its tributaries.
resources, preparation of the joint permit application and acquisition of Corps of Engineers, Department of Environmental Quality, and Virginia Marine Resources permits for multiple stream crossings and work in Mudlick Creek.

**Town of Front Royal | Long Term 2 Enhanced Surface Water Treatment Ryle Compliance Assistance; Front Royal, VA**

**Permitting Specialist.** Reviewed Cryptosporidium monitoring data and conducted an assessment of options for compliance with the LT2ESRTR for a 4.0 MGD water treatment plant.

**Virginia Department of Health | Source Water Protection Plans for Small Community Waterworks; Various Locations VA**

**Permitting Specialist.** Project Manager for assisting Small Public Water Systems in Virginia to develop wellhead protection plans for 65 different public small groundwater community waterworks. Activities include contacting small public water systems to determine interest and educate public water system managers about the program and giving program presentations for those water systems interested in participating. Also responsible for coordinating local advisory committees, collecting site specific information, preparing/reviewing plans, preparing progress reports for submittal to VDH, and oversight of staff involved in the project.

**Town of Rich Creek | Wastewater Treatment Plant Upgrades; Rich Creek, VA**

**Permitting Specialist.** Project Manager for a comprehensive environmental assessment to fulfill NEPA requirements and rural development project funding. Evaluated potential impact of project and alternatives on endangered and threatened species, archeological and historic resources, air quality, water quality, and other environmental concerns associated with the installation of a new force main to convey water to a regional wastewater service facility.
William B. (Brent) Ferren, P.E.

Brent manages the Acoustical Consulting Services group within Black & Veatch's global energy business and coordinates the acoustical evaluation and design of Black & Veatch projects worldwide. Projects range from small consulting projects to large engineering, procurement, and construction (EPC) (turnkey) projects. As the Senior Acoustical Engineer, Ferren participates in projects across all Black & Veatch divisions and business lines. Projects include power generation facilities, electrical substations, water/wastewater treatment facilities, pump stations, refinery/petrochemical plants, and manufacturing facilities as well as transportation projects, land use development, aviation facilities, and federal facilities.

Responsibilities include directing acoustical services projects, supervising and mentoring Black & Veatch's team of acoustical engineers and specialists, pursuing new business, and managing quality. Project services include facility noise assessments, regulatory reviews, community noise evaluations, land use compatibility planning, environmental noise assessments, permitting/site certification studies, public hearing participation, traffic noise analyses, room acoustics design, architectural sound isolation design, and building systems noise control.

Mr. Ferren’s experience includes projects throughout the United States as well as Argentina, Australia, Canada, China, Columbia, Egypt, Ghana, India, Indonesia, Italy, Mexico, Philippines, Saudi Arabia, South Africa, South Korea, Thailand, Turkey, United Arab Emirates, United Kingdom, Venezuela, and Vietnam.

PROJECT EXPERIENCE

**Potomac Interceptor Odor Control; DC Water and Sewer Authority; DC**

Senior Acoustical Engineer. Environmental noise assessments were conducted to support preliminary siting and conceptual design of odor control facility sites. Applicable noise ordinances were evaluated and general acoustical design requirements were established to support regulatory compliance.

**Advanced Water Purification Facility Expansion; Orange County Water District; Fountain Valley, CA**

Senior Acoustical Engineer. Black & Veatch was engaged to develop plans and specifications for the expansion of the groundwater replenishment system. An acoustical design was developed to ensure compliance with applicable noise regulations and minimizing impacts on the surrounding community. The existing acoustical environment within the surrounding community was determined by conducting an ambient sound level survey.

**Delta Habitat Conservation & Conveyance Program; California Department of Water Resources; Sacramento, San Joaquin, Yolo, and Solano Counties, CA**

Senior Acoustical Engineer. Black & Veatch was engaged to design conveyance facilities and pumping plants to be located in multiple counties in northern California. Applicable noise ordinances were investigated and appropriate equipment and architectural design requirements were established based on ensuring compliance with applicable noise regulations.
**Bransholme Pumping Station Environmental Noise Investigation; Yorkshire Water Service; Kingston Upon Hull, United Kingdom**

**Senior Acoustical Engineer.** Black & Veatch completed an environmental noise assessment of a proposed pumping station involving two screw pumps that are designed to operate continuously throughout the year during dry weather conditions and six screw pumps designed to deal with increased flows during storm events. The environmental noise emissions associated with the pumping station were modeled in accordance with International Organization for Standardization (ISO) 9613. Noise control strategies were developed to ensure station environmental noise emissions complied with British Standard (BS) 4142 requirements at the residential receptors located immediately adjacent to the pumping station site. The environmental noise assessment was submitted to the local permitting authority for approval.

**Biosolids and Energy Recovery Facilities; Irvine Ranch Water District (IRWD); Irvine, CA**

**Senior Acoustical Engineer.** IRWD is proceeding with the design and construction of biosolids and energy recovery facilities to implement solids handling at the existing Michelson Water Recycling Plant. Black & Veatch provided detailed design and special studies, including a noise emissions evaluation. The noise emissions evaluation included ambient noise monitoring within the community surrounding the facility, evaluation of applicable regulatory limits and noise impacts (City of Irvine and California Environmental Quality Act [CEQA]), detailed noise modeling, and acoustical design development as related to construction and operational noise emissions. Special considerations included adjacent wildlife sanctuary and nearby preservation land.

**Tai Po Water Treatment Works Ozone Building; Hong Kong Water Supplies Department; Hong Kong, China**

**Senior Acoustical Engineer.** Black & Veatch was engaged to design the expansion to the Tai Po Water Treatment Works and associated raw water and fresh water transfer facilities. The expanded facility is required to comply with specified operational noise emissions limits. Detailed noise modeling was conducted in order to evaluate and develop acoustical design measures to ensure the ozone building supports compliance. Design-build specification requirements were developed for the ozone building, which will house ozone generators, air and oxygen compressors, condensers pumps, blowers, and cooling towers, and will also include building ventilation components such as supply fans, exhaust fans, and wall louvers.
Dennis Trupka, RA, NCARB

Mr. Trupka is a design architect for laboratory, water, and wastewater projects. His experience as a project architect and a design architect includes 30 years of design of municipal and commercial buildings. He has been involved in programming, design, construction drawings, specification writing, room finish selection, and construction observation.

PROJECT EXPERIENCE

City of Fargo | Fargo Membrane WTP and Improvements; Fargo, ND

Project Architect. Mr. Trupka is the lead architect on the design of a 55,000 square foot membrane plant addition to the Fargo WTP. Mr. Trupka was the lead architect on the original 120,000 water treatment plant constructed in 1993. The expanded plant will be surrounded by residential neighborhoods. The client was very pleased with the original building and wants a consistent look for the new membrane plant. The brick and block expansion will feature cast stone accents and large arched windows. All silos and building mechanical equipment will be concealed within penthouses.

City of Olathe | Hedge Lane Pump Station & Reservoir; Olathe, KS

Project Architect. Mr. Trupka is the lead architect on the design of a 12,000 pumping station. The pumping station will be designed to meet the growing water demands for the District through the year 2050. The masonry and rough cast stone exterior of the building will fit well into the rural landscape of the site.

Lancaster County Water and Sewer District | Catawba River Water Treatment Plant Raw Water Reservoir Expansion; Van Wyck, SC

Project Architect. Designed the reservoir pumping station. The pumping station will sit atop a 90 foot intake tower and will be accessible by a bridge. The building has a steel frame structure and single wythe masonry walls.

Cape Fear Public Utility Authority | Raw Water Booster Pumping Station; Wilmington, NC

Project Architect. Lead the architectural design effort for the new raw water booster pumping station. The load bearing masonry building has a brick veneer with cast stone accent bands. Its appearance is similar to the architecture of the water plant designed by Mr. Trupka for this client three years earlier.

City of Durham | Williams WTP Upgrades; Durham, NC

Project Architect. Lead the design efforts in converting the second floor filters into office space for a 1914 building that is on the National Historical Registry. The mixed use building presented challenges for fire ratings and exiting requirements. The new offices, restroom, break room and control room were carefully designed to have period appropriate finishes.

City of Durham | Brown WTP Upgrade and Expansion; Durham, NC

Project Architect. Designed a two story administration building to meet LEED Silver certification. The contemporary building with “green” design concepts will elevate the utilities’ public image. The building will make use of a unique energy efficient wall construction, natural light, a roof garden, a highly reflective roof, water reuse, high efficiency lighting, and water source heat pumps. The
project also includes a new chemical building, a filter building expansion, and an operations building remodel.

**City of Sioux City | Southbridge Regional WTP; Sioux City, IA**  
**Project Architect.** Lead architect for new water treatment plant. The plant was designed on a fast track schedule and will be a catalyst for development of the industrial office park. In addition to process areas, the plant included a laboratory and other personnel spaces. The precast concrete wall panels are very decorative and give an upscale appearance to the inexpensive construction. The building emphasizes energy efficiency with highly insulated walls and a highly insulated reflective white roof. The construction is expected to take 18 months rather than the traditional 30 months.

**Charlotte-Mecklenburg Utilities | Vest Water Treatment Plant Superstructure Improvements; Charlotte, NC**  
**Project Architect.** The art deco style building is on the National Historical Registry and required major renovations. We resurfaced the stucco exterior with historically correct colors and replaced all windows with appropriate style new frames and insulated glass. The flat roof was replaced with an energy efficient white roof. Black & Veatch handled all paperwork and documentation to meet the requirements of the Landmark Commission.

**Cape Fear Public Utility Authority | Sweeney WTP Expansion; Wilmington, NC**  
**Project Architect.** Lead architect for the expansion facilities including new administration building, operations center, and chemical building expansion. All buildings were connected and required special consideration for fire ratings. The veneers were brick and prairie stone supported by concrete block.

**Water District No. 1 of Johnson County | Laboratory Evaluation for Facility No. 2; Johnson County, KS**  
**Project Architect.** Mr. Trupka was a member of an advisory panel to help the District evaluate lab alternatives for a large laboratory addition. After reviewing several proposals by another design firm, the panel recommended a new building be constructed to provide an optimal laboratory workflow and allow for future growth. Since Black & Veatch had designed the past several projects for the client, the District felt political pressure to use another design firm, but felt strongly that Black & Veatch would be valuable in giving them direction.

**Water District No. 1 of Johnson County | Facility 3 (Phase V) Water Treatment Plant; Johnson County, KS**  
**Project Architect.** Designed the four buildings for this green-field site. To blend with the rural setting, the collections of buildings were designed to look like a horse farm. The operations building was designed using a 3-D computer model and the whole plant was modeled for a photo realistic tour. These computer models clearly communicated the design to the community and the client. The operations building housed the administrative spaces, membranes and associated chemicals.
Douglas B. Hudgins, P.E.

Doug has more than 18 years’ experience in planning and designing wastewater collection and water supply systems. He provides engineering and project management for water and wastewater treatment, pump station, water distribution, and sewage collection projects. Representative project experience includes:

**City of War | Water System Improvements; War, WV**

**Project Manager.** The project included the construction of over 21,000 linear feet of 2-, 6-, 8-, and 10-inch water main and appurtenances to serve the Warriormine, Centreville, and Shop Hollow communities.

**Henry County Public Service Authority | Philpott Water Treatment Plant PER; Collinsville, VA**

**Project Manager.** The project provided design, construction contract administration, and inspection services for standby power at the Philpott Water Filtration Plant, the raw water intake, and the 57 west booster pump station.

**Washington County Service Authority | South Fork Intake & Water Treatment Plant Expansion; Abingdon, VA**

**Project Manager.** The project included the preparation of a Preliminary Engineering Report, permitting, design, construction contract administration, and inspection for the construction of a new intake on the South Fork of the Holsten River and an expansion/upgrade of the Middle Fork Water Treatment Plant to 12 MGD capacity.

**Washington County Service Authority | Brumley Gap Road Water Facilities; Abingdon, VA**

**Project Engineer.** This project consisted of the design, contract administration, and resident project representation for the construction of approximately 72,000 linear feet of 8 and 10-inch waterline, 175 gallon per minute booster pump station and 150,000-gallon water storage tank. Project funding was secured through a Virginia Water Supply Revolving Loan.

**Washington County Service Authority | Valley Street Waterline Replacement; Abingdon, VA**

**Project Engineer.** This project included the upgrade and replacement of 4-inch and 6-inch waterline with approximately 7500 linear feet of 12-inch and 14-inch waterline. The design and construction of the project was completed in less than seven months to meet the Service Authority’s schedule.

**City of Norton | WTP Upgrade; Norton, KS**

**Project Engineer.** Provided preliminary engineering design for the upgrade and expansion of a 3 MGD surface water treatment plant. Project included a new clearwell, chlorine, chorine dioxide, and ammonia feed systems; filter additions and reconstruction; and a new plant-wide SCADA system.
Thomas P. Karis, P.E.

Mr. Karis is a veteran Project Manager with 27 years of transportation infrastructure design, construction and management experience. Beginning his professional career with CHA in 1986 as a field engineer on a major Interstate interchange construction project, Tom has advanced to his current position as a Vice President and veteran Project Manager through his pragmatic approach to problem solving and his decision-making capabilities. His entire career has been with CHA, and he has been involved with, or directly responsible for all types of transportation projects encompassing everything from field supervision to design development and delivery, including constructability reviews, special studies, task forces, forensic engineering and expert opinion, and technical publications and presentations. Tom has extensive knowledge of federal policies and procedures and their application to state and local transportation initiatives. He is “hands-on”, well organized, and detail oriented. As a veteran Project Manager, he knows the importance of, and is committed to, ensuring our team responds with the needed resources, experience and expertise. Tom provides GDOT with a framework of transportation planning, design and construction knowledge founded on a thorough understanding of the GDOT PDP, Environmental Procedures Manual and NEPA processes. His most recent and relevant project focus has been committed to GDOT and to opportunities with counties throughout north and central Georgia. Representative project experience includes:

I-85/Poplar Road Interchange Concept Design through Final Design; GDOT PI 0009323

**Project Manager.** CHA, working with Coweta County and GDOT, is responsible for accelerating the design development for a new interchange on I-85 through the GDOT PDP and NEPA Environmental Assessment processes. The project has been identified by GDOT as a high priority project. The project complied with the GDOT PDP and all applicable state and federal agencies and regulations involving coordination with the USACOE, EPD, OES, FHWA, and DNR. The Draft EA will be submitted to GDOT and the FHWA in April 2013; design development has been on-going to advance immediately into Preliminary Plan Preparation. GDOT Project Letting is scheduled for 2016.

SR 34 / Newnan Bypass (Turkey Creek Road to SR 16) Concept Design through Final Design; GDOT PI’s 0006293, 0006877, 0007694

**Project Manager.** CHA has been working closely with Coweta County and GDOT for more than 5 years on this challenging locally-sponsored, federal-aid project for the portion of the SR 34/Newnan Bypass between Turkey Creek Road and SR 16 along the east side of I-85. The project has involved the consolidation and coordination of multiple PI’s into one comprehensive NEPA action. The project is being advanced through the GDOT PDP and NEPA processes as an EA. The project complied with the GDOT PDP and all applicable state and federal agencies and regulations involving coordination with FEMA, USACOE, EPD, OES, FHWA, and DNR. The FONSI was submitted to GDOT in March 2013. Preliminary Field Plan Review occurred in early April 2013. GDOT Project Letting is scheduled for 2014.
CR 130 (Cannon Road) Bridge Replacement over White Oak Creek Concept Design through Final Design; GDOT PI 0006957

**Project Manager:** CHA satisfied all GDOT PDP and permitting requirements for this off-system bridge replacement between mid-2006 through mid-2011. The 264 ft long replacement bridge consisted of three 88 ft PSC spans on concrete piers with drilled shaft foundations. An endangered minnow species was identified during the aquatic survey, requiring that CHA work closely with GDOT OES to avoid impacts during construction by clear-spanning the stream channel. The project complied with the GDOT PDP and all applicable state and federal agencies and regulations involving coordination with FEMA, USACE, EPD, OES, FHWA, and DNR. GDOT Let the project and construction was completed in 2011.

CR 41 (Greentop Road) Bridge Replacement over CSX Railroad Concept Design through Final Design; GDOT PI 0006956

**Project Manager:** CHA satisfied all GDOT PDP requirements with the replacement of an existing steel through truss bridge that had been closed as a result of biennial inspection concerns. The project required significant vertical realignment of the roadway approaches to provide the required vertical clearance over the two mainline tracks and also to eliminate the existing substandard crest vertical curve. The 193 ft replacement bridge consisted of two Type III PSC spans and one Type II PSC span. Extensive coordination with CSX RR and utility owners (fiber optic, gas, communications, and water) was required to advance the project through design development. The project duration was between mid-2006 through mid-2011. The project complied with the GDOT PDP and all applicable state and federal agencies and regulations involving coordination with OES, USACE, EPD, FHWA, and DNR. GDOT Let the project and construction was completed in 2011.

This project was originally advanced as a County-sponsored, 80/20 federal-aid project. In mid-2009, GDOT in cooperation with the County and CHA, identified the project as a candidate for the American Recovery and Reinvestment Act “Stimulus Project.” The project was advanced through the GDOT PDP and NEPA processes as a CE. CHA met very tight procedural and schedule requirements to secure funding. The Concept Report Evaluation by GDOT Ratings: CHA received the highest scores (100) in each of the following categories: Presentation, Judgment, Environmental, Right of Way, Utility, Constructability, Schedule (Minor Rural Bridge Replacement).
William (Bill) Ernst, P.E.

Bill Ernst has 40 years of experience in the water and wastewater industry. His experience includes domestic and international projects using both the traditional Design-Bid-Build and the Design-Build delivery methods. In the Design-Build market, Mr. Ernst has served as both the Owner’s Engineer and the Design-Build Contractor. In the early 1990s, Mr. Ernst directed the preparation of one of the first sets of Design-Build tendering documents for USAID on a $500 million competitively bid project serving the Canal Cities of Egypt with wastewater treatment facilities, and later prepared similar tendering documents for a $193 million Design-Build-Operate project in Monterrey, Mexico. As a Design-Build Contractor, Mr. Ernst directed the engineering on the Morris Forman Alternative Solids Project in Louisville, Kentucky. That project resulted in significant savings for the Owner and was awarded the Design-Build Institute of America’s “Best Project” award for large projects. Mr. Ernst is currently serving as Director of Operations and a Senior Engineering Manager in the Design-Build/EPC Group in Black & Veatch America’s Water Division.

PROJECT EXPERIENCE

Domestic Design-Build Projects

City of Midland | T Bar Well Field Development and Delivery Project; Midland, TX

Design-Build Director. Black & Veatch is one of two Joint Venture partners that serve as prime Design Build Contractor for this project that is installing 45 water wells on the T Bar Ranch in Texas and delivering 20 mgd of water to the City of Midland over 60 miles away. As Director of Operations for Design Build, Mr. Ernst oversees quality control and schedule management for the design teams and procurement of major equipment.

City of Santa Monica | Charnock Well Field Restoration Project, Santa Monica, CA

Design-Build Director. Black & Veatch was the Prime Contractor for the City of Santa Monica to provide progressive design-build services for the design and construction of a new 10 MGD greensand filter and reverse osmosis water treatment system. The project consisted of two sites: the Charnock well field site, where a pretreatment system was developed to remove specific contaminants from the groundwater, and the Arcadia site, where the groundwater is softened, blended with water from other wells and distributed to the City of Santa Monica residents. As Director of Operations for the Design Build Department, Mr. Ernst managed quality control for the final design of the project and was intimately engaged throughout start-up and commissioning to assure on time delivery and a high quality product. Mr. Ernst has also helped troubleshoot issues that have arisen during the 2 year warranty period.

Black & Veatch Water | Engineering Manager, Design-Build Department

Engineering Manager. Responsible for establishing engineering policy and managing technical activities of the engineering staff on competitively bid and negotiated Design-Build projects in the Design-Build Department of the America’s Water Division of Black & Veatch.
USAID–Wadi Ma’in Water Treatment and Conveyance Design-Build | Operate Project; Amman, Jordan

Engineering Manager. Part of Construction Management Consultant team contracted directly with USAID for the oversight and review of engineering activities on a Design-Build-Operate project for the Water Authority of Jordan. The project included design and construction of a 47 MCM (40 mgd) reverse osmosis water treatment plant located near the Dead Sea and a 1200 mm (48”) conveyance pipeline with 6 major pumping stations to raise the treated water 1800 m (0.8 mi) in elevation and to convey it 40 km (25 mi) to the City of Amman. In addition to reverse osmosis treatment, the project includes a conventional filtration pretreatment facility and UV disinfection.

Design-Build Contractor | Wadi Ma’in Water Treatment and Conveyance Design-Build-Operate Project; Amman, Jordan

Proposal Manager. Provided services for an international consortium of companies, including key firms from Egypt, France, Greece, the UK, the UAE and the United States in the preparation of a proposal for the engineering, construction, and operation & maintenance of a water treatment plant and conveyance system in Jordan.

City of Holland | Water Treatment Plant; Holland, MI

Project Engineer. Prepared plans and specifications to expand the capacity of the existing water treatment plant from 80,000 to 106,000 m³-d (21 to 28 mgd).

City of Fort Collins | Water Treatment Plant; Fort Collins, CO

Resident Engineer. Performed resident engineering services for a water treatment plant improvements project that added chemical stabilization facilities to two water treatment plants.

City of Elgin | Water Treatment Plant Expansion; Elgin, IL

Design Engineer. Designed improvements for a lime-softening water treatment plant.

City of Cape Girardeau | Water Distribution; Cape Girardeau, MO

Project Engineer. Prepared plans and specifications and directed construction phase services for a new fire protection pumping station and water storage reservoir to serve an industrial district.

Gauley River Power Partners | Summersville Hydroelectric Design-Build Project; Summersville, WV

Engineering Manager. Directed design services for the engineering, procurement, and construction of a new $26 million, 80 MW hydroelectric power plant project constructed at the existing 400-ft high Corps of Engineers Summersville Dam with Black & Veatch as design-build contractor. The new power plant takes flow from an existing 17 foot (14.7 m) diameter penstock and directs it through two hydro-electric turbine generators. Flow rate is controlled by a 108” (2745 mm) Howell Bunger Valve. The project included coordination and permitting through the Corps of Engineers and National Parks Department.
Scott D. Stockam, P.E.

Mr. Stockam specializes in electrical design and field services related to water and wastewater treatment plants and stormwater regulation systems. He has experience in design-build projects as well as conventional design projects. Scott is the electrical team supervisor for the expanded scope/design-build support group in the Water division. He has experience in electrical power and control systems, including their installation. He has been involved in numerous designs and construction support on new and existing plants.

Mr. Stockam’s responsibilities have included plan and specification development of power distribution systems, control schematics, wiring diagrams, intercom systems, fire alarm systems, and security systems. In addition, he has witnessed the field installation of all of these systems, including instrumentation and controls and SCADA systems. He has witnessed factory acceptance tests and field start-up services on medium voltage adjustable frequency drives and distribution equipment.

Mr. Stockam is one of the Water Division’s adjustable frequency drive and cathodic protection experts.

PROJECT EXPERIENCE

City of Santa Monica | Charnock Well Field and Arcadia Water Treatment Plant, DBO, Santa Monica, CA

Electrical Project Engineer and Design Coordinator. Design build expansion of the water treatment plant at Arcadia using primary filters, membrane, and GAC Contactor technology. The Charnock site involved primary filters and reconditioning of well pumps.

City of San Bernardino | San Bernardino Valley Municipal Water District, Central Feeder Pumping Station

Electrical Project Engineer and Design Coordinator. Design build with CPS implementation of a new ground water pumping station requiring power distribution and controls for three 4160 volt pumps and motors. The project was unique as it required the construction of a new Southern California Edison (SCE) 69Kv substation to be built on the same lot next to the pumping station. Required direct coordination with the planners and designers from SCE.

City of Phoenix | Lake Pleasant Water Treatment Plant Design-Build-Operate, Phoenix, AZ

Electrical Project Engineer and Design Coordinator. Joint venture design, build, and operate 80 mgd water treatment plant using primary filters, Ozonation, GAC Contactor, and UV reactor technology. Designed and constructed a small 69Kv substation on the property for power distribution to the plant.

California Water Service Co. | N.E. Bakersfield WTP, Bakersfield, CA

Electrical Project Engineer and Design Coordinator. Design and CPS implementation of a new 8 mgd surface water treatment plant using membrane filtration technology.
California Water Service Co. | Bakersfield WTP, Bakersfield, CA  
**Electrical Project Engineer and Electrical Construction Coordinator.** Design and construction on design/build approach to implementation of new 20 mgd surface water treatment plant using membrane filtration technology.

City of Detroit | Water Works Park II WTP Design-Build Project, Detroit, MI  
**Electrical Project Engineer.** Provided electrical design for the new 240-mgd water treatment plant $275 million design-build project to replace the existing treatment plant. The new facility includes a low lift pump station, chemical facilities, pretreatment, intermediate ozonation, rapid rate monomedia filtration/waste wash water equalization, administration building, finished water storage, residuals handling and treatment facilities, and plant overflow facilities.

City of Milwaukee | Milwaukee Ozonation Facilities, Linnwood and Howard Ave Design-Build Project, Milwaukee, WI  
**Electrical Project Engineer and Electrical Construction Coordinator.** Project was a $43 million ozonation facilities at two existing (275mgd and 105mgd) municipal water purification plants. Prepared all electrical power bid documents for the RFP (Request For Proposal) including preliminary design documents, procurement of equipment, and coordination of bids from subcontractors. Overseer in the preparation of all of the electrical design drawings and specifications. Responsible for the electrical construction and start-up of the project.

Modesto Irrigation District | Domestic WTP Project, Modesto, CA  
**Electrical Project Leader.** Prepared technical papers and the electrical design guide for the project. Oversaw the design of power drawings and specifications for a 30 mgd water treatment utilizing ozone as the primary disinfectant.

City of Hannibal | WTP Expansion, Hannibal, MO  
**Electrical Project Engineer.** Prepared all power design drawings, specifications, and performed all electrical calculations.
Mark E. Wright

Mr. Wright has 25 years of electrical engineering and design experience with industrial, commercial, institutional and municipal type clients. The vast variety of engineering and design efforts that he was involved with encompasses electrical power distribution both for normal and emergency power, indoor and outdoor lighting, control, premise wiring, and fire alarm systems. His experience also includes several years with systems integration and automation firm where he was responsible for the hardware design of control system architecture for batch chemical and extrusion manufacturing processes.

Representative project experience includes:

**Department of the Army Corp of Engineers | Design-Build Water System Expansion; Syracuse, NY**  
**Electrical Designer.** Design/build project to expand and improve the public water system serving the Fort Drum military base. This project improves the water storage and distribution system serving drinking water to approximately 42,000 people on the base, in addition to providing a fire flow of 1,500 gpm across the base for fire protection. Total water consumption on the average day is about 1.0 MGD, with the maximum day at about 2.5 MGD.

**Westchester County | Glycol Recovery and Disposal System Design; NY**  
**Electrical Designer.** Planning and design of upgrades to the existing deicing facility at the Westchester County Airport. Design components include two 200,000 gallon underground precast concrete holding tanks, two 40,000 gallon underground polyethylene storage tanks, three submersible pump stations, and testing/control equipment used to separate high and low concentration glycol contaminated stormwater to be disposed of.

**NYS Office of Children & Family Services | Industry Campus Water & Wastewater Improvements; NY**  
**Electrical Designer.** Planning, design, hydraulic modeling and contract administration for the complete replacement of the water system at the Industry Residential Center. Facilities included a glass-fused-to-steel 280,000-gallon water storage tank; altitude valve vault; new booster pump station components; and 22,000 linear feet of 3, 4, 6, 8, and 12-inch water main. Furthermore, the hydraulic model was used to design a booster pump system that relied on the existing pressure in the system to reduce pumping needs, which in turn will reduce the operation and maintenance costs of the facility.

**Village of Hoosick Falls | 2.0 MGD Membrane Filtration Plant; NY**  
**Electrical Designer.** Controls Engineer for the planning, design, and construction of a 2.0-mgd water treatment facility. Key features of the treatment facility include membrane filtration, a 26,000-gallon pretreatment tank, potassium permanganate and sodium hypochlorite pretreatment chemical feed systems, disinfection, corrosion control, and fluoride chemical feed systems, chlorine contact tanks, finished water pumping, and instrumentation and controls.
Gabriel Bistue, P.E.

Mr. Bistue is a lead civil/structural engineer with Black & Veatch. His responsibilities include the evaluation of design alternatives; conducting, reviewing, and supervising civil/structural design; preparing technical specifications; reviewing shop drawings and submittals; answering construction field requests and designing construction changes; coordination with other engineering disciplines; coordination with contractors; and providing construction field services and inspections.

PROJECT EXPERIENCE

City of Santa Monica | Charnock Well Field Restoration, Design-Build Project; Santa Monica, CA

Lead Civil/Structural Engineer. Responsible for preliminary and detailed civil/structural design of the $50M water treatment plant upgrade and well field restoration project; Black & Veatch as Prime Contractor. Plant includes GAC and Reverse Osmosis treatment to remove MtBE from groundwater. Responsibilities include review of existing geotechnical investigation; supervising site/structural design; coordination of site/structural design with other disciplines; review of submittals; answer RFI; design of construction changes; review of change orders; and field inspections.

San Bernardino Valley Municipal Water District | Central Feeder Pump Station, Pipeline and Vaults, Design-Build Project, San Bernardino, CA

Lead Structural Engineer. Responsible for structural engineering during construction phase of the $50 million pump station facility and pipeline with Black & Veatch / Kiewit Joint Venture design-build contractor. Green field 300cfs pump station with five million gallon below grade reservoir and four miles of 78" pipeline. Responsibilities include design of construction changes; coordination with other engineering disciplines; answering RFIs; review of submittals and calculations; and coordination of structural work with field engineers.

City of Phoenix and American Water Services | Lake Pleasant Water Treatment Plant, Design-Build-Operate Project; Phoenix, AZ

Field Civil/Structural Engineer. Responsible for field civil/structural engineering for the Black & Veatch design-build joint venture with McCarthy Construction to design and construct the new $215 million, 80 MGD water treatment facility using Ballasted Floculation, Ozone, filtration, GAC contactors technology and UV disinfection. The project involves a 20 year operations component led by American Water Services. The project includes raw water intake and pump station, finish water storage basin, and chemical feed systems. On site during 2004-2007, responsibilities include preliminary site work design; detailed civil/structural design of construction changes; answering RFIs; review of submittals and calculations; performing field inspections; and coordinating civil/structural work with subcontractors and sub-consultants.
City of Cottage Grove — Row River Water Treatment Plant Facility, Design-Build Project; Cottage Grove, OR

**Lead Structural Engineer.** Responsible for civil/structural engineering during construction phase of the $10M membrane water treatment plant upgrade project, Black & Veatch in Joint Venture. Responsibilities include design of construction changes; coordination with other engineering disciplines; answering RFIs; review of submittals and calculations; and coordination of structural work with field engineers and designers.

City of Westminster | Reclaimed Water Facility, Design-Build Project; Westminster, CO

**Lead Structural Engineer.** Responsible for the construction of deep foundations for the 2.2 MG buried storage tank, which is part of a $7M facility upgrade; Black & Veatch as prime contractor. Responsibilities include evaluation of previously installed drilled piers; review of pier redesign and new construction methods; supervision and inspection of 120 new drilled piers; coordination of activities with client, subcontractor, and third party inspectors; and preparation of construction records.

City of Phoenix | Val Vista WTP GAC Implementation; Phoenix, AZ

**Lead Structural Engineer.** Responsible for detailed structural design of the 220 MGD supply pump station, post-filter GAC contactors, electrical building, basins, and ancillary structures for the existing treatment facility. Responsibilities include evaluation of existing geotechnical investigation; conducting and supervising structural design; coordination with other engineering disciplines; value-engineering evaluations with contractor and client; preparation of specifications; and review of submittals.

Project 7 Water Authority | Water Treatment Plant Improvements, Design-Build Project; Montrose, CO

**Lead Structural Engineer.** Responsible for civil/structural engineering during construction phase of the $9M water treatment plant upgrade project including intake modifications, filter additions and addition of flow control structure; Black & Veatch as prime contractor. Responsibilities include design of construction changes; answering RFIs; review of submittals and calculations; and coordination of structural work with field engineers and designers.

United Water New York—Lake DeForest Water Treatment Plant, Design-Build Project; West Nyack, NY

**Structural Engineer.** Responsible for structural design of the $8 million water treatment facility upgrade to a 20 MGD firm capacity with Black & Veatch as design-build contractor. The project includes new AquaDAF dissolved air flotation process, chemical feed system improvements and associated electrical and I&C upgrades. Responsibilities include structural design of the DAF basin, DAF building and residuals pump station; review of shop drawings and submittals; detailed design of field changes; and answering RFI.
Gregory T. Schultz, P.E.

Mr. Schultz’s responsibilities involve the structural analysis and design of institutional, recreational, public works, and military facilities including editing of technical specifications. He also has significant experience in the design of water and sewer systems throughout Virginia and West Virginia.

Representative project experience includes:

**John Flannagan Water Authority | Water Treatment Plant & Intake Expansion; Haysi, VA**
**Structural Engineer/Construction Manager.** Bidding and construction of an 8.0 MGD water treatment plant and intake expansion.

**Washington County Service Authority | Water Treatment Plant & Intake Expansion; Abingdon, VA**
**Structural Engineer.** Design and construction services for 2-million gallon wire-wound circular prestressed concrete ground level water storage tank, and 9,000 feet of 14-inch water line.

**Washington County Service Authority | Highway 58 Pump Station; Abingdon, VA**
**Structural Engineer.** Modify and retrofit existing potable water booster pump station. Extensive roof framing redesign, roofing replacement, bridge crane hoisting system, exterior renovation, and construction management.

**City of War | Water System Improvements; War, WV**
**Structural Engineer/Construction Manager.** Design and construction contract administration for the replacement of the City’s water distribution and storage system.

**Pepper’s Ferry Regional Wastewater Treatment Authority | Wastewater Treatment Plant Upgrade; Radford, VA**
**Lead Structural Engineer.** Design of wastewater treatment plant upgrade including retrofit of 70-foot diameter floating anaerobic digester covers to fixed position covers.

**Powhatan County | Dutoy Creek Wastewater Treatment Plant Upgrade; VA**
**Lead Structural Engineer.** Design of several masonry process and administration buildings, including steel joist and precast concrete roof framing. Multiple cell, 30’x40’x24’ deep cast-in-place concrete SBR tanks and other miscellaneous concrete process structures.
Rick Campbell

Rick Campbell is an experienced construction manager and safety engineer with the Water Americas Design-Build Group. He possesses a strong ability to deliver projects with challenging phasing and has experience in coordination of all construction project requirements including scheduling, buyout, change orders, progress payments, certified payroll, safety, and quality control.

Mr. Campbell has consulted on several water plant designs with engineers, architects, owners, and equipment manufacturers. His project delivery experience includes design-build, construction management, and traditional design-bid-build for water and wastewater facilities.

PROJECT EXPERIENCE

City of Midland | T-Bar Well Field Development and Delivery Progressive Design-Build Project; Midland, Texas

Project Close-Out Manager. This $162M Progressive Design-Build delivery of this DBOF project included approximately 50 deep groundwater supply wells, high service pump station, storage tanks, chlorination facility, terminus facility and approximately 56 miles of 48” water transmission main in West Texas. Because of the severe drought conditions in this area of the country, schedule and quality were high priorities, and the project was delivered utilizing the progressive design-build model in 14 months from contract through water delivery from the wellfield site to the City of Midland, Texas within the established budget.

City of Phoenix | American Water Services, Lake Pleasant WTP, Design-Build-Operate Project; Phoenix, AZ

Assistant Construction Manager/Start-up Manager. Responsible for all field related start-up activities including all water flow / production. The project consists of an 80 mgd design-build water treatment plant. Construction consists of a raw water intake, raw water pump station/electrical building, over 2 miles of 90-inch diameter raw water welded steel-concrete lined pipe, ballasted flocculation, ozone treatment, filtration, GAC contactors and regeneration, UV disinfection as well as chlorine gas, finished water pump station and discharge piping, residuals handling building and centrifuge equipment, and a 40 million gallon finished water reservoir. Duties included Start-Up management and QA/QC of the entire project site including six (6) staff. Directly involved in planning for and implementing overall facility Startup Plan, including commissioning, functional testing, and startup testing (both regulatory and demonstration testing) for process that includes ballasted flocculation, ozone, deep-bed filtration, GAC contactors, UV disinfection, and multiple on-site chemical systems. In addition, responsible for the complete start-up and commissioning of a GAC Regeneration facility on the site.

Cal Water | Northeast Bakersfield Water Treatment Plant; Bakersfield, CA

Construction Manager/Start-Up Manager. Responsible for the construction of a new 20-mgd potable water facility using membrane technology. Key responsibilities included constructability evaluation of the design, and management of all subcontracts and major purchase orders on the project. Major subcontractors included both union and non-union trades. Significant
challenges included receiving DHS certification to operate the membranes at a higher flux rate (flow rate) and coordination with several other entities.

Construction Phase Services Regional Manager, Colorado River Basin
Construction Support Manager 1. Responsible for all construction phase services support personnel in the Colorado River Basin area. Monitored all staff related to safety standards, quality control, and reporting requirements. Supports the region related to proposals and constructability reviews. In addition to the above duties, directly supports staff on site and corporate management related to challenging projects.

Project 7 Water Authority Water Treatment Plant Improvements, Design-Build Project; Montrose, CO
Project Manager. Responsible for all design and construction and safety aspects of a $9 million upgrade to an existing facility, increasing its capacity from 20.0 to 27.6 MGD. Key plant components include a new flow control structure with hydro-power units, additional filtration capacity and a chlorine contact basin. Currently, this project is on schedule and under budget with an anticipated savings to the owner in excess of $300k.

Bundamba Advanced WTP, Design-Build Project; Queensland, Australia
Construction Manager/Start-up Manager. Involved in the construction and the commissioning of this fast-track project that included a pre-treatment facility, microfiltration membranes, reverse osmosis, associated chemical feed systems and a clearwell. The entire plant was delivered in ten (10) months and was a part of the Aus $2.54 billion Western Corridor Recycled Water Project. Duties included working with staff and field personnel during the heavy mechanical work to ensure proper construction of the process equipment and commissioning of said equipment.

Minneapolis Water Works | Columbia Heights Membrane Filtration Plant; Minneapolis, MN
Start-up Manager. Responsible for the mitigation of all coordination issues, i.e., start-up and punch list, related to optimizing a new 70 mgd water treatment plant prior to acceptance testing. At the time of construction, this was the largest plant in the U.S. to use state of the art ultra-filtration treatment process.

Cal Water | Northwest Bakersfield Water Treatment Plant; Bakersfield, CA
Construction & Start-up Manager. Providing oversight during design and all phases of construction and start-up for a 10.4 mgd micro-filtration potable water plant. The construction of this project occurred at two separate sites; the membrane plant in one location and the pre-treatment facilities and the canal intake structure are at a separate location. Both locations had existing facilities that remained in operation during the construction period. This plant incorporates a backwash recovery membrane skid that increases the efficiency of the plant to over 92 percent. Mr. Campbell’s responsibilities included helping the Owner select the contractor and purchase all of the major equipment related to the facility. The current budget is approximately $12 million with less than 1% change orders.
James Greenyer

James Greenyer is a Project Operations Manager who specializes in design/build projects. He had participated in progressive design/build projects that were managed through a partnership/alliance delivery approach. He has also provided commercial management of a JV alliance team, as well as managed complex construction projects that were completed as part of a larger program of work. James also has experience working on design/build projects that were rehabilitating an existing plant and required keeping it operational during construction. In his current role as Operations Manager in Water North America, he is responsible for ensuring the smooth running of all Water Construction in the region.

PROJECT EXPERIENCE

City of Midland | T-Bar Wellfield Development & Delivery Project; Midland, TX
Responsible for the establishment of the lump sum price for a fast track water supply project in West Texas. This project was executed under a Progressive D/B model, with the construction phase cost of approximately $160M being generated in under 3 months. James lead the Pre-construction phase price establishment and ensured a smooth transition into construction phase, leading the procurement of over $18M of equipment and subcontract packages. This project is on track to meet a deadline to supply water to the drought stricken city of Midland by May 2013.

Black & Veatch Corporation | Americas Water
Operations Manager. Working in the Construction & Procurement Division of Black & Veatch, James provided support to multiple projects across the United States. He provided management of projects from the proposal stage through to completion, with responsibility for ensuring the safe and satisfactory execution of project construction. Other duties included reviewing and approving contracting partners and subcontractors, allocating resources to projects and generating Construction Execution Plans for proposals and projects.

Budds Farm WTW; United Kingdom
Approx $45M project ($13M to BV) The project scope included the following elements:

- Sequential refurbishment and reconfiguration of 8 existing aeration lanes, installing mixed liquor return and diffused air systems.
- Refurbishment of 8 secondary clarifiers, with the retro-fitting of energy dissipation baffles.
- Methanol Storage and dosing system
- Standby Generation
- RAS/WAS pump station

Peel Common WWTW; United Kingdom
Approx $45M project ($10M to BV) The project scope included the following elements:
- Sequential refurbishment and reconfiguration of 8 existing aeration lanes, installing mixed liquor return and diffused air systems.
- Refurbishment of 4 secondary clarifiers,
- New Aeration Train, replicating the existing system.
- Methanol Storage and dosing system
- Standby Generation
- Imported Sludge Reception Facility

**Chichester WwTW & Sludge Treatment Center; United Kingdom**
Approx $25M Project ($8M to BV) The project scope included the following elements:
- New Modified Lutzack Ettinger Activated Sludge Treatment Process
- 4 New Secondary Clarifiers, constructed within Glass Coated Steel Tanks.
- New UV Disinfection system
- New storm storage facility and return pumping station
- Sequential de-commissioning of existing trickling filters, while maintaining process compliance (the filters occupied space that was required for storm storage facility meaning that temporary works were required to allow construction to proceed)
- New Sludge storage tanks
- 2 New Sludge centrifuges, polymer systems and cake transfer system.

**Thornham, Bisham and Sidlesham WWTWs; United Kingdom**
Total Approx $25M ($12M to BV) Each of these plants comprised the following elements:
- New Denitrifying Deep Bed recirculating sand filters.
- New Methanol storage and dosing facilities
- Trickling Filter refurbishment

**Scottish Water Solutions | South East Area Progressive Design/Build Projects**

**Project Manager.** Led the joint venture project with AMEC Construction, which worked in fully collaborative environment and shared office space. James’ responsibilities included the development of preliminary design technical memoranda in order to create target cost estimate. He was also responsible for the subsequent design and construction of approximately $40 million (lump sum) of wastewater treatment plant work. James managed 25 engineers, buyers, estimators and site personnel as well as the cost reporting, monitoring and financial modeling.
Jeff L. McKee

Mr. McKee has over 36 years experience in the field of construction, including 15 years in cost estimating. Positions have included estimating manager, chief estimator, lead estimator, civil/structural/architectural estimator, construction manager and project manager for numerous multi-discipline projects. Experience includes water and wastewater treatment facilities, pump stations and conveyance, fossil power, highways and bridges, industrial and commercial projects. Active participation in value engineering and constructability reviews in order to reduce the cost of construction while maintaining function and level of quality. Developed estimating processes and procedures to insure costs are captured at each stage of design Experience achieved through employment with self-performing general contractors to world renowned E/P/C firms. Successfully managed multi-million dollar construction projects for wide ranging clients including private, local and state municipalities and the federal government including the US Army Corps of Engineers and the US Department of Energy. Developed and wrote specific task based estimating processes and procedures for developing estimates and proposals to support the varied project delivery methods encountered.

PROJECT EXPERIENCE

AVEK Water District | Antelope Valley East Kern WTP Expansion and Upgrades Project, Palmdale, CA

Estimating Manager. Responsibilities included management of estimating staff to produce cost information to proposal team for Guaranteed Maximum Price proposal under a Construction Manager at Risk format. Coordinated estimating activities with procurement staff in order to provide commodity and equipment pricing.

City of Goleta | Corona Del Mar WTP Upgrade Project, Goleta, CA

Lead Estimator. Managed estimating staff for GMP proposal under a Design/Build format. Coordinated estimating activities with procurement staff in order to provide commodity and equipment pricing. Reviewed scoping documents provided to subcontractors and suppliers for bidding purposes. Received and reviewed bids, provided recommendations for award, tabulated results into final proposal submitted to client.

SembCorp / Grupo Mexico | El Arco Hybrid 200 MW Power & Desalination Facility, Baja, Mexico, North America

Estimating Manager. 800 liter/second seawater reverse osmosis desalination water treatment facility and 200 MW Gas Turbine 2 on 1 combined cycle power plant with Medi distillation process. Responsibilities include coordination of estimating process, and providing costing information to design team, construction operations team and client representatives. Participate in design selections including value engineering workshops and constructability reviews. Fully integrate with design team in order to provide timely estimating functions to support final deliverable schedule. Coordinate estimating resources in order to facilitate estimate production. Project proposal pricing to determine a target price as required by feasibility phase study.

ESTIMATING

Specialization:
Estimating Concept through Bidding

Office Location
Kansas City, MO

Education
- Studied Architecture at Ball State University in Muncie, IN 1972-1973
- Construction Management coursework at Metro State College in Denver, CO in 1975.

Year Career Started
1976

Year Started with B&V
2011
BHP Billiton | Spence Hypogene Water Supply Project, Mejillones, Chile, South America
Estimating Manager. 800 liter/second seawater reverse osmosis desalination water treatment facility. Responsibilities include coordination of estimating process, and providing costing information to design team, construction operations team and client representatives. Participate in design selections including value engineering workshops and constructability reviews. Fully integrate with design team in order to provide timely estimating functions to support final deliverable schedule. Coordinate estimating resources in order to facilitate estimate production. Project proposal pricing to determine a target price as required by selection phase study.

BHP Billiton | Escondida Water Supply Project, Coloso, Chile, South America
Estimating Manager. 4,000 liter/second seawater reverse osmosis desalination water treatment facility and conveyance system. Responsibilities include coordination of estimating process, and providing costing information to design team, construction operations team and client representatives. Participate in design selections including value engineering workshops and constructability reviews. Fully integrate with design team in order to provide timely estimating functions to support final deliverable schedule. Coordinate estimating resources in order to facilitate estimate production. Project proposal pricing to determine a target price as required by selection and definition phase studies.

City of Cape Coral | North Cape RO WTP Project, Cape Coral, FL
Estimating Manager. Responsibilities included management of estimating staff for GMP proposal under a CM@R format. Coordinated estimating activities with procurement staff in order to provide commodity and equipment pricing. Reviewed scoping documents provided to subcontractors and suppliers for bidding purposes. Received and reviewed bids, provided recommendations for award, tabulated results into final proposal submitted to client. Project was part of an overall Facilities Expansion Program for the city.

City of Cape Coral | Southwest RO WTP/WWTP Upgrade and Expansion Project, Cape Coral, FL
Estimating Manager. MWH Constructors. Responsibilities included management of estimating staff for GMP proposal under a CM@R format. Coordinated estimating activities with procurement staff in order to provide commodity and equipment pricing. Reviewed scoping documents provided to subcontractors and suppliers for bidding purposes. Received and reviewed bids, provided recommendations for award, tabulated results into final proposal submitted to client. Project was part of an overall Facilities Expansion Program for the city.
T.J. Moore

As group manager of water procurement operations, T.J. Moore is responsible for overall staffing, administration and management of procurement proposals and execution of procurement activities required for active projects. This includes development of man-hour and equipment estimates, bidder lists, preparation of specifications, issuance of bidding documents, coordination of bid evaluations, contract negotiations, preparation of conform ed contracts, administration of executed contracts, expediting document submittals and equipment/material delivery, and monitoring and reporting procurement activities. Mr. Moore has held positions responsible for all aspects of procurement activities (inclusive of wastewater treatment equipment, chemical feed equipment, RO systems, etc.) working alongside clients in both private and public sectors within the United States as well as internationally. He coordinates with Project Managers and multi-discipline engineering departments. In addition, he develops policies, procedures and schedules involving procurement and provides supervision of procurement staff.

PROJECT EXPERIENCE

Black & Veatch Water Division | Various Water and Wastewater Projects

Group Manager, Water Procurement Operations. Responsible for overall coordination and execution of all procurement activities for projects within the Water Division Design-Build/EPC group. Supervises procurement staff responsible for project procurement of all materials, equipment, and subcontracts. Assists Water Design-Build group with various aspects of proposal development.

City of Midland | T-Bar Wellfield Development and Delivery Project – 25MGD

Water Wellfield, Pump Station and Water Transmission; Midland, TX

Project Procurement Manager

- Responsible for writing the Project Procurement Plan for the project, managing all procurement activities and a team of buyers, expeditors, and contract administrators.
- Negotiate and award major equipment and construction contracts.
- Work with Project Controls regarding scheduling, cost reports, and budgets.
- Work with Engineering on development of bidding documents, negotiations, and award.
- Provide weekly updates to Project Management and other team members.

PG&E | Pit 6 & 7 Low Level Outlet Spill Prevention, Control and Countermeasure (SPCC), Valve Actuator Replacement; Redding, CA

Lead Project Procurement Manager

- Responsible for writing the Project Procurement Plan for the project, managing all procurement activities and a team of buyers, expeditors, and contract administrators.
- Negotiate and award equipment and construction contracts.
- Work with Project Controls regarding scheduling, cost reports, and budgets.
- Work with Engineering on development of bidding documents, negotiations, and award.
- Provide weekly updates to Project Management and other team members.
**Energy Proposals Group**

**Procurement Estimating Manager**
- Manage all procurement responsibilities to support major Power and Process EPC proposals in domestic and international markets, including procurement strategies, bid evaluation and selection and implementation of strategic sourcing.
- Establish capital cost budgets for primary equipment.
- Analyze and develop escalation estimates.
- Assist in the development of logistics plans for international projects.
- Manage supplier relationships through the proposal stage and into the project execution stage.
- Support integration of established procurement procedures across multiple divisions.

**Kiewit Power Constructors | ENMAX Shepherd Energy Centre Combined Cycle Project, Calgary, Canada**

**Lead Project Procurement Manager**
- Responsible for writing the Project Procurement Plan for the project, managing all procurement activities and a team of buyers, expeditors, and contract administrators.
- Negotiate and award major equipment and construction contracts.
- Worked with Project Controls regarding scheduling, cost reports, and budgets.
- Worked with Engineering on development of bidding documents, negotiations, and award.
- Provided weekly updates to Project Management and other team members.

**Kiewit Power Constructors | Energy Proposals Group**

**Procurement Estimating Manager**
- Managed all procurement responsibilities to support major Power EPC proposals in domestic and international markets, including procurement strategies, bid evaluation and selection and implementation of strategic sourcing.
- Established capital cost budgets for primary equipment.
- Analyzed and developed escalation estimates.
- Assisted in the development of logistics plans for international projects.
- Managed supplier relationships through the proposal stage and into the project execution stage.
- Supported integration of established procurement procedures across multiple divisions.

**FPL West County Units 1 & 2 Combined Cycle Project; Loxahatchee, FL**

**Lead Project Procurement Manager**
- Responsible for writing the Project Procurement Plan for the project, managing all procurement activities and a team of buyers, expeditors, and contract administrators.
- Worked with Project Controls regarding scheduling, cost reports, and budgets.
- Negotiate and award major equipment and construction contracts.
- Worked with Engineering on development of bidding documents, negotiations, and award.
- Provided weekly updates to Project Management and other team members.
Chris Hogsed

Mr. Hogsed has worked in the construction industry since 1981. His experience includes mechanical and civil construction, beginning in the field with progressive responsibilities. He has proven experience in personnel and project management skills, the ability to coordinate construction activities in and around ongoing operations with minimum disruption, and possess practical problem-solving skills under stressful conditions.

PROJECT EXPERIENCE

T-Bar Well Field Development & Delivery Progressive Design-Build Project; Midland, TX

Project Superintendent. Project included approximately 50 deep groundwater supply wells, high service pump station, storage tanks, chlorination facility, terminus facility and approximately 56 miles of 48” water transmission main in West Texas. Because of the severe drought conditions in this area of the country, schedule and quality were high priorities, and the project was delivered utilizing the progressive design-build model in 14 months from contract through water delivery from the well field site to the City of Midland, Texas within the established budget. Responsibilities included ensuring the safe execution of construction of all aspects of the OCI scope (including all subcontractors) and accountable for the construction cost, schedule and quality. Also to assist each general foreman of civil and mechanical crews with planning day to day work of the craft and having materials onsite for installation.

Cobb County | Various Pumping Stations/Piping

General Superintendent. Installation of large and small bore underground piping for both water and sewer. Construction consisted of new /retro-fit existing Pump Stations. D.O.T. project improvements including; site work, paving, curb & gutter, sidewalk, retaining walls, landscape and utilities. My responsibilities are to oversee all field activities, coordination of all work, estimating the projects, submittals, scheduling of the work and completing pay applications.

South Carolina Department of Public Utilities | Mauldin Road WRF; Mauldin, SC

General Mechanical Superintendent. The construction of the new 60 mgd wastewater treatment facility includes f buried ductile iron and large bore steel yard piping. This project also incorporated an excess of 45,000 cys of heavy structural reinforced cast-in-place concrete. We constructed two 10-million gallon sludge holding tanks, retro-fit two aeration basins, 4 secondary clarifiers, sludge holding facility, chemical feed building, a new filter building, and two flocculation basins. My responsibilities included supervision of all construction activities, safety and quality issues associated with field activities on the project site.

City of Atlanta | Chattahoochee WTP Sludge Thickeners and Wash-water Holding Tank, Design/Build; Atlanta, GA

Superintendent. The City of Atlanta Bureau of Water was issued a consent order to reduce and improve the overall quality of the Chattahoochee Water Treatment Plant’s discharge of filter backwash water to the Chattahoochee

GENERAL SUPERINTENDANT

Specialization: Water and Wastewater System Construction Management

Office Location
Conyers, GA

Education
• High School Diploma

Specialized Training
• OSHA 10 Hour
• UGA Fundamentals of Soil Erosion & Sedimentation Control
• Soil Identification and Classification
• Supervisory Safety Training I and II
• NCCER Certified Instructor - Pipefitting, Plumbing, Millwright
• State of Georgia Certified Utility Foreman
• First Aid/CPR
• Primavera P3 Training
• MSDS
• NPDES Storm Water Monitoring Certificate
• Competent Person – Safety, Scaffolding, Excavation, Lockout/Tag out, Confined Space

Year Career Started
1981

Year Started with B&V
2012
River. As a result, the Design Build Team of Western Summit Constructors (WSCI) and Hartman & Associates were chosen to implement a program for upgrades to the plant. The construction on this $10 million project included the addition of a 1.0 million gallon filter backwash water recovery basin, two 85-foot diameter gravity thickeners, electrical and instrumentation upgrades, and pumping and yard piping modifications.

Not only did the D-B team accomplish the City's goal of improving the quality of the water discharged to the river, but the WSCI-led team also worked to improve operations of the residual management facilities and acquisition/reporting systems. As Water Utility Development Director, Lee Hunt conceded, "The finished project exceeded the original specifications, provided our Operations with greater operating flexibility, and addressed our EPD consent order requirements. As Superintendent, I helped develop the Design/Build project from its inception and oversaw all field operations and construction activities.

Gwinnett County Department of Public Utilities | Shoal Creek Filter Plant; Buford, GA

**General Mechanical Superintendent.** The construction of the new 75 mgd water treatment facility includes 1.2 million cubic yards of excavation, nearly 3 miles of buried ductile iron yard piping, and approximately 3 miles of large bore steel piping ranging form 108 inch and less. The project also incorporates an excess of 55,000 cys of heavy structural reinforced cast-in-place concrete, over 1800 tons of fabricated structural steel, and three million brick and masonry units.

We constructed two 4-million gallon raw water equalization basins, a pre-ozone facility, two 2-stage rapid mix basins and three 3-stage flocculation basins, six gravity filters and an associated operations center. In addition, the plant included two 9.2 million gallon finished water clear wells, a high service pump station, bulk chemical storage facility, a maintenance facility center.

Responsibilities included supervision of all construction activities, safety and quality issues associated with field activities on the project site.
Attachment B – Certification Forms

CERTIFICATION OF COMPLIANCE WITH PROHIBITION OF POLITICAL CONTRIBUTIONS AND GIFTS DURING THE PROCUREMENT PROCESS

For contracts with a stated or expected value of $5 million or more except those awarded as the result of competitive sealed bidding

I, Mark A. Prenni, a representative of Overland Contracting Inc.,

Please Print Name Name of Bidder/Offeror

am submitting a proposal to the Bedford Regional Water Authority in response to the Request for Qualifications – Smith Mountain Lake Water Treatment Plant and Lakes to Forest Waterline Extension Progressive Design-Build Project, a solicitation where the stated or expected contract value is $5 million or more which is being solicited by a method of procurement other than competitive sealed bidding as defined in § 2.2-4301 of the Code of Virginia.

I hereby certify the following statements to be true with respect to the provisions of §2.2-4376.1 of the Code of Virginia. I further state that I have the authority to make the following representation on behalf of myself and the business entity:

1. The offeror shall not knowingly provide a contribution, gift, or other item with a value greater than $50 or make an express or implied promise to make such a contribution or gift to the Governor, his political action committee, or the Governor's Secretaries, if the Secretary is responsible to the Governor for an agency with jurisdiction over the matters at issue, during the period between the submission of the bid/proposal and the award of the contract.

2. No individual who is an officer or director of the offeror, shall knowingly provide a contribution, gift, or other item with a value greater than $50 or make an express or implied promise to make such a contribution or gift to the Governor, his political action committee, or the Governor's Secretaries, if the Secretary is responsible to the Governor for an agency with jurisdiction over the matters at issue, during the period between the submission of the bid/proposal and the award of the contract.

3. I understand that any person who violates § 2.2-4376.1 of the Code of Virginia shall be subject to a civil penalty of $500 or up to two times the amount of the contribution or gift, whichever is greater.

Signature

Managing Director / Vice President

Title

August 29, 2013

Date
# SUBMITTAL CERTIFICATION

<table>
<thead>
<tr>
<th>Name of Firm:</th>
<th>Overland Contracting Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal shall be valid for 180 days. Agreement shall include a statement that “all materials and documents acquired or produced by the Design-Build team members, both individually and collectively, in conjunction with the resulting contract shall be delivered to and become property of the Authority without restriction or limitation of their future use.” As submitted, all of the content contained in this response to the Request for Qualifications becomes the property of the Authority without restriction or limitation of their future use. All of the content contained in this response to the Request for Qualifications is true and accurate to the best of my knowledge and belief.</td>
<td></td>
</tr>
</tbody>
</table>

| Signature of Officer Authorized to represent firm in negotiations and sign any contract that may result: | [Signature] |

<table>
<thead>
<tr>
<th>Name of Officer:</th>
<th>Mark A. Prenni</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title:</td>
<td>Managing Director / Vice President</td>
</tr>
<tr>
<td>Telephone:</td>
<td>(913) 458-4122</td>
</tr>
<tr>
<td>Fax:</td>
<td>(678) 413-0330</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:PrenniMA@overlandcontracting.com">PrenniMA@overlandcontracting.com</a></td>
</tr>
<tr>
<td>Federal Tax ID No.:</td>
<td>48-1192113</td>
</tr>
<tr>
<td>State Tax ID No.:</td>
<td>14 0150405998 000</td>
</tr>
<tr>
<td>State of Incorporation:</td>
<td>Delaware</td>
</tr>
<tr>
<td>Address of office that will be responsible for performance of Firm:</td>
<td>587 Sigman Road, NE, Conyers, GA 30013</td>
</tr>
</tbody>
</table>

| Project Manager’s Signature: | [Signature] |

| Project Manager’s Name: | David E. Kinchen |
| Title:                  | Associate Vice President |
| Telephone:              | (770) 752-5265 |
| Fax:                    | KinchenDE@bv.com |
BOARD FOR CONTRACTORS
CLASS A CONTRACTOR
*CLASSIFICATIONS* BLD ELE

OVERLAND CONTRACTING INC
587 SIGMAN ROAD, NE
CONYERS, GA 30013

ALTERATION OF THIS DOCUMENT, USE AFTER EXPIRATION, OR USE BY PERSONS OR FIRMS OTHER THAN THOSE NAMED MAY RESULT IN CRIMINAL PROSECUTION UNDER THE CODE OF VIRGINIA.

(SEE REVERSE SIDE FOR NAME AND/OR ADDRESS CHANGE)
August 29, 2013

Rhonda B. English, P.E.
Engineering Manager
Bedford Regional Water Authority
1723 Falling Creek Road
Bedford, VA 24523

RE: Overland Contracting, Inc.
RFQ - Smith Mountain Lake Water Treatment Plant and Lakes to Forest Waterline Extension Project
Estimate: $25 - 50 million

Dear Ms. English:

We are pleased to provide this letter on behalf of Overland Contracting, Inc. Bonding for Overland Contracting, Inc. is provided in a co-surety arrangement by Federal Insurance Company (Chubb), as lead surety, together with Fidelity and Deposit Company of Maryland (Zurich). Chubb is rated A++/XV by A.M. Best, and Zurich is rated A+/XV by A.M. Best. Both sureties are authorized to do business in Virginia.

Chubb and Zurich will favorably consider single bonds in excess of $400,000,000, with an aggregate bonded work program of $1,000,000,000. Overland Contracting, Inc. currently has the available capacity to bond the above referenced project. The issuance of any bid, performance or payment bond is a matter between our principal and us.

We are confident in Overland Contracting, Inc.'s ability to perform and we recommend them for your favorable consideration. It is understood that approval of bonds for the referenced project is subject to receipt and review of acceptable contract terms and conditions, acceptable bond forms, confirmation of adequate financing, as well as other underwriting conditions that may exist at the time such bonds are requested by Overland Contracting, Inc.

This letter is not to be construed as an agreement to provide surety bonds, but is offered as an indication of our past experience with this firm. Any request for bonds in this case and in other cases is a matter solely between Overland Contracting, Inc. and its sureties, and they assume no liability to you or any third party if for any reason they do not execute said bonds.

Please consider this letter as a reference of this highly regarded client. In the event you have any questions or need additional information, please feel free to contact me at (816) 960-9155.

Sincerely,

FEDERAL INSURANCE COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND

[Signature]
Debra J. Scarborough
Attorney-in-Fact
each as their true and lawful Attorney-in-fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligated in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY have each executed and attested these presents and affixed their corporate seals on this 8th day of August, 2012.

Kenneth C. Wendel, Assistant Secretary

STATE OF NEW JERSEY
County of Somerset

On this 8th day of August, 2012 before me, a Notary Public of New Jersey, personally came Kenneth C. Wendel, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Kenneth C. Wendel, being by me duly sworn, did depose and say that he is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By-Laws of said Companies; and that he signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that he is acquainted with David B. Norris, Jr., and knows him to be Vice President of said Companies; and that the signature of David B. Norris, Jr., subscribed to said Power of Attorney is in the genuine handwriting of David B. Norris, Jr., and was thereto subscribed by authority of said By-Laws and in deponent’s presence.

Notarial Seal

KATHERINE J. ADELAAR
NOTARY PUBLIC OF NEW JERSEY
No. 231685
Commission Expires July 14, 2014

CERTIFICATION

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligated in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Kenneth C. Wendel, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

(i) the foregoing extract of the By-Laws of the Companies is true and correct,
(ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U.S. Treasury Department; further, Federal and Vigilant are licensed in Puerto Rico and the U.S. Virgin Islands, and Federal is licensed in American Samoa, Guam, and each of the Provinces of Canada except Prince Edward Island; and
(iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this 29th day of August, 2013.

Kenneth C. Wendel, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY Telephone (908) 903-3493 Fax (908) 903-3856 e-mail: surety@chubb.com

Form 15-10-02258-U (Ed. 5-03) CONSENT
ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by THOMAS O. MCCLELLAN, Vice President, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint Debra J. SCARBOROUGH, Claudia MANDATO, Christy M. MCCART, Mary T. FLANIGAN, Kathleen M. COEN, Kathy L. FAGAN, Nancy A. CLOVER, Laura M. MURREN, Charissa D. LECUYER and Rebecca S. GROSS, all of Kansas City, Missouri, EACH its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: any and all bonds and undertakings, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND, this 1st day of May, A.D. 2012.

ATTEST:

ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND

By: Eric D. Barnes
   Assistant Secretary
   Thomas O. McClellan

State of Maryland
City of Baltimore

On this 1st day of May, A.D. 2012, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, THOMAS O. MCCLELLAN, Vice President, and ERIC D. BARNES, Assistant Secretary, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposes and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Constance A. Dunn, Notary Public
My Commission Expires: July 14, 2015

POA-F 076-5892U
EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify of revoke any such appointment or authority at any time."

CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies, this ___ day of ___ 2013 ___, 20__.

[Seals]

Geoffrey Delisio, Vice President
CERTIFICATE OF LIABILITY INSURANCE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CON芙RS 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

INSURED:
1009074 BLACK & VEATCH CORP
11401 LAMAR
OVERLAND PARK KS 66211
Kenche, David

INsurer:
A: ZURICH AMERICAN INSURANCE COMPANY

INSURER B: Lexington Insurance Company

INSURER C:

INSURER D:

INSURER E:

INSURER F:

COVERAGES:

1. GENERAL LIABILITY
   - COMMERCIAL GENERAL LIABILITY
     - CLAIMS-MADE
     - OCCUR
   - CONTRACTUAL
   - BPFD & C/O & XCU
   - GENL AGGREGATE LIMIT APPLIES PER:
     - POLICY
     - PROJ
     - LOC

2. AUTOMOBILE LIABILITY
   - ANY AUTO
     - SCHEDULED AUTOS
   - HIRED AUTOS
   - OCCUR
   - CLAIMS-MADE

3. UMBRELLA LIABILITY
   - EXCESS LIAB
     - OCCUR
     - CLAIMS-MADE

4. WORKERS COMPENSATION
   - ANY PROPR/OWNER/EXECUTIVE OFFICER/MEMBER EXCLUDED (Mandatory in NH)
   - WC 4641353
     - WC 4641354

5. OTHER
   - WC STATUTORY LIMITS
   - E.L. EACH ACCIDENT
   - E.L. DISEASE - EA EMPLOYEE
   - E.L. DISEASE - POLICY LIMIT

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

B&V Proposal # 27873.0005, Smith Mountain Lake Water Treatment Plant and Lakes to Forest Waterline Extension Project

INSURANCE CERTIFICATE ISSUED FOR INFORMATIONAL PURPOSES UNTIL CONTRACT AWARD

CERTIFICATE HOLDER

12500306
Bedford Regional Water Authority
1723 Falling Creek Road
Bedford, VA 24523

CANCELATION

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
CERTIFICATE OF LIABILITY INSURANCE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFER 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

INSURED
15218 BLACK & VEATCH CORP
11401 LAMAR
OVERLAND PARK KS 66211
Kinchen, David

COVERAGE
BLAVE01
CERTIFICATE NUMBER: 12500320
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 LIMIT TYPE OF INSURANCE ADDL SUB LIMIT restrictive limits
GENERAL LIABILITY COMMERCIAL GENERAL LIABILITY NOT APPLICABLE
CLAIMS-MADE OCCUR

GENL LIMIT APPLIES PER:
POLICY
PROJECT
LOC

AUTOMOBILE LIABILITY
ANY AUTO
SCHEDULED AUTOS
NON-OWNED AUTOS

UMBRELLA LIABILITY
EXCESS LIABILITY

DECL RETENTION $ 1

WORKERS COMPENSATION
ANY PROPRIETOR/ASSOCIATE EXECUTIVE OFFICER/OWNER EXCLUDED?
(Mandatory in NH)
If yes, describe under:

DESCRIPTION OF OPERATIONS BELOW:

PROFESSIONAL LIABILITY
Y 11/1/2012 11/1/2013
N 02630198

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

B & V Proposal # 278731.0005, Smith Mountain Lake Water Treatment Plant and Lakes to Forest Waterline Extension Project

INSURANCE CERTIFICATE ISSUED FOR INFORMATIONAL PURPOSES UNTIL CONTRACT AWARD

CERTIFICATE HOLDER
12500320
Bedford Regional Water Authority
1723 Falling Creek Road
Bedford, VA 24523

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

[Signature]
Appendix C. Comments to the Progressive Design-Build Contract

Black & Veatch has reviewed the two forms of contract (WDBC and DBIA) and have found both generally acceptable in their current forms. We have included comments as requested in the Appendix for further consideration, understanding that the ultimate details and appropriate risk sharing are to be determined during contract negotiations.

FOR THE COMMENTS FORM IN THE APPENDIX:

1. **With respect to remedies**, we found no language outlining exclusive remedies for either party. Our recommendation would be to adopt an exclusive remedies approach and insert the appropriate language.

2. **WDBC Contract**: In review of the “exit ramp”, Article 1.4 appears to fall short in defining the termination approach, while Attachment B to the Agreement, Article 2.2.4.3, references Termination for Convenience. We recommend harmonizing the language between the two articles for consistency.

3. **WDBC Contract**: With respect to Article 5.2.2, we recommend limiting the language specifically to “substantial completion”, as the term “Interim Milestones” doesn’t appear to have contractual relevance and inserts vagueness into the completion conditions.

4. **WDBC Contract Attachment A**: With respect to the warranty scope of work, we suggest a more definitive scope to clearly outline the design-builder’s responsibility beyond “collection” of the warranty documents. Possible language may read as follows:

   "Design-Builder shall provide to the Owner, for the protection of Owner, warranties and/or process Guarantees from all vendors and subcontractors from whom Design-Builder procures equipment, materials, or services for the Project. Such guarantees shall be made available to Owner to the full extent of the terms thereof; Design-Builder's liability, with respect to such equipment and materials obtained from vendors or services obtained from subcontractors, shall be limited to procuring guarantees from such vendors or subcontractors and rendering all reasonable assistance to Owner for the purpose of enforcing the same on a cost reimbursable basis beyond the standard warranty period defined elsewhere in the contract."

5. **WDBC Contract Attachment A**: With respect to Article 2.2.1, we suggest this language also contemplate changes in the terms and conditions during the GMP negotiations, which is beyond the purview of Drawings and Specifications.
6. **WDBC Contract Attachment B:** In Article 4.4.1, we recommend using pre-determined and agreed upon rates or cost reimbursable based on reasonable supportable wages and appropriate burdens rather than "prevailing market rates".

7. **WDBC Contract General Conditions:** In Article 2.3.1, we suggest consideration for limited warranty period for design services consistent with the construction warranty period, with re-performance (make right) of work being the exclusive remedy.

8. **WDBC Contract General Conditions:** Pursuant to Article 8.2.4, rather than go to mandatory non-binding mediation, we suggest that mediation be voluntary from both parties. Mediation is best suited when both parties are willing to negotiate, but is ineffective and expensive if either party is not.

9. **DBIA Contract:** In general, some of the same comments to the WDBC contract would apply to the DBIA contract, as both forms share the same background and basis. Some of the over arching considerations would include exclusive remedies language applicable in both contractual and legal forums, limited warranty period for both construction and design services, and the re-performance cure (make right approach) of those warranty issues.
Appendix D. Financial Statements

Per the RFQ on page 11-12, our audited financial statements for the past three years have been provided in a separate seal envelope and has not be included on either CD.
Appendix E. Project Experience

BLACK & VEATCH EXPERIENCE

Design-Build Awards ...................................................................................................................... 1
T-Bar Well Field Development and Delivery Progressive Design-Build Project ................................................................. 2
Charnock Well Field Restoration Progressive Design-Build Project ............................................ 3
Central Feeder Groundwater Banking/Conjunctive Use Project ........................................... 4
Lake Pleasant Water Treatment Plant DBO .............................................................................. 6
Hummelstown Advanced Membrane Water Treatment Plant .............................................. 7
Row River Microfiltration Membrane WTP Expansion and Distribution Pipeline ........................................... 8
Stone Canyon Pumping and Filtration Plant .............................................................................. 9
Northeast Bakersfield Water Treatment Plant Design-Build Project ................................... 10
Conestoga and Susquehanna WTP Upgrades and Enhancements ........................................ 11
East Chicago WTP Design ............................................................................................................ 12
SJWD Water Treatment Plant ..................................................................................................... 13

CHA EXPERIENCE

Water System Improvements ...................................................................................................... 14
Water System Upgrades .............................................................................................................. 15
Water Treatment Plant/Intake .................................................................................................... 16
Phase I-6 Water System Improvements ................................................................................... 17
Philpott Water Treatment Plant Expansion ............................................................................ 18
DBP Bench Testing & Study ...................................................................................................... 19
Intake Permitting ......................................................................................................................... 20
Design-Build Awards

The following statistics help define B&V’s dominance as a leader in delivering projects under alternative delivery contract structures:

- **T-Bar Well Field Development and Delivery PDB Project**, Midland, TX: 2013 DBIA Merit Award Winner
- **Charnock Well Field Restoration PDB Project**, Santa Monica, CA: 2012 DBIA Merit Award Winner
- **Lake Pleasant WTP**: 2009 Excellence in Public/Private Partnership, Outstanding Achievement Award, The Mayors Business Council, U.S. Conference of Mayors and 2008 Design-Build Institute of America, National Design-Build Award: Best Project, Water/Wastewater over $15 Million
- **Enbridge’s Sarnia Solar Project**: 80 megawatt (MW) solar photovoltaic (PV) plant, the largest in the world. Black & Veatch served as independent and owner's engineer on this project located in Ontario, Canada.
- **Glencorse Water Treatment Works**, Scotland: 2011 and 2010 Considerate Constructor Gold Award
- **Campbeltown Wastewater Quality Project**, Scotland: 2010 Considerate Constructor Silver Award
- **Glenfarg Wastewater Treatment Works**: 2009 Most Considerate Site Award
- **Bundamba AWTP**: 2008 Global Water Awards, Water Project of the Year; 2008 Construction Management Association of America Project Achievement Awards, Best International Project
- **Nelson-Flanders WTP**: 2006 Design-Build Institute of America, National Design-Build Award: Best Project, Water over $15 Million
- **Morris-Forman WWTP Biosolids**: 2004 Design-Build Institute of America, National Design-Build Award; Best Project Water over $15 Million
- **Milwaukee Ozonation Facility**: Design-Build Institute of America Water Systems Quality Award Winner
- **Foothills Pump Station**: 2006 Design-Build Institute of America, Outstanding Project Water/Wastewater Project
- **Anglian Water Special Projects Biosolids Team**: 2008 Merit Award, Institute of Civil Engineers East of England
- **Lake DeForest WTP**: 2005 Outstanding Project, 2005 DBIA Water/Wastewater Conference
- **Ringsend Wastewater Treatment Works**: 2004 Ken Roberts Award for Technical Innovation, CIWEM (Chartered Institution of Water and Environmental Management)
The area around Midland has suffered in nearly two years of “extreme to severe drought.” According to the National Weather Service, in 2011 and 2012, the area had only 10 inches of precipitation as compared to expected 30 inches in the 2-year period. Some reservoirs are closer to being empty than full. The region has already enacted water restrictions and drought contingency plans. To meet the demands, The Midland County Freshwater Supply District #1 hired the Joint Venture team of Black & Veatch/Garney to design and construct the $162M project in just 14 months from execution of the Phase 1 contract (preliminary design and GMP development). The first stick of pipe was delivered in June, 2012, and the project was substantially completed on 17 days ahead of the City of Midland’s deadline of May 31, 2013.

Black & Veatch was the managing partner of the Joint Venture for the design and construction of the project. The team initiated design of the project in February 2012 as part of the phase one element of the contract. Phase 1 services included the preliminary design, ROW determination and coordination for land acquisition, permitting, geotechnical evaluation, constructability, value engineering, early pipe material procurement and GMP development. All work for phase was completed in May 2012. The final design and start of construction began immediately upon agreement of the GMP, and included a fast-tracked design-build plan that delivered the much needed 20-million gallons per day of water to the city of Midland – from start to finish in less than 12 months.

The project consisted of a new raw water well field on approximately 7,000 acres of land. Forty-five raw water wells were drilled to a depth of approximately 650 feet, with approximately ½ mile between wells. The corresponding well field tank was designed to hold 2-million gallons of water.

Black & Veatch self performed electrical, mechanical, telemetry and SCADA construction activities through its contracting entity, Overland Contracting Incorporated (OCI) for the following: well field, pump station facilities, tank storage area, and the chlorination facility.

BV’s JV partner, Garney, constructed the pipeline work from the well field to the terminus facility in Midland.
Charnock Well Field Restoration Progressive Design-Build Project

Santa Monica, California

The City of Santa Monica undertook this project to restore local groundwater supplies that were contaminated (1996) with gasoline additives. In addition to providing safe, drought-proof potable water to its customers, the provision of local supply and treatment contributed to the City’s sustainability goals. The Owner chose Progressive Design Build because they wanted operational flexibility and were obligated to meet an aggressive schedule. Since the project was addressing contaminated water, it was necessary to meet very strict regulatory approvals, documentation and consultation.

As the Design-Build Contractor for the project, Black & Veatch compiled a cohesive team of engineers and construction managers to take the project from conceptual to final design and complete regulatory permitting, quality control during design and construction, and startup and commissioning activities of a 10 MGD groundwater treatment system. A multi-step, open-book Design-Build approach was implemented to streamline the project schedule, save money, and increase local reliability as soon as possible. Black & Veatch competitively bid equipment and construction packages based on 60% design, and presented the City with a GMP (Cost Plus Fixed Fee with a Not to Exceed Value).

The Arcadia WTP treats the water in a 4-step process prior to being distributed to Santa Monica customers including: pressure filters with greensand and anthracite for iron and manganese removal, chemical addition, reverse osmosis (RO), and final chemical treatment. Associated processes include a backwash treatment system and associated pumping and chemical feed systems.

The community and a private school surrounding the Charnock Well Field Site were concerned with the environmental impact the treatment plant would have on their area. Black & Veatch and the City worked closely with the community to incorporate environmental modifications to the plant to ease the communities concerns. Screens with vines were installed around the perimeter of the treatment plant to provide an aesthetic and natural visual barrier so the community would not be able to see the plant.
Central Feeder Groundwater Banking/Conjunctive Use Project
San Bernardino Valley Municipal Water District; San Bernardino, CA

Black & Veatch, in joint venture with Kiewit Pacific, provided *design-build services under a cost based/GMP form of contract* for the $56 million Phase I portion of the Central Feeder Groundwater Banking project. Black & Veatch was responsible for permitting support, design, engineered equipment procurement, construction inspections and start-up services. Kiewit Pacific was responsible for managing the construction.

The overall Central Feeder project expanded the District’s system-wide water capacity and includes *332 cfs pump facilities, 78-inch diameter water conveyance pipeline, 10 million gallon reservoir, groundwater wells, and a new water treatment plant.*

The project was delivered under a phased approach (stepped increase) to expand the water pumping capacity to the ultimate capacity of 332 cfs. Phase 1 of the project had a nominal design capacity of 50 cfs and included the construction of approximately four miles a large diameter (78-inch) conveyance pipeline, expandable 50 cfs pump station with reservoir and intertie vaults to allow connection to Metropolitan Water District of Southern California’s 144-inch Inland Feeder Pipeline.

Phase 2 extended the Phase 1 Pipeline four miles to the west, increase the capacity of the pump station by 60 cfs and provide an additional 5 million gallons of reservoir capacity. The Phase 2 facilities included groundwater wells to extract contaminated groundwater from an area of historical high groundwater for treatment at a new water treatment plant to be provided as part of a future phase.

All Phases commenced with design development to establish scope, GMP price, and schedule. Once scope, price, and schedule were agreed upon, a notice-to-proceed was issued for final design and construction.
September 1, 2011

Amy M. Watson, J.D., M.S.L.A
Principal Contracting Agent
Planning & Finance Division
Procurement and Contract Services
Colorado Springs Utilities
P.O. Box 1103, Mail Code 920
Colorado Springs, CO 80947-0920

Dear Ms. Watson:

From November 2003 to October 2004, Black & Veatch was the Design-Builder of the Foothill Pump Station, a project implemented by the San Bernardino Valley Municipal Water District (SBVMWD) to increase the hydraulic gradeline in its Foothill Pipeline. The Foothill Pump Station was developed to facilitate the delivery of California State Water Project water to Metropolitan Water District’s Diamond Valley Lake Reservoir.

The Foothill Pump Station was implemented as a fast-track project using a two-stage approach. The first stage included the development of a Basis of Design Report (BDR) and Guaranteed Maximum Price (GMP). Black & Veatch worked closely with SBVMWD and Metropolitan Water District (Metropolitan) during conceptual design. Long lead time equipment was procured before formal notice to proceed. Once the final contract was awarded, the design was finalized in approximately one month and construction drawings issued. This aggressive approach produced a project that went from design to operation in eight months and was accomplished within the GMP.

Black & Veatch also completed a second design-build project for SBVMWD from October 2004–June 2008. This project, the Central Feeder, consisted of a pump station and pipeline which connected to Metropolitan’s Inland Feeder. The Inland Feeder is a 144-inch diameter, 30+ mile pipeline that conveys water from the California State Water Project Devil Canyon Powerhouse to Diamond Valley Reservoir. The first phase of the Central Feeder Pump Station utilized three vertical turbine pumps designed at a TDH of 700 feet. The ultimate phase of this project is planned to increase the capacity to 300 cfs and include more than ten miles of 78-inch diameter pipeline.

The Black & Veatch design-build team on these projects included Bruce Ainsworth, Steve Foellmi, Bill Rothgeb, and Suzie Carpenter. This entire team was responsive and attentive to detail and served as a full partner to SBVMWD and Metropolitan for the projects durations. The District was very pleased with their performance.

Very truly yours,

Samuel H. Fuller,
Chief Engineer

Board of Directors and Officers

MARK ALVARZ
Division 1

GEORGE A. AGUILAR
Division 2

C. PATRICK MULLIGAN
Division 3

MARK BULLOT
Division 4

STEVE COPELAN
Division 5

DOUGLAS D. HEADRICK
General Manager
Lake Pleasant Water Treatment Plant DBO
Phoenix, Arizona

Black & Veatch, in 50/50 joint venture with McCarthy Building Companies Inc., provided design-build services to American Water Services Company under a lump sum contract for the $215 million, 80 mgd water treatment plant project. Advanced and emerging treatment technology played a prominent part in North America's largest DBO project at the time, which now supplies safe drinking water to 400,000 households in northern Phoenix.

The project consisted of the design, construction, and operation of a new 80 mgd water treatment plant and related facilities to reliably meet future water needs for the City of Phoenix under a 15 year, $336 million Design-Build-Operate contract with The All American Water Team consisting of American Water Services and the design-build joint venture of Black & Veatch and McCarthy Building Companies as subcontractor to American Water. Black & Veatch was responsible for design-build project management, design, engineered equipment procurement, and start-up services. McCarthy was responsible for managing the construction. American Water was the overall lead of the DBO project and long term operations.

The Lake Pleasant plant incorporated the latest in modern water treatment technology and automation. Treatment included an innovative ballasted flocculation process for high-rate sedimentation, ozonation, deep-bed monomedia filters, post-filtration granular activated carbon contactors and ultraviolet disinfection. These processes control taste and odor, eliminate harmful bacteria and other substances, and provide a reliable supply of high-quality drinking water. The project also included a raw water intake and pump station, 2.0 miles of 92-inch diameter pipeline, on-site storage and pumping of finished water, and on-site carbon regeneration facilities.

The plant was designed to match the natural environment, consistent with the Frank Lloyd Wright architectural philosophy. Extensive use of indigenous materials was incorporated to link the worlds of nature and man and demonstrate the interdependence of the architecture and the site. Former Frank Lloyd Wright apprentice Vern Swaback of Swaback Partners led the architectural concept design as a subcontractor to the Black & Veatch/McCarthy team.
Hummelstown Advanced Membrane Water Treatment Plant

United Water Management & Services, Inc.; Harrisburg, PA

Black & Veatch served as the Design-Builder for the new Hummelstown Advanced Membrane Water Treatment Plant for United Water Pennsylvania. Black & Veatch executed the design and construction under the Engineer-Procure-Construction-Manage (EPCM) approach, performing as the Engineer/Construction Manager responsible for the procurement and construction of this project (*similar to Progressive Design-Build with no Self-Perform construction*).

Responsibilities included Design, Construction Management, Procurement of Materials, Process Equipment, and Subcontracts, and Start-up and Commissioning. The project delivery method for this project was EPCM with a Guaranteed Maximum Price (GMP). *Start-up and commissioning was achieved with minimum disruption to the existing water system.*

United Water decided to construct a new WTP in Hummelstown to replace the existing aging and flood prone plant. The water source, Swatara Creek, includes rapidly changing surface water characteristics. *Primary challenges were high peak turbidity, high peak TOC, low water temperature and low minimum alkalinity.* Water is now treated by utilizing advanced membrane filtration technology consisting of GE-Zenon immersed hollow fiber UFmembranes.

This upgrade required *improvements at the existing intake facility,* including new variable speed pumps sized to provide a maximum instantaneous capacity of 4.7 mgd, new intake screens, and a new raw water transmission main. Additionally, the project involves approximately 1500 feet of raw water piping, 1000 feet of distribution system piping and solids handling improvements.

The new treatment facility consists of a 9,700 square foot masonry block and metal clad structure to hold the new plant. Treatment elements include chemical dosing, mixing, coagulation, immersed membrane filtration), final disinfection, finished water pumping, two finished water clear wells, and a separate compressor/equipment building to serve the intake facility. The plant is also provided with a fully automated control system that enables treatment to be undertaken with only remote monitoring from another plant location. The plant structure also incorporates office space, laboratory space, storage and other support facilities. A *2,500 kW back-up generator* is located near the east side of the facility to provide backup power in emergency situations.
Row River Microfiltration Membrane WTP Expansion and Distribution Pipeline

Cottage Grove, Oregon

The City of Cottage Grove, Oregon selected Black & Veatch to expand their Row River Water Treatment Plant under a design-build (GMP) delivery method. The plant was expanded to replace capacity that was lost when the Layng Creek Filter Plant was decommissioned.

The Row River WTP capacity was increased from 2 to 4 mgd. The treatment process was converted from conventional granular media filtration to pressurized microfiltration membranes. The treatment building expansion was sized to allow for a future expansion to 8 mgd within the building by adding additional membrane module trains.

Key project elements include:

- Two new discharging backwash ponds.
- A new intake structure on the Row River with a capacity of 8 mgd, which includes an air burst screen cleaning system and NMFS compliant fish screens.
- A new two-mile long 12-inch and 8-inch distribution pipeline crossing the Row River.
- Joint USACE/DSL permit for the new intake structure, floodplain permits from the City and County, a City conditional use permit, a City public works development permit, and a Lane County right-of-way permit.
- Optimized pre-treatment and chemical feed processes for enhanced membrane operation and improved water quality.

Guaranteed maximum price (GMP) approval was granted by the City in March 2007 and expanded plant was brought on line in June 2008.
Stone Canyon Pumping and Filtration Plant
Los Angeles, California

In the early 2000’s, the Los Angeles Department of Water and Power (LADWP) developed the Stone Canyon Water Quality Improvement Project (SWQIP), which included several new facilities. The Stone Canyon Pumping and Filtration Plant, a major project component, was designed by Black & Veatch.

The Stone Canyon Pumping and Filtration Plant employed a **minimalistic design to hide the facility** from the view of the surrounding Bel Air community. To ensure public satisfaction, the environmental sensitivities of the quiet residential area were taken into account, and scale and impact of design and construction were minimized. The structure was recessed into the hillside. The building footprint was curved around existing trees which will be maintained throughout construction, and the facility had been acoustically designed to maintain the existing ambient noise level at the project site of 30 dBA during operation.

The Stone Canyon Pumping and Filtration Plant replaced two existing pump stations and provided new water treatment capability, all within a single common structure. The new plant is 6.4 million gallons per day (mgd), with capability of future expansion to 10 mgd. The facility filters Lower Stone Canyon Reservoir water using **microfiltration membranes** for use in LADWP’s 930-Foot Service Zone and 1216-Foot Service Zone distribution systems. The facility includes aqua ammonia and zinc orthophosphate chemical feed systems in addition to those required for cleaning the microfiltration system. The facility was designed to be **fully automated for remote operation** and **standby power generation** was provided.

The project also included the design of pumping systems for both distribution system Service Zones. The 930-Foot Service Zone pumping units were provided to transfer filtered water from the filtered water wetwell to the 930-Foot Service Zone. The design flowrate for this system is 10 mgd (15.4 cfs). The 1216-Foot Service Zone pumping units transfer potable water from the 930-Foot Service Zone to the 1216-Foot Service Zone. The firm capacity for this system, three pumps operating at maximum head, is also 10 mgd (15.4 cfs).
Northeast Bakersfield Water Treatment Plant Design-Build Project
California Water Service Company

Black & Veatch was retained by the California Service Water Co. to provide services for a new 20 mgd surface water treatment plant (expandable to 60 mgd) that now supplies water to the northeastern part of Bakersfield. Black & Veatch provided integrated design and construction management services under a Design-Build contract.

Black & Veatch optimized the facility by pre-selecting a Pall Corporation membrane system and designing the pretreatment process, auxiliary systems, and spaces specific to their equipment. The vendor was selected through a competitive bid process based on total life cycle costs, including equipment capital costs, structure and auxiliary process mechanical costs, membrane replacement costs, and annual power and chemical costs.

With Black & Veatch oversight, Pall conducted a four month proof-of-design pilot test to demonstrate performance on this specific water and optimize operating strategies. During pilot testing they were able to demonstrate cost-effective operation, and obtain state certification at increased flux rates when using the proposed pretreatment process.

The plant treats water from the Kern River with an integrated membrane system (IMS) that includes coagulation (ferric addition), floculation, high-rate sedimentation, micro screening membrane, microfiltration, and chlorine disinfection. The pretreatment process served several purposes: (1) reduce dissolved organics and disinfection by-products, (2) produce consistent quality in the membrane feedwater, and (3) mitigate turbidity peaks in the raw water. The Kern River is typically not a “flashy” source; however, the turbidity can increase from 15 to 1200 NTU during spring rains.

Construction was managed by Overland Contracting, Inc., a wholly owned subsidiary of Black & Veatch. In addition to the membrane system, other major engineered equipment packages included flocculation mixers, high-rate sedimentation plate packs, membrane feed and treated water pumps, chemical feed systems, and the plant control system. Black & Veatch provided full turnkey start-up, control system programming, and process support to deliver a complete, cost effective, and operational facility.

The project was executed under a Design-CM at Risk project delivery approach with an Open Book with Guaranteed Maximum Price contract.
Conestoga and Susquehanna WTP Upgrades and Enhancements
Lancaster, Pennsylvania

The City of Lancaster owns, operates and maintains two water treatment facilities that provide drinking water for more than 110,000 people. These two aging conventional water treatment plants were in need of upgrades to ensure compliance with the Interim Enhanced Surface Water Treatment (IESWT) Rule and the Stage II Disinfectants/Disinfection By-Products (D/DBP) Rule. The Conestoga WTP is a 12 mgd WTP that was constructed in 1933, and the Susquehanna WTP is a 24 mgd WTP that was constructed in 1955. Each of these facilities has undergone minor upgrades since their construction. However, the major parts of both facilities are of original vintage.

The City evaluated and decided to incorporate **low-pressure membrane systems** into both of the plants which include the following:

- **Replacement of pumps and electrical gear at the Susquehanna Low Service Pumping Station and High Service Pumping Station**
- Construction of strainer facilities at both treatment plants
- Construction of new pretreatment, chemical storage and feed facilities, and low-pressure membrane facilities at both treatment plants
- Upgrades to the clearwells at both plants to provide additional disinfection CT
- Installation of a high-rate clarification system (DensaDeg) for the membrane reject stream treatment at the Susquehanna treatment plant
- **Installation of a second stage low-pressure membrane system and UV disinfection system for first stage membrane reject stream treatment at the Conestoga treatment plant**
- Replacement of the electrical substation at the Susquehanna treatment plant
- Incorporation of a **new SCADA system for monitoring and control of all treatment systems** as well as associated off-site facilities
- Sitework Security improvements at both plants, including video surveillance and microwave detection systems

### Relevance to BRWA
- Membrane WTPs
- Raw water and finished water pumping
- Membrane wastewater management
- Construction management
- Membrane system start-up and commissioning

### Project Elements
- Regulatory Considerations
- Membrane Water Treatment Facilities
- UV Disinfection
- Construction Management
- Start-up and Commissioning

### Key Team Members
- Paul Delphos, Project Director
- Pete Baskette, Manager
- Alan Edwards, Lead Design Engineer
- Doug Brinkman, QA/QC

### Period of Services
2007 to 2010

### Cost
- Capital Cost ...$76.6 M (Both)
- B&V Fee .........................$5 M
- Sub Fees .......................$1.7 M
  (breakdown by subs is not available)

### Reference
Ms. Charlotte Katzenmoyer
Director of Public Works
City of Lancaster
120 N Duke Street
Lancaster, PA 17602
(717) 291-4738
East Chicago WTP Design

East Chicago, Indiana

The City of East Chicago currently utilizes a 24 mgd water treatment facility that was built in 1964 to provide water to its various industrial, residential and commercial customers. A Preliminary Design Report performed by others recommended construction of a new membrane treatment plant to treat 24 mgd of raw water from Lake Michigan. The facility was designed to meet current and 30-year projected demand patterns, but has a hydraulic capacity of 30 mgd for future expansion, when necessary.

Value Engineering

The Value Engineering workshop included specialists in major areas of water treatment plant design and construction including water process, membrane technology, architectural, structural, civil, geotechnical, electrical, instrumentation, and mechanical. Staff from the City of East Chicago also participated in the Value Engineering workshop by providing valuable information on project goals and constraints.

Preliminary and Final Design

During the design phase procurement documents were prepared and proposals were accepted and evaluated for the membrane filtration system. In addition, a Preliminary Engineering Report was prepared and a public hearing was held in accordance with Indiana State Revolving Fund requirements.

Black & Veatch obtained the necessary railroad, INDOT, and IDEM permit applications for project completion and prepared final construction documents that includes a hydraulic profile, various process drawings, and an updated opinion of probable costs for the raw water and treatment facilities.

Construction Phase Engineering

During construction of the new East Chicago Water Treatment Plant, Black & Veatch took part in a preconstruction conference in order to confirm the project goals and review the procedures for contractor submittals, change orders and payments. Throughout the construction phase submittals were reviewed and compared to the Contract Drawings for conformance.

SCADA System Configuration and Start-up

Programming of PLCs and development of graphics interfaces were performed in conjunction with the manufacturer’s services to successfully start-up the new SCADA system. Once online, the East Chicago Water Treatment Plant staff were trained on each SCADA interface.
As a result of the pilot testing, inclined plate settlers and encased microfiltration membranes were chosen for the plant expansion.

**Distill Water Treatment Plant**

**Lyman, South Carolina**

Black & Veatch has assisted the SJWD Water District (SJWD) with water treatment supply, capacity, and distribution system planning since the 1980’s. In 2008, Black & Veatch completed a comprehensive system master plan for SJWD Water District. One of the recommendations of that report was the need to expand the capacity of the SJWD WTP. As a precursor to the plant expansion, Black & Veatch assisted the SJWD Water District with process pilot testing to determine the appropriate technology and design criteria for the expansion. Specific technologies tested included inclined plate settlers, encased membranes, and granular media filters.

Pilot testing was performed over a three month period, focusing on turbidity removal, organics reduction, and manganese control. As a result of the pilot testing, inclined plate settlers and Pall Corporation microfiltration membranes were chosen for the plant expansion.

Concurrent with the pilot testing, Black & Veatch worked with SJWD on an Immediate Improvements project, which included addition of continuous sludge collection in an existing sedimentation basin, new liquid lime storage and feed facility, new filter effluent transfer line, and rehab of existing clay tile underdrains. The project was completed in January 2009.

Subsequent to the pilot testing, Black & Veatch designed new plate settler and membrane treatment facilities for the SJWD WTP. The 4 mgd SJWD WTP expansion included new flocculation and inclined plate settler pretreatment basin, and membrane building to house the membrane equipment and associated ancillary equipment. In addition, an upgrade to the alum sludge pumping station and miscellaneous sitework and other improvements are included in the project. The project was completed in October of 2012.

**Relevance to BRWA**
- 4 MGD Pall Facility
- Membrane Piloting
- Membrane System Procurement and Negotiation
- Future Expandability

**Project Elements**
- Retrofit Project
- High Rate Processes
- Membrane Piloting and Procurement

**Key Team Members**
- George Budd, Senior Process Engineer
- Paul Delphos, Membrane Procurement and Design

**Period of Service**
2009 to October 2012 (Design and Construction)

**Construction Cost**
- Estimate ................... $13.0 M
- Actual ....................... $12.5 M

**Schedule**
- Estimated ............. 20 months
- Actual ................... 22 months

**Client Reference**
Mike Caston
General Manager
SJWD Water District
(864) 949-2802
The City of Covington operates a 6 MGD conventional water treatment plant with water withdrawal from the Jackson River and a water distribution system that contains approximately 50 miles of pipeline with 6 water storage tanks and three pump stations in seven pressure zones. In 2010, CHA completed a comprehensive water system evaluation report for the City to address growing needs at both the treatment plant and in the distribution system. The work included development of system mapping and a hydraulic model to identify recommended water distribution system improvements to correct problems with pressure, fire flow delivery, and regulation of the tanks and pressure zones. A comprehensive evaluation of the treatment plant was completed to address issues with the intake, solids management, filter controls, and automation. Design of the system improvements is underway and construction will be completed in early 2015. The new water treatment plant facilities will include a new intake screen, new filter controls, a continuous sludge withdrawal system, a plant and system-wide SCADA system to automate operations and improve control. Distribution system improvements will include over 40,000 feet of new water transmission and distribution piping throughout the City, new pressure regulating stations, and a new water booster pump station.

“CHA and Stevie Steele have truly done a superb job for the City on our water system improvement project. I have been impressed by their level of knowledge and commitment to service. They not only engineered a sound plan to address our many problems, they assisted us with all of the administrative, financial, and regulatory requirements needed to make it happen. They have truly been a valued partner in this effort.”
— Jack Munsey, Director of Public Works
Water System Upgrades
John Flannagan Water Authority, VA

Since 1990, CHA has served as the engineer of record for the John Flannagan Water Authority. During this period, CHA has modeled their raw and finished water transmission system, constructed a new 8 MGD raw water intake in the John Flannagan Reservoir, upgrade the raw water booster station, and assisted in the upgrade of its water treatment plant on two separate occasions.

Specific tasks included upgrade/expansion from 2 MGD to 4 MGD, upgrade/expansions from 4 MGD to 8 MGD, construction of a new 1.5 MG finished water reservoir, solids dewatering improvements, DBP control evaluation and implementation, and hydraulic analysis and modeling of their water transmission system. We are currently providing manual transfer switches at the intake, booster pump station and water treatment plant.

Tasks included:

- Hydraulic Modeling
- **DBP Evaluation**
- Preliminary Engineering Report
- Bench Scale Testing
- **Pilot Testing**
- Design
- Environmental Assessment
- Construction Contract Administration
- Resident Project Representation

Relevance to BRWA
- Raw water intake
- WTP expansion
- Finished water storage

Key Team Members
- Shawn Veltman, PhD, PE
- Douglas Hudgins, PE
- Gregory Schultz, PE

Period of Service
1990 to Present

Schedule for 1.5 MG tank
Estimated ............... 6 months
Actual ..................... 6 months

Cost
Estimated ............... $900,000
Actual ..................... $750,000

Client Reference
Mr. Billy R. Hylton,
Superintendent
Route 1, Box 265
Haysi, VA 24256
(276) 835-8629
chief13@mounet.com
The CHA/Lane Group Team was commissioned by the Washington County Service Authority (WCSA) to assist in permitting and design of an expansion of the existing 4.6 MGD water plant to 12 MGD with a phase interim expansion from 4.6 to 6.6 MGD on the Middle Fork of the Holston River near South Holston Lake in Washington County. The project also includes a new surface water intake on the South Fork of the Holston River and a raw waterline from the intake to the drinking water plant. CHA was responsible for the process, structural, mechanical, electrical, and controls design for both the interim expansion and the final expansion to 12 MGD for the water treatment plant. CHA performed the structural, mechanical, electrical and controls design for the 12 MGD raw water intake. Services provided have included the completion of the Preliminary Engineering Report, Environmental Assessment, Permit Acquisition and Funding Acquisition; and design of interim plant expansion.

The 12 MGD expansion and the raw waterline are substantially complete and the raw water intake is scheduled for completion by March 2014.
Phase I-6 Water System Improvements
City of War, VA

The City of War hired CHA to design water system improvements to systematically replace and upgrade the City's water system. The overall project was divided into six phases to maximize the grant/loan mix from Rural Development, the Abandoned Land Mine Program, and the West Virginia Small Cities Grant Program. The City of War with the assistance from CHA, applied for and secured a $1.5 million Small Cities Grant for the first phase of the recommended improvements.

Due to the age and condition of the existing water mains, it was necessary to replace the water lines throughout the City. Replacing the existing water distribution system:

- Eliminated the existing pipes that are routinely breaking under existing pressures;
- Allowed fire flows to be provided throughout the project area;
- Reduced the amount of unaccounted water that currently plagues the system;
- Maintained water quality to the customers in this area; and
- The sum of all projects consists of over 80,000 linear feet of 6, 8 and 10-inch water main, valves and fire hydrants. The project also replaces all of the existing water service connections and meters. In addition to the water lines and appurtenances, two 100,000-gallon glass-fused-to-steel storage tanks were designed and constructed in the John's Branch & Yukon area to ensure adequate water pressure and fire flow for this service area. CHA secured over $6 million in grants for all project phases.

Relevance to BRWA
- Water distribution
- Water storage

Key Team Members
- Douglas Hudgins, PE
- Gregory Schultz, PE
- Lawrence Hoffman

Period of Service
2006 to Present

Schedule
Estimated Phase I... 10 months
Actual Phase I ....... 10 months
Estimated Phase II ... 8 months
Actual Phase II ....... 7 months

Cost
Estimated $1.5 million for Phase I
Actual $1.3 million for Phase I
Estimated $3.3 million for Phase II & III
Actual $2.6 million for Phase II & III

Client Reference
Ms. Carolyn “Kitten” Cempella
PO Box 280
11701 Highway 16
South War, WV 24892
(304) 875-3111
kittenc77@hotmail.com
Philpott Water Treatment Plant Expansion
Henry County Public Service Authority, VA

CHAll has been assisting the Henry County Public Service Authority (HCPSA) with the upgrade of their Philpott Water Filtration Plant on an annual basis as part of their capital improvements plan. The plant is a conventional plant with a rated withdrawal and treatment capacity of 4.0 MGD. The facility has a raw intake on the Smith River just below Philpott Reservoir. Since 2007, CHA has performed the following work for the HCPSA:

- Preliminary Engineering Report to upgrade the treatment capacity for 6.0 MGD
- Preliminary Engineering Report to increase withdrawal capacity to 6.0 MGD
- Virginia Water Protection Permit Application to VDEQ
- DBP bench testing and pilot study for their Smith River water source.
- Design and construction services for the installation of standby generators at the Intake, Plant and 57 West Booster Station.

Relevance to BRWA
- Raw water intake
- WTP expansion

Key Team Members
- Douglas Hudgins, PE
- Shawn Veltman, PhD, PE
- Lawrence Hoffman

Period of Service
2007 to Present

Schedule for Generators
Estimated .................. 6 months
Actual .................... 6 months

Cost for Generators
Estimated ................. $600,000
Actual .................... $550,000

Client Reference
Mr. Mike Ward
PO Box 7
Collinsville, VA 24078
(276) 634-2540
mward@co.henry.va.us
DBP Bench Testing & Study
City of Salem, VA

The City of Salem, Virginia operates a **10 MGD water treatment plant with a surface water intake on the Roanoke River**. The surface water is augmented by groundwater from three wells, which can give rise to occasional customer complaints associated with hardness. In early 2008, CHA was retained by the City to assist with optimization and control of the processes and chemistry in the water treatment plant in an effort to reduce elevated concentrations of Haloacetic Acids (HAA5) measured in the distribution system, and to evaluate low cost options to control the hardness complaints.

Work to date has included:

- **10 MGD conventional surface water treatment plant with dual sources:** Roanoke River & groundwater wells.
- Conducted disinfection by-product evaluation to address LTESWTR1 requirements.
- **Evaluated various blending and treatment scenarios** including the use of alternative oxidants (NaMnO4, ClO2, H2O2) and PAC.
- Developed recommendations for **operational strategies to control DBPs** by both treatment techniques and water age management.

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Relevance to BRWA
- DBP bench testing

Key Team Members
- Shawn Veltman, PhD, PE
- Doug Hudgins, PE

Period of Service
2008-to 2008

Schedule
Estimated ............... 4 months
Actual ..................... 4 months

Study Cost
Estimated .................. $25,000
Actual ...................... $25,000

Client Reference
Mr. Caleb Taylor, PE, Water & Sewer Director
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This project was the result of a VDOT bridge replacement project. CHA coordinated the removal and upsizing of 24-inch intake pipe to a 42-inch intake pipe in the New River and assisted VDOT in securing the permits with the ACOE and VDGIF.
Proprietary Information

The information in this section is considered proprietary. Volume 2 contains our response to this section.