KENTUCKY
AMERICAN WATER

New Filter Building
Richmond Road Station Water Treatment Plant

Lexington, Kentucky

REQUEST FOR PROPOSAL

MAY 2013

KENTUCKY AMERICAN WATER COMPANY
Engineering
2300 Richmond Road
Lexington, Kentucky 40502

Request for Proposal for the Richmond Road Station Filter Building

1. PROJECT DESCRIPTION

Kentucky American Water (KAW) is requesting proposals from preselected firms for Engineering Services to prepare a High Level Design for replacement of the Richmond Road Station 25 MGD Filter Building. This work will build on a previous KAW study by providing a complete facility assessment and present a plan for a new filter facility, treatment options and construction alternatives.

The Condition Assessment will

• Provide a structural assessment of the existing clearwell located beneath the filter building.

• If applicable identify, describe and prioritize structural rehabilitation.

• Identify and describe alternate site locations for future filter building.

Some of the key objectives of the Condition Assessment will be to identify the current condition of the existing facilities and determine optimal rehabilitation or replacement.

2. PROJECT BACKGROUND

The existing Richmond Road Station Filter Building consist of sixteen (16) filters numbered eleven (11) through twenty-six (26) rated at 1.56 MGD each, Leopold clay tile bottoms, 8-inch graded gravel, 24-inch granular activated carbon, 6-inch sand, equipped with air wash and a wash water pump from the 600,000 gallon clearwell located directly beneath the filters to a wash water holding tank.

The filter piping gallery at the Richmond Road Station is in poor condition and requires upgrades in order to remain in service. Significant amount of pipe, pipe fittings, valves, and electrical equipment located in the filter gallery are in need of replacement due to corrosion. The cause of the severe corrosion in this area is likely due to a combination of chlorine vapors from the clearwell below the filters and the moisture in the room from leaking pipe joints, valves and filter walls. The corrosive environment needs to be addressed in order to prevent future corrosion. Additionally, the filter piping gallery is so congested that it makes the maintenance required to keep the facility in full operation extremely difficult resulting in diminished operating capacity of the filters.

Four of the filters (Filters 11 to 14) at the Richmond Road Station were constructed in 1924. Since then, several additions were made to expand the filter capacity. Six filters (Filters 15 to 20) were added in 1937, two more filters (Filters 21 and 22) were added in 1938 and the final four filters (Filters 23 to 26) were added in 1953 to bring the total number of filters to 16. The filter gallery is located beneath the operating floor of the filter building, between the two rows of filters. The clearwell is located directly beneath the filters and filter gallery.

The filter gallery has been the source of significant maintenance issues for many years. Corrosion has impacted the concrete, piping, and equipment in the filter gallery. Based on the presence of a chlorine odor in the filter gallery, it appears that some of the corrosion is caused by chlorine vapors in the room. It is likely that the source of the chlorine vapor is from the clearwell which is located directly beneath the filter gallery. In addition, standing water can be found in the filter gallery as a result of leaks in the piping and valves in the filter gallery as well as from seepage from the concrete filters which abut the filter gallery on both sides. As a result of the corrosion, significant time and money is spent on maintaining the equipment in the filter building.

3. SCOPE OF WORK

The scope of work below is an abbreviated scope of work and should not be construed as being final and comprehensive. Combination and reordering of tasks for greatest efficiency is acceptable. A final scope of work and fee will be negotiated with the highest ranked Firm. The selected Firm will be required to perform or provide the following services. In all tasks review and coordination with Kentucky American Water and communication of decisions and results should be addressed.

Task 1 - Facility Description

1.1 Prepare a description of existing filter building, pipe gallery and clearwell. It should include information available from the Company and also include information gathered by the Firm during its inspections of the Facility.

1.2 Prepare a detailed description of the current operations and procedures at the existing filter building.

Task 2 – Design Considerations

2.1 Location of new filter building:
- Demo and replace in the same location
- Move location of new filter building
- Hydraulics, reliability, costs related to location chosen
- Site piping
- Constructability

2.2 Filter Technologies:
- Conventional high rate mixed media
- Membranes
- Anthracite
- Air Scour Backwash
- Backwash Options/Strategy
- Other alternatives

2.3 New Facility Preferences
- Sustainable design/construction
- Possibility of future expansion
- Use existing emergency power
- SCADA

• Review ability to include offices

Task 3 - Project Description and Cost Estimate

3.1 Identify the facility components to be expanded and/or replaced and the recommended technology and improvements options for them based on the previous tasks.
3.2 Estimate costs of the improvements for project planning. Life cycle costs are not required to be determined unless shown to be necessary or justify one alternative over another.
3.3 Logically combine improvements into the project for efficient rehabilitation and/or replacement of the facility. Prepare project cost estimates and schedules.

4. MINIMUM MEETINGS

The Firm shall include the following meetings in their schedule at a minimum. The Firm should develop a listing of the number of on-site reviews and meetings that it believes is necessary to deliver the report.
• Kick Off and Facility Review Meeting
• Monthly Project Status Meetings
• Draft Report Review Meeting
• Final Draft Report Review Meeting

5. DELIVERABLES

The Firm will prepare the following deliverables.
• Structure Inventory and Condition Assessment Memorandum
• Performance Requirements Technical Memorandum
• Draft Condition Assessment and Improvement Plan Report
• Final Condition Assessment and Improvement Plan Report

6. PRE-PROPOSAL CONFERENCE

Individual Pre-Proposal Meetings with each firm will be scheduled at the Kentucky American Water, located at 2300 Richmond Road Lexington, Kentucky 40507. The meeting will be conducted on Tuesday, June 18, 2013 at 1:00 PM. This meeting IS mandatory for your firm to attend. Individual tours of the facility will NOT be allowed outside of the Pre-Proposal Meeting.

7. SUBMITTAL REQUIREMENTS

Reply to this request with four (4) copies of your response. Limit your submittal to ten *(10) 8 1/2"* x 11" pages (text on one side only). A cover letter and project member resumes will not be considered as part of the ten-page limitation. Submittals that exceed the ten-page limitation will not be considered.

Please address the following:
1. Contact Information - List the name of the firm, address, contact person and phone number.

2. Firm's Capabilities -	Briefly describe three similar design projects, which your firm has completed in the past three years that are similar in scope and magnitude to the proposed project. List the members of each project team and the role played by each member. Please provide references for each project.
3. Project Team -	List the members of the project team and the role played by each member. Please provide resumes of experience for each member.
4. Project Approach -	Incorporating the scope of work identified above, discuss the various strategies you would employ during this project to develop the High Level Condition Assessment and Long Range Improvement Plan for the Richmond Road Station Filter Building. Identify any potential challenges that could be encountered during this work.
5. Project Schedule -	Provide a graphic project schedule that identifies significant issues/tasks, relationships between tasks and time frames required to address the completion of the project.

8. EVALUATION CRITERIA

The Company is looking to engage a Firm skilled and experienced in water treatment plant technology and facility planning. The following criteria will be used to evaluate and rank responding firms.

- Firm's Capabilities - experience with similar projects (0-20 points)
- Project Approach (0-30 points)
- Project Team (0-20 points)
- Project Schedule (0-20 points)
- Fee Proposal (0 - 10 points)

9. SELECTION PROCESS

Selection of firms who submit proposals for this engineering services contract will be made through an evaluation process based on the written proposals submitted and the above Evaluation Criteria.

10. ANTICIPATED PROJECT SCHEDULE

It is anticipated that a notice to proceed will be issued by Friday, July 19, 2013 and the final report shall be complete by Friday, September 27, 2013.

11. INDEMIFICATION & INSURANCE REQUIREMENTS

Kentucky American Water indemnification and insurance requirements will be included in Kentucky American Water's standard Professional Services Agreement, a copy of which is attached to this RFP. Submission of your Statement of Qualifications shall indicate your firm's ability and agreement to sign the Professional Services Agreement. Questions shall be addressed prior to submittal in writing. For firms submitting proposals, Kentucky American Water requires a statement in the proposal that the firms have read and understood all the elements laid out in the Professional Services Agreement

12. SUBMITTAL TIME AND PLACE

Responses to this request must be received at Kentucky American Water Company's Engineering Office at 2300 Richmond Road Lexington, Kentucky 40502 no later than 3:00 PM on Tuesday, July 2, 2013. The Company reserves the right to cancel or modify this Request for Proposal at any time.
Address responses to:

Kentucky American Water Company
Attn: Zach Dukes, Project Manager Engineer
2300 Richmond Road
Lexington, Kentucky 40502

13. GENERAL INFORMATION

1. Authorized Contact - Please direct all questions and comments to Zach Dukes, Project Manager Engineer, at:
Phone: 859.268.6352
Fax: 859.335.3393
Email: zachery.dukes@amwater.com

2. Instructions – Kentucky American Water shall not be held responsible for any oral instructions. Any changes to this Request for Proposals will be in the form of an addendum, which will be furnished to all registered Request for Proposals holders.

3. Kentucky American Water Rights – Kentucky American Water reserves the right to reject any oral Statements of Proposals, to waive any informality or irregularity in any Request for Proposals received, and to be the sole judge of the merits of the respective Statements of Proposals received.

4. Release of Project Information – Kentucky American Water shall coordinate the release of all public information concerning the project, including selection announcements and contract awards. Firms desiring to release information to the public must receive prior written approval from the Company.

14. ANTICIPATED RESOURCES

Following selection of a Firm, Kentucky American Water anticipates to be able to provide the successful firm with the following list of information to assist the review of the Richmond Road Filter Building.

1. Kentucky American Water Comprehensive Planning Study 2013
2. Previous Comprehensive Planning Study conducted in 1992
3. Facility Operation Reports
4. Access to Facility Drawings

15. ATTACHMENTS

A. Project Location Map
B. Professional Service Agreement

proposal

Professional Engineering Services for

RICHMOND ROAD STATION WTP NEW FILTER BUILDING

Kentucky American Water Company

July 2013

HDR

HDR

[Successful completion of any assignment requires sound solutions, timely performance, and quality service. HDR's primary focus is your satisfaction, and we are committed to providing the necessary resources to exceed your expectations.]

July 2, 2013

Mr. Zach Dukes, Project Manager Engineer
Kentucky American Water Company
2300 Richmond Road
Lexington, Kentucky 40502

RE: **Proposal** for Professional Services for
NEW FILTER BUILDING AT RICHMOND ROAD STATION WATER TREATMENT PLANT

Dear Mr. Dukes:

HDR Engineering Inc. is very pleased to submit this Proposal to Kentucky American Water Company (KAW) for professional services associated with the referenced project. HDR offers the following positive attributes concerning this project:

- QUALIFICATIONS – The HDR team is highly qualified to perform the structural condition assessment and alternatives development associated with the "New Filter Building at Richmond Road Station (RRS) Water Treatment Plant (WTP)" based on our past experience on KAW projects at RRS, background understanding of the work to be performed, as well as demonstrated proficiency in multi-discipline condition assessments, and cost estimating.
- EXPERIENCE – The HDR team has demonstrated local experience in the evaluation and rehabilitation of aging, historic facilities. Our team has worked on rehabilitation or conversion-of-use projects at six historic WTPs in the last three years.
- STAFFING – The HDR team is a diverse and experienced project team with a successful track record on projects of a similar nature. Section 3 of this Proposal presents qualifications, experience, assigned roles, and responsibilities of key personnel. Due to page limiatations, resumes for project team members, are not included in this submittal; however, detailed resumes for all team members are available upon request.

Enclosed is a concise, straightforward document that follows the "Proposal Format" outlined in the "Request for Proposals," including the following:

We greatly appreciate the opportunity to submit this Proposal and look forward to the possibility of working on this project with you. Thank you for your consideration.

Sincerely,

Brent A. Tippey, P.E.
Vice President

HDR Engineering, Inc.
2517 Sir Barton Way
Lexington, KY 40509
Phone: (859) 629-4800
Fax: (859) 629-4801
www.hdrinc.com

RICHMOND ROAD STATION WTP NEW FILTER BUILDING

Section 1 | FIRM INFORMATION

Unique Advantages of the HDR Team:

- **Unparalleled experience on projects of this nature in Central Kentucky** assures KAW they are selecting a team whose day-to-day activities are focused on improving water plant operations
- **Knowledge from previous experience at KAW facilities** will allow HDR to avoid project learning curve
- **Balanced team of national experts and local resources** to provide out-of-the-box thinking and technical proficiency
- **Innovative approach that couples project costs and quantified risk** to provide more comprehensive information for decision making
- **HDR has demonstrated to KAW that we stand behind our work** and will see projects through to successful completion
- **The team you trust**, including Brent Tippey, Larry Anderson, Jerry McClary, and Eddie Alexander. Our team has successfully completed more than 10 projects in the last 10 years for KAW

HDR BUSINESS INDICATORS

- Ranked **No. 11** among Engineering News-Record's 2013 "**Top 500 Design Firms**"
- Ranked **No. 6** among Engineering News-Record's 2013 "**Top 20 Water Firms**"
- Ranked **No. 6** among Engineering News-Record's 2013 "**Top 20 Sewer/Wastewater Firms**"

HDR
www.hdrinc.com

HDR ENGINEERING, INC.

Firm Name:	**HDR ENGINEERING, INC. (HDR)**
Address:	2517 Sir Barton Way | Lexington, Kentucky 40509
Phone No. | Fax No.:	(859) 629-4800 | (859) 629-4801
Contact | Title | Email:	Brent A. Tippey, P.E. | Vice President | brent.tippey@hdrinc.com

Headquartered in Omaha, Nebraska, HDR was founded in 1917, and maintains local offices in Lexington and Louisville, Kentucky; Cincinnati and Columbus, Ohio; and Chattanooga, Tennessee. HDR is a service-oriented firm with a strong commitment to local communities. This year, HDR celebrates its 96th anniversary of providing engineering and architectural services to its clients. We have grown from a small municipal engineering firm to a No. 11 ranking in 2013 by "Engineering News Record (ENR)" as one of the Top 500 Design Firms. More importantly, HDR was ranked No. 6 in Water Firms by ENR in 2013.

FREELAND HARRIS CONSULTING ENGINEERS

Freeland Harris Consulting Engineers of Kentucky, Inc. (FHCE), a Kentucky corporation, founded in 1996, with a unique background in the area of structural condition assessment, will serve as a local subcontractor on the "Richmond Road Station (RRS) New Filter Building Project." The firm is among the industry leaders in providing comprehensive and service-oriented structural consulting services. Their hands-on approach and commitment to our customers have earned us a solid reputation among our clients and the industry.

LOCAL PRESENCE & PROJECT EXPERIENCE

HDR's operating philosophy is to be an expertise-driven firm that delivers tailored solutions through a strong local presence. The HDR team has over 75 qualified professionals to work on the "RRS New Filter Building Project" within Fayette County. It is expected that the work will be performed in HDR's Lexington office along with the local offices of FHCE.

HDR's Kentucky Water Group has completed more local treatment and condition assessment projects than any other firm in the region. A few of the large-scale (10+ MGD) projects of this nature completed in recent years include:

- Danville, KY | Water Treatment Plant (WTP) Renovation
- Northern KY Water District (NKWD) | Advanced Treatment Projects at Fort Thomas Treatment Plant (FTTP) and Memorial Parkway Treatment Plant (MPTP)
- NKWD | Pretreatment Facility at FTTP
- NKWD | Chemical Feed Building at MPTP
- Ashland, KY | WTP Renovation
- Fort Meade, MD (American Water Military Services Group) | WTP Improvements

RICHMOND ROAD STATION WTP NEW FILTER BUILDING

Section 2 | FIRM EXPERIENCE & CAPABILITIES

HDR Local Services Overview

Water/Wastewater
- Condition Assessment
- Water/Wastewater Treatment
- System Analysis/Review
- Water Distribution/Storage
- Pump Stations
- Sewer System Evaluation/Rehabilitation
- CSOs/SSOs/Consent Decree/LTCP
- Rate Studies

Funding/Finance
- Source Identification
- Application Preparation/Administration
- Financial Reviews
- Sustainable Return on Investment (SROI)

Stormwater
- Master Plans/Utility Formation
- Conveyance Systems
- NPDES Permits
- Mapping/Ordinances
- Retention/Detention Basins

Electrical/Instrumentation
- SCADA Systems
- Fiber Optics/Data Networks
- Instrumentation & Controls
- Security/Access Control Systems
- Communication Systems
- Power Distribution/Lighting

GIS
- Data Collection/Creation/Conversion
- Spatial Analysis
- Development/Integration
- Cartography/GPS

Sustainability
- Green Infrastructure
- Renewable Opportunities
- Energy Audits
- LEED Certifications

Impoundments/Reservoirs
- Watershed Planning/Dam Assessment
- Reservoir Monitoring/Yield Studies
- Stream Restoration

WORKING ON HISTORIC WATER PLANTS IS AN HDR SPECIALTY…

OVERVIEW

HDR understands that setting the future direction of filtration facilities at the Richmond Road Station (RRS) is a once-in-a-generation activity and will be a highly visible project to Kentucky American Water (KAW). The success of this evaluation and the recommendations that come from it will be dependent upon the capabilities of the team and their experience in undertaking complex, comprehensive structural evaluations as well as identifying and analyzing prospective treatment facility solutions. This is especially the case when considering the 80+ years of age for portions of the current facility. HDR is unique in their recent experience (last three years) for condition assessments and options evaluation on historical water treatment facilities in Kentucky and in the American Water community of systems. The following paragraphs highlight the areas of specialized experience gained during these investigations.

CONDITION ASSESSMENTS OF AGING HISTORICAL STRUCTURES

The structural condition of the clearwell is a very significant part of this project. Including divers who are also structural engineers as part of the evaluation team will produce detailed findings and recommendations on the condition of the existing structure and suitability for continued use. Additionally, an assessment of existing equipment, building construction, HVAC and electrical systems will enable HDR to determine whether renovation, conversion-of-purpose or decommissioning is most feasible. Historic (or venerable) structures require a more detailed review as added scrutiny is present from the State Historic Preservation Officer (SHPO) and the Kentucky Heritage Council (KHC) when conversion-of-use or demolition are considered. Conversion-of-use can also be impacted by Building Code and Seismic Zone issues. All this information needs to be collected so that KAW can make a fully informed decision on the future of the Filter Building.

IDENTIFYING FEASIBLE ALTERNATIVES THAT COULD MEET PROJECT GOALS

Over the last three years, HDR's Lexington water treatment design team has worked on several comparable projects involving feasibility studies for large scale, historical water treatment facilities. These include the following projects inside American Water and in the Central Kentucky region.

- City of Danville WTP (original construction 1924) – 12 MGD capacity
- Northern Kentucky Water District (NKWD) – Fort Thomas Treatment Plant (original construction 1897) -44 MGD capacity
- American Water Military Services – Fort Meade WTP (original construction 1918) – 6 MGD
- NKWD – Memorial Parkway Treatment Plant (original construction 1959) – 20 MGD

This experience helps us to anticipate some of the issues that will be present during the options identification and feasibility review process. Alternatives reviewed during past projects include membrane filtration (both pressure and vacuum), modifications to media materials, backwashing approaches, granular activated carbon (GAC) addition, disinfection approaches and biological filtration.

We also realize that KAW has a very good understanding of their process approach and filtration needs. Our role is simply to "cast a wide net" to identify possible options and then provide feasible, constructable conceptual designs for KAW's consideration.

DEVELOPMENT OF SCREENING METHODS FOR COMPARISON METRICS BETWEEN ALTERNATIVES

Screening methods should balance financial and non-financial factors for KAW's consideration when comparing the well-developed alternatives. The scoring criteria will reflect KAW's priorities through the assignment of appropriate weighting to various factors. Some factors that could be considered include capital cost, operating cost impact on current treatment approach, regulatory compliance probability, etc.

PRODUCING RELIABLE COST ESTIMATING FOR KAW PLANNING, BASED ON LOCAL MARKET CONDITIONS

Cost will certainly be a key factor in the final decision-making process as KAW tries to mitigate the impact of large construction projects on rate-payers. Reliable, market-focused cost estimates will assist KAW in anticipating the necessary size of investment as well as being a screening metric for alternatives. HDR has completed over $500 million in construction in the Kentucky market and is very familiar with its conditions. In addition, we believe our specific experience in estimating rehabilitation projects at larger (>10 MGD) historical treatment facilities is a key differentiator between us and other firms.

PROJECT EXPERIENCE

HDR has demonstrated local experience in the four key areas identified above. Table 2-1 is a representative summary of relevant projects (with pertinent details) that were either performed by proposed project team members or were part of the American Water network. It is worth highlighting that American Water projects typically contained tasks related to condition assessments and long-term strategic process planning. These elements are key pieces of the proposed RRS project.

Table 2-1 HDR STRUCTURAL CONDITION ASSESSMENT/STRATEGIC PROCESS PLANNING EXPERIENCE ON HISTORIC WATER PLANTS (2010 - 2013)

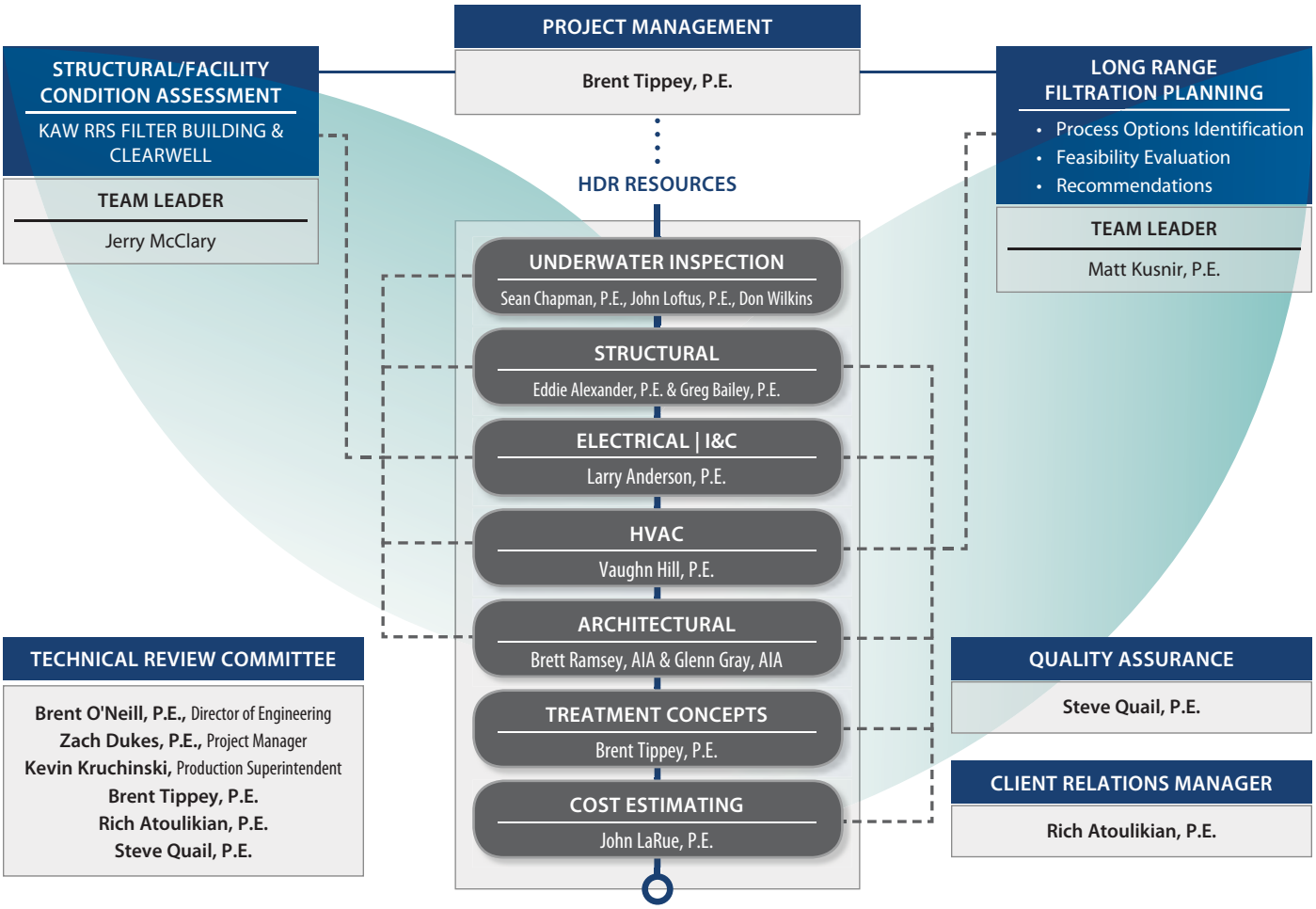
Project Name, Facility & Client Contact	Year	Specific Project Experience/Element	Relevance to KAW RRS Project	Structural Condition Assessment / Evaluation	Identification of Alternatives	Screening of Alternatives	Cost Estimating
Advanced Treatment Project FTTP & MPTP | NKWD Amy Kramer, P.E. | 859-426-2734	2012	• Structural Assessment/Analysis of Existing Walls/Clearwell No.2 at FTTP for GAC effluent piping • Structural Assessment/Design at MPTP for new facility to be built within existing footprint	• Structural impact determined on FTTP, a historic structure constructed over 75 years ago. • MPTP GAC facility within existing footprint which requiring walls to be removed and others to be fortified for continued use oof infrastructure such as raw water tunnel	♦	♦	♦	♦
Water Treatment Plant Improvements City of Danville, KY Earl Coffey, P.E. | 859-238-1200	2013	• Structural Assessment of Historic Filter Building and Clearwell for Continued Use or Conversion of Purpose • Structural Assessment of Historical Raw Water Intake for Additional Piping, Appurtenances and Support Walls	• Danville WTP was Constructed in Similar Era to RRS and Had Many Periodic Upgrades • Review Against Modern Design Code was Performed to Consider Future Use Prospects • Maintenance Access and Age of Equipment was Impacting Ability yo Perform at High Level	♦	♦	♦	♦
Water Treatment Plant Upgrades Fort Meade, MD American Water Military Services	2011	• Project Involved Structural Assessment, Functionality Reviews and Condition Assessments of the Historic Water Treatment Plant, Specifically the Filter Building, Clarifiers, and Three Clearwells	• American Water Project that Evaluated Remaining Service Life of Facilities Along with Renovation/Replacement Options for Historic Designations and Architectural Features • Long-Term Process Planning Support at American Water Facility	♦	♦	♦	♦
Long Range Plan East St. Louis, MO WTP Illinois - American Water	2013	• Condition Assessment of Original Water Plant, Dating to 1916. Multi-Disciplined Review of Facility for Continued Use and Recommended Improvements Needed. Prioritized Implementation Included • Long-Term (30-year) Process Planning Support Including Workshops, Cost Estimates, Feasibility Reviews for Options to Expand the WTP from 56 MGD to 75 MGD	• Condition Assessment of Facilities for Continued Use. Identification of Improvements Needed to Extend Service Life • Similar Scope and Approach to the RRS Project	♦	♦	♦	♦

*Notes - Other Projects not shown due to page limitations. Additional experience is available upon request.

RICHMOND ROAD STATION WTP NEW FILTER BUILDING

Section 3 | PROJECT TEAM

Figure 3-1
PROJECT TEAM ORGANIZATIONAL CHART



HIGHLY QUALIFIED TEAM & LEADERSHIP TO PERFORM

Our proposed project team is identified in Figure 3-1, which can be cross-referenced with Table 3-1 to review individual qualifications, assigned project roles, and responsibilities. Our team's proposed leadership is identified below.

Brent Tippey is Vice President of the Water Business Group for the HDR Kentucky and Ohio departments. He has a proven record of leadership on complex projects such as KAW's 30-mile High Service Mains to Pool 3, City of Danville WTP Renovation, and installation of advanced treatment (UV & GAC) at two WTPs for Northern Kentucky Water District. Brent will be involved in the overall project management and administration, from start to finish, and will coordinate all phases of the project with KAW staff and key project personnel.

Jerry McClary, has a 30-year operations background, and currently serves as a Project Manager in HDR's Lexington Office. Jerry will oversee all elements of the filter building condition assessment, including structural, HVAC, and electrical. He will produce comprehensive findings for KAW's consideration.

Matt Kusnir, HDR Project Engineer, will be responsible for identifying filtration options and, along with Brent Tippey, reviewing the feasibility of the identified options for RRS.

Eddie Alexander is a Senior Project Manager and Part-Owner of Freeland Harris Consulting Structural Engineers in Lexington. As a long-time (20+ years) subconsultant to HDR, Eddie has been responsible for structural designs on over 75 projects, and has also performed assessments of structural conditions on more than 20 projects with HDR.

PROJECT TEAM

Table 3-1 KEY PERSONNEL

Name, Position, Location	Degree | Registrations	Yrs of Exp.	Project Role & Responsibilities
Brent Tippey Vice President, Lexington, KY	BSCE | P.E.	18	**Project Manager** Day-to-Day Project Leadership, Final Responsibility for Deliverables
Jerry McClary Project Manager, Lexington, KY	BS | Class IV WW Op.	31	**Condition Assessment Lead** Coordinate Multi-Discipline Assessment, Develop Findings
Matt Kusnir Project Engineer, Lexington, KY	BSCE | P.E.	4	**Filtration Planning Lead** Identification of Options, Feasibility of Installation
Sean Chapman Civil Engineer, Lexington, KY	BSCE | P.E.	15	**Underwater Investigation** Structural Clearwell Inspection
John Loftus, P.E. Civil Engineer, Lexington, KY	BSCE | P.E.	9	**Underwater Investigation** Structural Clearwell Inspection
Don Wilkins Saftey Manager/Dive Supervisor, Lexington, KY	Comm. Diver | Rescue Diver Cert	19	**Underwater Investigation** Structural Clearwell Inspection
Eddie Alexander Structural Engineer, Lexington, KY	MSCE | P.E.	27	**Structural Engineer** Structural Assessment, Coordination of Underwater Inspection
Greg Bailey Structural Engineer, Lexington, KY	BSCE | P.E.	10	**Structural Engineer** Structural Assessment, Development of Cost Impacts
Larry Anderson Vice President, Lexington, KY	BSEE | P.E.	35	**Electrical Engineer** Electrical and I&C Condition Assessment, Options Development
Vaughn Hill Mechanical Engineer, Lexington, KY	BSME | PE, NCEE	30	**HVAC** Resource for HVAC Condition Assessment, Options Development
Brett Ramsey Architect, Lexington, KY	BArch | RA-KY, NCARB	29	**Architect** SHPO Involvement, Architectural Features
John LaRue Sr. Project Manager, Lexington, KY	MSCE | P.E.	38	**Cost Estimating** Development & Review of Costs for Alternatives
Steve Quail Sr. Project Manager, Sioux Falls, SD	MSEng | P.E.	36	**Quality Assurance** Lead Regular QA/QC Reviews (30%, 70%, 90%), Discipline Coordination
Rich Atoulikian Client Service Manager, Cleveland, OH	MSCE | P.E.	36	**Client Relations Manager** Assure Timely Delivery of Report/Evaluation

RESUMES

Due to page limiatations, resumes for project team members, are not included in this submittal; however, detailed resumes for all team members are available upon request.

HDR
www.hdrinc.com

RICHMOND ROAD STATION WTP NEW FILTER BUILDING

Section 4 | PROJECT APPROACH, SCHEDULE & FEE

OVERVIEW

For over nearly 90 years, the Filter Building at Kentucky American Water's (KAW) Richmond Road Station (RRS) has served customers in Central Kentucky with high quality drinking water. Originally built during the administration of Calvin Coolidge, this venerable structure has reliably produced clean water for human consumption despite difficult maintenance conditions, numerous influent water challenges, natural disasters and many other unforeseen events.

Now the time has come for KAW to look to the future and determine the best approach to their filtration process at RRS for the next century. KAW has a keen understanding of the limitations and conditions of the existing filter building and clearwell. Some notable items include:

- Deteriorating condition of concrete in the 85 year old clearwell and 10 of the existing filters which are built on top of it.
- Accessibility issues in pipe gallery prevent regular maintenance and improvement projects.
- GAC media assists in disinfection by-product reduction but is not good at turbidity removal.
- Shallow depth filters limit the options available for the existing vessels.

These issues are not new to KAW staff and the staff has many good ideas about possible solutions. What we have learned from similar projects in Danville, Northern Kentucky, and other locations is that the utility is interested in methods to fully balance and compare project cost, potential risk and system performance as elements of a comprehensive study approach. This approach will provide KAW with detailed and reliable information upon which to base their long-term decisions. Details of our proposed project approach for the New Filter Building at RRS are provided in the subsequent sections.

CAST A WIDE NET TO INCREASE CONFIDENCE IN SOLUTION

As previously noted, KAW has already recognized that potentially viable options exist for both a new filter building and renovation of the existing facilities. The scope, cost and details of both of these options need to be developed after a greater understanding of the structural conditions are determined and a full accounting of available space can be completed. In addition to these two alternative approaches, HDR believes that several other prospective opportunities should be evaluated. At present, we have tentatively identified five options worth initial consideration including:

- **Alternative A** – Renovation of Existing Structures and Filters
- **Alternative B** – Partial Renovation Through Re-use of Six Filters and Addition of New Filters
- **Alternative C** - Install Immersed Membranes in Filters 21-26 (Not Above Clearwell)
- **Alternative D** - Install Plate Settlers in Clarifiers/Create Space for Immersed Membrane Filtration
- **Alternative E** – New Filter Building Structure and Filters

HDR
www.hdrinc.com

These options do not exhaust the opportunities that are available to KAW. These are simply preliminary, out-of-the-box thinking that HDR can bring to the table with national and local expertise in the area of filtration. Further, HDR understands the importance of this study. The findings and recommendations will establish KAW's long-term process approach to filtration at RRS that will result in significant investment (possibly $8+ million) on part of the company. Therefore, the pursuit of the best solution must leave no stone unturned and operations must be satisfied that alternatives are technically sound and constructable.

In order to maximize KAW (and eventually the PSC) confidence in the solution, HDR proposes that an initial workshop be held to identify the universe of options that might be considered as a viable solution. The initial workshop would focus on specific topics identified below.

- Full detailing of the options listed above.
- Identification and development of any alternative options or derivatives of the options identified above that would merit consideration for additional study.
- Full discussion of site issues and what items could be removed or relocated.
- Determination of preliminary screening criteria to evaluate the further feasibility of any alternative or derivative options.

As noted previously, a preliminary screening process will be developed based upon both financial and non-financial factors, with KAW and HDR working together to provide the number, priority and value of areas. This will insure that results are aligned with KAW's goals. This initial identification and screening of options is expected to have a minimal impact on the overall schedule of project and would be completed within 21 days of the kickoff meeting.

OBTAIN DETAILED INFORMATION ABOUT EACH FEASIBLE OPTION

A common shortcoming of many investigations regarding facility rehabilitation is the limited availability of detailed information required for modern structural analysis. HDR understands that acquiring meaningful field data will be needed to yield solid engineering recommendations for this study. The subsequent consideration of risk and estimation of costs will be impacted, in large part, by the confidence in the data that will be accumulated through meetings, field reviews, inspections, investigations and testing.

For this reason, HDR has teamed with Marine Solutions (Marine) to perform the underwater survey of the condition of the concrete clearwell. Marine is operated by professional structural engineers who perform the inspections. Their engineering background enables them to identify and evaluate the severity and root causes of issues that may be found during inspections. They can also relay structural concerns directly to our structural engineers in a common technical language so that the full condition assessment can be developed.

The condition of the existing clearwell and filter building is important to the entire study because its findings have the potential to eliminate several of the alternatives and impact the feasibility of others. Once completed, the investigation of all the alternatives can commence. A short description of the previously identified alternatives including the details, advantages and shortcomings is provided in the following paragraphs to give more depth to the conceptual approaches.

ALTERNATIVE A - REHABILITATE RRS FILTER BUILDING

The rehabilitation of a 90 year old structure offers the most unknowns and challenges of all the options. It is also the alternative that all others will be compared against. Major work elements associated with this option include:

- Confirmation of structural suitability of clearwell and filter building for continued use in any function along with needed improvements
- Renovations of the mechanical, electrical and piping configurations to support modern maintenance needs and development of administrative space.
- Determination of filter media material and suitability of filter box. Conversion to another media material could impact RRS treatment approach based on GAC impact on DBP reduction.

Some record drawings exist for the facility but structural details on the clearwell are unavailable. Therefore, the materials information needed for an assessment of structural conditions may need to be performed if the underwater inspection can't yield conclusive results of the structural condition. If needed, this would need to be obtained through field testing methods that are both destructive and non-destructive.

HDR is not including any costs for concrete cores, petrographic analysis, or other testing in our overall fee but wants KAW to be aware that other investigations are available if the underwater structural inspection requires supplementation.

Additionally, an assessment of the electrical system capabilities at RRS will need to be performed to assure the rehabilitated filter building was compliant with applicable codes and had the capability to support desired treatment appurtenances. This investigation would include the following activities:

- Determine if there are any existing National Electric Code violations such as inadequate clearance in front of equipment.
- Consider any ongoing maintenance issues with existing equipment including accessibility.
- Develop a strategy for expanding the electrical system in the future.
- Identify the source of emergency power.
- Develop a preliminary filter control strategy and SCADA integration plan.
- Develop a KAW preferred equipment list.

As previously noted, the rehabilitation of the Filter Building offers many possible derivatives beyond a simple "fix in place" approach. Several examples of partial rehabilitation (if structurally suitable) are described below.

ALTERNATIVE B - PARTIAL RENOVATION THROUGH RE-USE OF EXISTING FILTERS AND ADDITION OF NEW FILTERS

Two potential approaches exist to this alternative with details as follows:

- If the clearwell condition assessment determines that it can continue in service or that reasonable rehabilitation could prolong service life, this option could consider rehabilitation and re-use of even-numbered filters, decommissioning of odd-numbered filters and construction of eight filters in a new, nearby facility.
  - Renovation would enable half of the existing pipe gallery to be removed which creates maintenance access. Upgrades to structural, HVAC, electrical and instrumentation would create a modern facility. Administrative/office space could also be developed on the operating floor.
- If clearwell structural condition is poor and not suitable for continued service, the existing filters that are not located over the clearwell could be candidates for re-use. Access for maintenance would need to be considered but renovation or re-programming of these vessels could prove economically beneficial with the lack of available space at RRS. New filter facilities would be required to supplement
- Alternative B would illustrate a commitment to re-use operationally feasible facilities when considering PSC oversight. The reduced footprint makes it feasible from a constructability perspective. However, both opportunities under this Alternative would require two filter buildings which could create operational issues.

ALTERNATIVE C – INSTALL IMMERSED MEMBRANES IN FILTERS 21-26

This option assumes that the clearwell and existing filters are not considered suitable for continued services and includes the following major work elements:

- Decommission or conversion-of-use for the remainder of the filters and clearwell.
- Installation of immersed membranes in six filters founded on bedrock. HDR can assist with arranging any pilot demonstration needed.
- Reworking the pipe gallery with alternative influent header locations and relocated drain or CFE line to create a better maintenance access.
- Replacement of GAC and implementation of membranes will require KAW to review pre-chlorination practices.
- Filter vessels may have to be re-configured or raised slightly to accommodate membranes.

ALTERNATIVE D - INSTALL PLATE SETTLERS IN CLARIFIERS/CREATE SPACE FOR IMMERSED MEMBRANE FILTRATION

This option assumes that the KAW will consider modifications to structures and processes other than the existing filters and clearwell along with a determination that those structures are not considered suitable for continued services. Major work elements include:

- Conversion of existing gravity sedimentation basins to plate settlers to reduce volume.
- Install structural walls to re-configure settling chambers and create filtration area and piping channels.
- Installation of immersed membranes in filtration area. HDR can assist with arranging any pilot demonstrations needed
- Filter control structure could be built separate or integral to construction with administrative space included.
- Capital cost on this option is likely to be lower than most or all other options. Operations access would need to be considered during design. Impact on DBP's from GAC conversion.

ALTERNATIVE E – NEW FILTER BUILDING

This option assumes that the clearwell and existing filters are not considered suitable for continued services and includes the following major work elements:

- New filter building, clearwell and operations area.
- Filtration could be membrane or granular with various media types and depths considered.

- Space availability could be challenge. Minimum anticipated area for a new filtration complex is approximately 6,000 sf. **Figure 4-1** *reveals* the available space. Existing yard piping would require relocation.
- Expected to be among the higher capital cost options as no existing structures would be re-used.

Regardless of the alterative that is selected for the filtration approach, the available clearwell capacity will also be considered and new facilities may be required. Baffling will be very important in this determination.

EQUATING PROJECT COSTS AND PROJECT RISK SO KAW HAS THE FACTS ON EACH ALTERNATIVE

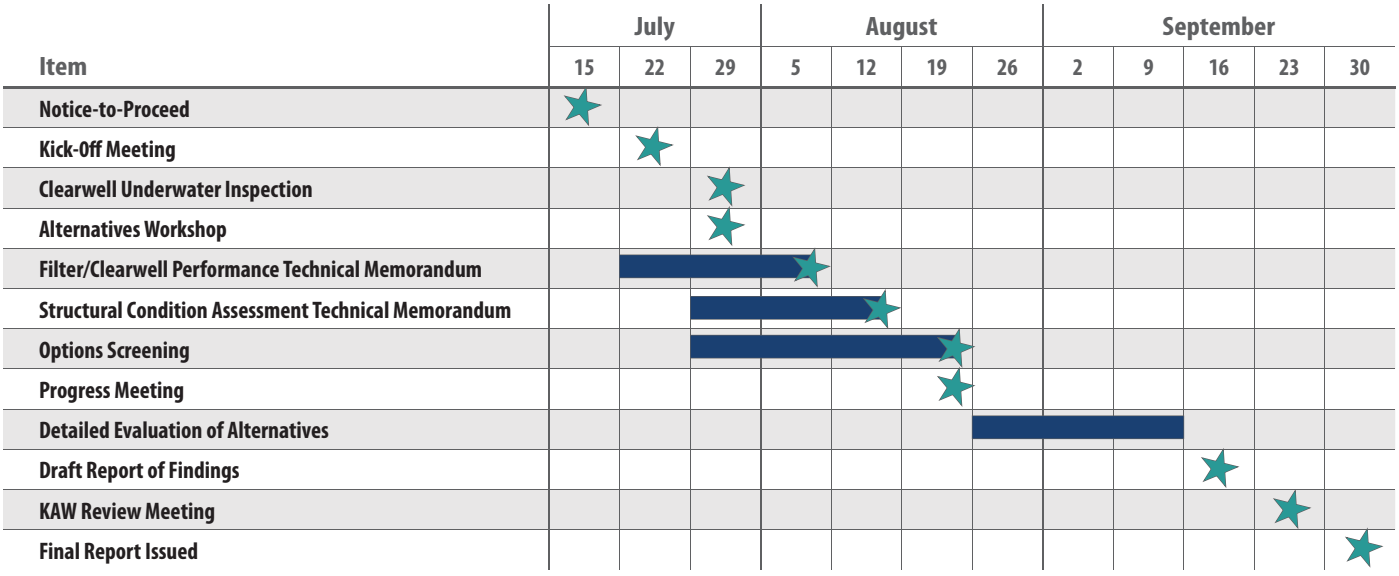
HDR understands the importance of preliminary cost estimating for the purposes of planning and comparison. A major element in decision-making by KAW leadership is going to be the anticipated project costs associated with the various alternatives. HDR has a demonstrated history of successful project cost estimating. Over the last 20 years, HDR project as-bid amounts have averaged 7.5% under our estimated construction costs.

Likewise, effective risk management is an essential element of a successful project and a key part of our approach to this study. Risk is inherent in all projects, and the alternatives being considered by KAW have varying degrees of associated risk. HDR has found that in comparative studies like this, it is valuable to make risk quantifiable so that it can be comparative to other project costs. The identification of the risk and its potential cost often sets in motion a recognition of the importance of mitigating it that will benefit the project throughout its implementation. In today's climate, virtually any utility activity could benefit from a risk mitigation plan but significant projects like the RRS Filter Building is more likely to have a successful outcome when an active risk mitigation plan is in place.

RECOMMENDATIONS MADE FROM A SOLID ENGINEERING BASIS

Once all the alternatives have been fully reviewed and the benefits, shortcomings, costs and risks have been identified, HDR will provide recommendations to KAW for their consideration as you select the best approach. The development of draft and final reports will be done in coordination with KAW project team members so that a thorough understanding and consensus on the findings will be accomplished.

PROJECT SCHEDULE



PROJECT FEE

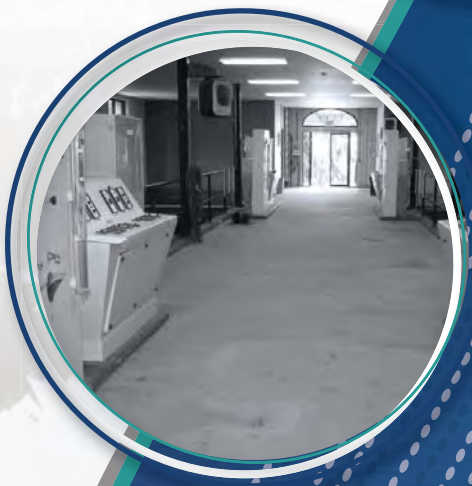
The Lump Sum Fee for the proposed work identified for the Kentucky American Water "Richmond Road Station WTP New Filter Building" is **$43,500**. This includes the underwater inspection provided by Marine Solutions.

EXCEPTIONS

The above cost does not include the following:

- Additional materials testing of concrete clearwell or other structural members
- Additional sub-surface information for any areas of new construction
- Day-to-Day operations of any pilot unit is not included in cost

2517 Sir Barton Road
Lexington, Kentucky 40509
859-629-4800
www.hdrinc.com



HDR is an employee-owned architectural, engineering and consulting firm with more than 8,000 professionals in more than 185 locations nationwide. All of them are committed to helping clients manage complex projects and make sound decisions.

Learn more at www.hdrinc.com.

Submitted to:

KENTUCKY AMERICAN WATER

New Filter Building
Richmond Road Station Water Treatment Plant

Submitted by:

Gannett Fleming

*Excellence Delivered **As Promised***



Gannett Fleming

Excellence Delivered ***As Promised***

July 2, 2013

Kentucky American Water Company
Attn: Zach Dukes, Project Manager Engineer
2300 Richmond Road
Lexington, KY 40502

RE: Request for Proposal for New Filter Building, Richmond Road Station Water Treatment Plant

Dear Mr. Dukes:

The Kentucky American Water Company's (KAW's) Richmond Road Station Water Treatment Plant (WTP) filter gallery is in poor condition and needs expanded and/or replaced. Gannett Fleming has performed numerous WTP assessments and designs for American Water Companies, as well as other clients, and will evaluate the best options for improvements to the WTP's filter building to allow KAW to continue to provide high quality water to its customers.

During our pre-proposal meeting at the WTP, our Structural Engineer and Project Principal performed a cursory inspection of the filter building and noticed several items, which were confirmed upon review of the existing drawings. Space is the primary concern regarding the filter building. The filter gallery is currently too small, and the existing filter boxes are not deep enough to be used as new modern media filters. In addition, space for construction of new filters around the existing filter building is restricted.

In response to these preliminary assessments, we have developed several possible options that will be further investigated after consultation with KAW upon Notice to Proceed. These include:

- Construction of a new conventional media or membrane filter building on the footprint of the existing adjacent office/storage building
- Construction of a new conventional media filter building, partially on the footprint of the existing filter building
- Construction of a new pressure membrane filter building
- Construction of a submerged membrane filter process within the existing filters
- Construction of a new filter building remote from the existing filter building site not yet identified.

With all options, new clearwell capacity will be considered if the existing filter building clearwell cannot be salvaged. Regardless of which option is chosen, the existing filter building clearwell must be piped to allow bypass for future maintenance and cleaning.

The proposed Project Team for this project includes Timothy J. Glessner, P.E. Tim has served as Project Manager on past KAW projects and will oversee all aspects of this project. He will be assisted by Jamie R. Shambaugh, P.E., Manager of our Water Process and Operations Group; Lori L. Kappen, a Senior Project Engineer and Project Manager responsible for water quality, regulatory, process, and economic assessments for potable drinking WTPs; and Vladimir Cecka, a Structural Project Manager who

participated in the pre-proposal visit and performed a cursory inspection of the facility. All proposed staff routinely work together on water treatment facility projects and have the availability to begin providing services to KAW as soon as Notice to Proceed is authorized.

With Gannett Fleming as its partner, KAW will receive the following benefits:

- **Responsiveness** – Gannett Fleming has a vested interest in KAW's future and has already begun evaluating options for the filter building. In addition, we will pre-plan some of our initial activities to assure a fast start of the project schedule once Notice to Proceed is authorized.
- **Water Treatment Plant Evaluation and Design Experience** – We offer multi-discipline engineering design, bid, and construction management services in addition to assessment and evaluation of facilities.
- **Membrane Experience** – Gannett Fleming has executed several full-scale membrane filtration designs, including the two largest membrane plants of their type in the United States at the time of their design. At the Forest Park WTP, we converted a 20 mgd filter building into a 40 mgd submerged membrane filter building for the approximate same cost to construct a new 20 mgd filter building to supplement the existing 20 mgd filter building.
- **Past Experience with KAW Facilities and Staff and Knowledge of KAW Practices and Procedures** – All members of our Project Team have provided services on past projects for KAW and are familiar with your facilities and procedures. We will develop the best option to meet the needs of all staff involved, from the KAW engineering staff to the plan production staff.
- **Designs Which are Sensitive to the Community and its Surroundings** – Our engineers work closely with our environmental professionals to develop innovative solutions that are socially responsible and cost-effective.
- **ISO 9001:2008 Certification** – This certification enhances our efficiency and effectiveness to provide quality service and deliverables to meet your requirements. All subconsultants are subject to the same quality standards.

The prospect of working for KAW again is very exciting. We trust the information provided in this document adequately presents our experience, capabilities, and genuine interest in providing services for KAW. Should you have any questions regarding this information, please contact me at 717-763-7212, extension 2277.

Sincerely,

GANNETT FLEMING, INC.

JEFFREY L. RAFFENSPERGER
Vice President

1. Contact Information

Gannett Fleming, Inc.
207 Senate Avenue
Camp Hill, PA 17011
Jeffrey L. Raffensperger
717-763-7212, ext. 2277
jraffensperger@gfnet.com

2. Firm's Capabilities

For 98 years, Gannett Fleming has provided comprehensive consulting and management services to water and wastewater management agencies. These services have included planning and feasibility studies; process analysis; detailed design; permitting; construction-related services; startup, operations, and manuals; modeling and analyses; pretreatment and toxic reduction programs; and asset management. We have designed and placed into service more than 150 water and wastewater treatment plants (1 to 395 mgd), hundreds of pumping stations (0.1 to 214 mgd), and thousands of miles of water mains and sewers (mains up to 96-inch diameter). Our staff of professionals includes certified water and wastewater operations experts that provide a wide variety of consulting services to our clients. Gannett Fleming's staff of nearly 2,000 people in 60 offices currently provides these services to hundreds of clients – some of which we have served continuously for over 50 years.

Three similar projects completed by our firm in the past three years are presented below.

2.1. Hays Mine Water Treatment Plant (WTP) Evaluation and Design, Pittsburgh, Pennsylvania

Completion Date: 2012 (design); currently under construction

Reference: Scott Thomas
Pennsylvania American Water
852 Wesley Drive,
Mechanicsburg, PA 17055
717-773-5238
Scott.Thomas@amwater.com

Key Team Members:

J. Raffensperger – Project Principal
J. Shambaugh – Project Manager (evaluation)/Project Engineer (design)
T. Glessner – Quality Assurance/Quality Control
V. Cecka – Structural Project Manager
L. Kappen – Project Engineer

Gannett Fleming conducted a complete evaluation of the existing 60 mgd Hays Mine WTP, one of two plants supplying the Pennsylvania American Water (PAW) Pittsburgh service area. The project included a detailed inspection, process evaluation, and selection of recommended improvements to the WTP, which was originally constructed in about 1905 and expanded four times between 1928 and 1953.

In the study, our firm evaluated system process alternatives and addressed the facilities' deficiencies, such as disinfection capabilities, which need to meet the Pennsylvania Department of Environmental Protection (PADEP) requirements. We evaluated alternatives, including the elimination of pre-chlorine; the use of chloramines; and the use of alternate oxidants and disinfectants, specifically ozone and ultraviolet light. The use of ozone and ultraviolet light to reduce the in-plant and distribution system formation of disinfection byproducts was monitored for compliance with the PADEP Stage 2 Disinfectants and Disinfection Byproducts Rule. Additionally, our firm evaluated the process filters, wastewater system, and associated deficiencies.

Figure 1: Gannett Fleming conducted a complete evaluation of the existing 60 mgd Hays Mine WTP.

Our firm conducted workshop discussions with PAW during the study, discussing alternatives and developing a final improvements approach in support of PAW's capital improvement plan.

Based on the recommendations of the study, Gannett Fleming providing engineering services, as well as supplemental response and supporting documentation, for replacement facilities, including two clearwater storage tanks, a pump station, electrical switchgear, and standby generation facilities.

2.2. Cabin Creek Water Treatment Plant Evaluation and Design, Red Lion, Pennsylvania

Completion Date: 2010

Reference: Keith Kahwajy
Red Lion Municipal Authority
11 East Broadway, P.O. Box 190,
Red Lion, PA 17356
717-224-3475
kkahwajy@redlionpa.org

Key Team Members:

J. Raffensperger – Project Principal
J. Shambaugh – Project Manager (evaluation)/Project Engineer (design)
T. Glessner – Quality Assurance/Quality Control
V. Cecka – Structural Project Manager
L. Kappen – Project Engineer

Gannett Fleming performed a two-phase assessment and evaluation of improvement alternatives, including evaluation of the feasibility and cost of constructing a new WTP, for the Red Lion Municipal Authority (the Authority). The Authority and the Pennsylvania Department of Environmental Protection (PADEP) identified several areas of concern related to the existing WTP process during their routine filter plant performance evaluation. The Authority contracted with our firm to complete engineering studies and develop recommendations to improve WTP operations.

During Phase 1 of the Study, our firm conducted a process evaluation and identified necessary improvements and/or improvement alternatives for discussion with the Authority and potential further evaluation. The system evaluation addressed process equipment condition, including upgrades required and opportunities for improved operations and reduced costs; WTP operations, including filter operations, chemical systems, and disinfection; and process wastewater and residuals handling evaluation. The Phase 1 evaluation included data analysis, a plant visit/assessment by water process personnel to identify and recommend improvements to address existing treatment process operations and performance issues, and development of a list of potential capital and/or operational improvements for discussion with the Authority.

Phase 2 of the Study involved further development and evaluation of improvement alternatives, including development of conceptual site plans and facility layouts, as well as opinions of capital and operating cost. The Phase 2 analysis, including a summary of risks/benefits and advantages/disadvantages provided the necessary documentation to support informed decision-making by the Authority.

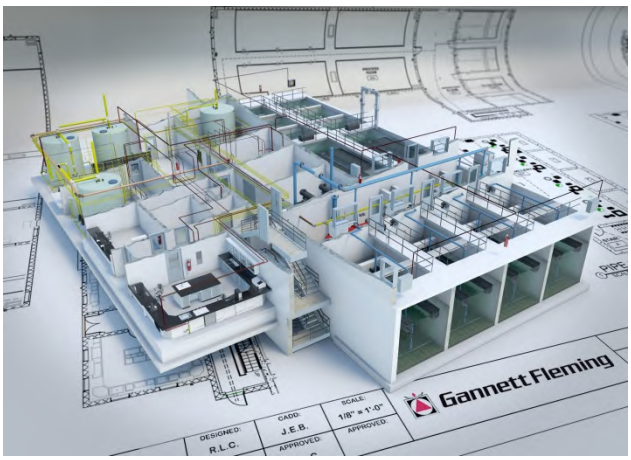


Figure 2: Gannett Fleming used Revit Building Information Model (BIM) software to design the Cabin Creek WTP, which enabled project stakeholders to see the facility constructed through a 3-D computer model during the design phase, before construction began.

Following the Authority's decision to construct a new WTP, reuse certain existing facilities, and repurpose the existing WTP for process wastewater and residuals handling, our firm completed, as part of the development of a basis of design document, a process selection study. The process selection portions of the Study included site selection evaluation and evaluation of alternative clarification and filtration processes (including granular media or membrane filtration), as well as an assessment and recommendations related to chemicals and chemical forms. Our firm also performed an evaluation of alternatives for process wastewater and residuals handling. Following completion of these study efforts, our firm completed design and permitting of the new 4 mgd WTP and associated facilities.

2.3. Hanover Water Treatment Plant Evaluation, Hanover, Pennsylvania

Completion Date: 2013
Reference: Terry Sterner
Borough of Hanover
44 Frederick Street, Hanover, PA 17331
717-637-3877
tsterner@borough.hanover.pa.us

Key Team Members:

J. Raffensperger – Project Principal
J. Shambaugh – Project Manager
V. Cecka – Structural Project Manager
L. Kappen – Project Engineer

Gannett Fleming conducted an evaluation of the Hanover WTP, which treats raw water from the South Branch of Conewago Creek and Slagle Run. Original facilities were constructed in the 1930's, with renovations and additions in 1946, 1986, and the 1990's. The 11.6 mgd WTP includes two conventional clarification-filtration process trains, referred to by the Borough as the "Old Plant," with seven mono media sand filters, and the "New Plant (1960's)," with four dual media sand and anthracite filters.

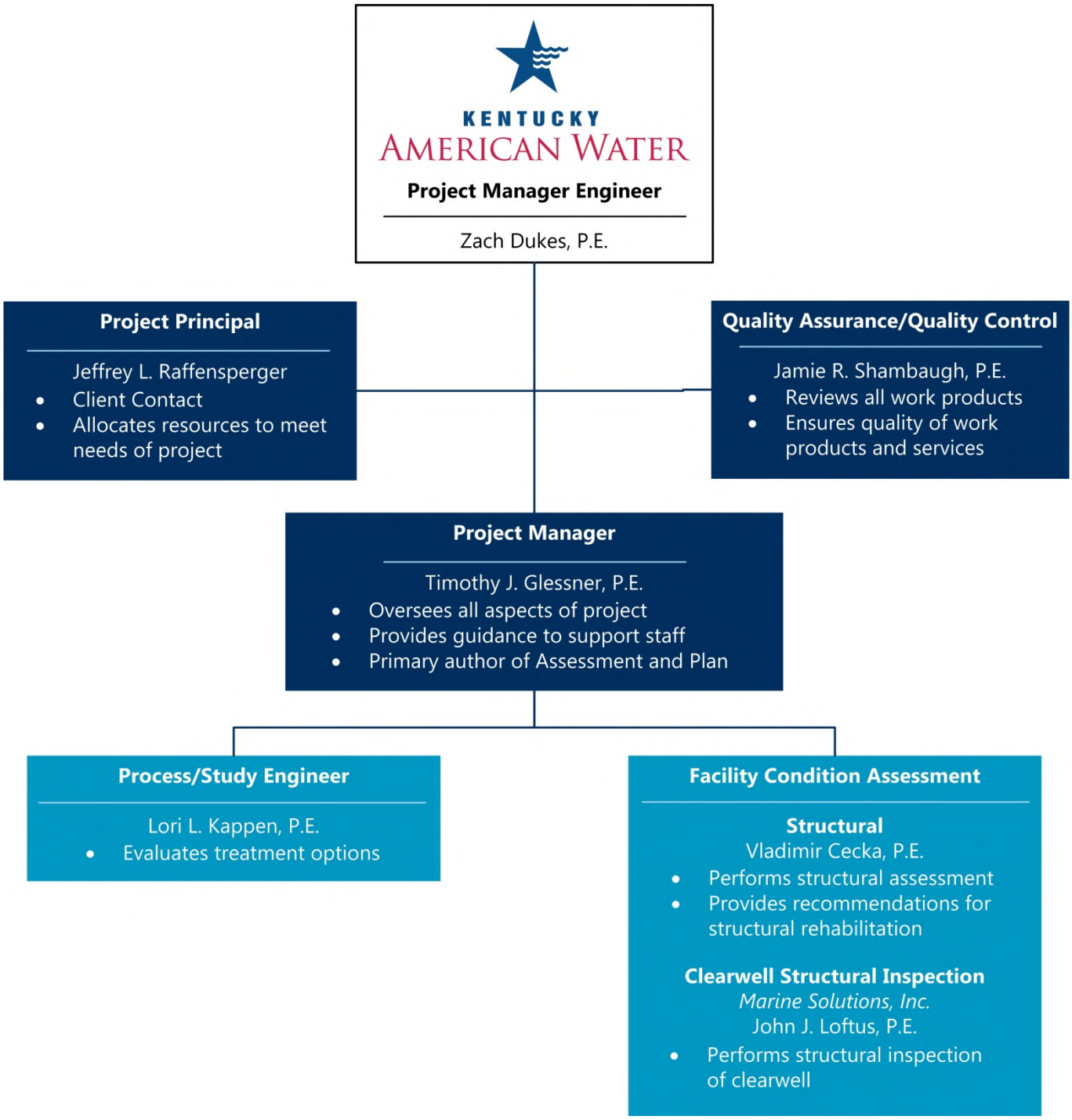
Gannett Fleming performed a detailed inspection, process evaluation, and selection of recommended improvements to the plant to establish a comprehensive improvement plan. Filter evaluations were a primary component of the inspection and process evaluation. All of the filters are operated and controlled using hydraulic control valves that are lever-actuated at individual control consoles. Filter controls are leaking and unreliable. The filters are equipped with Wheeler-style underdrains, and only the four new filters have surface wash equipment. The "Old Plant" filters were observed to have severe mudball accumulation, poor backwash water distribution, uneven support gravel distribution, inadequate depth, and other deficiencies. Although the "New Plant" dual media filters produce better filter effluent quality than the "Old Filters," poor backwash water flow distribution, a disturbed gravel layer, mudball accumulation, media loss, and other deficiencies were observed.

Gannett Fleming developed a filter rehabilitation plan for both filter process trains. The rehabilitation and improvement plan, including rebuilding each filter using Wheeler inserts with porous plate to improve flow distribution and gain additional filter box depth by eliminating the need for support gravel, installation of air scour equipment, new sand and anthracite media, raising backwash water troughs, new filter control valves, and a new filter control system, among other improvements.

3. Project Team

As demonstrated in the projects listed above, the members of the proposed Project Team routinely work together on water treatment plant evaluation and design projects. The experience and knowledge gained on past projects will enable them to provide the best solution for the Kentucky American Water Company (KAW) in a cost-effective and timely manner. Exhibit 1 presents the organizational structure of our Team and the roles each member will serve. Resumes are presented at the end of this Proposal document.

Exhibit 1: Project Team Organizational Chart



Marine Solutions, Inc. (MSI) has been added to the Team to provide structural inspection of the clearwell. MSI is a woman-owned, Disadvantaged Business Enterprise (DBE) located in Nicholasville, KY which specializes in marine engineering, underwater bridge inspection, marine construction, and commercial diving. The firm's combination of marine engineering and construction experience provides clients with high-quality, innovative solutions.

4. Project Approach

4.1. Project Understanding

KAW operates a 25 mgd rated filter building at the Richmond Road Water Treatment Plant (RRWTP). The filter building dates to the original construction of a 600,000 gallon clearwell and two filters in the 1920's through three expansions, adding 14 additional filters through the mid 1950's. Filters 11 through 20 are built on top of the clearwell, while Filters 21 through 26 do not have clear water storage below the filters.

The filter boxes are typical of early 1900's construction and suffer from shallow depth, which restricts full media expansion and carryover of media into the washwater troughs. Filters 11 through 20 are shallower than the six newest filters, and, due to their shallow depth, do not achieve re-stratification through the backwash period. The filter gallery is narrow and includes the settled water influent, filtered effluent in the newer filters, washwater supply main, air wash main, and drain, all in a cross-sectional area approximately 13.5 feet wide by 14 feet deep. Modern filters, constructed from the 1970's through present day, usually have galleries that are a minimum of 20 feet wide by 20 feet deep with the drain and filter effluent mains buried below the gallery slab, permitting full accessibility to piping, valves, and equipment, such as the WTP built at the Kentucky River Station II WTP at Hardin's Landing.

Because of the restricted access in the filter gallery, the ability of maintenance access is severely hampered, and there is no room to include ventilation and dehumidification equipment to keep the gallery dry and protected from corrosion.

During our pre-proposal visit, Vladimir Cecka, our structural engineer, viewed the foundation structure, except for the clearwell. The structure appears in good condition, with little cracks and leakage through the filter walls into the galleries.

During our pre-proposal visit, Vladimir Cecka, our structural engineer, viewed the foundation structure, except for the clearwell. The structure appears in good condition, with little cracks and leakage through the filter walls into the galleries. The gallery support beams appeared in good condition with some exposure of the steel support beams. The steel beams had a reinforced concrete cover coating that was deteriorated, but could easily be repaired for future service life. The filter box concrete exposed above the water line appeared to be in good condition, with the filter operating floor only showing perpendicular cracks at the expansion joints between sets of filter boxes.

Filtered water flows into the existing 600,000-gallon clearwell from the 16 filters. There is no way to bypass this filter building clearwell to direct filtered water directly to a second clearwell located adjacent to the high service station. If the filter building clearwell is to be saved, a structural condition assessment must be completed on the clearwell to determine condition and whether it can be re-conditioned for use for another 50 years of service life. If the clearwell can be saved, any new filter construction must account for the option to bypass this 80-year-old clearwell for future maintenance and cleaning.

We will conduct a structural inspection of the existing filter building clearwell using MSI. MSI should be very familiar to KAW and are unique in their ability to form dive teams consisting of professional structural engineers. Section 3. Project Team, further elaborates on the qualifications of MSI to deliver a high level condition assessment of the clearwell structure. If the result of the dive inspection is not conclusive, we can offer destructive

testing of the clearwell structure by coring the walls and ceiling to verify condition. If the structural drawings of the 1920's construction of the clearwell are not available, ground penetrating radar can be used to verify concrete thickness and to establish the steel reinforcement patterns in the concrete structure.

If the structural drawings of the 1920's construction of the clearwell are not available, ground penetrating radar can be used to verify concrete thickness and to establish the steel reinforcement patterns in the concrete structure.

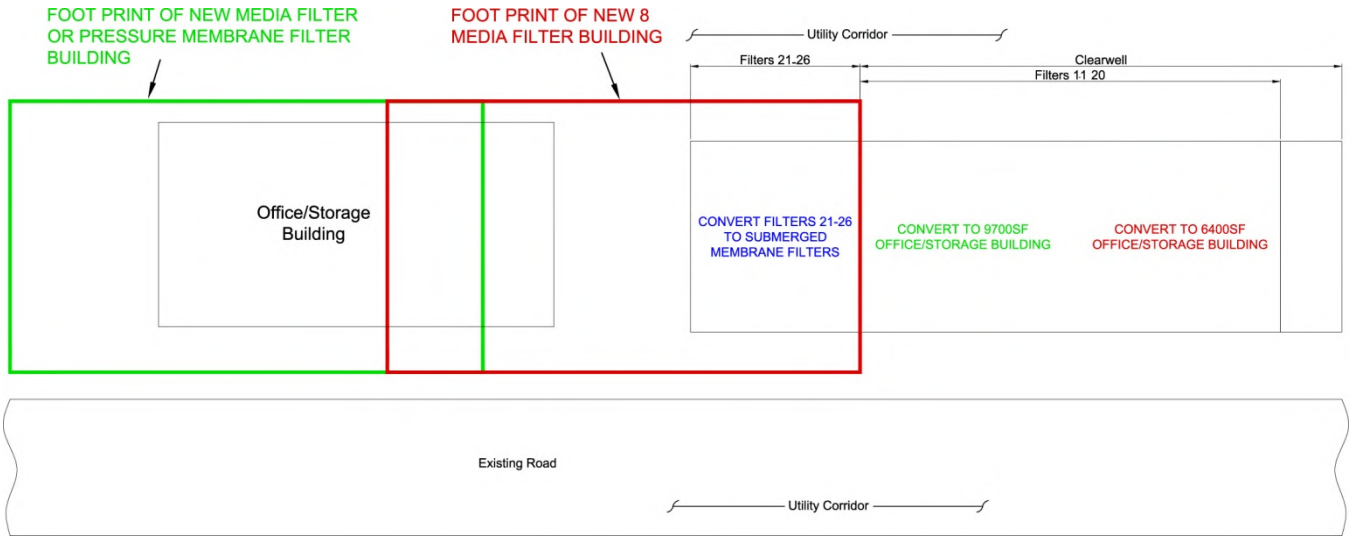
During the pre-proposal meeting visit to the filter building as well as analysis of the filter building drawings, multiple conclusions were easily reached:

- Space for construction of new filters around the existing filter building is restricted by a large amount of underground utilities on three sides of the building. Space may be available adjacent to Filters 25 and 26 between the neighboring office/storage building. Alternatively, the adjacent office/storage building could be abandoned and a new filter building could be constructed on its footprint.
- The filter gallery has insufficient cross-sectional area to be utilized as a modern filter gallery to serve new gravity media filters.
- The existing filter boxes are of insufficient depth to be used for new modern media filters. It may be possible to increase the depth of the filters by raising the filters walls, however, the filter gallery is too narrow for continued use. From visual observation, it appears that sufficient hydraulic head is available from the sedimentation basins to the water surface in the filters to easily raise the filters by 3 feet.
- The existing filters could be retro-fitted with submerged membranes only if the filter walls can be raised by approximately 4 feet, however, the existing structures may not withstand this additional water depth load. This would only apply to converting the newer Filters 21 through 26 without clearwell below, however, sufficient area is likely available to equip the area with up to 25 mgd of micro-filtration/ultra-filtration (MF/UF) membranes.

Our approach to the evaluation of the filter building replacement and possible existing clearwell abandonment will be outlined in our study of multiple approaches to provide new filtration capacity at this facility. Several of these possible approaches include:

- **Construct New Conventional Media or Membrane Filter Building on the Footprint of the Existing Adjacent Office/Storage Building** – If the existing filter building clearwell cannot be salvaged, a new clearwell could be constructed under a new filter building. Alternatively, when the new filter building is placed into service, a new clearwell could be constructed on the footprint of the existing filter building.
- **Construction of a New Conventional Media Filter Building** – KAW production staff stated that only 12 mgd of filtration capacity must be maintained through the construction period of adding new filters. Filters 11 through 20 provide this capacity. Filters 21 through 26 could be demolished, and six to eight new filters could be constructed on their extended footprint, offering up to 3.25 mgd capacity in each filter, or 25 mgd total capacity, while accounting for filters being out for backwash. We recognize the footprint of this filter building would be wider and longer than the footprint of existing Filters 21 through 26 but would evaluate the available space after receiving record site piping drawings from KAW.
- **Construct a New Membrane Filter Building** – Similar to the media filter building in the second bullet above, a pressure membrane filter building could be built on the available footprint after demolition of Filters 21 through 26. Chemical and air burst support equipment could be constructed in the existing Filters 11 through 20, but more likely in a new support building on the footprint of the adjacent office/storage building.

Exhibit 2: Existing and New Filter Building Site Plan



- **Construct a Submerged Membrane Filter Building** – As discussed above, existing Filters 21 through 26 could be modified to accommodate submerged membrane cells. At the Forest Park WTP, we converted a 20 mgd filter building into a 40 mgd submerged membrane filter building for the approximate same cost to construct a new 20 mgd filter building to supplement the existing 20 mgd filter building. The Forest Park WTP project continues to be the largest submerged membrane plant on the East Coast. A support chemical and air burst building could be constructed on the footprint of the existing office/storage building. New offices and storage could be constructed on the footprint of existing Filters 11 through 20.
- **Construct a New Filter Building Remote from the Existing Filter Building Site Not Yet Identified** – This option will be evaluated but likely quickly dismissed.

With all options, new clearwell capacity will be considered if the existing filter building clearwell cannot be salvaged. In any scenario, the existing filter building clearwell must be piped to allow bypass for future maintenance and cleaning.

Exhibit 2 illustrates some of the potential options to replace the existing filter building with new filters.

4.2. Approach

Our approach to the study will take the form requested in the Request for Proposal and further clarified below.

Task 1 – Facility Description

We will collect available information on the existing filter building and clearwell, including available utility information surrounding the structure. Information on the existing office/storage building and discussions with KAW staff on the uses of the building will assist in formulation of a plan to replace or save the structure as it relates to its use as a site for a new filter building. We will also collect information on the settling basins and connectivity with the existing filter building, as necessary, to determine whether the hydraulic grade line through the existing filters can be raised in the new filter building or retrofitted existing filters.

We will discuss with KAW engineering and operations staff their preferences related to filter design and support facilities, such as air scour blowers, granular activated carbon (GAC), or anthracite filter media, as it relates to the treatment

goals of the existing WTP and desired office and storage space, particularly in light of the potential loss of the office/storage building adjacent to the existing filter building and other factors impacting the design of the new filter building

Task 2 – Design/Alternatives Considerations

We have outlined above the alternatives that we will evaluate for the new filter building, all impacted by the condition assessment of the existing filter building clearwell and summarized below.

- **New Media Filters** – Evaluate high rate mixed media filters with anthracite and GAC media caps located on sites outside the footprint of the existing filter building or on the footprint of existing Filters 21 through 26.
- **New Membrane Filters: Submerged or Pressure Membrane Technology** – Submerged membrane technology is only economical if constructed within the footprint of existing Filters 21 through 26. A pressure filter building can be constructed on an adjacent site.
- **Clearwell Capacity** – Assuming the plant currently has disinfection capacity to meet the requirements of 1-log of CT credit post disinfection or is permitted to take credit for disinfection in the pre-treatment process, we will evaluate clearwell construction if the existing filter building clearwell cannot be maintained in service beyond the period of constructing a new filter building. Additional clearwell capacity will be considered, if there is insufficient post disinfection capacity, to allow flexibility in the plant treatment approaches to allow termination of chlorine residual being carried through the pre-treatment process. This was achieved recently for PAW at their 60 mgd Hays Mine WTP.
- Facilities to support either the media or membrane filter buildings will be assessed, including air scour for the media filters, backwash capacity and waste hydraulics for larger filters, and a support chemical/air burst building for the membrane filters.
- Sustainable design will be considered for the new filter building with consideration of future expansion and connectivity to existing standby power generation and interconnection with the existing supervisory control and data acquisition (SCADA) system.

Task 3 – Project Description and Opinion of Cost Estimating

Upon completion of the alternatives assessment and agreement by KAW on the viable alternatives to be considered, we will prepare opinions of construction cost for each remaining option. If membrane filters are still under consideration, life cycle cost analysis will be performed due to the high cost of membrane replacement on a 7- to 10-year cycle. In addition to membrane replacement, the cost of membrane cleaning chemicals will be compared to the high volume of backwash water, which must be processed for conventional media filters.

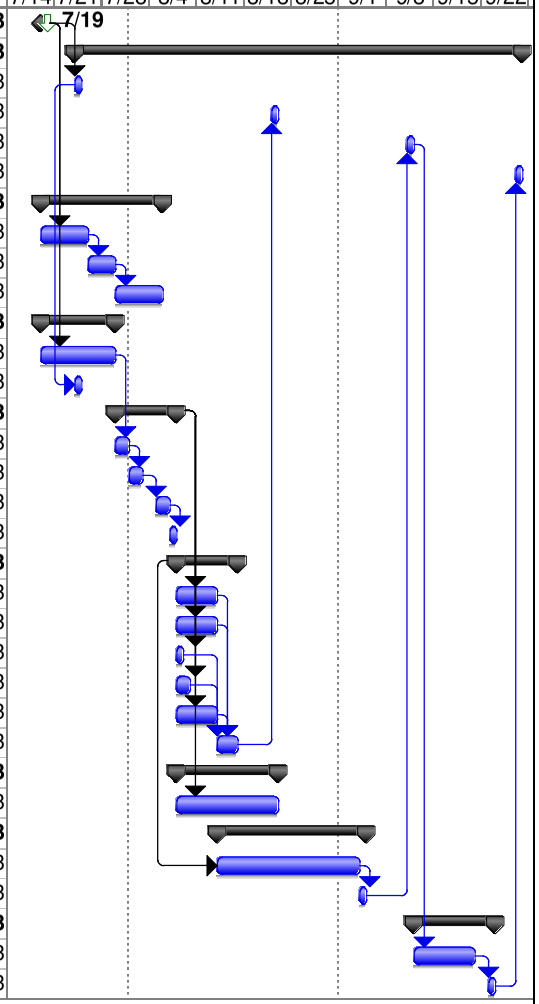
A preferred new filter process will be recommended to KAW, and a schedule will be developed for implementation of the preferred approach for use during the design and construction of the new filter building.

5. Project Schedule

Kentucky American Water has identified a two-month and one-week schedule (70 calendar days) for completion of this new filter building study. The schedule is aggressive but achievable, if the start of the project rapidly proceeds from kickoff to plant data analysis. It will be important for the timing of the project that plant records and drawings are provided to Gannett Fleming during the first week of the project schedule after the Notice to Proceed is issued. The second critical path task is to analyze the existing clearwell condition in the first two weeks of the schedule to verify that the clearwell will be available for operation in the long-term planning of the Richmond Road WTP. Coordination of the interior inspection of the clearwell will begin immediately upon issuance of the Notice to Proceed.

Gannett Fleming will pre-plan some of our initial activities to assure a fast start of the project schedule.

ID	Task Name	Duration	Start	Finish
1	**KAW Notice to Proceed**	**0 days**	**Fri 7/19/13**	**Fri 7/19/13**
2	**Meetings**	**48 days**	**Wed 7/24/13**	**Fri 9/27/13**
3	Kick Off and Facility Review Meeting	1 day	Wed 7/24/13	Wed 7/24/13
4	Monthly August Meeting and BOD Review	1 day	Thu 8/22/13	Thu 8/22/13
5	Draft Report Review Meeting	1 day	Wed 9/11/13	Wed 9/11/13
6	Final Draft Report Review Meeting	1 day	Fri 9/27/13	Fri 9/27/13
7	**Structure Inventory and Condition Assessment Investigation**	**12 days**	**Fri 7/19/13**	**Mon 8/5/13**
8	Pre-planning for Clearwell Structural Inspection	5 days	Fri 7/19/13	Thu 7/25/13
9	Clearwell Entry and Inspection	2 days	Fri 7/26/13	Mon 7/29/13
10	Clearwell Condition Assessment Memorandum Preparation	5 days	Tue 7/30/13	Mon 8/5/13
11	**Data Collection on Existing Filter Building and Associated Facilities**	**7 days**	**Fri 7/19/13**	**Mon 7/29/13**
12	Plant Record Data Collection	7 days	Fri 7/19/13	Mon 7/29/13
13	Discussion with Plant Staff and Engineering Team	1 day	Wed 7/24/13	Wed 7/24/13
14	**Alternatives Analysis**	**7 days**	**Tue 7/30/13**	**Wed 8/7/13**
15	Hydraulic Analysis	2 days	Tue 7/30/13	Wed 7/31/13
16	Alternatives Identification	2 days	Thu 8/1/13	Fri 8/2/13
17	Alternatives Screening	2 days	Mon 8/5/13	Tue 8/6/13
18	Short List Alternatives	1 day	Wed 8/7/13	Wed 8/7/13
19	**Performance Requirements (Basis Of Design)**	**7 days**	**Thu 8/8/13**	**Fri 8/16/13**
20	Conventional High Rate Mixed Media Alternatives	4 days	Thu 8/8/13	Tue 8/13/13
21	Submerged and Pressure Membranes	4 days	Thu 8/8/13	Tue 8/13/13
22	Anthracite/GAC Filter Caps	1 day	Thu 8/8/13	Thu 8/8/13
23	Backwash Options	2 days	Thu 8/8/13	Fri 8/9/13
24	Support Facilities Locations and Design Criteria	4 days	Thu 8/8/13	Tue 8/13/13
25	Prepare Memorandum for Review by KAW	3 days	Wed 8/14/13	Fri 8/16/13
26	**Facility Opinion of Cost**	**11 days**	**Thu 8/8/13**	**Thu 8/22/13**
27	Estimate Costs for Shortlisted Alternatives	11 days	Thu 8/8/13	Thu 8/22/13
28	**Draft Report Preparation**	**16 days**	**Wed 8/14/13**	**Wed 9/4/13**
29	Develop Report from Alternatives Analysis, BOD, Estimates	15 days	Wed 8/14/13	Tue 9/3/13
30	Send Draft Report to KAW for Review	1 day	Wed 9/4/13	Wed 9/4/13
31	**Final Draft Report Preparation**	**8 days**	**Thu 9/12/13**	**Mon 9/23/13**
32	Modify Draft Report Based on Review Comments by KAW	7 days	Thu 9/12/13	Fri 9/20/13
33	Send Final Draft to KAW for Review	1 day	Mon 9/23/13	Mon 9/23/13



Project: Study Schedule
Date: Fri 6/28/13

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

6. Fee Proposal

Our Fee Proposal is being offered as lump sum in accordance with the requirements of the Request for Proposal, however, we have broken down the fee in the following schedule in order for KAW to understand how we have allocated effort to address the scope of the project.

Exhibit 3: Fee Proposal

Work Task Description	Fee
Project Management and Meetings	$11,100
Clearwell Inspection and Report	$7,900
Data Collection and Alternatives Screening	$5300
Performance Requirements of Alternatives	$16,400
Alternatives Opinion of Costs	$10,500
Draft and Final Reports	$8,100
Total Lump Sum Fee	**$59,300**

Resumes

Gannett Fleming

*Excellence Delivered **As Promised***

Kentucky American Water

New Filter Building Richmond Road Station Water Treatment Plant

Project Assignment: Project Principal

Years Experience with Current Firm: 38

Years Experience with Other Firms: 0

Education:

B.S., Engineering Science, University of Virginia, 1976

Current Responsibilities:

Vice President/Central Pennsylvania Practice Leader for the Water and Wastewater Practice responsible for directing 55 technical support staff personnel, including office managers, project managers, project engineers, CAD technicians, and administrative support staff. Serves as the client contact for American Water master engineering services. Areas of design management include the design and preparation of contract documents for water supply projects and water supply permit applications. Detailed work groups provide the design of water and wastewater treatment plants (WTP and WWTP), well pumping stations, booster pumping stations, water transmission and distribution mains, raw water intakes, storage reservoirs, covering and lining for existing open reservoirs, expansion and upgrading of WTPs and WWTPs, and supervisory control and data acquisition (SCADA) systems from the plant design to distribution system control.

Summary of Experience:

Hays Mine WTP Evaluation and Improvements, Pittsburgh, PA, *Pennsylvania American Water.* Project Principal responsible for project oversight of new 4 Mgal clearwell tanks and a 60 mgd high-service pump station.

Water Treatment Plant Assessment, Red Lion, PA, *Red Lion Municipal Authority*. Project Principal for this project which involved the evaluation of the condition and performance of the Cabin Creek WTP and development of a recommended action plan to address plant deficiencies, improve plant effluent quality, and address multiple regulatory compliance issues. The WTP has a capacity of 3.5 mgd and includes a pretreatment facility, Superpulsator clarifiers, and Greenleaf filters. Work included inspection of WTP facilities, water quality evaluation, assessment of equipment capacity, and development of conceptual designs and opinions of probable cost for multiple improvement options.

Jacobson Reservoir Pump Station (JRPS) Design-Build Improvements, Lexington, KY, *Kentucky American Water.* Project Principal overseeing the design of pump station improvements including replacement of two existing 100 hp electric-motor-driven and one 400 hp electric/diesel-driven pump with three new 250 hp variable-frequency drive pumps; replacement of existing electrical gear; installation of a prefabricated building to house electrical gear; installation of a new standby generator; installation of a bulk-liquid-sodium permanganate feed system; and installation of a new SCADA programmable logic controller unit. The JRPS is used to transfer raw water from Jacobson Reservoir to the Richmond Road station for treatment. The pumping equipment, electrical systems, and permanganate feed system are worn and in need of replacement with new pumps and motors, electrical service rated at 480 volts, and a bulk-liquid-sodium permanganate system for application into the discharge lines of the pumping equipment.

Kentucky River Station II Water Treatment Plant at Hardin's Landing, Lexington, KY, *Kentucky American Water.* Project Manager responsible for client management and project oversight for the design of a new 20 mgd WTP expandable in 5 mgd modules to 30 mgd. The first 5 mgd expansion module was designed for bidding. Features of the WTP included raw water facilities with in-river Vee-Wire intake screens, raw water sump of a circular caisson construction, raw water pump station, potassium permanganate feed at the raw water station from a batched system from the WTP, and redundant, 5 kV electric service feeds. A raw water transmission line was installed along a bluff with up to a 40 percent slope founded on concrete piers. The WTP includes unit processes of rapid mixing, horizontal reel three-stage flocculation, plate settler clarification with sludge collectors driven with cable reels, mixed-media sand-anthracite dual-cell filters, and a two-cell clearwell; chemical feed systems, including bulk storage, day tank and feed systems

for two coagulant systems, fluoride, sodium thiosulfate, caustic soda, aqua ammonia, and corrosion inhibitor; a carbon bulk sack unloading system with volumetric feeder for powdered activated carbon; a potassium permanganate solution mixing system unloading from 330 drums; a chlorine system delivered in ton liquid cylinders with an emergency gas scrubber system; and a high-service and wash-water pumping station using 5 kV motors and 5 kV variable-frequency drive equipment. In addition, the WTP houses an administrative area; chemical and bacteriological laboratories; a fully automated plant SCADA system allowing unmanned plant operation; and 5 kV electric service switchgear with low-voltage 480/277/208/120-V sub fed systems. An extensive process-wastewater-handling system was provided using two backwash-wastewater clarifiers, two sludge thickeners, five wastewater-pumping systems, and a sludge dewatering building designed by a subconsultant.

Fullerton Water Filtration Plant Study and Design, Baltimore, MD, *City of Baltimore Department of Public Works.* Technical Advisor responsible for review of this plant study, which started with an assortment of investigations into technical design issues, including raw water supply management, hydraulic model, distribution system impacts, treatment process alternatives, plant hydraulic configuration, initial site investigations, system integration needs, and residuals management alternatives. The investigations were formalized in technical memorandums and issued for review. Using the results, a final report was prepared to assist the City in planning and budgeting purposes. To assist in evaluating alternative treatment technologies, a pilot plant was designed, constructed, and tested for 1 year. Provided management of the pilot study, including developing experimental designs, selecting a contractor and managing the construction of the plant, performing bench-scale testing and pilot operations, developing technical memoranda, and attending project meetings. At the conclusion of the 1 year pilot test program, a concept design was developed for the recommended treatment plant alternative.

Water Treatment Plant Improvements, Easton, PA, *Easton Suburban Water Authority.* Project Principal responsible for project oversight and quality assurance/quality control reviews of four improvement components at the existing WTP, including the installation of membrane baffles in Clearwell Nos. 1, 2, and 3 to minimize short-circuiting and to improve detention at 16 mgd; modification of filter face piping to eliminate cross-connections; design of a containment dike for the alum bulk storage tanks; and design of a coagulant-aid feed system.

Forest Park Water Treatment Plant Expansion, Design, Bid, and Construction, Chalfont, PA, *Forest Park Water.* Project Manager responsible for design of the expansion of the WTP from a 20 mgd to a 40 mgd delivery capacity. Features of the expansion included conversion of the sand-anthracite gravity filters to microfiltration membrane units; auxiliary support facilities for the membrane units, including backwash pumps, air blowers, a compressed-air system, acid cleaning systems, a hypochlorite washing system, bisulfite and caustic soda neutralization systems, and an automated supervisory control and monitoring system; and hydraulic upgrades to the mixed-water system. The project also involved the addition of an on-site sodium hypochlorite generation system to replace a 1-ton container gas chlorine system; expansion of the air-preparation system for the ozone generators; five new granular activated carbon (GAC) contactors; and expansion of the raw water, GAC contactor transfer, and high-service pumping systems with 480- and 4,160-volt variable-frequency drive systems. Two process-wastewater equalization basins were converted to floating plate settlers and sludge collection systems; a third centrifuge was added for wastewater-sludge processing; dual 2,250-kilowatt diesel engine emergency power generators with load banks for testing were installed; and the plant SCADA process and monitoring control system was updated. The expansion was designed to maintain the operation of the gravity filters while converting adjacent filters to membrane units.

Kentucky American Water

New Filter Building Richmond Road Station Water Treatment Plant

Project Assignment: Quality Assurance/Quality Control

Years Experience with Current Firm: 14

Years Experience with Other Firms: 1

Education:

B.S., Environmental Engineering, Wilkes University, 1999

M.Eng., Environmental Engineering, The Pennsylvania State University, 2010

Professional Registrations:

P.E.: Pennsylvania - No. PE062924 (2004)

Maryland - No. 41775 (2012)

Florida - No. 75312 (2012)

First Aid: American Red Cross (2011)

Adult CPR/AED: American Red Cross (2011)

PADEP Class A Water System Operator Certification – No. 298087 (2013)

Professional Affiliations:

American Membrane Technology Association (AMTA)
American Water Works Association (AWWA)
Water Works Operators Association of Pennsylvania (WWOAP)

Current Responsibilities:

Manager - Water Process and Operations Group responsible for management of group providing technical studies, preliminary designs, treatability studies, water quality evaluations, pilot testing, regulatory compliance assessments, preparation of basis-of-design reports, selection of treatment processes, filter evaluations, plant optimization, and operating assistance and training. Assignments include planning, conceptual design, and final design of raw water intakes, pumping stations, treatment facilities, and transmission mains; pilot treatment studies; evaluation and analysis of existing treatment plants; development of treatment plant upgrade and expansion plans; and water treatment plant (WTP) rehabilitations.

Summary of Experience:

Cabin Creek Water Treatment Plant Assessment, Red Lion, PA, *Red Lion Municipal Authority.* Project Manager responsible for evaluation of the condition and performance of the Cabin Creek WTP and development of a recommended action plan to address plant deficiencies, improve plant effluent quality, and address multiple regulatory compliance issues. The WTP has a capacity of 3.5 mgd and includes a pretreatment facility, Superpulsator clarifiers, and Greenleaf filters. Work included inspection of WTP facilities, water quality evaluation, assessment of equipment capacity, and development of conceptual designs and opinions of probable cost for multiple improvement options.

Hays Mine Water Treatment Plant Evaluation, Pittsburgh, PA, *Pennsylvania American Water.* Project Manager responsible for an evaluation of the existing 60 mgd Hays Mine WTP, coordination of a multidiscipline inspection team, and development of recommended improvement alternatives, including opinions of probable project cost. Work involved a detailed evaluation of chemical disinfection capabilities and evaluation of alternatives to reduce in-plant and distribution system formation of disinfection byproducts to facilitate compliance with the U.S. Environmental Protection Agency's Stage 2 Disinfectants and Disinfection Byproducts Rule. Project deliverables included a comprehensive evaluation report, technical memoranda, facility improvement layouts, and a comprehensive production planning study report.

Hanover Water Treatment Plant Evaluation and Improvement Study, Hanover, PA, *Borough of Hanover.* Project Manager responsible for an evaluation of the 11.6 mgd Hanover Water Treatment Plant, which includes two conventional clarification-filtration process trains with seven mono media sand filters and four dual media sand and anthracite filters. Performed a detailed inspection, process evaluation, and selection of recommended improvements to the plant to establish a comprehensive improvement plan. Developed a filter rehabilitation plan for both filter process trains, which included rebuilding each filter using Wheeler inserts with porous plate to improve flow distribution and gain additional filter box depth by eliminating the need for support gravel, installation of air scour equipment, new sand and anthracite media, raising backwash water troughs, new filter control valves, and a new filter control system, among other improvements.

Membrane Filtration Water Treatment Plant Operating Report and Filter Plant Performance Evaluation Responses, McConnellsburg, PA, *McConnellsburg Borough Municipal Authority.* Senior Project Manager responsible for preparation of a membrane filtration plant operating report for compliance with the Pennsylvania Department of Environmental Protection (PADEP) Innovative Technology Permit requirements. Responsibilities also included assistance related to addressing the PADEP Filter Plant Performance Evaluation comments.

Water Treatment Plant Process and Site Selection Study, Bloomsburg, PA, *United Water Pennsylvania.* Senior Project Manager responsible for performing an engineering study for a new Bloomsburg WTP to replace the existing WTP, which has been flooded multiple times in recent years, resulting in service interruptions. The WTP is also approaching the end of its useful life and requires significant rehabilitation. The study provided technical and economic evaluation of process and site alternatives for replacing the existing WTP with a new WTP with an initial capacity of 4 mgd, expandable to 5 mgd, located above the 100-year-flood elevation. The use of a submerged vacuum-driven membrane treatment process located on a site adjacent to the existing WTP was recommended. The study included evaluation of alternatives to improve or replace the Fishing Creek raw water intake and pumping station and consideration of reuse and/or repurposing existing facilities to achieve economic efficiencies. In addition, the study included evaluating the feasibility of utilizing a 1 mgd package WTP to supply emergency minimum-day demands during a flood event as a short-term alternative to constructing a new WTP.

Water Treatment Plant Assessment and Evaluation of Improvement Alternatives, West Chester, PA, *Aqua Pennsylvania, Inc.* Project Manager responsible for an evaluation of the condition of the existing Fern Hill WTP facilities and development of recommended process modifications to return the plant to service as a fully automated facility with a 1 mgd firm capacity. Responsibilities included an inspection of the existing WTP facilities, evaluation of historical data, evaluation of recommended alternatives to provide a 1 mgd reliable capacity using either microfiltration membranes or improvements to the existing dissolved air floatation and granular media filtration equipment, development of WTP improvement layouts, preparation of an evaluation report, and development of opinions of probable cost for all alternatives.

Water Treatment Plant Evaluation and Improvements, Montgomery County, PA, *Aqua Pennsylvania, Inc.* Project Manager responsible for a multidiscipline evaluation of the Upper Merion WTP facilities and development of recommended improvements. The WTP is a direct filtration facility with a capacity of 15 mgd and treats raw water obtained from an abandoned quarry reservoir. Responsibilities included an inspection of the existing WTP facilities, evaluation of historical operating data, and evaluation of recommended improvements. Work also included evaluation of alternatives for improved management and treatment of source water algae and evaluation of alternatives to provide softening. The project culminated with the development of an assessment report and prioritized capital improvement project descriptions complete with opinions of probable cost.

Water Treatment Plant Process Evaluation, Genesee County, MI, *Genesee County Drain Commissioner - Division of Water and Waste Services.* Project Engineer responsible for evaluation of alternative filtration processes for a proposed 80 mgd regional WTP supplied by Lake Huron. Responsibilities included filtration process and cost comparisons in support of evaluation of water supply project alternatives.

Kentucky American Water

New Filter Building Richmond Road Station Water Treatment Plant

Project Assignment: Project Manager

Years Experience with Current Firm: 25

Years Experience with Other Firms: 5

Education:

B.S., Civil Engineering, The Pennsylvania State University, 1982

Professional Registrations:

P.E.: Pennsylvania - No. PE036621E (1987)

Missouri - No. 2006033967 (2006)

Maryland - No. 41749 (2012)

Professional Affiliations:

American Water Works Association

Current Responsibilities:

Principal Project Engineer in the Water Practice responsible for managing the Camp Hill office Water Design Group, as well as leading individual projects. Project responsibilities include developing detailed engineering plans and specifications for water supply projects, including water/wastewater treatment plants (WTP/WWTP), pump stations, and transmission mains. Performs hydraulic calculations, sizes chemical feed and other process equipment, and makes pump selections. Performs design coordination with other design disciplines. Responsibilities also include conceptual and preliminary design, governmental permitting, engineering cost estimates, shop drawing review, preparation of operations and maintenance (O&M) manuals, and operator training.

Summary of Experience:

Reliability Improvements at Kentucky River and Richmond Road Stations, Lexington, KY, *Kentucky American Water (KAW).* Project Manager for pumping upgrades to improve reliability at KAW's Kentucky River and Richmond Road WTPs. The project included replacement of six 12.5 mgd, 1,250 hp vertical turbine raw water pumps with larger 14.5 mgd units; a hydraulic model study of the existing intake to determine necessary modifications to eliminate cavitation and make certain that the higher-capacity pumps performed properly; replacement of two 15 mgd, 900 hp horizontal raw water transfer pumps with larger 18 mgd, 1,000 hp units; addition of a second electrical service for reliability (Kentucky River Station); and addition of a portable generator connection and transfer switch (Richmond Road Station). Responsibilities included hydraulic calculations; pump selection; coordination of design with structural and electrical disciplines; observation of hydraulic model testing for intake; preparation of bidding documents, including pre-purchased equipment contract for pumps; shop drawing review; and assistance with start-up and testing.

Cabin Creek Water Treatment Plant Design, Red Lion, PA, *Red Lion Municipal Water Authority.* Quality Control Manager responsible for technical review and verification of design documents for a 3.5 mgd WTP. The project included a new 3.5 mgd conventional WTP utilizing pre-chemical treatment, mechanical rapid mixing, flocculation, high-rate plate settlers, granular media filters, post-chemical treatment, and a new clearwell and high-service pumping station. The project also involved conversion of existing water treatment facilities for process wastewater treatment. Responsible for technical review and verification of client submittals in accordance with our firm's ISO 9001:2008 requirements at Basis of Design and at 30 percent, 60 percent, 90 percent, and 100 percent design. Reviewed documents for appropriateness of design approach, correct design calculations, completeness and correctness of drawings and specifications, clear and appropriate drawing presentation, and coordination with other design disciplines. Also reviewed and verified Pennsylvania Department of Environmental Protection permit submission.

Jacobson Reservoir Pump Station Improvements Design-Build, Lexington, KY, *KAW.* Project Manager responsible for replacement of three existing pumps with new more-efficient units, addition of a new electrical building, and replacement of an existing dry permanganate system with a liquid system at an existing pump station facility. The project includes replacement of two 100 hp constant-speed electric pumps and one 400 hp electric/diesel-driven pump with three new 250 hp pumps. One pump will be constant speed

and two pumps will be powered by variable-frequency drives (VFD). The new electrical building, which will house the new electrical switchgear and VFDs, is designed to provide adequate cooling to the VFDs with ventilation only, eliminating the need for air conditioning. The project also includes installation of a liquid chemical feed system designed to feed 40 percent sodium permanganate solution. The system includes an outdoor heated bulk-storage tank and a day tank and feed pumps inside the existing pump station building. Project requirements included development of a construction-sequencing plan that would allow the existing pump station to remain in service during construction. The project is being constructed using a design-build delivery. Responsible for oversight of civil and process design, hydraulic calculations and pump selection, basis-of-design development, coordination with other design disciplines, client communications, communications with the design-build contractor, responses to requests for information, permit applications, and attendance at regular design and construction meetings.

Blendville Water Treatment Plant Improvements and Expansion, Design-Build Delivery, Joplin, MO, *Missouri American Water.* Assistant Project Manager responsible for the design of improvements to a 16 mgd WTP that is being expanded to 21 mgd with an ultimate design capacity of 26 mgd. Features include a new chemical building to replace plant chemical systems with an on-site sodium hypochlorite generation system, powdered activated carbon in bulk sacks, bulk liquid lime, coagulant, fluoride and aqua ammonia, and polymer systems for filter aid and wastewater. The project also includes a new administrative building; rehabilitation of the existing filter control building that involves replacing filter valves and associated instruments; high-service pump replacement; high-service ventilation and lighting upgrades; new electric utility service, service switchgear, motor control centers, and standby power generation; and a new supervisory control and data acquisition (SCADA) instrumentation monitoring and control system. Features of the expansion include a new 5.5 mgd process building with rapid mixing to split raw water flow between the existing and new processes, vertical turbine dual-stage flocculation, clarification with plate settlers, and dual-media gravity filters; a new 27 mgd filtered water low-lift pump station with ultraviolet (UV) light disinfection; a new 1.0 Mgal aboveground clearwell; a process wastewater equalization basin and pump station; and a new off-site process wastewater lagoon. Special features include on-site hypochlorite generation facilities for primary disinfection (replacing a gas chlorine system) and a UV disinfection system to meet the U.S. Environmental Protection Agency's Long-Term 2 Surface Water Treatment disinfection standards.

Highland Avenue Water Treatment Plant Expansion and Improvements, Construction Management, At-Risk Delivery, Augusta, GA, *Augusta Utilities Department.* Project Engineer responsible for preliminary and final design of a new chemical/filter building, including seven deep-bed gravity filters; coagulant, corrosion inhibitor, polymer, potassium permanganate, and fluoride feed systems; and filter air-wash blowers. Also responsible for the design of modifications to existing sedimentation basins, including the replacement of flocculation equipment and the addition of plate settlers. Developed the hydraulic profile throughout the entire WTP. Performed hydraulic calculations and design of a new high-service/filter-backwash pump station utilizing vertical turbine can pumps. The station includes two filter-backwash pumps and four high-service pumps. Three of the high-service pumps use variable-frequency drives.

Water Treatment Plant Improvements, Easton, PA, *Easton Suburban Water Authority.* Project Engineer responsible for preliminary design, final design, and permitting of four improvement components at an existing WTP, including the installation of membrane baffles to Clearwell Nos. 1, 2, and 3 to minimize short-circuiting and to improve detention at 16 mgd; modification of filter rinse to eliminate cross-connection; design of a containment dike for the alum bulk storage tanks; and design of a coagulant-aid feed system.

Kentucky American Water

New Filter Building Richmond Road Station Water Treatment Plant

Project Assignment: Process/Study Engineer

Years Experience with Current Firm: 11

Years Experience with Other Firms: 0

Education:

B.S., Environmental Science, Albright College, 1997

M.S., Environmental Engineering, University of Cincinnati, 2003

Professional Registrations:

P.E.: Maryland – No. 30397 (2007)

Standard First Aid: American Red Cross (2012)

CPR/AED - Adult: American Red Cross (2012)

Professional Affiliations:

American Water Works Association (AWWA)

Current Responsibilities:

Senior Project Engineer and Project Manager responsible for water quality, regulatory, process, and economic assessments for potable drinking water treatment plants (WTPs). Specific responsibilities include conducting bench- and pilot-scale testing, evaluating process treatment options, and developing process and facility design criteria for drinking WTPs.

Summary of Experience:

Hays Mine Water Treatment Plant Evaluation, Pittsburgh, PA, *Pennsylvania American Water.* Project Manager and Project Engineer responsible for conducting a multidiscipline evaluation of the treatment process and facilities at the existing 60 mgd capacity Hays Mine WTP and developing a comprehensive recommendation for process improvements. Responsibilities included inspection of the existing facilities, analysis of the existing treatment process and treated water quality, development of alternative improvement concepts, conceptual process layouts, and opinions of probable cost; preparation of a detailed technical memorandum on existing disinfection processes, disinfection by-product formation, and alternative disinfection improvements; and completion of a preliminary basis of design report.

Hanover Water Treatment Plant Evaluation and Improvement Study, Hanover, PA, *Borough of Hanover.* Project Engineer responsible for an evaluation of the 11.6 mgd Hanover Water Treatment Plant, which includes two conventional clarification-filtration process trains with seven mono media sand filters and four dual media sand and anthracite filters. Performed a detailed inspection, process evaluation, and selection of recommended improvements to the plant to establish a comprehensive improvement plan. Developed a filter rehabilitation plan for both filter process trains, which included rebuilding each filter using Wheeler inserts with porous plate to improve flow distribution and gain additional filter box depth by eliminating the need for support gravel, installation of air scour equipment, new sand and anthracite media, raising backwash water troughs, new filter control valves, and a new filter control system, among other improvements.

Kentucky River Station II Water Treatment Plant at Hardin's Landing, Lexington, KY, *Kentucky American Water.* Process Specialist responsible for evaluating treatment process options and designing selected treatment processes for a new 20 mgd WTP, with an ultimate capacity of 30 mgd. Work included design of raw water intake screens, flocculation, plate setter clarification basins, and residuals-handling facilities, which involved design of two wastewater clarifiers, two sludge thickeners, and a wastewater pumping station.

Rock Run Water Treatment Plant Evaluation, Coatesville, PA, *Pennsylvania American Water.* Project Manager and Project Engineer responsible for evaluating treatment processes at the existing 5 mgd capacity WTP and evaluating improvement alternatives for WTP capacity expansion to 7 mgd and 10 mgd. Responsibilities included evaluation of existing pre-treatment, filtration, and waste-handling processes; cost analysis of chemical alternatives; capital cost evaluation of recommended treatment alternatives; and preparation of a basis of design report.

Fern Hill Water Treatment Plant Evaluation, West Chester, PA, *Aqua Pennsylvania, Inc.* Project Engineer responsible for conducting an evaluation of the condition of the existing Fern Hill WTP and developing recommendations to restore the WTP to

operating condition, with largely unmanned operation. The 1 mgd plant was originally constructed with dissolved air flotation (DAF), ozonation, and a granular media filtration treatment process; however, the plant had not been recently operated due to difficulty maintaining finished water quality. Work included an inspection of the existing facility, evaluation of historical water quality data, and assessment of alternative treatment processes for a 1 mgd reliable treatment capacity, including improvements to the existing DAF and granular media processes or membrane filtration. Treatment process evaluation included consideration of operation labor requirements, treatment reliability, and capital and operating costs and development of preliminary layouts for plant improvements.

Upper Merion Water Treatment Plant Evaluation, Upper Merion Township, Montgomery County, PA, *Aqua Pennsylvania, Inc.* Project Engineer responsible for a multidiscipline evaluation of the Upper Merion WTP facilities and development of recommended improvements. The plant is a direct-filtration facility with a capacity of 15 mgd and treats raw water obtained from an abandoned quarry reservoir. Responsibilities included an inspection of the existing facilities, evaluation of historical operating data, and assessment of recommended improvements. Work also included evaluation of alternatives for improved management and treatment of source-water algae and evaluation of alternatives to provide softening. The project culminated with the development of an assessment report and prioritized capital improvement project descriptions complete with opinions of probable cost.

E.H. Aldrich Water Treatment Plant Evaluation, Pittsburgh, PA, *Pennsylvania American Water.* Project Engineer responsible for evaluating disinfection practices at the existing 50 mgd E.H. Aldrich Station WTP and developing recommendations to minimize the formation of disinfection by-products during the treatment process. Also responsible for developing a test protocol for conducting jar testing to optimize cold water coagulation and developing a pilot-test protocol for testing tube settlers to enhance settling in existing clarifiers.

Crum Creek and Ridley Creek Water Treatment Plant Evaluations, Springfield and Media, PA, *Aqua Pennsylvania, Inc.* Project Manager responsible for a multidisciplinary evaluation of two WTPs. Work included field inspection of the WTPs; evaluation of the treatment process and identification of opportunities for improvement; coordination with electrical, mechanical, structural, architectural, and instrumentation disciplines; and preparation of capital improvement sheets for each recommended project, including a summary of the project and a preliminary opinion of probable cost.

Roaring Creek Water Treatment Plant Membrane Feasibility Study, Shamokin, PA, *Aqua Pennsylvania, Inc.* Process Specialist responsible for conducting a study on the economic viability of converting a conventional treatment process into a direct membrane filtration treatment process at an existing WTP. Responsibilities included evaluating raw, settled, and filter effluent water quality for the existing conventional treatment process; developing several alternative design concepts and preliminary WTP layouts for a pressure or vacuum membrane treatment process; and evaluating the probable construction and operating costs for the conventional and alternative membrane treatment processes.

Pennichuck Water Works Water Treatment Plant, Nashua, NH, *Pennichuck Water Works, Inc.* Process Specialist responsible for developing a replacement cost for an existing 35 mgd WTP in support of a Research Coordination Network Analysis valuation. Responsibilities included making a site visit to document existing facilities and equipment, obtaining replacement costs for equipment, and developing an opinion of probable cost for replacement of the water supply and treatment facilities, including on-site structures, pumping stations, treatment process units, and waste-handling facilities.

Kentucky American Water

New Filter Building Richmond Road Station Water Treatment Plant

Project Assignment: Structural

Years Experience with Current Firm: 23

Years Experience with Other Firms: 0

Education:

B.S., Civil Engineering, Structural Design, South Dakota School of Mines and Technology, 1987

Professional Registrations:

P.E.: Pennsylvania - No. PE045454E (1996)

Georgia - No. PE028290 (2002)

Missouri - No. 2006029697 (2006)

Kentucky - No. 25195 (2007)

Virginia - No. 0402046873 (2009)

Florida - No. 72544 (2011)

First Aid: American Red Cross (2011)

CPR/AED - Adult: American Red Cross (2011)

Professional Affiliations:

American Concrete Institute

National Council of Examiners for Engineering and Surveying

Current Responsibilities:

Structural Project Manager experienced in the inspection, design, and rehabilitation of commercial and industrial buildings, water and wastewater treatment facilities, and maintenance facilities for bus and rail systems. Responsibilities include project management, design development, contract document production, discipline coordination, and in-house construction-phase supervision for structural projects.

Summary of Experience:

Kentucky River Station II Water Treatment Plant (WTP) at Hardin's Landing, Lexington, KY, *Kentucky American Water (KAW).* Structural Project Manager responsible for designing a 25 mgd WTP, intake foundation, and raw water pump station.

Reliability Improvements at Kentucky River and Richmond Road Stations, Lexington, KY, *KAW.* Senior Structural Engineer for pumping upgrades to improve reliability at KAW's Kentucky River and Richmond Road water treatment plants. The project included inspection of existing steel framing, finite element vibration analysis, strengthening of existing connections, and new thrust restraints.

Hays Mine Water Treatment Plant, Pittsburgh, PA, *Pennsylvania American Water.* Structural Project Manager responsible for the design of a new chemical building, underground chambers, silo foundation, pedestrian bridge, and miscellaneous structural modifications to the existing structures.

Hopewell Water Treatment Plant, Hopewell, VA, *Virginia American Water.* Structural Engineer responsible for design of a new chemical building, filter building addition, new industrial filter building, office building addition, and modifications to existing buildings. Subsequently designed bearing and lateral masonry shear walls to resist wind and seismic loads. Also designed foundations to support large liquid storage tanks and aluminum and fiber-reinforced plastic platforms. Inspected existing sludge holding tanks and developed concrete repair details to extend service life of these tanks. Coordinated the development of the construction drawings and specifications and responded to applicable requests for information during construction.

Blendville Water Treatment Plant, Joplin, MO, *Missouri American Water/Reynolds, Inc.* Structural Discipline Manager responsible for the design, development of contract drawings, and construction-phase services of a 16 mgd WTP rehabilitation and two 5 mgd WTP expansions. The plant's capacity was expanded to 21.5 mgd. The two-phase assignment included rehabilitating the existing plant by replacing all chemical systems; rehabilitating filter valves; relocating operations facilities to a new administration building; installing a new filtered-water transfer pumping station; and adding ultraviolet disinfection, clearwell capacity, and high-service pump replacement.

Lebanon Water Treatment Plant Clearwell Addition, Lebanon, PA, *City of Lebanon Authority.* Structural Project Manager responsible for the design of a new 4 Mgal clearwell. Design also included new baffling and miscellaneous modifications inside of the existing clearwell and connections between new and existing clearwells.

Water Treatment Facility Improvements, Manassas, VA, *City of Manassas.* Structural Engineer for water treatment plant upgrades that include a new 10 mgd raw water pump, a new powdered activated carbon system, settling-basin improvements, filter-media replacements, new chemical storage and feed systems and modifications to existing systems, and other miscellaneous improvements.

McConnellsburg Water Treatment Plant, Franklin County, PA, *McConnellsburg Borough Municipal Authority.* Structural Project Manager responsible for the structural design of the process facilities of a WTP.

Chambersburg Water Treatment Plant Structural Repairs, Chambersburg, PA, *Borough of Chambersburg.* Structural Project Manager responsible for the investigation, design, and bid-phase services for structural repairs for the Julio D. Lecuona WTP. The walls were deteriorated due to water migrating from the inside tanks through the wall and then spalling the concrete due to freeze-thaw cycles.

Blendville Water Treatment Plant , Design-Build Delivery, Joplin, MO, *Missouri American Water.* Structural Project Manager responsible for renovations and upgrades to an existing WTP. The design included a new pump station, filters, flocculation basins, and chemical and administrations buildings.

Canal Road Water Treatment Plant Expansion, Design-Build Delivery, Elizabethtown, NJ, *New Jersey American Water.* Structural Discipline Manager responsible for the design of new 30 mgd flocculator/sedimentation basins and a new intermediate ozone contactor.

Potomac Water Filtration Plant Improvements, Potomac, MD, *Washington Suburban Sanitary Commission.* Structural Project Manager responsible for the design of new rapid-mix facilities, replacement and improvements to existing flocculation facilities, and modifications to existing and provision for new pretreatment chemical facilities. Improvements included increasing the plant capacity from approximately 235 mgd to 288 mgd.

Swimming River Water Treatment Plant, Monmouth, NJ, *New Jersey American Water.* Structural Discipline Manager responsible for designing ozone facilities and filter improvements for a 45 mgd WTP.

Northampton Water Treatment Plant, Northampton, PA, *Northampton Borough Municipal Authority.* Discipline Manager responsible for the design and coordination of a new 8 mgd WTP. Work included designing a clearwell/distributive pumping station and WTP building.

Surface Water Treatment Plant Clearwell Design Update, Fort Dix, NJ, *U.S. Army Corps of Engineers.* Structural Project Manager responsible for updating plans and specifications, originally prepared by our firm in 1998, for an addition to the clearwell at the surface WTP serving Fort Dix. The existing clearwell is undersized and does not provide proper chlorine contact time. The clearwell addition will increase capacity to 1 Mgal, which represents a doubling in size.

Appomattox Water Treatment Plant, Petersburg, VA, *Appomattox River Water Authority.* Structural Project Manager responsible for the design to expand an existing WTP from 46 mgd to 96 mgd. Work included addition of 16 filters, 6 sedimentation/flocculation basins, a rapid-mixer building, a raw water pumping station, a distributive pumping station, and modifications to the existing basins, including structural concrete repairs. Coordinated work with other disciplines.

Clarion Water Treatment Plant, Clarion, PA, *Pennsylvania American Water.* Structural Project Manager responsible for the design of a new 4 mgd WTP. Work included design of a raw water pumping station, a clearwell/distributive pumping station, and a treatment plant building. Coordinated project tasks with other disciplines.

Kentucky American Water

New Filter Building Richmond Road Station Water Treatment Plant

Project Assignment: Clearwell Structure Inspection

Years Experience with Current Firm: 9

Years Experience with Other Firms: 0

Education:

B.S., Civil Engineering, Marquette University, 2003

Professional Registrations:

P.E.: Kentucky, Ohio, Indiana, Wisconsin

Current Responsibilities:

Mr. Loftus is an experienced engineer and diver with over 9 years of engineering experience and 15 years of diving experience. He has worked as an engineer in both the private and public sector. He has performed several hundred bridge inspections both above and below water. He has been involved in bridge design and repair projects over the years.

Since 2008, Mr. Loftus has also been performing underwater sonar imaging on a variety of marine structures and bridges. Many of the structures he has imaged have been published in a variety of papers and an FHWA study. Mr. Loftus also has extensive experience with PONTIS data recording, hydrographic surveys and post-event structure inspections.

Summary of Experience:

Underwater Inspection and Scour Countermeasure Design, Statewide, *Kentucky Transportation Cabinet*. Project Manager responsible for performing the underwater inspection, sonar imaging, hydrographic survey, and scour analysis on various bridges throughout Kentucky. Some special inspections were done on an emergency basis due to record flooding in the state and a ship collision. Thirty four bridges were inspected on the contract, four Ohio River bridges, and three emergency inspections including the Eggnar's Ferry Bridge Collapse. Sonar imaging was performed on nine of the bridges; five of the bridges required scour analysis, and one bridge required a repair and scour countermeasure design.

Ironton-Russell Bridge Underwater Inspection, Ironton, OH, *Ohio Department of Transportation (DOT).* Project Manager responsible for performing a routine underwater inspection of the Ironton-Russell Bridge on the Ohio River. Produced an underwater inspection report with evaluations and repair recommendations.

Underwater Bridge Inspection, Statewide, IN, *Indiana DOT.* Team Leader/Engineer-Diver, responsible for conducting underwater inspection of approximately 100 bridges. Several inspections included sonar imaging of the bridge substructures. Reports were produced including an Underwater Inspection Condition Rating Form, a Daily Diving Report, photos and sketches indicating structural deficiencies, plots of the channel bottom profiles comparing the current and previous conditions.

Underwater Bridge Inspections, Statewide, *Illinois DOT.* Engineer-Diver/Sonar Operator responsible for performing routine underwater inspections and/or acoustic imaging for approximately 40 bridges throughout the state. Underwater imaging was done to supplement portions of the dive inspection and determine which bridges were candidates for future imaging.

Underwater Bridge Inspections, Statewide, ID, *Idaho Transportation Department.* Engineer-Diver/Sonar Operator, responsible for performing statewide underwater bridge inspections on approximately 40 bridges, including underwater sonar imaging on 6 of the bridges. The underwater sonar imaging was done as part of a study to determine where it may be used as a tool in the future to better evaluate certain bridges.

Gannett Fleming

*Excellence Delivered **As Promised***

Contact Information:

Jeffrey L. Raffensperger
207 Senate Avenue
Camp Hill, PA 17011
t: 717.763.7212 x2277
jraffensperger@gfnet.com

bell engineering

Statement of Qualifications

New Filter Building
Richmond Road Station
Water Treatment Plant

Kentucky American Water
Lexington, Kentucky

July 2, 2013

July 2, 2013

Mr. Zach Dukes
Project Manager Engineer
Kentucky American Water Company
2300 Richmond Road
Lexington, KY 40502

Re: Statement of Qualifications for Richmond Road Station New Filter Building Project

Dear Mr. Dukes,

With **nearly 100 years of experience** in the water and wastewater industry, Bell Engineering offers expertise in the **evaluation of water treatment needs** and **development of reliable yet innovative solutions**. We are pleased to submit our Statement of Qualifications for engineering services associated with the above referenced project.

Bell Engineering brings the following strengths to your project:

- **Ability to design and move projects quickly through Kentucky Division of Water approval process,**
- **Extensive familiarity with water treatment in Central Kentucky, including areas served with water from the Kentucky River,**
- **Utilize innovative technology including engineer for 50% of the membrane plants currently operating or being designed/constructed in Kentucky,**
- **Specialize in projects that require small footprints and working within existing site space,**
- **All team members, including subconsultants, are located in Lexington, KY providing 100% local employment,**
- **Years of experience including evaluation, design and construction of similar projects,**
- **Meeting schedules and cost effective design are top priorities.**

On behalf of Bell Engineering, we thank you for the opportunity to showcase our **experience and outline the strengths that our team has to offer**. We look forward to the opportunity to provide quality engineering services to Kentucky American Water Company on this and many future projects.

Sincerely,
Bell Engineering

David F. Schrader, P.E.
Principal-In-Charge/Project Manager

STATEMENT OF QUALIFICATIONS
Richmond Road Station New Filter Building Project

KENTUCKY AMERICAN WATER

TABLE OF CONTENTS

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

APPENDICES

STATEMENT OF QUALIFICATIONS
Richmond Road Station New Filter Building Project

KENTUCKY AMERICAN WATER

1.0 CONTACT INFORMATION

Firm Name:	Bell Engineering
Address:	2480 Fortune Drive, Suite 350, Lexington, KY 40509
Contact Person:	David F. Schrader, P.E.
Phone Number:	859/278-5412

2.0 FIRM'S CAPABILITIES

Bell Engineering's team has experience with the study, design and construction of various types of water treatment plants (WTP), both large and small. We have field-tested knowledge that allows for effective problem solving and accurate design on projects similar to the Kentucky American Water Company (KAW) Richmond Road Filter Building Project. The following section outlines three projects similar in scope and magnitude completed in the past three years in the Commonwealth of Kentucky.

2.1 SOMERSET WATER TREATMENT PLANT

First built on Lake Cumberland in the 1950's, the Somerset Water Treatment Plant has been expanded five times with all work taking place on the existing site. Bell Engineering has worked with the Somerset system for approximately 60 years and has completed all work on the WTP. The expansion currently under construction transitions the plant from a combined conventional/super pulsator filtration method to membrane filtration and brings the capacity to 16 mgd with the ability to easily upgrade to 20 mgd in the future. The membrane building also includes administration/office space.

The order of construction is crucial as the plant consistently operates 24 hours a day and there is no other source of water for customers. Additionally, on-site space is limited and half of the existing filters are being demolished to make room for new flocculation basins. To reduce the amount of backwash water discharged to Lake Cumberland and avoid regulatory constraints, recycling was designed and approved by Kentucky Division of Water (KY DOW). This process reuses some of the existing structures.

Because of the limited space, a Feasibility Study was performed to evaluate if expansion could occur on the existing site or if another plant site would be necessary. The feasibility study determined that it was possible to expand on the existing site if small footprint options were utilized. Three treatment options with a small footprint were evaluated in a preliminary engineering report, including membrane filtration.

After working closely with Somerset, membrane filtration was the selected treatment process. Bell worked with the KY DOW to formulate pilot testing criteria that would satisfy regulatory agencies. Three membrane manufacturers (GE, Siemans & Pall)

successfully piloted their membranes and were invited to submit proposals including information for life cycle cost analysis.

Bell reviewed the proposals and determined the ancillary requirements to make a complete system and associated costs. An overall life cycle cost was determined and a "cost-effectiveness matrix" was developed. The matrix took into account operability, reliability, environmental impact, constructability, flexibility and public perception. Somerset negotiated with the selected manufacturer, GE, and the final design was configured around the GE membrane.

Bell began working with the City to develop this project in 2006. This project was funded by a $20 million RD grant and loan package and is currently the largest American Recovery Reinvestment Act (ARRA) water project in the United States. The project was bid in August 2011 and construction began in November 2011.

2.2 DANVILLE WATER SYSTEM MASTER PLAN

Completed in 2010, Bell Engineering performed a detailed examination of the existing needs and proposed improvements for every aspect of the City of Danville water system from source to customer, including the WTP. Recommendations were outlined and provided to the City in the form of a Water System Master Plan.

The Danville Water Treatment Plant filters have much in common with the KAW Richmond Road Filter Building. Originally built in the early 1920's, the plant has been expanded four times and currently has a total of nine filters. Clearwells are located beneath the filters, and pipe corrosion and potential structural and mechanical failures are imminent. The plant was built on two levels, and proper flow splitting has been challenging.

Bell examined every aspect of the filters including operational procedures and a year's worth of SCADA results for all parameters monitored. Unit Filter Run Volumes (UFRV) were calculated for an extended period and media levels were examined. Core samples were taken, sieve analyses were conducted, filter backwashes were observed and air entrainment problems were investigated.

Bell concluded that all filters, except those built in 1966, should be abandoned and reused as an administration area. The new filters are to be in line with the 1966 filters. In addition to the new conventional filters, pilot testing was done for granular activated carbon (GAC) contactors to handle the high levels of haloacetic acids (HAA5) found in Herrington Lake, the raw water source. Preliminary design and probable construction costs for new filters and for the contactors were performed. A sequence of construction was developed to complete the project while maintaining maximum water production. Upon completion, the WTP will have a capacity of 12 mgd with one filter out of service.

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

2.3 BEREA WATER TREATMENT PLANT

The original Berea Water Treatment Plant was designed and built by Bell Engineering in the early 1990's when the water utility was owned by Berea College. The plant contained four steel Neptune Microfloc units providing combined clarification and filtration. When the current owner, the City of Berea, needed to upgrade the plant to improve TOC removals, Bell worked with the City to also design an expansion on the existing site to avoid future construction costs. Particular attention was given to making the structure accessible for school groups, including building the filters on grade and locating piping and valves away from walkways.

The final project, completed in 2010, included replacing the combination up-flow clarifier and filter units with dissolved air flotation (DAF) clarification and separate new granular media filters. The project also added a new concrete clearwell and chemical building, changed the sludge handling system from small lagoons to a geotextile bag system, provided a treatment-wide SCADA system and made various other additions and modifications that brought the existing facility up to current building codes.

The design required extensive filter work including replacing the four treatment units with five concrete filters. Order of construction was critical because the new filters were located in the same location as the existing filters. The new filters had to tie-in to the existing piping and the plant had to be kept in service.

Along with the new filters, the project also included the design of GAC contactors with piping connections and structural reinforcement included for future addition within the current building. An extended pilot study indicated that the contactors would reduce the HAA5 for an extended period. Since the expanded plant is easily meeting Stage 2 DBP regulations, there are no current plans to add the GAC contactors.

2.4 TEAM MEMBERS/ROLE

	Somerset WTP	Danville Master Plan	Berea WTP
David F. Schrader, P.E.	Project Manager/Engineer	Project Engineer	Project Engineer
Ronald C. McMaine, P.E.	Project Engineer	Project Manager/Engineer	Project Manager/Engineer
T. Michael Wilmoth, P.E.	Project Engineer	Project Engineer	Project Engineer
David E. Gerhart, P.E.	Project Engineer	Project Engineer	Project Engineer
R. Michael Williams, P.E., Ph.D.	Hydraulics	Hydraulics	Hydraulics
Tom A. Jones, CIPE/CPD	Plumbing	Plumbing	Plumbing
John D. Prince, P.E.	Mechanical Engineer	Mechanical Engineer	Mechanical Engineer
Brian D. Scott, P.E.	Structural Engineer	Structural Engineer	N/A
Ben L. Murphy, P.E.	Electrical Engineer	Electrical Engineer	N/A
Jason Ainslie, P.E.	Geotechnical Engineer	N/A	N/A

3.0 PROJECT TEAM

Richmond Road Station New Filter Building Project

Kentucky American Water

Bell Engineering

Subconsultants

Kentucky American Water
Zach Dukes, Project Manager

Principal-In-Charge/Project Manager
David F. Schrader, P.E.

bell engineering

Engineering Services
David F. Schrader, P.E.
Ronald C. McMaine, P.E.
T. Michael Wilmoth, P.E.
R. Michael Williams, P.E., Ph.D.
David E. Gerhart, P.E.

Operations
Ronald C. McMaine, P.E.
Harry Johnson
Robert Barrett

Structural Engineering
Brian D. Scott, P.E.
Poage Engineers

Electrical Engineering
Ben L. Murphy, P.E.
LoVo Systems, Inc.

Mechanical Engineering
John D. Prince, P.E.

Plumbing
Thomas A. Jones, CIPE/CPD

Geotechnical Engineering
Jason Ainslie, P.E.
LE Gregg Associates

4.0 PROJECT APPROACH

4.1 INTRODUCTION

Based on Bell Engineering's past experience and recent field investigations, the existing Richmond Road Filter Building has reached the end of its useful life. Considering the structural condition, maintenance difficulty, safety concerns, lack of redundancy and non-compliance with current building codes, salvaging the building for re-use is not a cost effective option. Replacing the building with another structure at a different location on-site is the only viable long-term option.

The proposed scope of work will allow Bell to quantify the problems with the existing filter building/clearwell and develop recommendations for rehabilitation/replacement. Recommendations will be based upon evaluation of alternative treatment methods, potential locations for a new structure, potential re-use of existing building and opinions of probable costs for the various alternatives.

In addition to determining treatment method and whether to rehabilitate or replace the structure, three other factors that must be considered are PSC approval, public perception and shareholder approval. As noted in the narrative on the Somerset, Kentucky WTP Project in Section 2.0, Bell will develop a cost effectiveness matrix to provide justification to key stakeholders.

4.2 KICK OFF

Per the Request for Proposal, several documents will be made available to the selected firm. Bell will review these materials in preparation for the kick off meeting. We would also like to assign one of our certified operators to spend time with KAW personnel during a shift to learn more about existing problems and KAW operational procedures. Bell will then work with KAW personnel to further define the project scope.

4.3 FACILITY DESCRIPTION

A Facility Description is defined as Task 1 in the scope of work. The Bell team, including civil, structural and electrical engineers and a Class IV Water Plant Operator, has made several visits to the facility. A detailed description will be developed for each discipline to be combined into the Facility Description including:

4.3.1 Civil Engineer/Operator

Bell's standard practice is to use AWWA publications as reference for filter evaluations in addition to checking for conformance with state requirements. Maintenance records will be reviewed (including costs), maintenance personnel will be interviewed and design criteria will be developed.

A diagnostic review will be conducted to ensure conformance with applicable design standards such as piping sizes, velocities, media depths, effective size, backwash rate and regulatory requirements. Preliminary review during site visits reflects the fact that, though the facility is in conformance with regulatory requirements, re-use of the existing filter building would require extensive improvements to bring the facility into conformance with today's design standards and building codes.

A timeline for the design and construction of a new facility will be developed based upon the diagnostic review and, as appropriate, short term improvements will be identified to keep the facility in service until the new facility is brought online. The final Facility Description will also include a detailed description and evaluation of the operations and procedures at the existing filter building.

4.3.2 Structural Engineer

The operating floor is in reasonably good shape with some de-lamination of the column base plates that needs to be addressed. The majority of the structural deficiencies can be seen in the pipe gallery. The structural members in this area have significant deterioration of the concrete with exposed and de-laminated reinforcing steel. The integrity and capacity of the structure in this area have been severely compromised.

Visual observations indicated that there has been some differential movement in the veneer. This could be due to inadequate anchorage of the support angle resulting from the improper installation of the anchor or deterioration of the base concrete material.

There is a significant amount of remedial work that will be required to address all of the structural concerns and, due to the limited access and existing conditions, performing the required remedial work while keeping the facility operational will be virtually impossible. Adaptive re-use of the building would be an option, but it would require significant demolition which would result in making the facility in-operable.

4.3.3 Electrical Engineer

The electrical components of the operating floor in the filter building were found to be in relatively good shape. Some corrosion was observed on metallic equipment such as struts and straps. The Roberts Filter consoles, while old with dated electrical devices and displays, were in good condition with only minimal problems such as expired pilot lights. It appeared that Bristol programmable logic controls had been retrofitted into the filter systems and this equipment was in good condition. The filter instrumentation was also in good condition with relatively new Hach 1720E turbidimeters and Endress Prosonic level transducers. Certain light switches and receptacles were found to be recessed into the walls due to a wall cladding installation which was not trimmed out properly and does not meet current building code. The lighting system on the operating

floor was T-12 fluorescent and in need of a full replacement. The emergency lighting system was not adequate to meet current building codes.

The conditions of the pipe gallery are unsafe and do not comply with the minimum provisions of the National Electrical Code. There is water on the floor underneath all of the electrical panels due to inadequate drainage in the gallery. Many of the electrical boxes are inaccessible or do not have the NEC-mandated working clearance necessary for safe maintenance. Significant corrosion has severely damaged much of the older electrical equipment. Some of the utilization equipment was either unlabeled or inadequately labeled. The lighting system in the pipe gallery was relatively new and in good condition with sealed T-8 fluorescent fixtures. However, it was unclear whether or not emergency lighting provisions were installed suitable to comply with the current Kentucky Building Code. Much of the original instrumentation in the pipe gallery had been replaced and was in relatively good condition.

4.4 DESIGN CONSIDERATIONS

Available filter technologies will be evaluated and rated based on applicability and constructability. This evaluation will start simultaneously with Task 1 after the kick off meeting as outlined in the project schedule in Section 5.0.

4.4.1 Media

For granular media, only high rate configurations will be evaluated as they are most cost effective and offer a smaller footprint. This will include mixed media and different configurations of dual media (anthracite and sand). Bell has piloted these for extended periods on Kentucky River water and will utilize this data in determining the most cost effective media configuration that will produce high quality finished water.

4.4.2 Microporous Films

Membranes, including both pressure and vacuum systems, will be thoroughly investigated since they offer several advantages. They are a positive barrier, which gives some assurance that water quality is not compromised if there is a malfunction in the raw water quality. If membranes are selected, Bell will work with KY DOW to modify the current settled water turbidity requirements. Site constraints are minimized, especially using pressure membranes, since the settled water can be pumped to any location on-site (see map on Page 9). Minimal finished water is needed for cleaning, so the clearwell size can be minimized. Types of membranes will include polymeric and ceramic.

4.4.3 Backwash Options/Strategy

Bell currently has three new plants in Kentucky in design utilizing air/water backwash. We will evaluate both simultaneous and sequential air/water backwash for granular

media systems. In addition, backwash systems which utilize the water from other filters and require minimal supplemental water from other sources will be evaluated. This could significantly reduce the amount of clearwell volume needed.

4.4.4 Alternatives

The first alternative for granular media filters is the conventional layout, similar to the existing process. This can be configured in such a way that access to piping and valves is optimized. Options to be considered include automatic backwash and filter underdrains designed to eliminate the need for gravel. Another configuration which will be evaluated is four-cell cluster gravity filters with inlet control and backwash from the other filters. This type of filter requires minimal piping. For all alternatives, Bell recommends a high level of SCADA so that filters can be monitored. The filters may also be controlled to the extent desired by the Owner.

4.4.5 Location of New Building

The potential for demolishing the existing building and constructing a new building in the same location will be evaluated, but is not expected to be feasible due to constructability constraints, operations and scheduling issues. A more viable option is to move the location of the filter building dependent upon the type of filtration selected.

For a conventional gravity filtration building, potential locations are restricted by the hydraulics from the sedimentation basins and into the wastewater clarifiers and other clearwell. Bell will lay out a potential building and determine the least costly alternative for making it fit into the existing treatment scheme. Other factors to be evaluated include the relocation of existing site piping, electrical lines and other obstructions and the ability to utilize existing electrical power.

The building selected for all alternatives will have several traits in common including durability, expandability, accessibility and green components. Potential office areas will also be evaluated in the new building design.

4.5 PROJECT DESCRIPTION & COST ESTIMATE

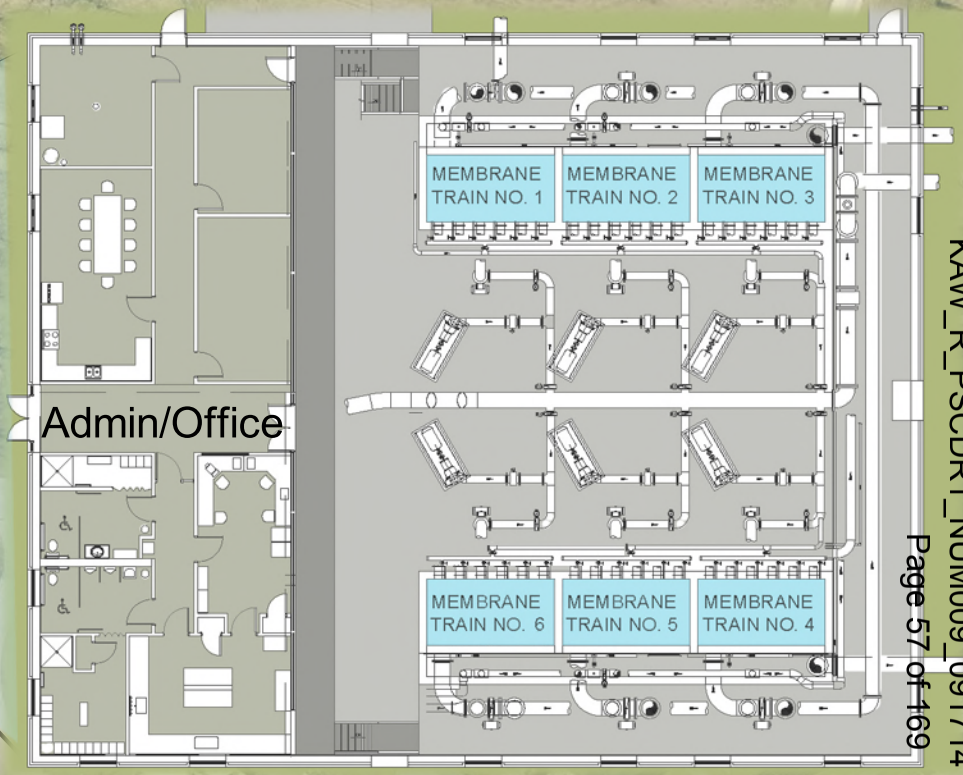
As we begin Task 3, only a few alternatives should remain and detailed costs will be prepared. These options will give KAW adequate information to make a final decision. Along with opinion of probable costs, preliminary floor plans, site plans and piping plans will be prepared. A proposed schedule of events, both design and regulatory, will be formulated to show the project completion within the estimated life span of the existing facility. A suggested sequence of work will show how the project can be constructed while maintaining a capacity of 6 to 12 mgd throughout construction.

bell engineering

KENTUCKY AMERICAN WATER

Existing 24 MGD Filter Building

Potential Membrane Building



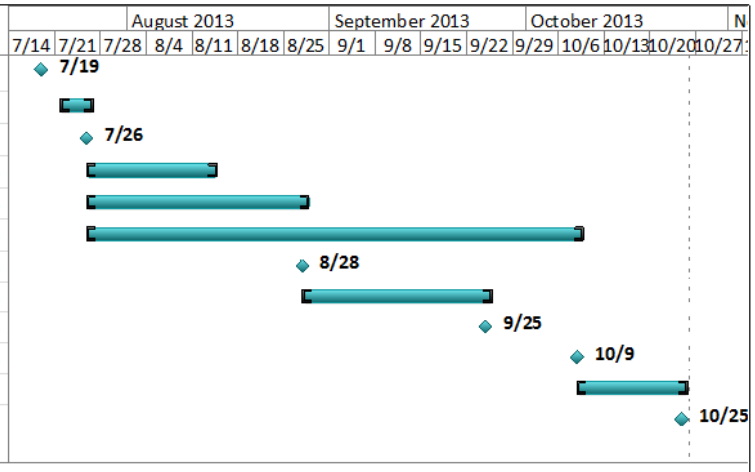
Potential 24 MGD Membrane Building Plan

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

5.0 PROJECT SCHEDULE

ID	Task Name	Duration	Start	Finish
1	Notice of Award	0 days	Fri 7/19/13	Fri 7/19/13
2	Pre Kick Off Tasks	5 days	Mon 7/22/13	Fri 7/26/13
3	Kick Off Meeting	0 days	Fri 7/26/13	Fri 7/26/13
4	Task 1	14 days	Fri 7/26/13	Wed 8/14/13
5	Task 2	24 days	Fri 7/26/13	Wed 8/28/13
6	Draft Reports	54 days	Fri 7/26/13	Wed 10/9/13
7	Progress Meeting #1	0 days	Wed 8/28/13	Wed 8/28/13
8	Task 3	21 days	Wed 8/28/13	Wed 9/25/13
9	Progress Meeting #2	0 days	Wed 9/25/13	Wed 9/25/13
10	Draft Review Meeting	0 days	Wed 10/9/13	Wed 10/9/13
11	Finalize Reports	13 days	Wed 10/9/13	Fri 10/25/13
12	Final Draft Report Review Meeting	0 days	Fri 10/25/13	Fri 10/25/13



Kentucky American Water
New Filter Building

Milestone ◆ Task

Page 1

6.0 LUMP SUM FEE

Based on the scope of work provided in the Request for Proposal, we offer the following lump sum fee:

Design Memorandum: $25,000
Piloting (if required): $1,750/week

7.0 RATE SCHEDULE

Classification	Hourly Rate	Classification	Hourly Rate
Principal IV	$175.00	**Designer/Planner III**	$79.00
Principal III	175.00	**Designer/Planner II**	76.00
Principal II	169.00	**Engineering Tech I**	42.00
Associate I	102.00	**Inspector II**	68.00
Engineer VI	151.00	**Draftsman III**	68.00
Engineer V	134.00	**Acct./Econ. III**	136.00
Engineer IV	128.00	**Acct./Econ. II**	86.00
Engineer II	97.00	**Admin. Assist. III**	76.00
Engineer I	80.00	**Admin. Assist. II**	53.00
Landscape Architect	108.00	**Admin. Assist. I**	44.00
Designer/Planner IV	96.00	**Secretary III**	61.00

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

David F. Schrader, P.E.
Principal-In-Charge/Project Manager

bell engineering

As a **Principal in the firm** and Assistant Director of Bell's Engineering Department, Mr. Schrader has designed and managed numerous water and wastewater treatment, collection and distribution projects. He has **20 years' experience** serving as client manager, process designer, project manager and construction administrator. Over the last 6 years, Mr. Schrader has **managed $200 million in construction** of water and wastewater projects.

Education

B.S. Civil Engineering, University of Kentucky
Water Treatment Plant Operations, University of Wisconsin, Madison

Registrations

Professional Engineer, KY – 20981
Professional Engineer, WV – 18569
Professional Engineer, OH – 72615
Professional Engineer, IN – 11011548
Professional Engineer, AR – 15128
Pretreatment Coordinator, KY/TN

Relevant Experience

- Project manager for $20,500,000 water treatment plant upgrade to 16 mgd membrane filtration plant – Somerset, KY
- Project manager for feasibility study for water treatment plant needs and for piloting membrane filters from three of the largest membrane manufacturers – Somerset, KY
- Project engineer for water treatment plant expansion to 6 mgd membrane filtration plant (piloting done in Somerset was transferred to Monticello) – Monticello, KY ($2,500,000)
- Project manager for new 4 mgd conventional water treatment plant – Lancaster, KY
- Project engineer for feasibility study for water treatment needs – Lancaster, KY
- Project engineer for water system master plan including membrane piloting process with three large membrane manufacturers – Danville, KY
- Project manager/lead engineer for a new 4 mgd water treatment plant that included a new water intake structure, a ballasted flocculation system followed by conventional filters and over seven miles of 16-inch transmission main – Lawrenceburg, KY ($13,000,000)
- Project manager/lead engineer for a new 2 mgd water treatment plant that included a new water intake structure, a ballasted flocculation system followed by conventional filters and over five miles of 12 inch-transmission main – Jackson, KY ($12,000,000)

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

David F. Schrader, P.E.
Principal-In-Charge/Project Manager

bell engineering

- Project engineer for WTP upgrade to 6 mgd including replacing the combination up-flow clarifier and filter units with IDI dissolved air flotation and separate new granular media filters, new concrete clearwell, upgrading raw water pump station, changing the sludge handling system from small lagoons to a geotextile bag system, providing a treatment-wide SCADA system, making various other additions or modifications and bringing the existing facility up to current building codes – Berea, KY ($8,000,000)

- Project engineer for DAF system piloting – Berea, KY

- Project manager for Robert R. Martin Bypass Water Main Extension project including 325 L.F. of 24-inch, 303 L.F. of 20-inch, 3,350 L.F. of 16-inch and 463 L.F. of 8-inch ductile iron transmission main and 410 L.F. of 30-inch bore and case – Richmond, KY

- Project manager for Duncannon Lane Transmission Main Relocation project including the relocation of approximately 3,000 L.F. of 16-inch transmission main – Richmond, KY

- Project manager/lead engineer for 120,000 L.F. of 4- through 8-inch water lines, one booster pump station and a 100,000 gallon ground storage tank – Beaver Creek; Monticello, KY

- Project manager/lead engineer for 120,000 L.F. of 4- through 8-inch water lines, one booster pump station and a 100,000 gallon ground storage tank – Otter Creek; Monticello, KY

- Project manager/lead engineer for 50,000 L.F. of 4- through 8-inch water lines, a booster pump station and a 150,000 gallon elevated water storage tank – Junction City, KY

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

Ronald C. McMaine, P.E.
Engineering/Operation Services

bell engineering

Mr. McMaine is a **Principal in the firm** and is a recognized expert in **water system evaluation and planning**. He has **41 years of industry experience** and specializes in bringing water treatment plants into conformance with Safe Drinking Water Act requirements, especially disinfection by-products. He has written several articles which have appeared in national technical journals on topics such as emergency planning, distribution system management and hydraulic analysis of distribution systems. Prior to coming to Bell, Mr. McMaine had several years of commercial experience dealing with ion exchange softening and gained operator experience with two water systems.

Education

B.S. Mathematics, Michigan State University (Minor in Chemistry, Physics & Geology)
M.S. Civil Engineering, University of Kentucky

Registrations

Professional Engineer, KY – 11658
Professional Engineer, WV – 12321
Class IV Water Plant Operator, KY – 1272
Class IV Water System Operator, KY – 3212

Water Experience

- Project engineer for $20,500,000 water treatment plant upgrade to 16 mgd membrane filtration plant – Somerset, KY
- Project engineer for water treatment plant expansion to 6 mgd membrane filtration plant (piloting done in Somerset was transferred to Monticello) – Monticello, KY ($2,500,000)
- Project manager and project engineer for water treatment plant upgrade to 10.5 mgd membrane plant, first Zenon membrane plant in Kentucky – Madisonville, KY
- Project manager and project engineer for WTP upgrade to 6 mgd including replacing the combination up-flow clarifier and filter units with IDI dissolved air flotation and separate new granular media filters, new concrete clearwell, upgrading raw water pump station, changing the sludge handling system from small lagoons to a geotextile bag system, providing a treatment-wide SCADA system, making various other additions or modifications and bringing the existing facility up to current building codes – Berea, KY ($8,000,000)
- Project engineer for WTP expansion including renovation of existing buildings and construction of new buildings, addition of 6 filters – Richmond, KY
- Project engineer for preliminary engineering and quality assurance for new 4 mgd WTP including 5 air/water backwash conventional media filters – Lancaster, KY

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

Ronald C. McMaine, P.E.
Engineering/Operation Services

bell engineering

- Project engineer for preliminary engineering and quality assurance for WTP expansion to 2 mgd including 3 air/water backwash conventional media filters – Greensburg, KY
- Project engineer for preliminary engineering and quality assurance for new 2 mgd WTP including 3 air/water backwash conventional media filters – McLean Co. Regional Water Commission
- Project engineer for 3 mgd WTP including cluster gravity filters, first package Actiflo system in KY – Providence, KY
- Project manager for water plant expansion to 6.0 mgd including addition of conventional granular media filter – Shelbyville, KY
- Project manager for clarification and filtration upgrade for 15 mgd WTP, first ballasted flocculation plant in KY – Newport, KY
- Project manager for water treatment plant and pump station expansion including custom designed gravity filter – Flatwoods-Canoe Run PSD; Braxton County, WV
- Project manager for expansion of WTP to 2.5 mgd, including construction of bulk hypochlorite facilities, filters, and 1.3 million gallon clearwell with mixing – Putnam PSD, WV
- Project manager for WTP expansion/upgrade to 10 mgd including four cluster gravity filters and influent control – Hopkinsville, KY
- Project manager for WTP expansion from 3 mgd to 5 mgd, including filters, clarifiers, and baffling an existing clearwell – Prestonsburg, KY
- Project manager for WTP expansion (redesign) from 1.5 mgd to 3 mgd, including clarifiers and filters and a baffled clearwell – Williamstown, KY
- Project engineer for the 4 mgd WTP, first municipal Neptune Microfloc Trident system in KY, including treatment units, filters, baffled clearwell, and pumps – Berea, KY
- Project engineer for the Adena Springs Farm water treatment plant, first Culligan Multi-tech water treatment plant in KY
- Project engineer for water treatment plant improvements including 750,000 gallon baffled clearwell – Shelbyville, KY

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

Ronald C. McMaine, P.E.
Engineering/Operation Services

bell engineering

Piloting Experience

- Project manager for pilot testing and preliminary engineering for membrane filtration – Madisonville, KY
- Project manager for pilot filtering of ultra-high rate ceramic filter media at Williamstown, Grayson, and Frankfort, KY. Project manager for design and construction of ceramic media filter at Williamstown, KY. Engineer of record for plant expansion at Grayson, including four ceramic media filters.
- Project manager for pilot testing of dissolved air flotation clarification process at Beckley, WV and at Berea Municipal Utilities, Berea, KY
- Project manager for evaluation of nanofiltration of high dissolved solids at St. Albans, WV
- Project engineer for preliminary engineering on reverse osmosis treatment at Sebree, KY
- Project manager for pilot testing and subsequent design of ballasted flocculation process at Newport, KY
- Project manager for pilot testing of membrane filtration at Madisonville, KY, Putnam PSD, WV, Flatwoods-Canoe Run PSD, Sutton, WV
- Project manager for evaluation of filtration and clarification including supplemental piping between units – Frankfort, KY
- Project manager for pilot testing of magnetic ion exchange resin – Berea, KY

Water Quality Experience

- Developed trihalomethane reduction plans for Maysville, Mt. Sterling, Berea College, Richmond, Versailles, Frankfort, and Laurel County Water District
- Evaluated water quality problems in the Newport and Frankfort water distribution systems
- Evaluated Campbellsville, KY water treatment plant and recommended modifications to bring it into compliance with coming federal regulations

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

T. Michael Wilmoth, P.E.
Engineering Services

bell engineering

Mr. Wilmoth brings a broad background including **45 years of experience** in water and wastewater facilities engineering and management. He provides technical expertise for solutions to water and wastewater facilities problems, cost-effective analyses, rate studies and completes loan and grant applications. Prior to joining Bell, Mr. Wilmoth served eight years in the state government and four years as general manager of Winchester Municipal Utilities. He completes **project design and management** on a variety of treatment plant and distribution systems.

Education

B.S. Civil Engineering, Tennessee Technological University
M.S. Civil Engineering, University of Kentucky

Registrations

Professional Engineer, KY – 7824
Professional Engineer, WV – 15788
Professional Engineer, TN – 10722

Relevant Experience

- Project engineer for $20,500,000 water treatment plant upgrade to 16 mgd membrane filtration plant – Somerset, KY
- Project manager and engineer for water treatment plant expansion to 6 mgd membrane filtration plant – Monticello, KY ($2,500,000)
- Project manager and engineer for new 1 mgd water treatment plant utilizing membrane filtration and raw water pumping facility upgrade – Campton, KY
- Project manager for water treatment plant renovation including new filters and sedimentation units, modifications to the existing raw water intake facilities, flocculation basins and chemical feed system – Flatwoods-Canoe Run PSD
- Project manager for water treatment plant improvements including design for renovation of flocculation and sedimentation basins (including tube settlers) and gravity filters – Richwood, WV
- Project manager for final design and construction of 10.5 mgd water treatment plant upgrade including raw water intake, pumping facilities and membrane filter treatment system – Madisonville, KY
- Project manager for water treatment plant improvements and raw water intake chemical feed system including new instrumentation – Winchester Municipal Utilities; Clark County, KY

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

T. Michael Wilmoth, P.E.
Engineering Services

bell engineering

- Project manager for water treatment plant expansion to 1.5 mgd including improvements to the raw water intake, new high service pumping equipment and 16-inch high service transmission main – Monticello Utility Commission; Monticello, KY
- Project manager for water treatment plant expansion to 4.0 mgd including a new high service pumping equipment and telemetry system - Mt. Vernon, KY
- Project manager for water treatment plant expansion and new raw water intake – London Utility Commission; Laurel County, KY
- Project manager for design and construction of 1 mgd water treatment plant which required demolition of existing flocculation and sedimentation basins and redesign of new, design of solids handling facilities, modification of raw water intake, redesign of chemical storage facilities and raw water intake remediation – Whitesburg Municipal Water Works; Letcher County, KY
- Project manager for 8 mgd water treatment plant expansion and raw water intake pumping facilities – Madisonville, KY
- Project manager for water distribution system improvements and water treatment plant expansion – Millersburg Municipal Water Works; Bourbon County, KY
- Project manager for preliminary engineering report for water treatment plant expansion – Bardstown, KY
- Project manager for water treatment plant improvements and distribution system expansion – Taylorsville Water and Sewer; Spencer County, KY

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

R. Michael Williams, P.E., Ph.D.
Hydraulics

bell engineering

Dr. Williams has **27 years of industry experience** and is recognized as an expert in the areas of environmental risk assessments, site audits and pollution prevention plans. He has published a number of articles and provided public outreach presentations on **hydraulic and water quality software programs**. Dr. Williams is a Senior Project Manager and has successfully acted in the project manager role on countless projects.

Education

B.S. Agricultural Engineering, University of Kentucky
M.S. Agricultural Engineering, University of Kentucky
Ph.D. Biosystems & Agricultural Engineering, University of Kentucky

Registrations

Professional Engineer, KY – 15835
Professional Engineer, WV – 14673

Relevant Experience

- Raw water line hydraulics for pumped storage to Jonathon Larck Reservoir – Putnam PSD
- Raw water line hydraulics – Lancaster, KY
- Project manager for hydraulic analysis of distribution system – Newport, KY
- Project engineer for hydraulic analysis of distribution system – Caldwell Co. Water District, KY
- Project engineer for hydraulic analysis of Blue Grass Army Depot water distribution system – Richmond Utilities; Richmond, KY
- Project engineer for NASA Glen Research Facility Water System Modeling including creation of a hydraulic model of the entire facility made up of a combined domestic and fire service system for 120+ structures (buildings, cooling towers, test facilities and maintenance hangars) and production of a Master Planning Document – NASA; Cleveland, OH
- Project engineer for water treatment plant study – Richmond Utilities Board; Richmond, KY
- Project manager for Cole Road water storage tank & pump station – ECCWD
- Project manager for Phase VII water line extensions & pump station upgrade – ECCWD
- Project manager for Hickory Nut Crossing pump station & water line extensions – WPCWD

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

David E. Gerhart, P.E.
Engineering Services

bell engineering

Mr. Gerhart has **24 years of experience** as a civil/environmental engineer and has been involved in projects varying from municipal to industrial in nature. Though most of his work has focused on the design of municipal type **potable water treatment plants** and wastewater treatment plants, he also has experience in industrial wastewater treatment and hazardous waste management. Recently, most of Mr. Gerhart's work has been in the design of **new, expanded and improved potable water treatment plants including several new or improved filter systems**. These systems include submerged membrane (Zenon type) filters, conventional gravity filters, conventional gravity filters with air and water backwash instead of water only backwash and gravity filters with modern ceramic media and air-water backwash.

Education

B.S. Environmental Engineering, Penn State University

Registrations

Professional Engineer, KY – 20706
Professional Engineer, WV – 14474

Relevant Experience

- Project engineer for the design of the 8 mgd submerged membrane, Zenon, improvements project – Madisonville, KY
- Project engineer for the design of improvements to Richmond WTP's filter building and chemical building – Richmond, KY
- Project engineer for the design of a 1 mgd pressure membrane system – Campton, KY
- Project engineer for the preliminary engineering report and membrane treatment pilot study for the Madisonville water treatment plant improvement project – Madisonville, KY
- Project engineer for design of a 6 mgd dissolved air flotation (DAF) system and other improvements – Berea, KY
- Project engineer for water treatment plant improvements project – Putnam PSD, WV
- Project engineer for the construction/installation of an air backblow intake screen in the Green River intake facility – Madisonville, KY
- Design engineer for design of a 1.5 mgd water treatment plant – Flatwoods Canoe Run, WV
- Project engineer for the design of the revised water treatment plant intake facilities – Grayson, KY

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

David E. Gerhart, P.E.
Engineering Services

bell engineering

- Project engineer for the design of the artificially manufactured ceramic media with air and water backwash equipment installation in the water treatment plant – Williamstown, KY
- Project engineer for the design of water treatment plant expansion and upgrade – Grayson, KY
- Project engineer for the design of the replacement, upgrade and conversion of the water treatment plant filters, from conventional water only backwash to air-water backwash – Newport, KY
- Project engineer for design and resident project representative during construction of the water treatment plant expansion from 4.6 to 6.0 mgd – Shelbyville, KY
- Project engineer for the design of the water treatment plant improvements, including new sludge (waste process water) handling facilities and filter media replacement – Mt. Sterling, KY
- Project engineer for design and part-time resident project representative during construction of water treatment plant sludge (waste process water) handling facilities – Newport, KY
- Assistant project engineer for design of new and expanded 10 mgd water treatment plant – Hopkinsville, KY
- Estimated water treatment plant sludge production quantities and sludge handling alternatives for several Kentucky clients including Crofton, East Knox County Water District, Middlesboro, Kentucky-American Water Company, and Newport
- Project engineer on water treatment plant upgrade – Maysville, KY
- Designed a potable water booster pump station – Webster County, KY
- Completed preliminary engineering for Putnam County, West Virginia PSD, Mt. Sterling, KY and Princeton, KY water treatment plant expansion

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

John D. Prince, P.E.
Mechanical Engineering

bell engineering

Mr. Prince has **20 years of industry experience** and is a **Principal in the firm**. Prior to joining Bell as the head of the Environmental Engineering Department, he had five years of experience as a plumber/pipefitter/welder and is still a registered Journeyman. His construction experience includes hands-on assembly of HVAC, plumbing and industrial process piping and equipment which have given him valuable insight into the design and construction of mechanical systems and devices. Mr. Prince has served as Principal-In-Charge, Project Manager and Project Engineer on a wide variety of plumbing/HVAC related projects.

Education

B.S. Mechanical Engineering, University of Kentucky

Registrations

Professional Engineer, KY – 22585
Professional Engineer, WV – 15904

Relevant Experience

- Designed HVAC and plumbing for the renovation of existing and construction of new buildings which included dedicated air conditioning for high heat load areas such as the high service and raw water pump stations, as well as general administration area heating/air conditioning and ventilation for hazardous chemical areas for the Madisonville Water Treatment Plant Expansion – Madisonville, KY

- Designed new sealed combustion gas fired heating, air conditioning, and dehumidification for various buildings throughout the facility and acted as project manager through design and construction of HVAC upgrades at WTP – Somerset, KY

- Designed the HVAC, plumbing & fire protection for $8,000,000 WTP – Berea, KY

- Designed the HVAC, plumbing & fire protection for membrane WTP – Campton, KY

- Designed HVAC, plumbing, and fire protection for WTP – Flatwoods-Canoe Run, WV

- Designed HVAC and plumbing for College Hill Water Treatment Plant Expansion including renovation of existing buildings and construction of new buildings. Designed dedicated air conditioning for high heat load areas such as the high service and raw water pump stations, as well as general administration area heating/air conditioning and ventilation for hazardous chemical areas – Richmond, KY

- Designed the heating and cooling for a new raw water intake structure located on the Kentucky River. The project consisted of two 15 ton packaged air cooled heat pump units with economizer and low ambient cooling capability located on the roof to provide a

conditioned environment for the 800 horsepower vertical turbine raw water pumps and related electrical equipment – Richmond, KY

- Designed the heating and cooling for a new raw water intake structure located on Lake Cumberland. The project consisted of two 10 ton packaged air cooled heat pump units with low ambient cooling capability located on the roof to provide a conditioned environment for the vertical turbine raw water pumps and related electrical equipment – Somerset, KY

- Designed the heating and cooling for the high service water pump station located at the Somerset WTP. The project consisted of three 5 ton packaged air cooled heat pump units with low ambient cooling capability mounted externally and vertically on the outside wall to provide a conditioned environment for the pumps and related electrical equipment – Somerset, KY

- HVAC renovation of heating and cooling systems for historical building including a new 5 ton split system heat pump and 5 ton packaged wall mount heat pump with air balance of new and existing heat pump systems – Blue Licks State Park Museum; Mt. Olivet, KY

- Project manager for an $800,000 repair and maintenance project at the Grayson WTP. The project consisted of a raw water pump replacement, 2,000 L.F. of 10 inch PVC backwash line, emergency backup power generators, replacement of various valves, expanding the sludge press capacity, and various modifications to the SCADA system – Grayson, KY

- Project manager and assistant project engineer for a 4 mgd water treatment plant expansion from the planning stages with the city council through design, bidding and construction. Assisted with preliminary planning with the DOW and filed funding applications with state and federal agencies. Assisted in all design aspects of the project for the Grayson water treatment plant expansion – Grayson, KY

- Assisted instrumentation design engineer with the instrumentation and controls of a filter addition to an existing water plant which included writing specifications, cost estimating, designing PID control loops, field component (instrument) selection and sizing, layout and sizing of signal wiring, and coordination of electrical power service for instrumentation devices for the Shelbyville Water Treatment Plant – Shelbyville, KY

- Assisted an instrumentation design engineer in the layout of PID control loops, field mounted devices, specification writing, cost estimating, signal wiring, and electrical power service coordination. An existing filter basin was converted to implement an ActiFlo ballasted flocculation process – Newport, KY

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

Brian D. Scott, P.E.
Structural Engineering

POAGE ENGINEERS & ASSOCIATES

Mr. Scott is the Vice President and one of the partners at Poage Engineering. For 18 years he has served as Project Engineer and/or Engineer-of-Record on projects within the firm. Mr. Scott produces comprehensive building designs and has assisted or been responsible for the structural design of over $400 million in construction costs at Poage.

Education

M.S. Civil Engineering, University of Kentucky
B.S. Civil Engineering (emphasis on Structures), University of Kentucky

Registrations

Professional Engineer, KY – 21768
Professional Engineer, WV – 17705
Professional Engineer, OH – 73009
Professional Engineer, VA – 17705
Professional Engineer, TN – 112249

Relevant Experience

- Project engineer for $12.5 million United States Courthouse including progressive collapse analysis as well as 3-D computer model – Covington, KY
- Project engineer for three story steel frame Public Safety Building including management and production of construction documents and construction administration – Frankfort, KY
- Project engineer for $25.1 million Pike County Judicial Center including design of four story steel frame building with concrete shear walls – Pikeville, KY
- Project engineer for $25 million EKU Center for the Arts Business & Technology Phase II Addition – Richmond, KY
- Project engineer for design of Monticello Wastewater Treatment Plant – Monticello, KY
- Project engineer for design of $20 million Somerset Water Treatment Plant – Somerset, KY
- Project engineer for design of Manchester Water Treatment Plant – Manchester, KY
- Project engineer for design of Campton Water Treatment Plant – Campton, KY
- Project engineer for Warsaw Wastewater Treatment Plant – Warsaw, KY
- Project engineer for South Charleston Wastewater Treatment Plant (Structural evaluation of facilities) – South Charleston, WV

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

Ben L. Murphy, P.E.
Electrical Engineering

LoVo SYSTEMS, INC.

Mr. Murphy's areas of expertise include electrical power distribution design, **municipal water/ wastewater electrical design, supervisory control and data acquisition (SCADA) system design**, HVAC system design, fire protection design, code compliance, industrial control panels, troubleshooting, controls systems, wireless telemetry, and process and instrumentation design.

Education

B.S. Mechanical Engineering, University of Kentucky
Master of Arts, Saint Meinrad Archabbey
Industrial Electronics & Automation Diploma, Kentucky Advanced Technology Institute

Registrations

Professional Engineer, KY – 25348
Professional Engineer, WV – 18560
Professional Engineer, IN – 11011643
Professional Engineer, CA – M35292
Master Electrician, KY – ME12832

Relevant Experience

- Monticello Membrane Filter Water Treatment Plant Expansion Electrical & SCADA Design & Construction Administration – Monticello, KY
- Somerset Membrane Filter Water Treatment Plant Expansion Electrical & SCADA Design & Construction Administration – Somerset, KY
- Madisonville Membrane Filter Water Treatment Plant Expansion, SCADA & Electrical Design – Madisonville, KY
- Campton Membrane Filter Water Plant, Electrical & SCADA Design & Construction Admin. – Campton, KY
- Richmond Water Treatment Plant, SCADA Design & System Maintenance – Madison County, KY
- Warren County North Wellfield Pumping System, Electrical, HVAC, & SCADA Design – Warren Co., OH
- City of Danville Water Plant Carbon Feed System, Electrical & SCADA Design – Danville, KY
- City of Danville Pump Station Electrical & SCADA Designs: Balls Branch, York Lane, Phylben Village – Danville, KY
- Deerfield-Hamilton Water Plant Expansion HVAC, Electrical & SCADA Design – Warren County, OH
- Greensburg Wastewater Plant Screening & Grit Removal Electrical Design – Greensburg, KY

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

Ben L. Murphy, P.E.
Electrical Engineering

LoVo SYSTEMS, INC.

- Hopkinsville 2500 HP Raw Water Intake Electrical & SCADA Design – Hopkinsville, KY
- Shepherdsville Wastewater Treatment Plant Expansion Electrical, HVAC, & SCADA Design & Construction Administration – Shepherdsville, KY
- Jessamine County Wastewater Plant Expansion, Electrical & SCADA Design – Nicholasville, KY
- Electrical design and systems integration for Agricultural Research Center Swine Farm Wastewater Handling System – University of Kentucky; Versailles, KY
- Red River Wastewater Authority Plant Electrical & SCADA Design – Stanton, KY
- Shepherdsville Solids Processing Building Electrical, SCADA, HVAC, & Plumbing Design – Shepherdsville, KY
- Bluegrass Army Depot Wastewater Treatment Plant Electrical Improvements Design – Richmond, KY
- Whitesburg Wastewater Treatment Plant Electrical & Mechanical Design – Whitesburg, KY
- Elizabethtown Community & Technical College Phase II Building HVAC System Design – Elizabethtown, KY
- Sellersburg Wastewater Plant Expansion, Electrical & SCADA Design – Sellersburg, IN
- Wright Patterson Air Force Base Mechanical & Electrical Improvements – Dayton, OH
- Technology Campus Phase II Building HVAC Design – Ashland Community & Technology College, Ashland, KY

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

Tom A. Jones, CIPE/CPD
Plumbing

bell engineering

Mr. Jones has **38 years of experience** and **writes specifications** for all elevated, ground and standpipe storage tanks at Bell Engineering. He also **provides coordination/field inspection services** for the erection and coatings application of new tanks and repair/recoating of existing tanks. Additionally, Mr. Jones is a **certified backflow prevention specialist** and can test and repair backflow prevention devices. Mr. Jones has served as construction coordinator and project manager on a variety of projects.

Education

Architectural Drafting, Vocational School
Studied Architectural Technology, Lexington Technical Institute
Fundamentals of Protective Coatings for Industrial Structures, SSPC

Registrations

Certified Backflow Prevention Device Tester, KY - 89035
Certified Plumbing Engineering/Plumbing Designer (CIPE/CPD), KY – 1-14782

Relevant Experience

- Designed plumbing/fire protection systems (100% wet pipe) for Johnson Central Middle School addition/renovation, Paintsville, Kentucky
- Designed plumbing/fire protection systems (100% wet pipe/dry pipe) at Williamson, West Virginia Elementary School
- Designed plumbing/fire protection systems (100% wet pipe/dry pipe) at Johnson County Elementary School, Paintsville, Kentucky
- Designed plumbing system for a Student Preparatory Lab at the University of Kentucky Medical Center
- Designed plumbing system, Riverview Housing (apartment buildings) Thelma, Kentucky
- Designed plumbing system for women's' dormitory facilities at the Perkins Job Corps Center
- Designed plumbing/fire protection systems for the renovation of the Campbellsville College Student Center
- Designed plumbing system for the Berea Wastewater Treatment Plant and the Berea College Water Treatment Plant
- Designed plumbing system/fire protection system (100% dry pipe) for the Ft. Harrod Amphitheatre (Kentucky state park)

STATEMENT OF QUALIFICATIONS
Richmond Road Station New
Filter Building Project

KENTUCKY AMERICAN WATER

Tom A. Jones, CIPE/CPD
Plumbing

bell engineering

- Designed fire protection system for one classroom building at Morehead State University (100% wet). Designed fire protection system for library tower, library stacks area at Morehead State University (preaction system)
- Designed fire protection system for two classroom buildings, one office building and five dormitories at Murray State University (100% wet pipe)
- Designed plumbing system for the renovation of the post laundry, Ft. Campbell, KY
- Designed replacement hot water system for the center laundry at the Crane Division, Naval Surface Warfare Center, a system consisting of water softening equipment and packaged water heating systems including high velocity energy transfer steam heat exchangers
- Designed plumbing system for Richmond Water Treatment Plant expansion
- Designed plumbing/fire protection system for Madisonville Water Treatment Plant expansion
- Construction coordination/field inspection for the clarification system improvements, Newport water treatment plant, Newport, KY
- Construction coordination/field inspection for the installation of new filter equipment/filter media at the Williamstown Water Treatment Plant, Williamstown, KY
- Construction coordination for the plant expansion of the Grayson Water Treatment Plant, Grayson, KY
- Plumbing and fire protection design/construction coordination for the water treatment facilities upgrade, Berea, KY

STATEMENT OF QUALIFICATIONS
Richmond Road Station New Filter Building Project

KENTUCKY AMERICAN WATER

REFERENCES

Project: Somerset Water Treatment Plant
Owner: Somerset Water/Wastewater Department
Contact: Charlie Dick, Manager
Phone Number: 606/678-7111
Email Address: cdick@cityofsomerset.com

Project: Danville Water Master Plan
Owner: City of Danville, Kentucky
Contact: Earl Coffey, City Engineer
Phone Number: 859/238-1200
Email Address: ecoffey@danvilleky.org

Project: Berea Water Treatment Plant
Owner: Berea Municipal Utilities
Contact: Ed Fortner, Manager
Phone Number: 859/986-4391
Email Address: efortner@bereaky.gov

bell engineering

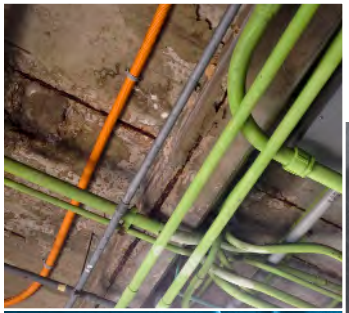
Lexington, KY
859/278-5412

Hopkinsville, KY
270/886-5466

Columbia, KY
270/385-9522

www.hkbell.com

GRW | engineers | architects | planners | www.grwinc.com



Engineering Services Proposal

New Filter Building at Richmond Road Station Water Treatment Plant

Kentucky American Water

07 | 02 | 2013

Engineers · Architects · Planners

801 Corporate Drive | Lexington, KY 40503 | 859-223-3999

Engineering Proposal

Kentucky American Water
New Filter Building
Richmond Road Station Water Treatment Plant

Table of Contents

Engineers · Architects · Planners

GRW | engineers | architects | planners
801 Corporate Drive • Lexington, KY 40503
859.223.3999 • www.grwinc.com

July 1, 2013

Mr. Zach Dukes, Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Re: Engineering Services Proposal for Richmond Road Station Water Treatment Plant Filter Building

Dear Mr. Dukes and Selection Committee Members:

The successful completion of the Richmond Road Station filter building project is critical to curtail costly and time-consuming maintenance, and for the reliability of a quality water supply to your customers. KAW can count on GRW's experienced staff to provide the specific services you need, and we are pleased to submit our engineering services proposal summarizing GRW's unique qualifications, experience and project approach.

- **History with American Water:** GRW is proud to claim American Water as one of our many long-term clients. Since 1976, GRW has completed more than 350 projects for American Water and its subsidiaries: Kentucky American Water, Indiana American Water, Tennessee American Water, Ohio American Water, West Virginia American Water and Pennsylvania American Water. Section 2 of our proposal highlights a few of these projects.
- **Expansive Water Treatment Experience and Familiarity with KAW:** GRW has designed more than 100 new, expanded or upgraded water treatment plants, with capacities up to 40 MGD and utilizing various forms of treatment and chemical processes. Our KAW experience includes sludge handling improvements at the Richmond Road Station; multi-phased improvements (expansion of river intake pumping station to 62.5 MGD; new 48" raw water main; new 22 MGD raw water transfer pumping station; new chemical feed building; solids handling facilities improvements) at the Kentucky River Station I; and the residuals dewatering facilities for the new Kentucky River Station II plant.
- **Experienced Local Team with Capacity:** We are a Kentucky-based firm, and all GRW team members proposed for this project are located in our Lexington office. GRW's team would be led by Alan Bryan, PE, whose specialized experience, leadership capabilities, and professional qualifications will result in an efficient, cost-effective project for KAW. With two decades of experience, Mr. Bryan was selected to manage this project due to his design experience at both your Richmond Road Station and Kentucky River Station II facilities. In addition to our assigned project team, GRW employs 60 water resources engineers and designers with an average of 20 years' experience, and an in-house, Lexington-based team of 30 architectural, mechanical, electrical/ instrumentation and structural professionals.
- **Service:** With more than 220 employees, GRW is large enough to successfully complete your project, yet small enough to provide personalized service on a daily basis. We encourage you to call our clients to discuss details of GRW's past performance. Over 90% of GRW's work involves repeat business with existing clients; we understand our commitment to you, our client, and your expectation of service.

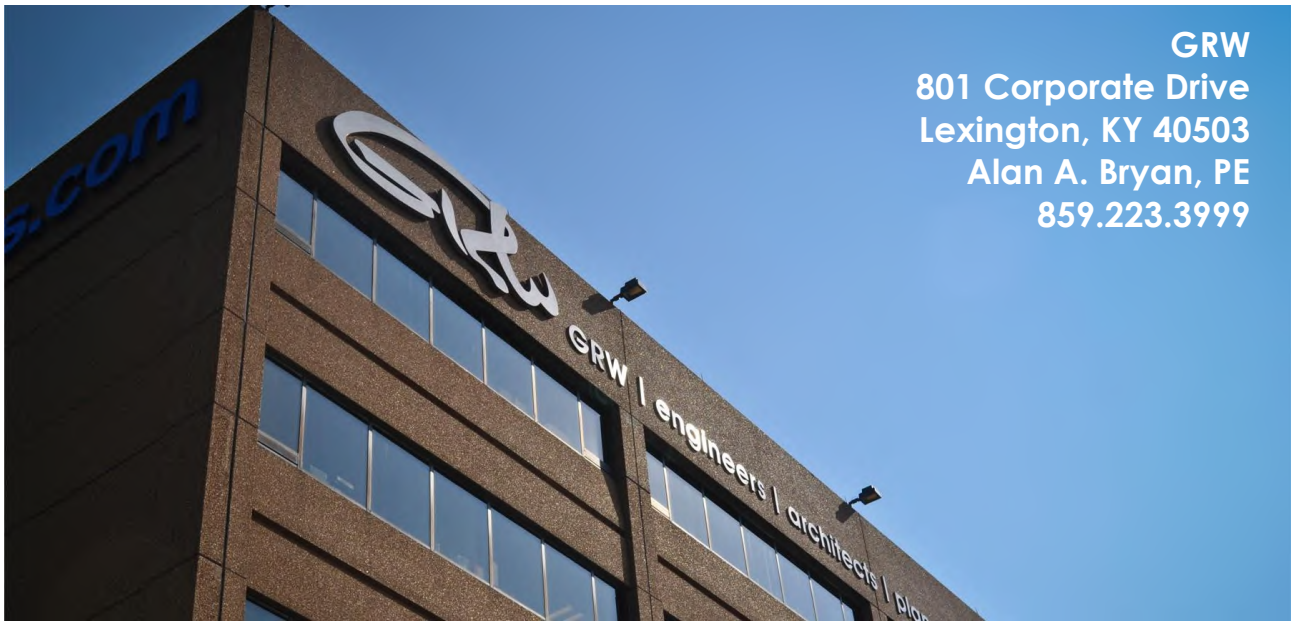
Thank you again for this opportunity to submit our proposal, and we would look forward to working with you and your staff on this important project.

Sincerely,

Bob Smallwood

Bob Smallwood, PE
Vice President

1.0 Contact Information



2.0 Firm's Capabilities

Kentucky American Water can depend on GRW to deliver a fiscally responsive and operationally efficient solution to the Richmond Road Station filter building rehabilitation and/or replacement. Our unique capabilities – honed by nearly five decades of service to the waterworks industry – are briefly summarized within this section.

GRW Understands American Water Requirements and Procedures.

Providing professional consulting services to American Water since 1976, GRW has completed more than 350 projects for American Water and its subsidiaries: Kentucky American Water, Indiana American Water, Tennessee American Water, Ohio American Water, West Virginia American Water and Pennsylvania American Water. Our work has encompassed planning studies, mapping/GIS services, hydraulic modeling, transient analysis surge modeling, water treatment plants, booster pumping stations, storage tanks, transmission and distribution mains, as well as associated surveys, permitting, construction administration and construction inspection. These projects have been completed under open end agreements – GRW has held a Master Agreement for Engineering Services with American Water since 2009 – and as work contracted individually with state subsidiaries. Examples include:

- 25 MGD Richmond Road Water Treatment Plant Sludge Handling Improvements
- 20 MGD Kentucky River Station II Water Treatment Plant Sludge Dewatering
- Kentucky River Station I Water Treatment Plant Upgrade (40.0 MGD) Intake, Raw Water Main, Chemical Feed Building
- 18 MGD Clays Mill Booster Pump Station and Two 3 MG Ground Storage Tanks
- Cleveland Street 30" Water Main and 17 MGD Pump Station, INAW
- Design-Build Stage 2D/DBPR Improvements at Five WTPs , INAW Kokomo & Richmond Districts
- White River WTP Caustic Soda Feed System and Filter Backwash Improvements, INAW
- Ohio American Water Marion Water Treatment Plant Upgrade (9.12 MGD), OHAW

GRW Knows KAW Treatment Facilities.

In addition to dozens of distribution, pumping and storage projects, GRW has designed major improvements to KAW's Richmond Road Station and Kentucky River Station I plants, and the residuals dewatering building design for the new Kentucky River Station II facility.

Richmond Road Station Water Treatment Plant – Replacement of existing sludge removal equipment with hoseless-type sludge collection equipment in sedimentation basin; new sludge thickener and sludge flow splitter box; replacement of existing sludge dewatering equipment; SCADA system modifications.

Kentucky River Station I Water Treatment Plant Upgrade – Expansion of existing river intake pumping station to 62.5 MGD; new 48" raw water main, new 22 MGD raw water transfer pumping station; new chemical feed building; solids handling facilities improvements.

Kentucky River Station II Water Treatment Plant – Sized and selected progressive cavity sludge pumps installed in piping gallery of residuals thickener for transfer of thickened sludge to residuals dewatering building; designed 3,500 SF residuals dewatering building with two belt filter presses and conveyor.

We Possess Similar WTP Experience.

GRW has designed more than 100 new, expanded or upgraded water treatment plants, treating up to 40 MGD and utilizing various forms of treatment and chemical processes. The following examples illustrate our expertise with three water treatment plant projects completed in the past three years and of similar complexity, scope and magnitude.

Harrodsburg Water Treatment Plant and Raw Water Intake Pump Station Expansion

Utilizing the Kentucky River as its water supply, the City of Harrodsburg is a regional water supplier providing treated water to the City and several water districts in the Mercer County area. Due to area growth, increased water consumption, more stringent regulatory requirements and aging infrastructure, the City realized the need for system improvements, and selected GRW to plan and design a two-phase improvements program.

The $12 million Phase 2 included an expansion of the existing raw water intake pumping station and water treatment plant from 4.0 MGD to 6.0 MGD.
The major improvements included:

- Additional filters
- New chemical storage and feed facilities (separate chemical feed building)
- New chemical mixing basin
- New flocculation and settling basins
- Additional clearwell capacity
- New solids processing facilities High service pumping station improvements
- Intake pumping station expansion (6 MGD)
- Additional river intake line
- Water system instrumentation (SCADA) upgrade
- Electrical distribution system upgrade

Project Team Member/Role: Bob Smallwood, Principal; Ryan Carr, Project Manager

Client Contact: Mayor Eddie Long, City of Harrodsburg, (859) 734-7705, mayor@harrodsburgcity.org

Northern Kentucky Water (NKWD) District Taylor Mill Treatment Plant

Basin Structural Evaluation: NKWD selected GRW to provide engineering services to investigate, evaluate and prepare a final report related to the structural condition of two basins housing rapid mix, flocculation, and sedimentation process, along with the influent and effluent channels at the 10 MGD Taylor Mill Treatment Plant (TMTP) in Kenton County, KY.

The initial stages of the project involved the review of the existing reports from previous investigations of the structures. A visual field investigation followed, including further discussion of issues with NKWD staff. The visual field inspection included: 1) observation of the existing problems identified in the reports; 2) examination of any new reported issues; and 3) investigation to learn of any new, undo-cumented problems. In addition to the concrete structures, our team evaluated appurtenances such as handrails and other safety-related features. An evaluation of all observations was made and recommendations, including whether or not more detailed sampling and testing would be required, were provided.

Based on a final evaluation of all findings, GRW provided a technical memorandum and report, including observations; data and sampling information; and the results of any tests; as well as conclusions and recommendations. The report covered the overall condition of the structure and its appurtenances; estimates of the remaining useful life of the structures; and a plan for ongoing inspection and monitoring.

Project Team Member/Role: Brad Montgomery, Principal; Ryan Carr, Project Manager; Matt Craig, Structural Engineer

Advanced Treatment Improvements: GRW served as part of the engineering team hired by NKWD to design advanced treatment improvements and replacement of preliminary treatment facilities for the TMTP. Designed improvements, to enable a 12 MGD capacity and estimated to cost $23.4 million, included:

- Replacement of existing rapid mix with two-stage rapid mix
- Replacement of existing flocculation basins with four three-stage flocculation basins
- Replacement of existing sedimentation basins with two plate settler sedimentation basins
- Renovation of existing residuals pump station
- New granular activated carbon (GAC) feed pump station with three vertical turbine pumps and variable frequency drives
- Fourteen pressure vessel type GAC contactors and associated backwash pumps
- GAC backwash equalization basin and return pumps
- Relocation of two existing ultraviolet (UV) disinfection units and related equipment to the GAC building
- Related site, SCADA and electrical improvements
- Two new, brick veneer buildings designed to architecturally blend with original filter building constructed in 1953

Project Team Member/Role: Brad Montgomery, Principal; Ryan Carr, Project Manager; Monty Maynard, Electrical Engineer

Client Contact: Amy Kramer, NKWD Design Engineering Manager, (859) 426-2734, akramer@nkywater.org

Nicholasville Water Treatment Plant Expansion (9.0 MGD)

In the early 1990s, GRW prepared a long-range master plan for the City which created a road map for the orderly modular expansion of the city's water treatment plant from its 3 MGD capacity to a future build-out capacity of 15 MGD. In 1992 the plant, located on the Kentucky River, was expanded from 3 MGD to 6 MGD, and in 2010 to 9 MGD.

In general, the following overall improvements were designed by GRW as part of the 9.0 MGD water treatment plant expansion

- Raw water platform improvements to provide up to 9 MGD of reliable pump operation and a new 4 MGD pump, pump control valves, surge protection and motor controls
- Installation of a new flow meter facility
- Installation of a new two-stage chemical mix facility
- New 3 MGD train of conventional vertical flocculation and rectangular sedimentation basin, and renovation of other four existing flocculation and sedimentation basins
- **Five new filters to provide up to 12 MGD of filtration capacity, and demolition of older existing small filters**
- Two new 300,000 gallon clearwells (pre-stressed concrete structures)
- New parallel high service pumping facility, and replacement of pump control valves on the 1992 high service pumps
- 1,500 kw generator to provide 4 MGD of treatment during power outages
- Major chemical feed facility renovations/replacements:
- Renovation of the existing offices and process rooms
- Renovation of most mechanical, electrical, and plumbing facilities from the original 1954 facility
- Provision of a new SCADA system with HMI software, redundant computer terminals, fiber optic networks, and PLC-based control modules at remote sites throughout the facility

"For more than 40 years, GRW has worked with the City of Nicholasville to provide innovative and water quality driven designs for our water treatment facility and our community. The 9 MGD expansion, one of the largest projects completed by the City and GRW, is an excellent example of our achievements. Of particular note is GRW's ability to unite the client and design team. We continually benefit from the firm's skill in cultivating cooperation and understanding." Tom Calkins, Director of Public Utilities, City of Nicholasville

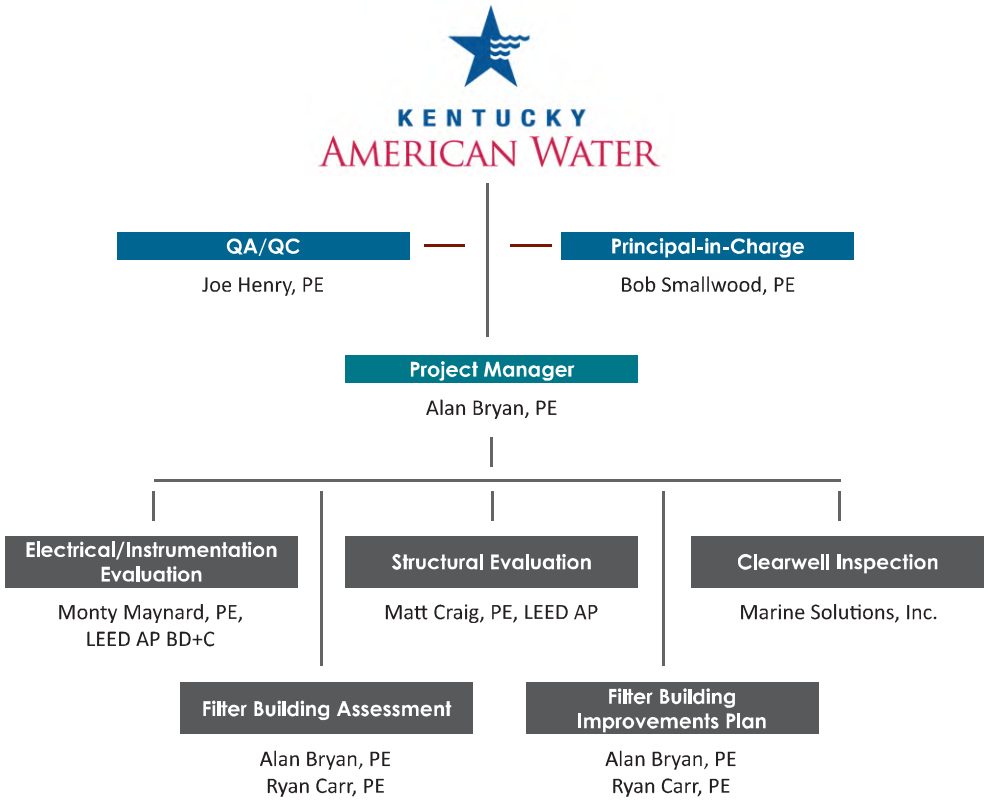
Project Team Member/Role: Joe Henry, Principal; Alan Bryan, Project Manager; Monty Maynard, QA/QC

Client Contact: Tom Calkins, Public Utilities Director, City of Nicholasville, KY (859) 885-1121, tom_calkins@nicholasville.org

3.0 Project Team

Our Project Team Will Meet Your Needs

GRW's experienced and local team, combined with our business philosophy of providing *close, personal service* to each of our clients, will result in a smooth and efficient project experience for you. Selected from GRW's water resources staff of 60 professional engineers and technicians, our KAW project team will systematically evaluate current facilities and accurately conceive the best alternatives for the Richmond Road Station Filter Building rehabilitation/replacement.



Team Member/Role/ Firm Years' Experience	Related Experience
Bob Smallwood, PE Principal-in-Charge / GRW Years Experience: 39	▪ KAW KY River Station 1 WTP Upgrade (40.0 MGD) ▪ Bowling Green Municipal Utilities WTP Expansion (22.5 MGD) ▪ Corbin WTP Expansion/Upgrade (10.0 MGD) ▪ Harrodsburg WTP Expansion Phase 2 (6 MGD)
Alan Bryan, PE Project Manager / GRW Years Experience: 21	▪ KAW Richmond Road Station WTP (25 MGD) Sludge Handling Improvements ▪ KAW KY River Station II WTP Residuals Dewatering Building (20 MGD) ▪ Nicholasville WTP Expansion (9.0 MGD) ▪ Oldham Co. Water District WTP Expansion (13 MGD) ▪ Versailles WTP Expansion (10 MGD)
Joe Henry, PE QA/QC / GRW Years Experience: 33	▪ KAW KY River Station1 WTP Upgrade (40.0 MGD) ▪ Nicholasville WTP Expansion (9.0 MGD) ▪ Corbin WTP Expansion/ Upgrade (10.0 MGD) ▪ Bowling Green Municipal Utilities WTP Masonry/Structural Repairs (22.5 MGD)

Team Member/Role/ Firm Years' Experience	Related Experience
Ryan Carr, PE Project Engineer / GRW Years Experience: 13	▪ Northern Kentucky Water District Taylor Mill WTP Basin Structural Evaluation ▪ Northern Kentucky Water District Taylor Mill WTP Residuals Improvements ▪ Northern Kentucky Water District Taylor Mill WTP Advanced Treatment Improvements (12 MGD) ▪ Harrodsburg WTP Expansion Phase 2 (6 MGD)
Matt Craig, PE, LEED AP Structural Engineer / GRW Years Experience: 23	▪ Northern Kentucky Water District Taylor Mill WTP Basin Structural Evaluation ▪ Frankfort WTP Disinfection and Chemical Feed Facilities ▪ Frankfort Wastewater Wet Weather Storage Tank (10 MG) ▪ Lexington Wastewater Wet Weather Storage Tanks (22 MG)
Monty Maynard, PE, LEED AP Electrical Engineer / GRW Years Experience:	▪ KAW Richmond Road Station WTP (25 MGD) Sludge Handling Improvements ▪ Corbin WTP Expansion/ Upgrade (10.0 MGD) ▪ Frankfort WTP Disinfection and Chemical Feed Facilities; High Service Pumping Station Motor Control Center Replacement; and SCADA System

4.0 Project Approach

General

We have reviewed the Scope of Work & Study Outline included in the Request for Proposal. We believe that we have a thorough understanding of the scope of work and are not proposing any significant changes to the study outline provided in the Request for Proposal. The following sections provide our thoughts about a detailed project approach.

Facility Description

We understand that the proposed New Filter Building Study would include a detailed Structure Inventory and Condition Assessment Memorandum of the existing Filter Building, its associated pipe gallery and the existing clearwell. This detailed Structure Inventory and Condition Assessment Memorandum will also address existing facility operations and procedures.

Evaluation of Existing Clearwell

- **Structural Assessment of Existing Facilities**
  - Underwater inspection – Since the oldest filters #11 through #20 discharge directly into the clearwell below the existing filter building, GRW will team with Marine Solutions, Inc. (MSI) to perform an underwater inspection of the clearwell. MSI will provide all of the equipment necessary to complete the underwater assessment. The MSI team will be led by an engineer-diver and be mobilized from their Lexington, KY office. The underwater investigation will include visual/tactile examination of 100 percent of the accessible structural walls, support beams, top slabs, and bottom slabs. The location, type, dimension and a description of all discovered defects will be recorded. The inspection will be documented on recorded digital video.
  - Review of underwater inspection by GRW structural engineer

- **Structural Assessment and Review of Existing Filter Building and Pipe Gallery**
  - Physical inspection of existing Filter Building and pipe gallery structural elements (structural engineer)
  - Review existing facilities, piping, valves, equipment, electrical/instrumentation, etc.
  - Evaluate necessary Filter Building renovations, improvements, upgrades, replacement, etc. to restore the existing facility to desired conditions
    - May be very expensive
    - May not be feasible
    - Cost estimates
  - Evaluate an alternative to the abandonment of the existing Filter Building and review the potential to renovate/re-purpose the existing structure and restore/upgrade the existing clearwell (structural repairs, baffling, etc.)
    - Possible renovations for new offices
    - Possible location future UV disinfection facilities
- **Existing Plant Operations and Procedures**
  - GRW will meet and discuss with the plant orations personnel about the treatment chemicals and application practices. GRW understands that it is of great importance to KAW to eliminate the formation of disinfection by-product precursors and to be in compliance with the SWTR for turbidity performance.
- **Develop Structure Inventory and Condition Assessment Memorandum**

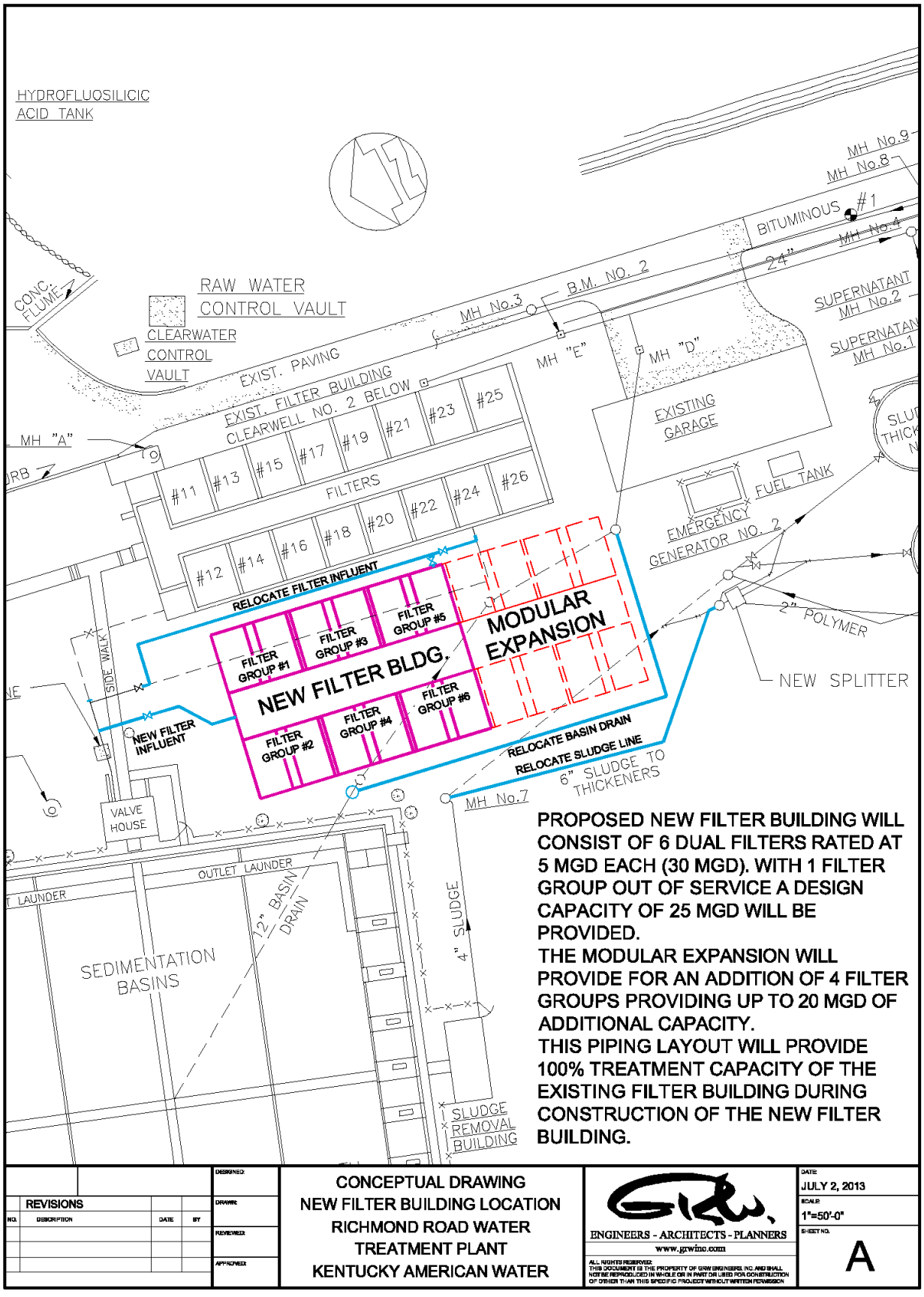
New Filter Building Evaluation

- **Location**
  - Demolish existing Filter Building and replace in the same location
    - Feasibility/Constructability (may not be feasible)
    - Cost
    - Hydraulics, yard piping
    - Maintaining 50% of plant production rates during construction
  - Construct new Filter Building adjacent to existing Filter Building
    - Sketch attached hereinafter
    - Feasibility/Constructability (may not be feasible)
    - Cost
    - Hydraulics, yard piping
    - Maintaining 100% of plant production rates during construction
- **Review of Filter Technologies**
  - High rate mixed media
    - Will meet treatment objectives at a lower cost
    - KY DOW design criteria of 5 gpm/sf
    - Filter sizing & arrangement (dual filters – advantages)
    - Filter media (gravel, sand, anthracite)
    - Underdrains (Roberts Filter, Leopold, Severn Trent, WesTech, etc…)
    - Air Scour
    - Backwash strategies (sequential, concurrent, etc…)
    - Cost estimates

- Membrane filtration
  - Will meet treatment objectives at a higher equipment cost
  - Guaranteed quality output
  - Requires more instrumentation than conventional filters
  - Requires pumping into membrane filter
  - Cost estimates

- **New Facility Preferences**
  - Sustainable design/construction
    - GRW is actively involved in the United States Green Building Council (USGBC) both on a national and local level, and we have 13 LEED Accredited Professionals in key disciplines (water resources, civil, architecture, electrical, mechanical and structural). We are committed to preserving sites and energy, incorporating renewable resources into our projects, and reducing waste and pollution. As a result, GRW has previously designed or is in the process of designing more than 1,800,000 SF of LEED registered projects. We are prepared to work with KAW to identify the different opportunities and levels of sustainable design for this project as well as to identify the associated costs to achieve those different elements of sustainable design opportunities.
  - Future expansion
    - Modular design
    - UV Disinfection
  - Use of existing emergency power
  - SCADA/instrumentation
    - GRW has extensive knowledge and past experience in integrating new systems into KAW's Richmond Road WTP existing SCADA system
  - Offices
    - New Filter Building
    - Existing Filter Building

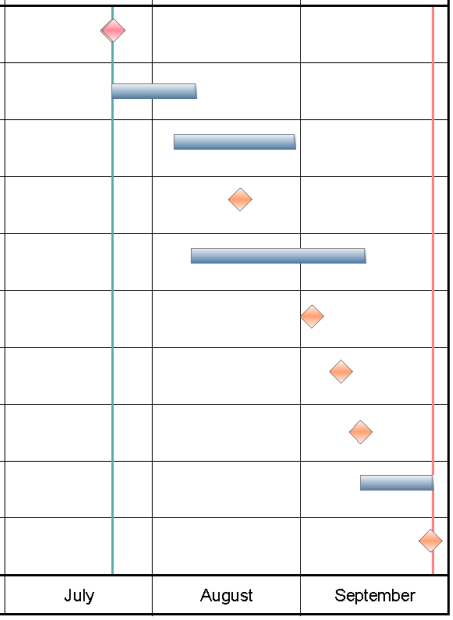
- **Summarize Improvement Plan**
  - Alternatives
  - Develop Performance Requirements Technical Memorandum
  - Cost estimates
    - Over the course of the study, GRW will prepare detailed construction and project costs for the alternatives selected for the comparison. Constructability time frames will be considered, as well as the effects on the WTP to maintain production rates. Schedules will be reviewed and discussed in reference to the time of year that certain construction activities will occur. GRW understands summer/peak water usage times are not optimal for construction projects which have the potential to limit treatment capacities. These types of production needs during construction activities will be considered and discussed in the Final Condition Assessment and Improvements Plan.
  - Developed Final Condition Assessment and Improvement Plan



5.0 Project Schedule

Assuming a notice to proceed date of approximately July 19, GRW will prepare and delivery your requested deliverables (including a Structural Inventory and Condition Assessment Memorandum, Performance Requirements Technical Memorandum, Draft Condition Assessment and Improvement Plant Report, and Final Condition Assessment and Improvement Plant Report) by your desired completion date of September 27.

Activity Name	Duration (Days)	Start Date	Finish Date
Kick-off & Facility Review Meeting	0.00	7/23/13	7/23/13
Information Collection & Review	18.00	7/23/13	8/9/13
Building Condition Assessment & Structural Evaluation	26.00	8/5/13	8/30/13
Progress Status Meeting/Workshop	0.00	8/19/13	8/19/13
Development of Design Considerations/Improvements Plan	36.00	8/9/13	9/13/13
Progress Status Meeting/Workshop	0.00	9/3/13	9/3/13
Submit Draft Report	0.00	9/9/13	9/9/13
Draft Report Review Meeting	0.00	9/13/13	9/13/13
Prepare Final Report	15.00	9/13/13	9/27/13
Submit Final Report	0.00	9/27/13	9/27/13



6.0 Fee Proposal

GRW proposes to complete the work associated with this assignment for a lump sum fee of $54,500. This proposed fee includes our subconsultant's (Marine Solutions, Inc.) fee of $5,883. Marine Solutions would perform the underwater investigations of the existing clearwell.

Appendix: Project Team Resumes

- Bob Smallwood, PE, Principal-in-Charge
- Alan Bryan, PE, Project Manager
- Joe Henry, PE, QA/QC Review
- Monty Maynard, PE, LEED AP BD+C, Electrical/Instrumentation Evaluation
- Matt Craig, PE, LEED AP, Structural Evaluation
- Ryan Carr, PE, Project Engineer
- Marine Solutions Inc. – Clearwell Inspectioin
  - John J. Loftus, PE
  - Sean P. Chapman, PE
  - Don W. Wilkins

Bob Smallwood, PE, PLS

GRW Principal-in-Charge

Years of Experience: 39 **Years with GRW:** 39

Education

B.S., Civil Engineering, 1974, University of Kentucky
M.S., Sanitary Engineering & Hydraulics, 1976, University of Kentucky

Registration

Professional Engineer: KY, IN, OH, NC, PA, WV, GA
Professional Land Surveyor, KY

Professional Affiliations and Training

National Society of Professional Engineers
Kentucky Society of Professional Engineers
Water Pollution Control Federation
American Water Works Association

Qualifications and Similar Project Experience

Mr. Smallwood has been selected as part of this project team based on his proven record of technical skills and management experience. He is a Vice President of GRW and has nearly four decades of experience in the planning, design and construction administration of water treatment, distribution, storage and pumping facilities. Mr. Smallwood has previously managed the design/construction of more than 15 water plants of all sizes and types including the KAW Kentucky River Station I Water Plant Upgrade (40.0 MGD). Examples of his water treatment plant projects include:

Kentucky American Water Kentucky River Station 1 Water Treatment Plant Upgrade (40.0 MGD), Lexington, KY – Project Manager. Design for series of major renovations and upgrading improvements constructed in four separate phases. Major items of work include: expansion of existing river intake pumping station to 62.5 MGD; new 48" raw water main; new 22 MGD raw water transfer pumping station; new, modern chemical feed building to centralize and consolidate 8 separate chemical feed systems into one, state-of-the art facility; upgrading improvements to existing plant solids handling facilities including four sludge lagoons (temporary storage for total plant solids from settling basins and filter backwash), two filter backwash waste storage/gravity thickeners and two new sludge pumping stations.

Bowling Green Municipal Utilities Water Treatment Plant Expansion (22.5 MGD), Bowling Green, KY - Project Manager. Engineering design for second plant expansion in two decades, most recently providing expansion from 15.0 MGD to 22.5 MGD, including: expansion of the existing river intake pumping station; new chemical mix basins; replacement of existing flocculation equipment in existing basins; new (7.5 MGD) vertical paddle "tapered" flocculation basins; new (7.5 MGD) rectangular chain & scraper settling basins; **new high rate media in ten (10) existing filters; filter piping improvements;** and new high service pumping station.

Nicholasville Water Treatment Plant Expansion (9.0 MGD), Nicholasville, KY – QA/QC.Water treatment plant expansion from 6 MGD to 9 MGD (2009). Expansion included raw water platform improvements; and renovation of four existing flocculation and sedimentation basins, chemical feed facilities, offices and process rooms, and most of the mechanical, electrical, and plumbing facilities. The following new equipment was installed: flow meter facility, two-stage chemical mix facility, 3 MGD train of conventional vertical flocculation and rectangular sedimentation basin, **5 new filters to provide up to 12 MGD of filtration capacity**, two new 300,000 gallon clearwells, parallel high service pumping facility, 1,500 kw generator and a SCADA system.

Fairfield Water Treatment Plant Expansion (6.0 MGD), Fairfield, OH - Project Manager. Design for expansion of a 1.5 MGD water treatment plant to 6.0 MGD, enabling the City to supply all water needs at an economical cost, involving a new well field and 3 new 2,000 GPM wells, cascade aeration, chemical feed facilities including bulk lime feed silos with slakers, solids contact softening clarifiers, recarbonation basin, **new filter building and pipe gallery with 4 new filters**, a new high service pumping station, additional below ground clearwell storage, backwash holding/pump basin and new lime sludge lagoons, and supervisory control and data acquisition (SCADA) instrumentation system.

Harrodsburg Water Treatment Plant Planning and Water System Improvements - Phase 1, Harrodsburg, KY – Project Manager. Planning, including hydraulic water modeling, for an aging water system infrastructure in an area experiencing rapid growth, increased water consumption rates, and more stringent regulatory requirements, as well as preliminary engineering, design, bidding and construction administration and inspection services for a dual-phase improvement program, including in Phase I: 6 miles of 20" water main around bypass at south end of town; 12" and 8" water mains; 1.0 MG elevated water storage tank, **treatment plant settling basin and filter renovation**, and addition of on-site sludge storage facilities.

Harrodsburg Water Treatment Plant and Raw Water Intake Pump Station Expansion - Phase 2, Harrodsburg, KY - Principal. Planning, design and construction administration for the expansion of the existing raw water intake pumping station and water treatment plant from 4.0 MGD to 6.0 MGD. Plant improvements included: new KY River intake system, two 6.0 MGD submersible pumps, two 6.0 MGD vertical turbine pumps, new chemical feed facilities, new chemical mix basin, four new 1.5 MGD flocculation and settling basins, **two new filters and upgrade of four existing filters**, new backwash pump, new 6.0 MGD vertical turbine high service pump, additional 600,000-gallon clearwell, new sludge holding basin and new sludge lagoons. Work included new electrical services, new motor control equipment, new instrumentation and SCADA system upgrades for the treatment plant and raw water intake sites.

Corbin Water Treatment Plant Expansion/Upgrade (10.0 MGD), Corbin, KY - Principal-in-Charge. Design for expansion of a conventional turbidity removal water treatment plant from 5.0 MGD to 10.0 MGD with a “high rate” expansion of the existing facilities including: raw water intake pumping station expansion; a new chemical feed building and chemical mix basin; additional flocculation and sedimentation basin capacity; **“high rate” renovation of existing filters**; additional clearwell capacity; new sludge storage lagoons; and SCADA instrumentation and control update.

Corbin Water Treatment Plant Miscellaneous Concrete Repairs, Corbin, KY - Project Manager. Design for extensive restoration and repairs of 60-year-old water treatment plant concrete basins, including extensive crack repair, removal and replacement of deteriorated concrete using specialty repair materials, replacement of caulking and expansion joints, and repair and seal coating of concrete decks. Numerous structures were involved, including Sedimentation Basins No. 1, 2, and 3; Flocculation Basins No. 1 and No. 2, and the Clearwell roof deck .

Henderson Water Treatment Plant Expansion (12.0 MGD), Henderson, KY - Project Manager. Design for "high rate" retrofit expansion of a water treatment plant to 12.0 MGD capacity, including: expansion of existing raw water pumping facility; replacement of existing chemical mix basin equipment and chemical feed equipment; conversion of two existing 2 MGD flocculation and settling basins to new superpulsator solids contact clarifiers (expanded capacity 12.0 MGD); conversion of third existing flocculation and settling basin to second stage chemical adjustment and settling basin; **replacement of filter media and replace surface wash equipment in six (6) existing filters**; upgrade of plant instrumentation; and expansion of existing high service pumping facility.

Lawrenceburg Municipal Utilities New Water Treatment Plant (2.5 MGD), Lawrenceburg, IN - Principal-in-Charge.Design, bidding and construction administration services for new 2.5 MGD ion exchange softening water treatment plant including new chemical feed system; ion exchange softening equipment; above ground treated water system facilities (clearwells); high-service pumping facilities; and three new water supply wells;

Liberty Water Treatment Plant Expansion (2.1 MGD), Liberty, KY - Principal-in-Charge. Design and construction administration services for expansion of existing 0.8 MGD plant to 2.1 MGD including chemical mixing and chemical feed facilities; new vertical paddle tapered flocculation basins; new rectangular chain and scraper sedimentation basins; **new gravity filters**; added clearwell capacity; additional high service pumping capacity; upgraded plant instrumentation; and 16,650 LF of 12" water transmission main.

Murray Water Treatment Plant (7.0 MGD), Murray, KY - Principal-in-Charge. New 7.0 MGD water treatment plant (groundwater source) including cascade aeration; chemical mix and feed facilities; two-stage, vertical paddle "tapered" flocculation basins; two rectangular chain and scrapers settling basins; **filter and chlorine feed building; backwash holding basin and sludge storage facilities**; and a 1,000,000 gallon cast-in-place concrete clearwell.

Ohio American Water Marion Water Treatment Plant Upgrade (9.12 MGD), Marion, OH - Project Manager. Upgrade of 9.12 MGD lime soda softening plant. Three of four existing low service pumps replaced with new 3.5 MGD pumps; chlorine feed system upgraded and expanded by replacing equipment and building expansion to provide added cylinder storage capacity; existing fluoride feed facilities upgraded with replacement of existing bulk storage tank, day tank and transfer pumps.

Paducah Water Works New 12 MGD Water Treatment Plant, Paducah, KY - Project Manager. New 12 MGD plant included Ohio River intake structure and 18 MGD raw water pumping station; chemical mix and chemical feed facilities; vertical paddle tapered flocculation basins; rectangular "chain and scraper" settling basins; filter, control and laboratory included in new filter/administration building; high service pumping station; distribution system maintenance building; backwash equalization basin; and a 3.5 MGD above ground clearwell.

Alan Bryan, PE

GRW Project Manager

Years of Experience: 21 **Years with GRW:** 16

Education

A.S., Mathematics and Physics, 1993, Lexington Community College
B.S., Civil Engineering, 1995, University of Kentucky

Registration

Professional Engineer: KY, IN

Professional Affiliations and Training

NASSCO Pipeline Assessment & Certification Program

Qualifications and Similar Project Experience

Mr. Bryan has more than two decades of experience in the planning, design and construction administration of water treatment plants, pumping stations, storage tanks and pipelines. He also has extensive experience with water distribution system modeling using the software programs KYPIPE, KYSURGE, WATERCAD (CYBERNET), and EPANET. Mr. Bryan has designed water treatment plant projects for Kentucky American Water and Indiana American Water.

Kentucky American Water Richmond Road Station Water Treatment Plant (25 MGD) Sludge Handling Improvements, Lexington, KY - Project Manager. Improvements included replacement of the existing sludge removal equipment with a hoseless type sludge collection equipment in the sedimentation basin, the addition of two concrete walls in the sedimentation basins to divide the two basins into four basins, construction of additional effluent launders in the primary sedimentation basins, construction of one new sludge thickener and a sludge flow splitter box, modifications to two existing sludge thickeners, replacement of the existing sludge dewatering equipment including: a new 2-meter belt filter press, polymer feed system, sludge conveyor, and sludge pumps, climate controlled Operator's office, and related HVAC systems in the existing sludge dewatering building, replacement of the sodium thiosulfate feed system located in the sludge dewatering building, modifications to the existing wash water holding basins, along with electrical and SCADA system modifications.

Kentucky American Water Kentucky River Station II Water Treatment Plant (20 MGD), Owenton, KY - Project Manager. Design as a subconsultant for a 3,500 SF residuals dewatering building receiving sludge from the residuals thickener at a new 25 MGD conventional turbidity removal facility constructed in two phases (20 MGD expanded to 25 MGD) for water intake with a wide range of turbidity (single-digit to in excess of 2,000 NTU). Sized and selected progressive cavity sludge pumps installed in the piping gallery of the residuals thickener for transfer of thickened sludge to the residuals dewatering building. Belt filter presses and conveyor designed to collect sludge cake continuously from discharge of each press, transported for deposit in a dump truck in a covered external storage area at the side of the building.

Nicholasville Water Treatment Plant Expansion (9.0 MGD), Nicholasville, KY - Project Engineer. Design of water treatment plant expansion from 6 MGD to 9 MGD (2009). Expansion included raw water platform improvements; and renovation of four existing flocculation and sedimentation basins, chemical feed facilities, offices and process rooms, and most of the mechanical, electrical, and plumbing facilities. The following new equipment was installed: flow meter facility, two-stage chemical mix facility, 3 MGD train of conventional vertical flocculation and rectangular sedimentation basin, **5 new filters to provide up to 12 MGD of filtration capacity**, two new 300,000 gallon clearwells, parallel high service pumping facility, 1,500 kw generator and a SCADA system.

Oldham County Water District Water Treatment Plant Expansion (13 MGD), LaGrange, KY - Project Manager. Expansion of water treatment plant (groundwater source) from 7.5 MGD to 13 MGD. Improvements included: four raw water supply wells (1,400 gpm each); chemical feed/high service pump building; three high pressure, high service pumps (2,500 gpm at 240 psi); liquid sodium hypochlorite feed system; three standby power generators; SCADA system, telemetry and security upgrades; electrical upgrades; and renovation of the existing control building.

Versailles Water Treatment Plant Expansion (10 MGD), Versailles, KY - Project Manager. Design for $12 million expansion of a 4.0 MGD water treatment plant to 10.0 MGD, providing a new 10.0 MGD raw water vertical turbine pump station on the Kentucky River and 2,100 LF of 24" raw water main. Included: new chemical feeds; 6 new air/water backwash, high rate media filters and conversion of the 4 existing filters to air/water backwash; additional clearwell storage of approximately 1,000,000 gallons; and a new 10.0 MGD high service, vertical turbine pump station; 30,000 LF of 24" high service transmission main.

Shelby Water Treatment Plant Expansion (4 MGD), Shelby, OH - Project Engineer. Design for upgrades to an existing 2.5 MGD facility in poor physical condition to expand capacity to 4 MGD, involving modifications to the chemical mix, two-stage solids contact clarification, recarbonation, filtration, disinfection, treated storage, high service pumping systems, new filter controls, valves, and operators installed along with new facility instrumentation, electric, plumbing, and HVAC systems. Results were a reduction of TTHM levels from 150% of allowable to below 80% of allowable, and regulatory compliance with the EPA Stage 1 and Stage 2 requirements of the Disinfectant and Disinfection By-Products Rule.

Lawrenceburg Municipal Utilities New Water Treatment Plant (2.5 MGD), Lawrenceburg, IN - Project Manager. Design, bidding and construction administration services for new 2.5 MGD ion exchange softening water treatment plant including a new chemical feed system; ion exchange softening equipment; above ground treated water system facilities (clearwells); high-service pumping facilities; and three new water supply wells.

Indiana American Water Borman Park Water Treatment Plant Coagulant Storage, Gary, IN - Project Engineer. Design of coagulant storage project for 54 MGD water treatment plant which treats surface water from Lake Michigan. Included replacement of existing liquid alum system with liquid ferric chloride as plant's primary coagulant, with all improvements occurring within lower level of existing pump building. Scope involved abandoning old alum feed and storage facilities and installing two 6,600 gallon bulk storage tanks, two 685 gallon day storage tanks with secondary containment, new transfer pumps, new peristaltic metering pumps and chemical feed piping for full redundancy, along with the necessary electrical and I/C upgrades.

Joe Henry, PE

GRW QA/QC Review

Years of Experience: 33 **Years with GRW:** 28

Education

B.S., Civil Engineering, 1979, University of Kentucky
M.S., Civil Engineering, 1990, University of Kentucky

Registration

Professional Engineer: KY, OH, TN

Professional Affiliations and Training

American Water Works Association
Water Environment Federation
Kentucky Rural Water Association

Qualifications and Similar Project Experience

Mr. Henry has more than three decades of experience with water system engineering. He has completed numerous computer hydraulic modeling studies, and water treatment, distribution and pumping projects. Mr. Henry has worked with Mr. Smallwood and Mr. Bryan on several of GRW's water treatment plant projects, and his relevant experience is partially summarized below.

Nicholasville Water Treatment Plant Expansion (9.0 MGD), Nicholasville, KY – Project Manager. Design of water treatment plant expansion from 6 MGD to 9 MGD (2009). Expansion included raw water platform improvements; and renovation of four existing flocculation and sedimentation basins, chemical feed facilities, offices and process rooms, and most of the mechanical, electrical, and plumbing facilities. The following new equipment was installed: flow meter facility, two-stage chemical mix facility, 3 MGD train of conventional vertical flocculation and rectangular sedimentation basin, **5 new filters to provide up to 12 MGD of filtration capacity**, two new 300,000 gallon clearwells, parallel high service pumping facility, 1,500 kw generator and a SCADA system.

Corbin Water Treatment Plant Expansion/Upgrade (10.0 MGD), Corbin, KY - Project Manager. Design for expansion of a conventional turbidity removal water treatment plant from 5.0 MGD to 10.0 MGD with a "high rate" expansion of the existing facilities including: raw water intake pumping station expansion; a new chemical feed building and chemical mix basin; additional flocculation and sedimentation basin capacity; **"high rate" renovation of existing filters;** additional clearwell capacity; new sludge storage lagoons; and SCADA instrumentation and control update.

Kentucky American Water Kentucky River Station 1 Water Treatment Plant Upgrade (40.0 MGD), Lexington, KY – Project Engineer. Design for series of major renovations and upgrading improvements constructed in four separate phases. Major items of work include: expansion of existing river intake pumping station to 62.5 MGD; new 48" raw water main; new 22 MGD raw water transfer pumping station; new, modern chemical feed building to centralize and consolidate 8 separate chemical feed systems into one, state-of-the art facility; upgrading improvements to existing plant solids handling facilities including four sludge lagoons, two filter backwash waste storage/gravity thickeners and two new sludge pumping stations.

Frankfort Water Treatment Plant Disinfection and Chemical Feed Evaluation and Design, Frankfort, KY - Project Manager. Evaluation and design of improvements to chemical feed systems, including chemical processes, safety concerns, and investigation of new chemical system technologies for outdated water treatment plant. Resulted in replacement of all chemical piping, equipment, and storage facilities with on-site generation of chlorine technology in lieu of traditional chlorine gas utilization, decreasing risk factors and allowing better compliance with Federal Safe Drinking Water Act Amendments for Stage 2 of the Disinfectants and Disinfection Byproducts Rule. Sulfuric acid feed system was provided and facilities were sized for a future treatment capacity of 27 MGD.

Frankfort Water Treatment Plant High Service Pumping Station Motor Control Center Replacement, Frankfort, KY - Principal. Engineering and system integration services for replacement of existing 4160 volt, electro-mechanical motor control center (MCC) which serves three independent 400 hp vertical turbine pumps. New equipment includes: 480-volt equivalent motors suitable for variable frequency drive (VFD) operation, with thermal protection, including bearing RTDs. VFDs setup allows for constant pressure control of the pumps as an emergency backup mode of operation if the main reservoir is out of service.

Pennsylvania American Water 33 MGD Shire Oaks Pump Station Surge Control, Pittsburgh, PA – Project Engineer. New 3600 cubic foot surge tank, 12 feet in diameter by 34 feet long with a 24-inch diameter inlet connection, and building addtion at Shire Oaks site to house tank. Work also included review and modification of KYSURGE hydraulic transient analysis computer files developed by the University of Kentucky to optimize tank design which was constructed to alleviate excessive pipe pressure ratings.

Shelby Water Treatment Plant Expansion (4 MGD), Shelby, OH - Project Manager. Design for upgrades to an existing 2.5 MGD facility in poor physical condition to expand capacity to 4 MGD, involving modifications to the chemical mix, two-stage solids contact clarification, recarbonation, filtration, disinfection, treated storage, high service pumping systems, new filter controls, valves, and operators installed along with new facility instrumentation, electric, plumbing, and HVAC systems. Results were a reduction of TTHM levels from 150% of allowable to below 80% of allowable, and regulatory compliance with the EPA Stage 1 and Stage 2 requirements of the Disinfectant and Disinfection By-Products Rule.

West Liberty Water Treatment Plant (2 MGD), West Liberty, KY - Project Manager. Planning, design and construction of 2.0 MGD water treatment plant located near the raw water source. Involved renovation of existing raw water pump station and construction of administration/filter building, chemical rapid mix chamber, two vertical paddle equipment flocculation basins, two high-rate sedimentation basins, two high-rate dual media filters, clearwell, high service pumping, residual solids lagoons, instrumentation, piping, and chemical feed facilities.

Bowling Green Municipal Utilities Water Treatment Plant Masonry/Structural Repairs, Bowling Green, KY - Project Manager. Design for comprehensive masonry and concrete repairs to the filter building (constructed in three phases over 75 years), flocculation and sedimentation basin Nos. 1, 2, 3, and 4, as well as the high service pumping station. Specialty repair products for historic structure renovation were used. Tuck-pointing and crack repair were performed.

Matthew Craig, PE, SE, LEED AP

GRW Structural Engineer

Years of Experience: 23 **Years with GRW:** 5

Education

B.S., Mechanical Engineering, 1990, The Ohio State University
M.S., Engineering (Focus on Structural), 1994, Purdue University

Registration

Professional Engineer: AL, FL, GA, IN, KY, LA, MD, MI, MN, MO, MS, NC, OH, PA, SC, TN, TX, VA, WI
Licensed Structural Engineer: IL
LEED Accredited Professional

Professional Affiliations and Training

Structural Engineers Association of Kentucky (SEAoK), Past President

Qualifications and Similar Project Experience

With 23 years of experience, Mr. Craig's technical experience includes structural steel, foundation design, reinforced concrete, and code compliance. He is extremely knowledgeable of the structural requirements for water and wastewater storage tanks, pumping stations, and treatment plants.

Northern Kentucky Water District Taylor Mill Treatment Plant Basin Structural Evaluation - Structural Engineer. Research, investigation, evaluation and final report related to structural condition of two basins housing rapid mix, flocculation, and sedimentation process, along with the influent and effluent channels. In addition to a review of existing reports and discussions with staff, performed a visual field inspection including observation of the existing problems identified; examination of any new issues; and investigation to learn of any new, as yet undocumented problems. Focus was on the concrete structures, as well as steps, handrails and other safety-related features. A final technical memorandum and report was provided.

Frankfort Water Treatment Plant Disinfection and Chemical Feed Evaluation and Design, Frankfort, KY - Structural Engineer. Evaluation and design of improvements to chemical feed systems, including chemical processes, safety concerns, and investigation of new chemical system technologies for outdated water treatment plant. Resulted in replacement of all chemical piping, equipment, and storage facilities with on-site generation of chlorine technology in lieu of traditional chlorine gas utilization, decreasing risk factors and allowing better compliance with Federal Safe Drinking Water Act Amendments for Stage 2 of the Disinfectants and Disinfection Byproducts Rule. Sulfuric acid feed system was provided and facilities were sized for a future treatment capacity of 27 MGD.

Frankfort Wastewater Treatment Plant Equalization Basin, Frankfort, KY - Structural Engineer. Planning, design, and construction administration services for 10 MG equalization basin facility to address wet weather flows in excess of existing wastewater treatment plant capacity and prevent sewer overflows in upstream areas of City. Initial study included evaluation of storage requirements associated with peak wet weather flow, feasible alternatives, and ultimate associated costs. Selected design alternative will store wastewater flows greater than hydraulic capacity of the plant, which is estimated to be approximately 24 MGD.

Monty Maynard, PE, LEED AP BD+C

GRW Electrical/Instrumentation Engineer

Years of Experience: 36 **Years with GRW:** 17

Education

B.S., Electrical Engineering, 1978, University of Kentucky

Registration

Professional Engineer (Electrical): KY, WV, IN, GA, TN, TX, NV, NC, MS, MI, AL, CA
NCEES Member allows reciprocity with other states
LEED Accredited Professional, Building Design + Construction

Professional Affiliations and Training

National Fire Protection Association
International Society of Automation
American Council of Engineering Companies
National Council of Examiners for Engineering and Surveying
Design Build Institute of America
Ohio Valley Region, Design Build Institute of America
American Water Works Association

Qualifications and Similar Project Experience

Mr. Maynard has 36 years of experience with electrical and mechanical design, process instrumentation and control, and project management. Mr. Maynard has designed instrumentation, controls and SCADA systems for numerous water and sewer systems throughout Kentucky, Indiana, West Virginia, Ohio and Tennessee, as well as provided electrical engineering for more than 100 water and wastewater treatment plants. Mr. Maynard has also served as a consultant for a successful instrumentation service and calibration company, supporting field service personnel. He is professionally trained in water and wastewater treatment instrumentation and he has given lectures on instrumentation design/acceptance testing. Examples of his project experience include:

Kentucky American Water Richmond Road Station Water Treatment Plant (25 MGD) Sludge Handling Improvements, Lexington, KY - Electrical/Instrumentation Engineer. Improvements included replacement of existing sludge removal equipment with a hoseless type sludge collection equipment in the sedimentation basin, the addition of two concrete walls in the sedimentation basins to divide the two basins into four basins, construction of additional effluent launders in the primary sedimentation basins, construction of one new sludge thickener and a sludge flow splitter box, modifications to two existing sludge thickeners, replacement of the existing sludge dewatering equipment including: a new 2-meter belt filter press, polymer feed system, sludge conveyor, and sludge pumps, climate controlled Operator's office, and related HVAC systems in the existing sludge dewatering building, replacement of the sodium thiosulfate feed system located in the sludge dewatering building, modifications to the existing wash water holding basins, along with electrical and SCADA system modifications.

Kentucky American Water Kentucky River Pool 3 Water Treatment Plant (20 MGD), Owenton, KY - Electrical/Instrumentation Engineer. Design as a subconsultant for a 3,500 SF residuals dewatering building receiving sludge from the residuals thickener at a new 25 MGD conventional turbidity removal facility

constructed in two phases (20 MGD expanded to 25 MGD) for water intake with a wide range of turbidity (single-digit to in excess of 2,000 NTU). Sized and selected progressive cavity sludge pumps installed in the piping gallery of the residuals thickener for transfer of thickened sludge to the residuals dewatering building. Belt filter presses and conveyor designed to collect sludge cake continuously from discharge of each press, transported for deposit in a dump truck in a covered external storage area at the side of the building.

West Knox Utility District Daugherty Water Treatment Plant Expansion (8 MGD), Knoxville, TN - Electrical/Instrumentation Engineer. Expansion and upgrade (2.0 MGD to 8.0 MGD) of utility district's conventional turbidity removal water treatment plant which treats surface water from Melton Hill Lake. Improvements and upgrades include: renovation of the existing raw water intake structure; new flash mix and flow splitting structure; conversion of the existing sedimentation basins to enhanced flocculation basins and construction of new chemical storage and feed facilities; and new 8 MGD membrane treatment facilities with required supporting systems. Work also includes renovation of the existing high service pumps and electrical components and upgraded plant control and SCADA systems, as well as approximately 30,700 LF of 30”, 24” and 16” water mains.

Nicholasville Water Treatment Plant Expansion (9.0 MGD), Nicholasville, KY – QA/QC for water treatment plant expansion from 6 MGD to 9 MGD (2009). Expansion included raw water platform improvements; and renovation of four existing flocculation and sedimentation basins, chemical feed facilities, offices and process rooms, and most of the mechanical, electrical, and plumbing facilities. The following new equipment was installed: flow meter facility, two-stage chemical mix facility, 3 MGD train of conventional vertical flocculation and rectangular sedimentation basin, 5 new filters to provide up to 12 MGD of filtration capacity, two new 300,000 gallon clearwells, parallel high service pumping facility, 1,500 kw generator and a SCADA system.

Oldham County Water District Water Treatment Plant Expansion (13 MGD), LaGrange, KY - Electrical/Instrumentation Engineer. Expansion of water treatment plant (groundwater source) from 7.5 MGD to 13 MGD. Improvements included: four raw water supply wells (1,400 gpm each); chemical feed/high service pump building; three high pressure, high service pumps (2,500 gpm at 240 psi); liquid sodium hypochlorite feed system; three standby power generators; SCADA system, telemetry and security upgrades; electrical upgrades; and renovation of the existing control building.

Versailles Water Treatment Plant Expansion (10 MGD), Versailles, KY - Electrical/Instrumentation Engineer. Design for $12 million expansion of a 4.0 MGD water treatment plant to 10.0 MGD, providing a new 10.0 MGD raw water vertical turbine pump station on the Kentucky River and 2,100 LF of 24" raw water main. Included: new chemical feeds; 6 new air/water backwash, high rate media filters and conversion of the 4 existing filters to air/water backwash; additional clearwell storage of approximately 1,000,000 gallons; and a new 10.0 MGD high service, vertical turbine pump station; 30,000 LF of 24" high service transmission main.

Indiana American Water Design-Build Stage 2D/DBPR Improvements for Kokomo and Richmond Districts, Kokomo and Richmond, IN - Electrical/Instrumentation Engineer. Design-build of new chemical feed facilities for two water treatment plants in Kokomo: Treatment Center (17 MGD surface and groundwater water) and Phillips Street (4 MGD groundwater), and three (3) plants in Richmond: Middle Fork (5 MGD surface water), South 4th Street (3 MGD groundwater), and

Main Station (3.6 MGD groundwater "under the influence") to bring facilities into full compliance with the federal Stage 2 D/DBPR in their respective distribution systems on a LRAA. Design involved addition of new ammonia feed facilities for chloramination for residual disinfection at all plants; new sodium permanganate feed facilities at Middle Fork to replace pre-chlorine feed; surface/groundwater blending point modifications at Treatment Center to increase C-T detention time; chlorine feed point relocations at Middle Fork and Treatment Center to delay formation of DBPs; and chlorine feed equipment upgrades throughout.

Corbin Water Treatment Plant Expansion/Upgrade (10.0 MGD), Corbin, KY - Electrical/Instrumentation Engineer. Design for expansion of a conventional turbidity removal water treatment plant from 5.0 MGD to 10.0 MGD with a “high rate” expansion of the existing facilities including: raw water intake pumping station expansion; a new chemical feed building and chemical mix basin; additional flocculation and sedimentation basin capacity; “high rate” renovation of existing filters; additional clearwell capacity; new sludge storage lagoons; and SCADA instrumentation and control update.

Frankfort Water Treatment Plant Disinfection and Chemical Feed Evaluation and Design, Frankfort, KY - Electrical/Instrumentation Engineer. Evaluation and design of improvements to chemical feed systems, including chemical processes, safety concerns, and investigation of new chemical system technologies for outdated water treatment plant. Resulted in replacement of all chemical piping, equipment, and storage facilities with on-site generation of chlorine technology in lieu of traditional chlorine gas utilization, decreasing risk factors and allowing better compliance with Federal Safe Drinking Water Act Amendments for Stage 2 of the Disinfectants and Disinfection Byproducts Rule. Sulfuric acid feed system was provided and facilities were sized for a future treatment capacity of 27 MGD.

Frankfort Water Treatment Plant High Service Pumping Station Motor Control Center Replacement, Frankfort, KY - Project Manager. Engineering and system integration services for replacement of existing 4160 volt, electro-mechanical motor control center (MCC) which serves three independent 400 hp vertical turbine pumps. New equipment includes: 480-volt equivalent motors suitable for variable frequency drive (VFD) operation, with thermal protection, including bearing RTDs. VFDs setup allows for constant pressure control of the pumps as an emergency backup mode of operation if the main reservoir is out of service.

Frankfort Water Treatment Plant SCADA System, Frankfort, KY - Project Manager. Design of SCADA system for plant (constructed in 1972) that has standalone PLCs at some buildings but no central SCADA system. New system architecture is a redundant self-healing fiber optic Ethernet network using Ethernet/IP; main PLC’s shall be Allen Bradley ControlLogix with redundant rack-mounted servers and a separate historian computer, as well as an uninterruptible power supply providing both battery backup and power conditioning.

Kentucky American Water 9 MGD Parkers Mill Pump Station, Lexington, KY - Electrical/Instrumentation Engineer. Design for replacement of 9 MGD booster pump (350 HP) with a new pump and the installation of a second new 9 MGD pump (350 HP), associated piping, valves and appurtenances, and replacement of electric service entrance including new motor control center, motor monitoring equipment, 500 kW diesel generator, and 1,000 ampere automatic transfer switch.

Ryan Carr, PE

GRW Project Engineer

Years of Experience: 13 **Years with GRW:** 6

Education

B.S., Civil Engineering, 1999, University of Kentucky

Registration

Professional Engineer: KY

Professional Affiliations and Training

American Water Works Association
Water Environment Federation

Qualifications and Similar Project Experience

At GRW, Mr. Carr is responsible for planning, cost estimating, project design, specification writing, coordination with regulatory and local officials, construction administration and field inspections for water and wastewater facilities. He has more than 13 years of experience with water distribution, storage and treatment systems, as well as wastewater collection and treatment facilities.

Harrodsburg Water Treatment Plant and Raw Water Intake Pump Station Expansion - Phase 2, Harrodsburg, KY - Project Manager. Planning, design and construction administration for the expansion of the existing raw water intake pumping station and water treatment plant from 4.0 MGD to 6.0 MGD. Plant improvements included: new KY River intake system, two 6.0 MGD submersible pumps, two 6.0 MGD vertical turbine pumps, new chemical feed facilities, new chemical mix basin, four new 1.5 MGD flocculation and settling basins, two new filters and upgrade of four existing filters, new backwash pump, new 6.0 MGD vertical turbine high service pump, additional 600,000-gallon clearwell, new sludge holding basin and new sludge lagoons. Work included new electrical services, new motor control equipment, new instrumentation and SCADA system upgrades for the treatment plant and raw water intake sites.

Northern Kentucky Water District Taylor Mill Treatment Plant Basin Structural Evaluation - Project Manager. Research, investigation, evaluation and final report related to structural condition of two basins housing rapid mix, flocculation, and sedimentation process, along with the influent and effluent channels. In addition to a review of existing reports and discussions with staff, performed a visual field inspection including observation of the existing problems identified; examination of any new issues; and investigation to learn of any new, as yet undocumented problems. Focus was on the concrete structures, as well as steps, handrails and other safety-related features. A final technical memorandum and report was provided.

Northern Kentucky Water District Taylor Mill WTP Advanced Treatment Improvements, Fort Thomas, KY - Project Manager. As part of a collaborative engineering team, designed advanced treatment improvements providing a capacity of 12 MGD to enable the plant to be re-rated for 12 MGD in the future and 2 new buildings designed to blend with the original filter building constructed in 1953: a new 21,510 SF preliminary treatment building/GAC facility with vegetative roof; and a 2,250 SF GAC pump station.

Northern Kentucky Water District Taylor Mill WTP Residuals Improvements, Fort Thomas, KY - Project Manager. Design for the replacement of process pumping equipment in the residuals processing building including the replacement of the progressive cavity belt filter press feed pumps, the submersible pumps that feed the plate thickener, six decant valves in the residuals holding tank, and associated piping and valves. The design of variable frequency drives on the submersible pumps also is included.

5.0 MGD Water Treatment Plant, Columbia/Adair County Water Commission, Adair County, KY - Project Manager for planning, design and construction administration of the Columbia/Adair County Water Treatment Plant. The conventional style plant consists of a floating intake system with three 2.5 MGD vertical turbine pumps, 1,500 feet of 36" raw water main, a rapid mix, eight flocculation basins, four sedimentation basins, four filters, a 1,000,000 gallon clearwell with an integrated high service pump station having three 2.5 MGD vertical turbine pumps and a backwash pump station having two 5.0 MGD vertical turbine pumps, chemical feed facilities for chlorine, alum, caustic soda, fluoride, and sodium permanganate, instrumentation and controls, two sludge basins, sludge pumping, polymer feed system, and sludge dewatering with a belt filter press for disposal.

Raw Water Intake and Transmission Main Relocation, City of Albany, KY - Project Manager for planning, design and construction administration of a new floating intake system with four 2.0 MGD vertical turbine pumps, four 16" HDPE raw water lines to a manifold vault with a 24" discharge header, 30,000 feet of 24" raw water transmission main.

Water Treatment Plant Improvements and Water Line Extensions, City of Campton, KY - Project Engineer for design of upgrade to the existing .5 MGD water treatment plant. Included new circular clarifier, remediation of three filters, replacement of influent, backwash, rewash and filter effluent valves, and new control and instrumentation system. Design and construction administration of approximately 110,000 feet of various sized water lines to serve customers in Wolfe County. Project included one booster pump station and a 100,000 gallon elevated water storage tank.

Harrodsburg Wastewater Treatment Plant Sludge Processing Facilities, Harrodsburg, KY - Project Manager. Planning, design, construction administration and funding/financial services for a new sludge dewatering building with mechanical belt press sludge dewatering equipment; new influent flow metering and raw sewage sampling equipment; and replacement of rotating biological contactor equipment. Project is the Phase II of a two-phase wastewater treatment plant improvement program.

Harrodsburg Wastewater Treatment Plant Upgrade (2.68 MGD), Harrodsburg, KY - Project Manager. Replacement of raw sewage and wet weather flow equalization pumping equipment, and renovation of two lined, earthen lagoon "sideline" wet weather flow equalization basins (total storage volume of 3.6 MG). EQ basin work included basin linings replacement and new jet diffusion mixing equipment. Work also included digested sludge holding basin lining replacement, and media replacement in existing sludge drying beds.

Sanitation District No. 1 Western Regional Water Reclamation Facility (20 MGD), Boone County, KY - Project Engineer. Design and construction services for secondary wastewater treatment plant with initial average flow of 20.0 MGD. Responsible for design and construction administration of potable water pumping facility including water supply wells, plant drainage/sewer system including pump station, progressive cavity gravity belt thickener/belt filter press pumps, scum concentrator pumps, grit pump station and scum pump station.

MSI MARINE SOLUTIONS, INC.
ENGINEERING & COMMERCIAL DIVING SERVICES

John J. Loftus, P.E.

Civil Engineer

Years of Experience: 9

Education:

B.S. Civil Engineering, Marquette University, 2003.

Commercial Diver, Minnesota School of Diving, 2009.

Professional Registrations:

Professional Engineer; Kentucky, Ohio, Indiana, Wisconsin.

Training:

Inspection and Maintenance of Ancillary Highway Structures, NHI, 2012.

ADCI Surface Supplied Air Diver Supervisor, 2011.

Bridge Inspection Refresher Course, NHI, 2011.

ADCI Entry Level Tender/Diver, 2009.

AWS Certified Welding Inspector, 2008.

Kongsberg Sonar Inspection Techniques Course, 2008.

Underwater Bridge Inspection, NHI, 2007.

Safety Inspection of In-Service Bridges, NHI, 2006.

Mr. Loftus is a licensed civil engineer and certified commercial diver specializing in structural engineering, underwater inspections and underwater acoustic sonar imaging. He has worked as an engineer in both the private and public sector. He has performed several hundred bridge inspections both above and below water. He has also been involved in various bridge design and repair projects over the years.

Since 2008, Mr. Loftus has also been performing underwater sonar imaging on a variety of marine structures and bridges. Many of the structures he has imaged have been published in a variety of papers and an FHWA study. Mr. Loftus also has extensive experience with PONTIS data recording, hydrographic surveys and post-event structure inspections.

Experience:

Underwater Inspection and Scour Countermeasure Design, Kentucky Transportation Cabinet, Statewide, 2011-2012: Served as project manager performing the underwater inspection, sonar imaging, hydrographic survey, and scour analysis on various bridges throughout Kentucky. Some special inspections were done on an emergency basis due to record flooding in the state and a ship collision. Thirty four bridges were inspected on the contract, four Ohio River bridges, and three emergency inspections including the Eggnar's Ferry Bridge Collapse. Sonar imaging was performed on nine of the bridges; five of the bridges required scour analysis, and one bridge required a repair and scour countermeasure design.

Ironton-Russell Bridge Underwater Inspection, Ohio DOT, Ironton, OH, 2012: Served as project manager for a routine underwater inspection of the Ironton-Russell Bridge on the Ohio River. Produced an underwater inspection report with evaluations and repair recommendations.

Underwater Bridge Inspection, Indiana DOT, Statewide, IN, 2009-2012: Served as team leader and engineer-diver for underwater inspections of approximately 100 bridges. Several inspections included sonar imaging of the bridge substructures. Reports were produced including an Underwater Inspection Condition Rating Form, a Daily Diving Report, photos and sketches indicating structural deficiencies, plots of the channel bottom profiles comparing the current and previous conditions.

Underwater Bridge Inspections, Illinois DOT, Statewide, 2009-2012: Served as engineer-diver and sonar operator for routine underwater inspections and/or acoustic imaging for approximately 40 bridges throughout the state. Underwater imaging was done to supplement portions of the dive inspection and determine which bridges were candidates for future imaging.

Underwater Bridge Inspections, Idaho Transportation Department, Statewide, ID, 2011 & 2012: Served as engineer-diver and sonar operator for statewide underwater bridge inspections on approximately 40 bridges, including underwater sonar imaging on 6 of the bridges. The underwater sonar imaging was done as part of a study to determine where it may be used as a tool in the future to better evaluate certain bridges.

MSI MARINE SOLUTIONS, INC.
ENGINEERING & COMMERCIAL DIVING SERVICES

Underwater Bridge Inspection, Minnesota DOT, Statewide, MN, 2007 & 2012: Served as engineer-diver for underwater inspection of approximately 60 bridges (2007) and 45 bridges (2012). Reports were produced including an Underwater Inspection Condition Rating Form, a Daily Diving Report, photos and sketches indicating structural deficiencies, and plots of the channel bottom profiles comparing the current and previous conditions.

Underwater Bridge Inspections, Ohio DOT District 10, 2010 & 2011: Served as project manager and engineer-diver for inspections of 18 bridges and 12 culverts. Culverts inspected were fully submerged and required special diving techniques.

Rock Island Arsenal Underwater Bridge Inspections, USACE, Rock Island, IL, 2011: Served as project manager and engineer-diver for routine underwater inspections of two bridges owned by the USACE at the Rock Island Arsenal on the Mississippi River. All diving was performed under the EM-385 standard and included a dive audit. Produced underwater inspection reports with evaluations and repair recommendations for each bridge.

Underwater Bridge Inspections, Kansas DOT, Various Locations, 2010: Served as engineer-diver and sonar operator for underwater inspections of 10 bridges. Also utilized underwater acoustic imaging equipment to obtain underwater images of the substructure units of each bridge.

Underwater Bridge Inspections, Rhode Island DOT, Statewide, 2009-2010: Served as engineer-diver for the underwater inspection of bridges of approximately 20 bridges of various foundation types, including some scour inspection assignments given on an emergency basis due to record flooding in the state.

Cook County Department of Highways, Underwater Inspections Bridge & Scour Evaluation, Chicago, IL, 2010: Served as assistant project manager and engineer-diver for the underwater inspection of 12 bridges and the scour evaluation of two bridges.

North Region Underwater Bridge Inspections, Michigan DOT North Region, 2010: Served as engineer-diver for underwater bridge inspection services for 13 structures. The inspections included underwater Level I and Level II inspections of all substructure units, an evaluation of the scour potential and installed counter measures, and a general assessment of the stream stability.

Bay Region Underwater Bridge Inspections, Michigan DOT Bay Region, 2010: Served as team leader and engineer-diver for underwater bridge inspection services for 33 structures. The inspections included underwater Level I and Level II inspections of all substructure units, an evaluation of the scour potential and installed countermeasures, and a general assessment of the stream stability. Performed underwater imaging on select structures to evaluate its usefulness

Underwater Bridge Inspections, Delaware DOT, Statewide, DE, 2010 & 2011: Served as engineer diver for statewide underwater inspections on approximately 25 bridges and culverts, including an emergency inspection of the Indian River Bridge after Hurricane Irene.

Underwater Bridge Inspections, Wisconsin DOT, Statewide, WI, 2008: Served as team leader and engineer diver for underwater inspection of approximately 50 bridges. Several inspections included hydrographical mapping of the waterway around the bridge. Reports were produced including an Underwater Inspection Condition Rating Form, a Daily Diving Report, photos and sketches indicating structural deficiencies, plots of the channel bottom profiles comparing the current and previous conditions.

MSI MARINE SOLUTIONS, INC.
ENGINEERING & COMMERCIAL DIVING SERVICES

Sean P. Chapman, P.E.

Civil Engineer

Years of Experience: 15

Education:

B.S. Civil Engineering, University of Wisconsin-Platteville, 1998.

Commercial Diver, Santa Barbara Marine Technology Inst., 2004.

Professional Registrations:

Professional Engineer; Kentucky, Ohio, Tennessee, Indiana, Mississippi, Maryland, Rhode Island, New Jersey.

Training:

Bridge Inspection Refresher Course, NHI, 2006, 2013.

PONTIS Reporting and Coding, NHI, 2009.

HYPACK Hydrographic Surveying Software, HYPACK, 2008.

Mooring Design, ASCE, 2007.

Air Diving Supervisor, ADCI, 2004.

Ultrasonic Testing, Moraine Valley College, 2003.

Cathodic Protection Level I, NACE, 2003.

Corrosion Technician, NACE, 2003.

Concrete Evaluation & Repair Technician, USACE WES, 2003.

Shore Protection and Coastal Eng, ASCE, 2003.

Air Diver, ADCI, 2002.

Project Manager Boot Camp, PSMJ, 2001.

Safety Inspection of In-Service Bridges, NHI, 2000.

Mr. Chapman is a licensed civil engineer and certified commercial diver specializing in geotechnical and structural engineering. Mr. Chapman's career has been focused on bridge and waterfront facilities. His experience includes leading over 1,000 inspections, performing analyses and designs for repairs and new structures, scour evaluations, and the design of scour countermeasures.

Mr. Chapman has advanced certifications in inspection, testing and surveying techniques and experience throughout the coastal and inland waters of the U.S. and in other countries. He has led engineering services in support of the U.S. Navy's waterfront asset management program for over 10 years and has conducted underwater bridge inspections for numerous federal, state and private agencies in more than 20 U.S. states.

Experience:

Waterfront Facilities Inspections and Assessments, U.S. Navy Naval Facilities Engineering Command, Various Locations, United States, 2003-2013: Mr. Chapman has served as the project manager and engineer-in-charge for waterfront facility inspections and assessments at more than 20 naval installations including over 200 facilities in California, Washington, Mississippi, Florida, Georgia, North Carolina, South Carolina, Virginia and Maryland. The projects have ranged from routing inspections to design of repairs and new facilities, including: above and underwater inspections, condition reports, load capacity analyses and ratings, structural analysis, designs, construction contract documents, cost estimating, database population, and structure modeling.

Underwater Bridge Inspections, Kentucky Transportation Cabinet, Statewide, Kentucky, 1998-2012: Mr. Chapman served as an assistant inspector, inspector, team leader and project manager for statewide underwater bridge inspection services during three consecutive contracts over a 12 year period (1998-2010). He also assisted with the coordination of deep water diving services over a two year period (2010-2012). The services included Level I, II and III underwater investigations of bridges, culverts and water control structures. Mr. Chapman also performed hydrographic surveys, PONTIS data recording and reporting, acoustic underwater imaging and scour evaluations for the various structures.

Underwater Bridge Inspections, Norfolk Southern Railroad, Various Locations, United States, 2010-2012: Mr. Chapman served as the team leader and project manager for the routine underwater bridge inspections of over 150 bridges located in 19 different states as part of repeat services for system wide contracts for bridge services. Mr. Chapman also served as a team leader and led engineering services for in-depth inspections and bridge repair designs.

MSI MARINE SOLUTIONS, INC.
ENGINEERING & COMMERCIAL DIVING SERVICES

Sean P. Chapman, P.E.
Civil Engineer

Publications:

Rehabilitation of Marine Structures, ASCE, 2004.

Rehabilitation of Military Marine Structures, USACE Infrastructure Report, 2005.

Post Hurricane Underwater Bridge Inspections, Transp. Research Board, 2009.

Study on the use of BIM for Waterfront Facility Inspections, NAVFAC Technical Report, 2013.

Millard E. Tydings Memorial Bridge Foundation Repairs, Maryland Department of Transportation, Baltimore, Maryland, 2011-2012: Mr. Chapman served as the project manager and lead engineer-diver for the structural repairs to the 12 in-water piers supporting the interstate bridge. The project included pre-construction and construction inspections, and underwater repairs for the in-the-wet structural encasement of the pier footing and sub-footings below water and the river bottom.

Underwater Bride Inspection, USACE, Fort Knox, Kentucky, 2011: Mr. Chapman served as the project manager and responsible engineer for the underwater inspection of the nine-span, military heavy load bridge. The inspections were scheduled with above water inspections and Mr. Chapman assisted in coordinating above water and below water results for condition and load ratings of the bridge.

Bridge Inspections Holston Army Ammunition Depot, USACE, Holston, Tennessee, 2011: Mr. Chapman served as the project manager and responsible engineer for the inspection of bridges as part of a combined consultant and USACE team to evaluate the bridges located at the munitions depot. The inspections include underwater inspections performed in accordance with federal requirements, bridge reports and assessments of the specialty heavy load rated bridges.

Waterfront Facility Inspections and Assessments, U.S. Navy Naval Facilities Engineering Command, Various Locations, United States, 2003-2012: Mr. Chapman has served as the project manager and engineer-in-charge for waterfront facility inspections and assessments at 18 naval installations including over 170 facilities. Mr. Chapman led the inventory, inspections, assessments and repair design services including; above and underwater inspections, condition reports, load capacity analyses and ratings, structural analysis, designs and construction contract documents, cost estimating, database population, and structure modeling.

Underwater Bridge Inspections, Ohio, Tennessee and Indiana Departments of Transportation, 1998-2010: Mr. Chapman served as a project manager and team leader for the underwater bridge inspections of 50 to 100 bridges annually throughout the states of Ohio, Tennessee and Indiana. The inspections included Level I and II underwater investigations, structure inventory and condition ratings and the development of electronic condition reports.

Naval Operations Support Center Bridge Inspection and Replacement, U.S. Navy Naval Facilities Engineering Command, Buffalo, New York, 2010: Mr. Chapman served as the project manager and lead inspector for the inspection, evaluation and replacement design for the historic bridge located at the naval installation. Inspections discovered severe deterioration of the historic bridge's arch truss. A replacement bridge was designed and constructed, retaining the aesthetics and function of the bridge.

Post –Event Underwater Bridge Inspections, CSXT Railroad, Various Locations, Louisiana, Mississippi, and Alabama, 2005, 2007, 2008: Mr. Chapman served as the project manager and team leader for emergency post-event underwater bridge inspections of 15 bridges located along the Gulf of Mexico immediately following hurricanes Katrina and Gustav. The projects included rapid deployment, in-depth inspections, hydrographic surveys and scour assessments for bridges affected by the storm surge.

Bridge and Harbor Facilities Inspections and Assessments, National Aeronautics and Space Administration (NASA) Huntsville, Alabama, 2007: Mr. Chapman served as the project manager and team leader for the above and below water inspections of one four-span bridge and harbor facilities located at the research and development center in preparation for transport of the Ares V launch vehicle. The inspections and evaluation provided confirmation of load carrying capability for the specialty loading requirements on recommendations for loading and transport procedures.

MSI MARINE SOLUTIONS, INC.
ENGINEERING & COMMERCIAL DIVING SERVICES

Don W. Wilkins

Safety Manager/Dive Supervisor

Years of Experience: 19

Education:

Divers Institute of Technology, Commercial Diver, 1992.

Rescue Diver Training, Certification, 1995.

Training:

Bridge Inspection Refresher Course, NHI, 2008.

Project Managers Bootcamp, PSMJ, 2004.

Cathodic Protection Certification Level I, NACE, 2003.

Concrete Evaluation & Repair, USACE-WES, 2003.

Ultrasonic Testing Level I, Moraine Valley College, 2003.

Air Diving Supervisor, ADCI, 2002.

Safety Inspection of In-Service Bridges, NHI, 2002.

Mr. Wilkins is responsible for the company Safety Program and is the Safety Manager on all projects. Mr. Wilkins is a qualified team leader under the National Bridge Inspection Standards and certified commercial diver with extensive experience performing underwater inspections, destructive and non-destructive testing, and repair and construction of bridges and marine structures.

Mr. Wilkins has assisted or led over 1,000 underwater bridge inspections in 23 different U.S. states. He is also a certified National Association of Corrosion Engineers (NACE) technician and is certified in several types of non-destructive and destructive testing. Mr. Wilkins has also performed as the Safety Manager and/or the Project Manager for underwater and marine construction projects of up to $30M.

Experience:

Underwater Bridge Inspections, Norfolk Southern Railroad, Various Locations, United States, 2009-2012: Mr. Wilkins served as the supervisor, team leader and/or inspection diver for the routine underwater bridge inspections of over 200 bridges located in 23 different states as part of multiple system wide contracts for bridge services. He has coordinated the inspections of structures over two miles in length and across inland and coastal navigable waterways. He was responsible for the equipment and safety for the inspections and as a liason to local bridge managers at each bridge. The projects have included careful coordination with rail road operations and perfomance in accordance with strict safety and operating guidelines for track management.

Kentucky River Pump Station Intake Inspection and Traveling Water Screen Repairs, Kentucky American Water Company (KAW), 2012-present. Mr. Wilkins serves as the project manager, Safety Manager and diving supervisor for the underwater inspections and repairs to the KY River Pump Station. These inspections and repairs include assisting with pump removals and installations, concrete assessments, traveling water screen inspections, adjustments and repairs.

Underwater Inspection of Six Raw Water Pump Stations, Northern Kentucky Water District, 2010 to 2013. Mr. Wilkins served as the project manager, Safety Manager and diving supervisor for the underwater inspections and cleaning of six raw water pump stations for Norther KY Water District. These inspections included lock out/tag out of intake structures and an underwater inspection to determine current conditions and debris accumulation. MSI also assisted with the installation of bulkheads for the dewatering of a intake struture for the removal of a sluice gate.

Waterfront Facility Inspections and Assessments, Naval Facilities Engineering Command, Various Locations, United States, 2012-2013: Mr. Wilkins has served as the contract Safety Manager and as a diving supervisor for the condition assessments and inspections of waterfront facilities located at eight installations located within the mid-Atlantic region. He was responsible for safety performance in accordance with the contract requirements for both above water and underwater services. He also served as an on-site diving supervisor and safety coordinator.

Underwater Bridge Inspections, Ohio, Tennessee and Kentucky Departments of Transportation, Various Locations, Statewide, 1996-2012: Mr. Wilkins served as an inspector and team leader, manager, logistics coordinator, decompression chamber operator and stand-by diver for underwater bridge inspections for 50 to 100 bridges annually performed throughout the states of Ohio, Tennessee and Kentucky with MSI and under previous employment. Mr. Wilkins

prepared and assisted with the condition reports. His experience includes dives in extremely cold water, confined space entry, high current, zero visibility and deep decompression diving.

Waterfront Facility Inspections and Assessments, Naval Facilities Engineering Command, Various Locations, United States, 2003-2011: Mr. Wilkins has served as a diving supervisor and inspector for the condition assessments and inspections of the waterfront facilities located at six installations including over 50 facilities with MSI and under previous employment. He has led inspection teams and managed and supervised non-destructive and destructive testing services provided for the design of repairs.

Dundalk Marine Terminal Wharf Upgrade Inspection and Construction, Maryland Port Administration, Baltimore, Maryland, 2011: Mr. Wilkins served as the safety manager and as a lead Inspector for services provided for the investigation, repair and upgrade to Berths 8 and 10. The project includes the underwater inspection of over 1,000 piles and more than 60 timber pile core samples as well as evaluation and repairs to the submerged timber relieving platform of the marginal wharf. Mr. Wilkins responsibilities include providing safety assurance, developing project safety procedures as well as monitoring and maintaining throughout the project.

Bridge Inspections Holston Army Ammunition Depot, USACE Rock Island District, Holston, Tennessee, 2011: Mr. Wilkins served as a lead inspector for the inspection of bridges as part of a combined consultant and USACE team to evaluate the bridges located at the munitions depot. The inspections include underwater inspections performed in accordance with EM385.

Pier 6 Waterfront Inspection, Norfolk Southern Railroad, Norfolk, Virginia, 2010: Mr. Wilkins served as the Safety Manager and a Dive Supervisor overseeing the underwater inspection and assessment of the pier, mooring dolphins and bulkhead supporting the facility. The inspections included a hydrographic survey and underwater Level I, II and III examinations of the concrete pile supported pier, mooring dolphins, and steel sheetpile bulkheads.

Inspection and Repair Services, USACE Philadelphia District, Francis E. Walter Dam, White Haven, Pennsylvania, 2010: Mr. Wilkins performed as the lead inspector for inspection and repair services to the reinforced concrete tower and dam hydraulic structures. Mr. Wilkins responsibilities included execution of all EM385 safety requirements for inspections and repairs of the elevated and underwater structures by rope access and diving, detailed crack mapping, concrete evaluation and identification of scour areas.

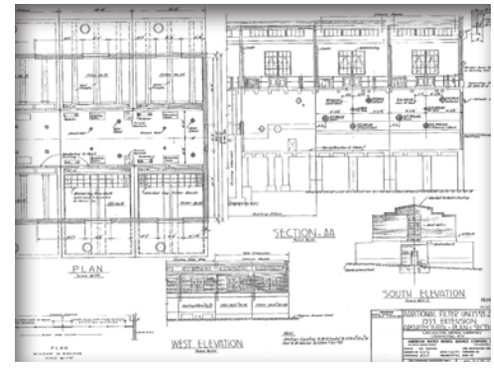
KENTUCKY
AMERICAN WATER

HAZEN AND SAWYER
Environmental Engineers & Scientists

Proposal for
New Filter Building
Richmond Road Station
Water Treatment Plant

Kentucky American Water Company
Lexington, Kentucky

July 2, 2013



HAZEN AND SAWYER
Environmental Engineers & Scientists

150 E. Campus View Blvd.
Suite 133
Columbus, OH 43235

(614) 781-9655
hazenandsawyer.com

July 2, 2013

Mr. Zach Dukes, P.E.
Project Manager Engineer
Kentucky American Water Company
2300 Richmond Road
Lexington, KY 40502

RE: Proposal – Professional Engineering Services for the Richmond Road Station Water Treatment Plant Filter Building Replacement

Dear Mr. Dukes:

Hazen and Sawyer is pleased to submit our proposal for Professional Engineering Services for the study for replacement of the Richmond Road Station Filter Building.

As you review our proposal you will discover that we have assembled a highly qualified team for your project. We understand Kentucky American's desire to quickly and efficiently determine the best assessment of existing facilities and potential solution for replacing the existing filter building. The core members of our project team lead by me as project manager and assisted by Bob Green, Brent Fulghum, David Laliberte and Michael Wang; have many years of experience focused on the study, design and construction of drinking water treatment facilities similar to the Richmond Road State Water Treatment Plant. While no two facilities are identical, there is no learning curve for our project team.

Hazen and Sawyer has in-house experts in all of the support disciplines that will be required to evaluate the condition of the existing facilities and determine the best long-term solution for replacing the existing filter building. Our discipline leads are supported by our Lexington staff as required during the project. Our project team members routinely work together on projects throughout the Midwest Region and you are assured of a well-coordinated and efficient project team without the need to coordinate with subconsultants. In addition, we have the benefit of other support discipline resources within Hazen and Sawyer, many of whom have a long history of successfully completing projects for American Water Company

HAZEN AND SAWYER
Environmental Engineers & Scientists

We appreciate the opportunity to submit this proposal and look forward to working on this critical project with Kentucky American Water. Should you have any questions, please feel free to contact me at (614) 596-4155.

Very truly yours,

Hazen and Sawyer, P.S.C.

Bret M. Casey, P.E., BCEE
Senior Associate, Project Manager

Kentucky American Water Company, Lexington, Kentucky
New Filter Building - Richmond Road Station Water Treatment Plant

1 CONTACT INFORMATION

Firm Name Hazen and Sawyer, P.S.C.

Office Supporting this Project:
444 Lewis Hargett Circle
Suite 260
Lexington, Kentucky 40503
(859) 219-1126
(859) 781-219-1134 (fax)

Primary Contact
Bret M. Casey, P.E., BCEE
Senior Associate
(614) 781-9655 (office)
(614) 596-4155 (mobile)

2 FIRM'S CAPABILITIES

Hazen and Sawyer is a leading engineering firm, specializing in the evaluation and design of water and wastewater treatment facilities and conveyance systems. We have completed numerous projects involving condition assessment and master planning for water treatment plants throughout the country, many of which are similar in scope and magnitude to the high level study for the replacement of the Richmond Road Station Filter Building. Following is a brief description of three of these projects.

1 Granite City Water Treatment Facility - Clearwell Addition Project | Granite City, Illinois

Reference: Brent O'Neill, Director Engineering | 2300 Richmond Road | Lexington, KY 40502 | (859) 268-6316

Illinois American Water's Granite City Water Treatment Facility (WTF) is a 15-mgd treatment plant that serves Granite City, Illinois. Hazen and Sawyer provided preliminary engineering, final design, and construction administration services for this project, which includes a new clearwell and related facilities.

The Granite City WTF is a conventional treatment plant consisting of a flocculation tank, two (2) sedimentation basins and eight (8) filters. The filtered water was directly discharged into a 0.67-mg clearwell underneath the filters and then pumped from the clearwell into the distribution system using a combination of vertical turbine and horizontal centrifugal pumps installed on top of the clearwell. Vertical turbine pumps, also installed on top of the clearwell, were provided to supply water for filter backwash.

The existing 0.67-million gallon clearwell at the Granite City WTF did not have sufficient capacity to provide 60 minutes of post-filter contact time or adequate CT at design conditions. Hazen and Sawyer designed a new 3.25-mg clearwell to meet Illinois EPA standards for CT and post-filtration contact time, as well as to provide storage for filter wash water supply and equalization between plant production and distributive pumping rates. The new clearwell was designed for a minimum of 2-log inactivation of viruses and 0.5-log inactivation of Giardia through disinfection.

A new distributive pumping station was designed adjacent to the clearwell to accommodate vertical turbine finished water pumps. Three (3) 7.5-mgd pumps, with space for a future fourth pump, were provided to pump finished water from the clearwell to the distribution system, and two (2) 9.5-mgd pumps were provided to pump finished water from the clearwell to the filters or to the existing wash water tank for filter backwash. The distribution and backwash pumps were designed with variable speed drives.

Modifications were also required to filter piping and valves, along with modifications to several chemical application points.

Design efforts for the project started in May of 2011 and construction was complete in 2013.

2 Streator Water Treatment Plant |Illinois-American Water Company | Streator, Illinois

Reference: Brent O'Neill, Director Engineering | 2300 Richmond Road | Lexington, KY 40502 | (859) 268-6316

The Streator Water Treatment Plant Design-Build (D-B) project involved major renovation of the existing 6 mgd water treatment facilities in Streator, Illinois. The D/B Team of Hazen and Sawyer and River City Construction provided engineering and construction, respectively. The project included adding a third filter, raw water flow meter and piping, design and installation of backwash supply pumps, replacing existing flocculators with twelve new vertical flocculators with variable frequency drives, providing a continuous sludge removal system, and providing a powdered activated carbon feed system. The project also included improvements to an existing lagoon to facilitate sludge removal and maintenance. The instrumentation/control and electrical systems were upgraded to accommodate the new treatment plant upgrades.

Water Treatment Plant

The Streator WTP treatment process consist of flocculation, sedimentation, filtration, and ground storage and high service pumping. Raw water is supplied by two surface water sources: the Vermilion River and an off-stream reservoir adjacent to the plant.

Pre-treatment chemicals (alum and coagulant aid polymer) are injected into the raw water pipe prior to the flocculation step of the treatment process. Raw water flows into two parallel, six-compartment flocculation basins. Twelve new flocculators were added during the plant renovations.

Solids removal from the existing sedimentation basins was improved during the project. The sedimentation process utilizes the two existing parallel sedimentation basins, each of which has an upper pass and a lower pass. A fixed grid system for solids removal in the sedimentation basins was installed in both the upper and lower passes to facilitate sludge removal. The settled solids are removal from each basin through a series of polyvinyl chloride (PVC) pipe with orifices. The solids are collected using three grids on the bottom and two grids on the top of each basin. Electrical motor-actuated plug valves are provided for each grid to control blow down of solids either locally or through the SCADA system.

Residuals generated by the sedimentation and the filtration processes are discharged to the residuals lagoons. Our D/B team developed and implemented modifications to one of the existing lagoons. The modifications allow for easier access to the lagoon for sludge removal.

The D-B Team determined that there were some significant bottlenecks in the electrical distribution system that allowed the existing standby generator to be used at only a portion of its full capacity. It was found that there was enough wire connected to the output of the generator to serve only 620A worth of loads, or 2/3 of its full capacity. Modifications were made to allow the generator to be used at its full capacity.

The design of the facility commenced in May 2009, and construction was completed in September 2010. Through the design-build process, the project was value-engineered to minimize the cost, which was approximately $4.6 million.

3 Bob McEwen Water Plant Expansion | Clermont County Water Resources Department | Batavia, Ohio

Reference: Lyle Bloom, P.E., Director | Clermont County Water Resources Department | 4400 Haskell Lane | Batavia, OH 45103 | 513-732-8860

The Clermont County Water Resources Department (CCWRD) owns and operates the 10 mgd Bob McEwen Water Plant, which treats surface water from an Army Corp of Engineers impoundment of the East Fork of the Little Miami River. The plant utilizes conventional coagulation, flocculation, sedimentation and filtration processes for treatment. Over the years the operational staff have struggled with efficient and adequate treatment for taste & odor (T&O), manganese, total organic carbon (TOC) and disinfection by-products (DBP), and atrazine. There are also concerns with the vulnerability of the water supply for VOC contamination from a nearby landfill. CCWRD desired a plant expansion to 20 mgd, with solutions for the water quality and treatment issues.

Hazen and Sawyer was retained as a sub-consultant to perform bench and pilot scale studies, a full scale demonstration and a detailed hydraulic analysis to: 1) develop a new treatment process strategy, 2) demonstrate the effectiveness and design parameters for a new GAC gravity contactor facility, 3) determine the up-rating capacity of the existing pre-treatment and filtration facilities, and 4) determine the impact and solutions to the plant's hydraulic grade line. Hazen and Sawyer was further retained to perform detailed design and construction administration services. Our final scope of services provided the following benefits to CCWRD:

1. Pilot testing demonstrated a treatment process, which would increase the TOC removed thus reducing the exhaustion rate and O&M expense of the new GAC contactors while still effectively removing manganese.
2. Rapid small scale column testing demonstrated the effectiveness of a 10 minute empty bed contact time for the new GAC facility, saving the client capital construction costs.
3. Full scale demonstration results of pre-treatment were submitted to the Ohio EPA and resulted in their approval for up-rating, which reduced the size of the new pre-treatment basins to be constructed, again saving the client capital cost
4. Pilot and full scale demonstration of increased filter rates with new media configuration were also submitted to Ohio EPA, which were accepted, allowing the client to double their treatment capacity without constructing any new filters.
5. Detailed design of a new intermediate pump station and GAC facility, which were retrofit into the existing treatment process between filtration and a chlorine contact basin, allowing for future installation of ozone or ultraviolet light facilities if needed.
6. A detailed analysis of the existing backwash pumps flow and head characteristics determined they could also be used for the new GAC facility, thus reducing both construction costs and additional equipment to maintain.
7. Detailed analysis of the existing chemical storage and feed equipment, allowing for the expanded plant capacity with minimal additional equipment required. Detailed design was performed for the reconfigured chemical feed systems.
8. Detailed design for the replacement of both hardware and software for the entire plant's SCADA system; converting from a proprietary distributed control system (DCS) to a non-proprietary PC/PLC based system.

Design was complete in 2010 and construction was substantially completed in 2012.

All three of these projects involved retrofitting existing water treatment plants and developing creative approaches for providing the most cost-effective method of meeting the client's needs. Rehabilitating existing facilities is often the most challenging type of project. It requires the ability to re-work existing facilities to meet conditions that they were not originally designed to meet. In addition, work related to water treatment facilities must be carefully planned to maintain sufficient treatment capacity to meet the required water demands for the community. These projects, two of which were performed for Illinois American Water Company, demonstrate Hazen and Sawyer's ability to meet these challenging requirements for our clients.

3 PROJECT TEAM

Hazen and Sawyer's proposed project team for the high level study for the replacement of the Richmond Road Station Filter Building is composed of individuals who have significant experience in the planning and design of water treatment facilities, especially those facilities related to filtration. Our Project Manager, Bret Casey has managed multiple projects for surface water treatment plants from planning through design and construction. These projects include both conventional filtration and membrane filtration facilities. In addition, our task leaders and discipline support staff have extensive experience in studies and design for rehabilitation of existing water treatment facilities. Bob Green and Brent Fulghum will lead the efforts related to evaluating conventional filters and membrane filters. Both have successfully led similar efforts for several clients. This experience specifically related to evaluating filtration options allows our project team to efficiently evaluate the potential options for replacing the Filter Building at the Richmond Road Station Water Treatment Plant.

In addition, we have several staff on our team that have played significant roles for several similar American Water projects. This background knowledge maximizes our ability to achieve the goals that Kentucky American Water has established for this project. Michael Wang, who has served as Project Manager on several recent projects for American Water, will provide technical review on the project. In addition, David Laliberte, who has lead the design and construction of several major projects for American Water, will assist with the membrane filtration evaluations and lead the critical effort associated with constructability review.

Our project team also includes key members from our Lexington office. John Steinmetz will lead the

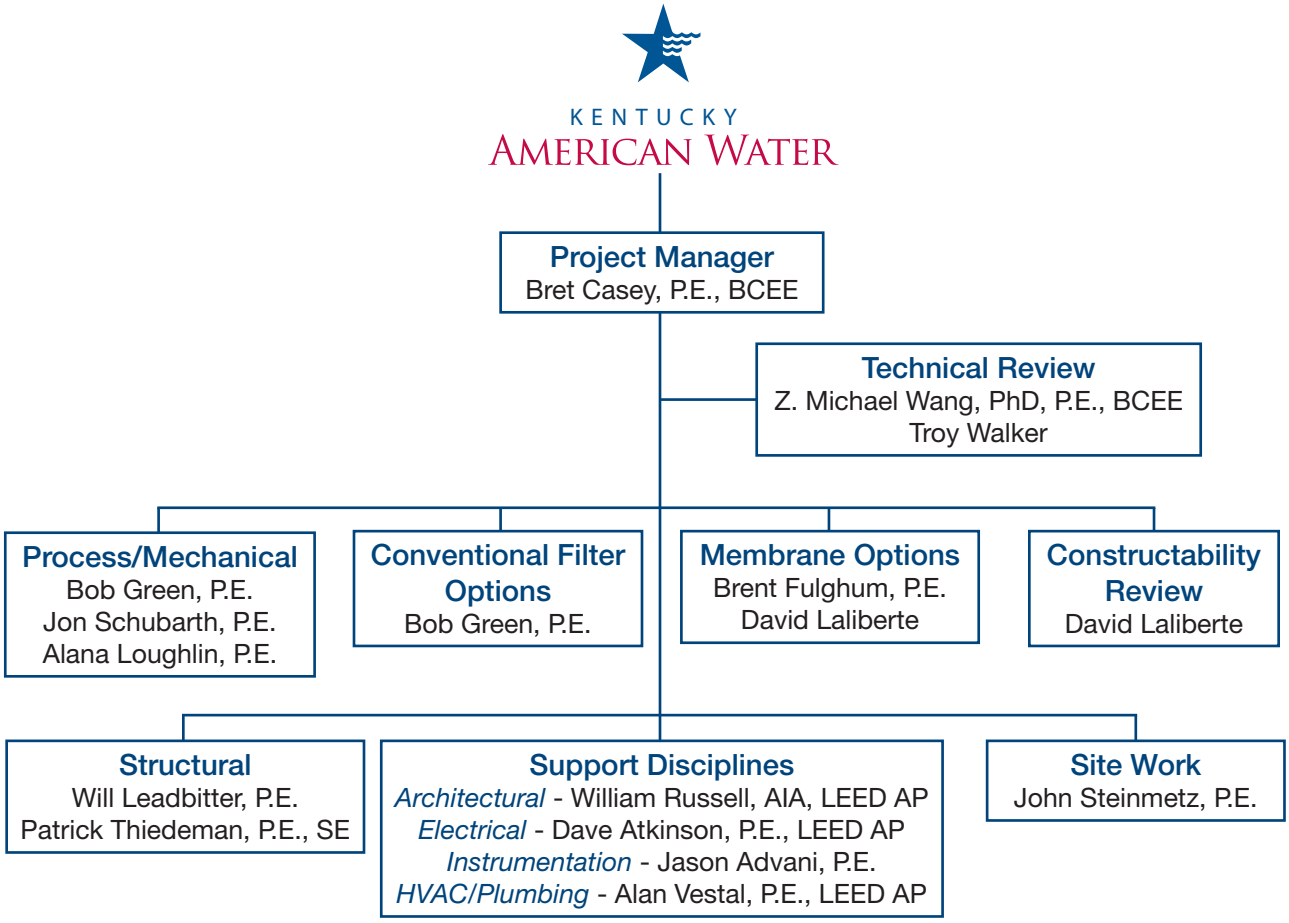


Figure 1

site work effort and Jon Schubarth will provide assistance with the process/mechanical effort. Our Lexington office will provide additional local support as required throughout the project.

Figure 1 on the previous page presents our proposed Organizational Chart, which includes all members of the project team and the roles to be played by each member. Resumes for the team members are included in the Appendix.

Table 1 provides information on the roles that our project team members played in the three projects described in Section 2. These staff have performed similar roles on several other American Water Company projects and will serve as lead or support for the proposed work at the Richmond Road Station Water Treatment Plant."

Hazen and Sawyer Project Team Experience

Team Member	Granite City WTF ILAW, Granite City, IL	Streator WTP ILAW, Streator, IL	Bob McEwen Clermont County, OH	Role Played in Project
Z. Michael Wang, Ph.D., P.E., BCEE	●	●		Project Management; Treatment Processes and Mechanical Condition Assessment and Design
Robert Green, P.E.		●	●	Project Management, Process Planning, Site Evaluation, Design, QC, Regulatory and Permitting
David Laliberte	●	●		Project Management; Mechanical Condition Assessment and Design; Constructability
Alana Loughlin, P.E.	●	●		Treatment Processes and Chemical System Condition Assessment and Design
Patrick Thiedeman, P.E., SE	●			Structural Condition Assessment and Design
William Russell, AIA, LEED AP	●	●		Architectural Condition Assessment and Design
David Atkinson, P.E., LEED AP	●	●		Electrical System Condition Assessment and Design

Table 1

4 TECHNICAL APPROACH

Background and Facilities Understanding

As stated in the Request for Proposal, the Richmond Road Station filter complex was built in stages from the original construction in 1924 to the final expansion in 1953, bringing the total number of filters at this site to 16. Each filter box has a media surface area of approximately 340 square feet, and as stated in the RFP are rated for 1.56 mgd/filter for a total production capacity of 25 mgd.

Settled water from the conventional basins originally supplied the filter complex from the north end as a single feed. With the 1953 expansion, a second settled water feed was added closer to the south end of the filter building, adjacent to Filter No. 24, providing a double-ended supply to the filter complex.

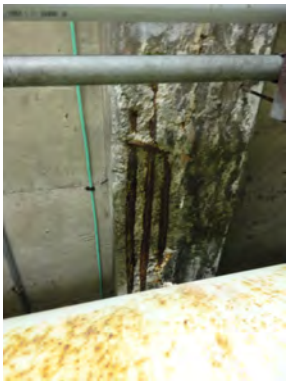
A filtered water clearwell exists beneath Filters No. 11 through No. 20 with a volume of approximately 600,000 gallons and a water depth of approximately 15 feet. Filter effluent from No. 11 through No. 20 discharge directly into the clearwell through the top slab. Filtered water from Filters No. 21 through No. 26 are collected into a filtered water header, which penetrates the south vertical wall of the clearwell between Filters No. 19 and No. 20.

A centrifugal pump takes suction out of this clearwell to transfer filtered water to a backwash tank located on higher ground northwest of the settling basins. The under filter clearwell is hydraulically connected to a second finished water clearwell, approximately 450,000 gallons in volume, located adjacent to the high service pump station. As currently configured, the clearwell under the filters cannot be bypassed and cannot be taken out of service for a dry inspection.

The existing overall box depth of approximately 8 feet and gravel media support limits both the filter

media depth and the depth of water column over the media, which limits the filtration rate and the available driving head over the media. These filter boxes have little more than 2 feet of water column over the top of media where more modern designs would provide 6 to 8 feet. The shallow filter box side wall and the front gullet wall design result in all of the piping in and out contained in the center pipe gallery, creating severe congestion for maintenance and repairs.

As stated in the RFP and observed in our pre-proposal walkthrough, significant visible evidence exists of deteriorated concrete, pipe supports (which many have recently been replaced), piping and equipment in the pipe gallery. Additionally, the pipe gallery is of a design inherent to heavy congestion, making maneuverability difficult to effect repairs. Significant moisture containing a chlorine residual is also evident in the piping gallery, accelerating deterioration. For the reasons stated, the cost of maintenance continues to increase.



Project Elements

Kentucky American Water (KAW) has issued this RFP, which requests a study to evaluate options for replacement of this filter complex with a desire to maintain the existing clearwell beneath the filters if possible. The project will involve the following core elements, based upon the requirements of the RFP and from our own experience with similar projects:

Task 1 – Facilities Description

Based upon the project team's observations, information and data provided by KAW, and on-site interviews with staff, prepare and submit to KAW a detailed description of the facilities and their condition, along with a detailed description of the operations.

Task 2 – Design Considerations

Conduct an alternatives evaluation for replacement of the filter facilities and other related components. The alternatives shall consider, as a minimum, 1) location of the new facilities considering all applicable elements of the existing site (piping, elevations, structures, constructability), 2) technologies for the filtration process, media type and make up, and equipment and materials preferences, and 3) versatility and sustainability of the new facilities including utilization of existing assets. We will prepare the Performance Requirement Technical Memorandum outlining the results of Task 2.

Task 3 – Project Description and Cost Estimate

Conclude and summarize the findings, make consensus recommendations with KAW on the Performance Requirement Technical Memorandum (Project Design Concept), prepare a project schedule and final conceptual cost estimates, prepare the draft and final Condition Assessment and Improvement Plan Report containing the proposed recommendations from the Performance Requirement Technical Memorandum.

Work Plan

Kickoff Meeting - Prior to the kickoff meeting, the project team will make a data and information request, which will include as a minimum operational and water quality information, reports, documentation or video on the filter facility, and any drawings that are available. At the kickoff meeting, the lines of communication will be established, the schedule, scope of work and deliverables will be reviewed, and KAW's goals and expected outcomes for the project will be established.

Facility Description – We will schedule the initial condition inspection and operational discussion with management and staff on the same day and/or the day following the kickoff meeting. This inspection will include all of the disciplines for process mechanical, structural/architectural, electrical/I&C and site/civil. Project team mem-

bers who have visited the site have familiarized themselves with relative water surface elevations between the settling basins, the filter boxes and the clearwells. A cursory understanding has been developed of the piping between the settling basins, the individual filter effluents, the under filter clearwell, and the connected clearwell near the high service station. From our site visits and through discussions with staff, we understand why the under filter clearwell cannot be taken out of service for a dry structural inspection. From this initial and any follow up visits and discussions with staff, the facilities and operational descriptions will be developed for review, comment and inclusion into the Structural Inventory and Condition Assessment Memorandum.

The contents of this condition assessment document will be key to KAW's case for a capital expenditure.

The process and structural team members will pay particular attention to the relationship between the filter boxes and piping of each vintage construction and the under filter clearwell for potential reuse.

In addition, we will review the seismic requirements for this facility to determine if the existing clearwell meets these requirements. We have performed a cursory review of the seismic risk for this area and it does not appear that seismic concerns will be a significant issue related to the clearwell. However, this will be confirmed during Task 1.

Design Considerations – As discussed in the RFP and conveyed at the pre-proposal meeting, a report that recommends, as a minimum, a new filter facility is a desired outcome from this study. Development of the Performance Requirements Technical Memorandum will consider multiple elements and sub-elements.

The filtration technology and placement for a new filter complex will consider many factors, such as:

- Available real estate in a suitable location on site,
- Utilization of the existing under filter clearwell,
- Vertical elevation in relation to the water surface elevations between the settling basins and the clearwells,
- Constructability and maintenance of plant operations (MOPO) during construction including interference with existing site piping and electrical ductbanks,
- Selection of filtration technology between conventional or membrane technology,
- Expandability (physical and/or expanded production capacity by up-rating),
- Utilization of other existing facilities and equipment, and
- Cost (capital, and life cycle as appropriate or needed to justify a decision).

The project team, in collaboration with KAW management and staff, will develop a complete list of criteria by which to determine the advantages/disadvantages for developed alternatives on technology and site selections for the new filter complex and associated supporting facilities. The project team will also explore with KAW the need for non-economic criteria by which to rank alternative site selections.

Other considerations during this study may be the total volume of clearwell capacity that is available, filter backwash pumping equipment and procedures, level of automation for the new facilities and the continued use or reuse of existing facilities and equipment as appropriate. Again, the project goals and expectations will be established with KAW during the kickoff meeting.

As for piloting, the project team does not propose piloting as a part of this study. For conventional filtration, KDOW allows a filtration rate up to 5 gpm/sf of filter surface area by following 10

States Standards design guidelines, providing dual media filters and providing individual filter turbidimeters. It is anticipated that these criteria would be incorporated into any new conventional filter design. As for piloting of membranes, initial discussions with Mr. Mark Rasche, Supervisor of Engineering at KDOW, indicates that sufficient existing pilot data may be available along the Kentucky River, which would preclude KAW from having to duplicate a full blown pilot study. In the event a pilot study was required for KDOW, they do not have a pilot protocol in place, and Mr. Rasche indicates that the requirements of a pilot are negotiated on a case by case basis. Mr. Rasche did indicate that in the past, pilot durations have ranged between six months and one year. For the purposes of this study, the Project Team will obtain sufficient water quality information from KAW to assist membrane manufacturers in preliminary sizing and cost of equipment.

The project team, through workshops conducted as part of the monthly progress meetings, will step through the design considerations matrix and solicit input and feedback from KAW.

The design considerations phase will culminate in the development of the Performance Requirements Technical Memorandum, which we anticipate will become the basis for KAW to develop their Design Concept document for a construction project.

Project Description and Cost Estimates – Upon consensus of the design considerations as identified above, a complete project description with project/construction costs and schedule for preliminary design, detailed design, permitting and construction will be developed for including into the draft and final Condition Assessment and Improvement Plan Reports.

Meetings

We believe that early and regular communication with KAW will be key to success and achieving the desired outcome for this project. Key project team members are located in our Lexington, Kentucky or Midwest Regional Office in Cincinnati, making quick availability possible. When required by the RFP, meetings will be conducted at the project onset, facilities review, monthly progress and draft and final report review meetings. In addition, because of our project team's close proximity to the project, we anticipate being available most anytime throughout the project to gather necessary information or discuss key issues or considerations.

5 PROJECT SCHEDULE

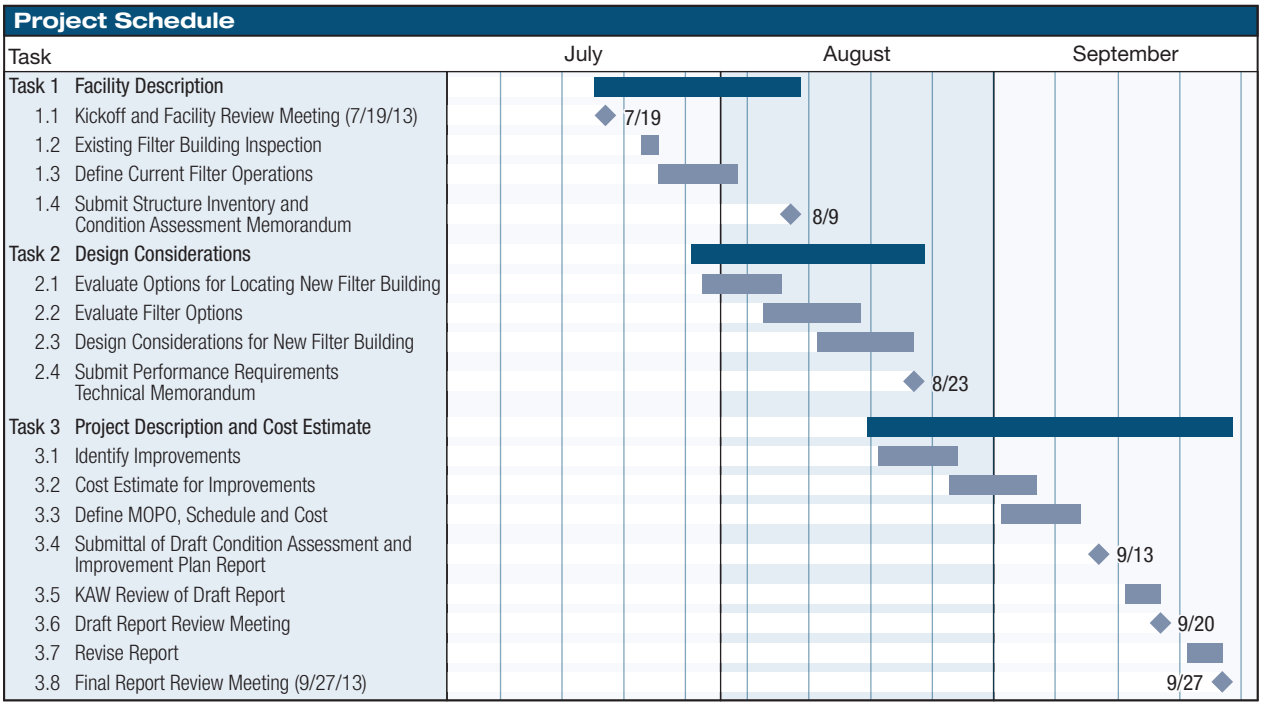


Table 2

6 FEE PROPOSAL

Our lump sum fee to provide a high level study for the replacement of the Richmond Road Station Filter Building is $53,600.

HAZEN AND SAWYER
Environmental Engineers & Scientists

Bret M. Casey, P.E., BCEE
Project Manager

Professional Record

Mr. Casey is a Senior Associate and manages the Columbus, Ohio office. He has 24 years of experience in municipal water and wastewater projects. He has served as project manager and design leader on the design, construction administration, and startup of several large water treatment plant projects. His experience covers all aspects of municipal water systems from raw water supply to treatment and distribution. Project work has involved all phases of design and construction from the conceptual level through planning, detailed design, construction administration, resident engineering, and ultimate startup of facilities. Mr. Casey has had a key role on major water treatment plant improvement and expansion projects for Del-Co Water Company; Delphos, Ohio; and Birmingham, Alabama.

City of Delphos: Upground Water Project / Delphos OH

Project Manager for the design and construction administration of a new 3.75-mgd water plant and 450-MG upground reservoir. A new intake and pump station were designed to pump water from the Little Auglaize River to the new upground reservoir. The project includes all of the environmental permitting associated with the river intake and reservoir. A new pump station was included to pump water from the reservoir to the new water plant, and telemetry was provided to communicate between the reservoir and the water plant. Both conventional treatment and membrane treatment were evaluated for treating the new surface water supply. Conventional treatment consisting of two-stage lime softening was selected based on cost considerations and the desire to conserve the surface water supply. The new plant also includes post-filter GAC carbon contactors and UV disinfection. Provided startup assistance and training to assist the City in the startup of the facility. The plant was successfully started up in the fall of 2007.

City of Westerville: Water Plant Improvements and Expansion – Phase I and II / Westerville OH

The project included a water quality and treatment audit to evaluate the options for meeting current and future regulatory requirements. This resulted in recommending GAC post filter contactors and a preliminary design of these facilities. The project also included a capacity evaluation (both supply and treatment) to determine the treatment capacity of the water treatment facilities. In addition, the project included a facilities audit of the treatment plant to develop a CIP for incorporating necessary upgrades to the water plant.

Del-Co Water Company: Olentangy Water Treatment Plant / Delaware OH

Deputy Project Manager for the design of water treatment plant improvements, including replacement of the existing 7.2-mgd, single-stage lime softening plant with a new 19.2-mgd, two-stage lime softening plant. Various clearwell arrangements were evaluated, with a final design approach utilizing a series of prestressed concrete tanks. Several UV disinfection options were evaluated for the new water plant. Hydraulics and piping layout were evaluated to accommodate medium-pressure UV reactors from multiple manufacturers. In the future, the utility intends to install three 10-mgd, medium-pressure reactors at the plant. The project also included modifications to the existing intake on the Olentangy River, and a new 40-mgd raw water pump station/force main to pump water to a new 1-billion-gallon upland reservoir being constructed under a separate contract. Acted as Deputy Project Manager during design of the project and assisted during the construction administration phase.

Puerto Rico Aqueduct and Sewer Authority: Sana Muerto and Hatillo-Camuy Water Treatment Plant Design

Deputy Project Manager for design of the improvements to the Sana Muerto WTP (0.5-mgd surface water treatment plant)

Areas of Specialization

- Drinking water treatment – planning, design, construction administration, startup.
- Project management

Academic Credentials

BSCE - University of Iowa, 1989

Professional Certifications

Professional Engineer:
Ohio, Iowa, Illinois, Missouri, Indiana

Employment Record

2011 - Present	Hazen and Sawyer, P.C.
2002 - 2011	Malcolm Pirnie/ARCADIS
2000 - 2002	Howard R. Green Company
1991 - 2000	Malcolm Pirnie, Inc.
1989 - 1991	Black & Veatch

Professional Affiliations

- American Water Works Association
- American Academy of Environmental Engineers

Selected Presentations

Hill, C.P., Casey, B.M., *"The Importance of Managing Distribution System Water Quality,"* presented to the County Commissioners' Association of Ohio and the County Sanitary Engineers' Association of Ohio, Columbus OH, November 29, 2004.

Casey, B. M., *"Meeting the Future Water Needs for The City of Findlay,"* presented at the 61st Annual Conference of the American Water Works Association, Ohio Section, Toledo OH, September 23, 1999.

Casey, B. M., Knight, K. S, *"A Common Sense Approach to Hydraulic Modeling,"* presented at the Summer Meeting of the Ohio Section, Southwest District, American Water Works Association, Miamisburg OH, July 8, 1999.Casey, B. M.,

and Project Manager for construction administration of the Sana Muerto WTP and Hatillo-Camuy WTP (3.45-mgd surface water treatment plant). A preliminary study was performed to establish treatment plant improvements required for each plant to achieve regulatory compliance. The improvements included design of new membrane filtration facilities as an additional treatment barrier and raw water pumping capacity improvement, new package treatment units, chlorine contact basin additions, and upgrades to chemical feed system.

City of Delaware: Delaware Water MP / Delaware OH

Design Leader for the study and preliminary design of improvements to the City of Delaware's water system. The project includes sizing and locating a new upground reservoir to provide raw water supply capacity to meet future demand requirements. Treatment options will be evaluated to provide future capacity while meeting the Stage 2 Disinfectants and Disinfection Byproduct Rule. Both conventional treatment technology and membrane treatment technology will be evaluated for the new water plant, as well as for modifications and upgrades to the existing water plant.

City of Delaware: Water Plant Rehabilitation Study and Membrane Pilot Testing / Delaware OH

Project Manager for the evalutation of the rehabilitation of the existing surface water treatment plant and pliot testing of high-rate iron removal and membrane softening of groundwater. The result was a comprehensive plan to upgrade the existing plant, including replacement of the filters with low-pressure membranes and construction of a new parallel groundwater treatment plant using the piloted technology. This solution allowed the City of Delaware to meet the requirements of the Stage 2 Disinfectant/ Disinfection Byproducts Rule and increase the plant capacity for significantly less cost as compared to construction of a new water plant.

Birmingham Water Works & Sewer Board: Carson Filter Plant Expansion / Birmingham AL

Process/Mechanical Discipline Leader for the design of an expansion to the Carson Filter Plant. A 10-mgd treatment train consisting of dissolved air flotation (DAF), filtration, and CT basin will be added to an existing plant, providing a total treatment capacity of 35.9 mgd. A new chemical feed building, high service pumping station, and sludge dewatering building will be added to serve the entire plant capacity. The new chemical building includes a liquid lime feed system for pre-filter alkalinity control as well as post-filter pH adjustment. In addition to liquid lime, several alkalinity/pH control options were evaluated based on cost and water quality implications. These included hydrated lime and caustic soda. The use of DAF (for drinking water treatment) and on-site generation of sodium hypochlorite are both firsts for the State of Alabama.

City of Wheeling: Water Treatment Plant Improvements / Wheeling WV

Design leader for improvements to the 20-mgd water plant, which treats Ohio River water. The project includes a 12-mgd membrane filtration facility (expandable to 20 mgd) and associated chemical feed systems, along with new high-service pumping facilities.

City of Newport News: Water Storage and High-Service Pumping Filtration Facilities / Newport News VA

Assisted in preparing the preliminary design report for a 52-mgd water treatment facility for the city. Tasks included a layout of filtration facilities, finished water storage, and high-service pumping.

City of Columbus: Hap Cremean Water Plant Value Engineering Study/ Columbus OH

Served as lead process mechanical engineer for a five day value engineering workshop for the ozone/ biofiltration project for the Hap Cremean Water Plant.

HAZEN AND SAWYER
Environmental Engineers & Scientists

Z. Michael Wang, PhD, PE, BCEE

Technical Review

Professional Record

Dr. Wang has over 30 years of experience in civil and environmental engineering including studies, planning, and design of water and wastewater facilities. He has also developed extensive expertise in computer modeling and hydraulic design and analysis of water and wastewater treatment facilities including chemical feed, instrumentation and control systems, and water distribution and wastewater collection systems.

Specialized in hydraulics, chemical storage and feed systems, and aeration systems, Dr. Wang has conducted start-up and trouble shooting of chemical facilities for numerous water treatment plants, wastewater aeration systems treatment plants, and water distribution systems. He currently serves as the Project Manager for the 2-mg clearwell addition at the Granite City WTF for Illinois American Water. He recently served as Design Project Manager for the Borman Park WTP Backwash Recycle and Residual Management Facility in Gary, IN for Indiana American Water. He recently served as the Design Project Manager for the new 6-mgd Hidden Lake WTF design-build project in Warsaw, Indiana for Indiana American Water, as well as the East River Station Flocculation Improvements in Davenport, Iowa for Iowa American Water. Dr. Wang was heavily involved in the San Koty WTP design-build project, and in the recent completion of the 15/20-mgd Bradley Avenue WTP design-build project in Champaign County; he also serves as the project manager for the 6-mgd Streator WTP design-build project and 22-mgd Mattis Avenue WTF design-build project in Champaign County, all for Illinois American Water.

Dr. Wang was Project Manager on the design of the 40-mgd Myrtle Beach Surface Water Treatment Facility Expansion, Myrtle Beach, SC; and Project Manager on Improvements to the 18-mgd Glenville Lake WTP and 32-mgd P.O. Hoffer Water Treatment Facility in Fayetteville, NC. He has played numerous project management and construction administration roles including the 5/15-mgd Bluestone WTP and the 2/4-mgd Weston WTP for the West Virginia American Water Company; the 6 to 12-mgd Expansion/Upgrade of the Sanford Water Treatment Plant in Sanford, NC; the 12 to 18-mgd Expansion/Upgrade of the Gaffney WTP in Gaffney, SC; and was in charge of evaluations on filters and chemical feed facilities for the 44-mgd industrial water treatment plant for Weyerhaeuser Paper Mill in Plymouth, NC. Dr. Wang also served as Project Engineer in design and start-up of the 15 to 20-mgd Jones Ferry Road WTP Expansion/Upgrade for the Orange Water and Sewer Authority, Carrboro, NC. Currently, he is in charge of construction administration for Raleigh, Fayetteville, Rocky Mount, NC and Myrtle Beach, SC WTP expansion construction. He is the project manager for several water treatment plants to convert Cl2 gas to sodium hypochlorite and free chlorine to chloramine, including Orange Water and Sewer Authority, Durham, Fayetteville, Greensboro, and Rocky Mount.

Dr. Wang has performed GIS and computerized hydraulic modeling on water distribution and wastewater collection system projects for Wake County, NC, South Cary, NC, Mount Airy, NC; Bessemer City, NC; and High Point, NC, as part of their Master Plans. In performing system analysis projects, Dr. Wang has applied water distribution system hydraulic models, such as KYPipe, WaterCAD, WaterWorks, and InfoWorks. Recently, as Project Engineer, he played a major role in completion of Water Distribution and Master Plan for the City of Sanford, NC, including evaluation of system pressure deficiencies, multiple pressure zones, pump station and elevated storage tanks. He has presented numerous papers on GIS and water distribution system analysis at various National AWWA and WEF Conferences, and in North Carolina, South Carolina and Virginia.

Areas of Specialization

- Design and analysis of water and wastewater treatment processes
- and facilities
- Computerized hydraulic modeling and mapping of water distribution
- and wastewater collection systems
- Hydraulic design and analysis of water and wastewater
- treatment facilities
- Specializes in chemical storage and feed facilities and aeration systems

Academic Credentials

PhD	North Carolina State University, 2007
MSE 1985	University of North Carolina at Charlotte,
BS	Rutgers University, 1982

Professional Certifications

Professional Engineer:
North Carolina, Illinois, South Carolina, New York, Virginia, Georgia, Ohio, Indiana, Iowa

Employment Record

1986 - Present	Hazen and Sawyer, P.C.
1985 - 1986	UNC, Chapel Hill, Dept. of Environmental Sciences and Engineering
1983 - 1985	UNC, Charlotte, Dept.of Civil and Environmental Engineering
1982 - 1983	Rutgers University, Microbiology Pollution Laboratory

Professional Affiliations

- American Academy of Environmental Engineers
- Diplomat, Board Certified
- Environmental Engineer
- American Water Works Association
- Water Environment Federation

HAZEN AND SAWYER
Environmental Engineers & Scientists

Professional Record

Mr. Walker has extensive expertise in the field of membrane water treatment applications, in particular microfiltration and reverse osmosis in recycling and seawater desalination applications.

This has included:

- Process design and commissioning for a leading microfiltration equipment supplier during the early adoption stage of the technology to the drinking water, waste water and recycling markets.
- Design and commissioning of membrane systems in design/construct contracts for low pressure membranes for drinking water in New Zealand, Australia and South East Asia. Also two large recycled water projects in Sydney and Perth.
- Operations of a 60 mgd recycling scheme using two different suppliers of low pressure membrane filtration.

Veolia Water Australia, 2011–2013 Brisbane Australia

Technical Manager – Australia/New Zealand

- Responsible for the Technical component of tenders/bids for the operations business across Australia/New Zealand including membrane filtration applications.
- Delivered an annual technical training of professionals from Asia Pacific, including China, Korea, Hong Kong, Japan and Australia for membrane technology in drinking water, water recycling and desalination applications.
- Has responsibility for Veolia Water Australia's research and development efforts, with significant research projects underway in the field of water recycling and membrane treatment. This includes collaboration with the University of Queensland, the University of New South Wales, and the Paris based corporate R&D group.

Veolia Water Australia, 2007–2011, Brisbane, Qld

Technical Manager – Qld Region

- Managed the technical team in place to support operating contracts for the Western Corridor Recycled Water Project and Gold Coast Desalination Project.
- Provided technical input to the design and construction of the Western Corridor Recycled Water Scheme, a landmark water recycling scheme built in Brisbane, Australia to mitigate severe drought conditions. This consisted of high level membrane water treatment including microfiltration, reverse osmosis and advanced oxidation processes.
- Provided direction and input into Veolia's R&D effort in Qld, including multiple membrane and R&D research projects with the University of Queensland and University of New South Wales. This included projects including low pressure membranes.
- Provided key technical input to the Western Corridor Recycled Water Project regulatory approval process. This included detailed process technical justification for regulatory approval and regular discussion with Qld Dept of Health, DERM, Office of Water Supply Regulator and Qld Govt Expert Panel on Water Recycling. This required high level technical research and review to provide sufficient evidence for regulators, especially as this was a first of its kind for Australia.
- Presented to various technical conferences. Presentations include Ozwater 07, IWA Reuse 09 and American Water Works Association Membrane Technology Conference in Memphis TN, 2009 (noted in detail below).

IWES, 2007 – Present, Australia Wide

Course Presenter – Membrane Plant Design and Operation

- Presenter of a highly specialist course in membrane plant design and operation for water treatment. (5 day course).

Areas of Specialization

- Low pressure membrane systems including microfiltration and ultrafiltration (submerged and pressurized systems).
- High pressure membrane systems including nanofiltration and reverse osmosis.
- Membrane system plant design including surface water, recycled water and desalination applications.
- Membrane plant operations including surface water, recycled water
- Water Treatment Operations Asset Management
- Water Quality and treatment regulation.
- Research and Development management
- Engineer and operations training

Mr. Walker has 19 years of water treatment experience in the fields of design and operations.

Academic Credentials

BSChE - University of New South Wales, Australia, 1990–1994; Graduate of CO-OP Scholarship Program

Employment Record

2013-Present	Hazen and Sawyer, P.C.
2007-2013	Veolia Water Australia
2007-2013	IWES
2000-2007	Veolia Water Systems
1998-2000	US Filter/Memcor
1994-2000	Memtec Ltd

Professional Affiliations

- AWWA Membrane Processes Committee
- AWWA Membrane Systems Subcommittee
- Engineers Australia
- American Membrane Technology Association Member
- PAC Member – Australian Water Recycling Centre of Excellence

- Course covers water treatment membrane technology including microfiltration and reverse osmosis. Includes presentations, example exercises and plant visits.
- Two courses conducted per year for engineering and technical professionals.

Veolia Water Systems, 2000–2007, Sydney, NSW

Process Engineer/ Process Design Manager

- Process Design Manager, managing a team of engineers for water treatment plant design in industrial and municipal markets. Responsible for tender and project process design and commissioning.
- Designed and commissioned the Kwinana Water Recycling plant (18 ML/d dual membrane process) for Water Corporation in Perth, Western Australia. This involved the use of microfiltration and reverse osmosis to treat secondary municipal effluent to a high level standard for industrial users. Was responsible for full process design, commissioning and plant performance testing.
- Designed and commissioned the Wollongong Water Recycling Plant (20 ML/d) as part of the Illawarra Wastewater Strategy project in Wollongong, New South Wales Australia. This involved the use of microfiltration and reverse osmosis to treat secondary municipal effluent to a high level standard for industry. This project also involved ground breaking studies into the impacts of trace industrial waste contaminants on membrane performance.
- Designed and commissioned the Port Macquarie Water Recycling Plant (1 ML/d) for Hastings Council. This was a landmark project in a small coastal community which provided high level recycled water from secondary effluent for use in local industries.
- Designed process treatment train for mining wastewater including clarification and reverse osmosis for Bendigo Mining Corporation. This project managed the de-watering of mine waste water for beneficial re-use in a drinking water supply using membrane technology.
- Designed microfiltration drinking water plant for Dunedin, New Zealand.
- Commissioned the 10 ML/d Bedok Demonstration recycling plant for Singapore Public Utilities Board. This plant utilises microfiltration and reverse osmosis and was the demonstration plant that proved the process viability and led to the development of the Singapore Newater recycling scheme.

US Filter/Memcor, 1998–2000, San Diego & Colorado Springs

Process Design and Commissioning Engineer

- Process design to support tendering for microfiltration technology projects in the western region of the United States, supporting Memcor microfiltration technology.
- Process commissioning and troubleshooting to various microfiltration applications throughout the United States as the technology was in the early stages of adoption.
- Development and commissioning of a microfiltration system post construction testing facility in Colorado Springs, Colorado.
- Commissioning and troubleshooting support for projects across the United States from California, Arizona, Wisconsin, New York, Michigan, South Dakota, Texas, Utah and Colorado.
- Commissioning of the Kenosha Water Treatment low pressure membrane plant in Kenosha, Wisconsin. This involved a ground breaking study on the sensitivity of the pressure decay integrity test method for determination of microbiological removal capability.
- Support to pilot studies for the Orange County Water District Groundwater Replenishment Scheme development.
- Support to pilot studies for the Scottsdale Water Campus recycling scheme in Scottsdale, Arizona.

Memtec Ltd, 1994–1998, Windsor, NSW

Process Engineer

- Process design for water treatment plants and processes including microfiltration, reverse osmosision exchange, classic coagulation, flocculation and filtration technologies. Commissioned 10 million litre per day / drinking water microfiltration plant at Tauranga, New Zealand. At the time this was the largest application of microfiltration for water treatment in the world. This project was in itself a significant advancement in the field of membrane water treatment. Bacterial challenge testing used to validate the treatment process on this project is still considered a benchmark

- Commissioned microfiltration pre-treatment process for water production facility at Samsung General Chemicals, Daesan, South Korea. This project was a unique application for microfiltration in the treatment of run-off water from ocean reclaimed land. Substantial developments in the use of chemical coagulation in conjunction with microfiltration membranes were achieved as a result of this project. .
- Commissioned a microfiltration and reverse osmosis plant for the recycling of electronics waste water for micro-electronics manufacturer Philips, Kaoshiung, Taiwan.
- Commissioned a microfiltration drinking water supply for the remote township of Collarenebri, NSW Australia. This project used membrane microfiltration technology coupled with granular activated carbon to treat a highly turbid water supply with known pesticide and herbicide contamination. On completion of the project, the township could for the first time use the town water supply for drinking.

HAZEN AND SAWYER
Environmental Engineers & Scientists

Professional Record

Mr. Green has 28 years of experience in municipal water projects both as a consulting engineer and a former State regulator. He specializes in water treatment processes and filtration and has served as project manager and design leader on all aspects of municipal water systems from raw water supply to treatment to pumping, storage and distribution. Project work has involved all phases of pilot testing and process optimization, study, design and construction from the conceptual level through planning, detailed design, construction administration, and ultimate startup of facilities. Mr. Green has had a key role on major water treatment plant improvement and expansion projects for Detroit Water and Sewerage Department, City of Ann Arbor MI, Greater Cincinnati Water Works, Clermont County OH and Indiana and Illinois American Water.

Illinois American Water:
Coordinated basis of design report and document submittal to Illinois EPA for the first ever Design/Build approval by this regulatory agency for the new 15 mgd Bradley Avenue lime softening plant in Champaign, IL. Performed QA/QC review during detailed design.

Illinois American Water:
Performed QA/QC review during detailed design for this project, which included adding a third filter, raw water flow meter and piping, design and instal¬lation of backwash supply pumps, replacing existing flocculators with twelve new vertical flocculators with variable frequency drives, providing a continuous sludge removal system, and providing a powdered activated carbon feed system.

Indiana- American Water:
Engineer of record and QA/QC for design of this 6 mgd ground water iron removal plant in Warsaw, IN, which included new wellfield, raw water transmission, aeration/detention/filtration, chemical feed systems, finished water storage and high service pumping. Coordinated all permitting, which included USACE Section 404, IDEM Section 401, IDNR Flood Control Act, IDEM Construction, IDEM NPDES, IDOT right of way and US Fish and Wildlife endangered species.

Indiana-American Water:
QA/QC review and permit coordinator for the design-build of a new backwash water recycle facility at the 50 mgd Borman Park Water treatment Plant in Gary, IN. The project includes a 1.2 mg, two cell equalization tank, recycle pumps and associated yard piping modifications. The project also included modifications to the plant's stormwater system for compliance with the City of Gary's stormwater ordinance.

Northern Area Water Authority, Tipp City, OH:
Project Manager for the investigation, recommendations and technical memorandum involving various issues with the engineering and operation of their 7 MGD groundwater nanofiltration membrane softening plant. The issues investigated revolved primarily around plant hydraulics associated with various treatment processes and residuals discharge. Currently managing the design of various plant improvements associated with the issues identified above.

Clermont County, OH:
Project manager for the treatment process piloting, rapid small scale column testing (RSSCT), design and construction for a new, retrofit intermediate pump station and granular activated carbon facility for the 20 mgd Bob McEwan WTP. The project also included pilot and full scale demonstration of existing filters to obtain regulatory approval for up-rating the filters from 10 mgd to 20 mgd and avoiding construction of additional filters. This project included extensive modeling to determine how best to up-rate both pretreatment and filtration processes, and incorporate the new GAC process into the hydraulic gradeline.

Areas of Specialization

- Water treatment process evaluation/optimization
- Water process design
- Water quality evaluation
- Pilot, bench, full scale treatment studies
- Environmental regulations

Academic Credentials

BSCE - Michigan Technological University, 1984
AAS - Michigan Technological University, 1981,

Professional Certifications

Professional Engineer:
Michigan, Ohio, Indiana

Employment Record

2000 - Present	Hazen and Sawyer, P.C.
1988 – 2000	Michigan Department of Environmental Quality
1985 – 1988	Orchard, Hiltz & McCliment
1984 – 1985	Thompson McCully

Professional Affiliations

- American Water Works Association

Detroit Water and Sewerage Department (DWSD):
Project Manager for the needs assessments of the 540 mgd Springwells and 220-mgd Southwest WTPs. Evaluations looked at mechanical (process), structural/architectural, electrical/I&C, and HVAC, as related to low and high-lift pumping, pretreatment, filtration, and chemical addition. The project had a focus on modifying existing and retrofitting new processes into the existing plant site and hydraulic grade line.

Detroit Water and Sewerage Department (DWSD):
Project Manager for an eight month pilot study for the 540 mgd Springwells, 300 mgd Northeast and 220 mgd Southwest WTPs. that evaluated flocculation times and mixing energy, plate settler loading rates, raw and intermediate ozonation, filtration, coagulants, coagulant aid polymers and filter aid polymers. This project had a focus on optimization of filter media configurations and loading rates that could be incorporated into the existing facilities.

HAZEN AND SAWYER
Environmental Engineers & Scientists

Jonathan E. Schubarth, P.E.

Process/Mechanical

Professional Record

Mr. Schubarth has over 19 years of experience in both private sector consulting and public sector utility engineering and management. As a consultant Mr. Schubarth's experience includes design and construction services for projects including water and wastewater systems, capital planning, permitting, pump stations, and treatment plants. As a utility manager, Mr. Schubarth managed, designed, and operated public water and wastewater systems including staff planning, capital planning, rate making, budgeting, and policy making; as well as the design of projects including water and wastewater systems, storage tanks, pump stations, and treatment plants. Mr. Schubarth directed, managed, or coordinated the following representative projects:

Water Operations/Studies:

Water System Operation – Warren County Water District, Butler County Water System, Inc., and Simpson County Water District
Operated and managed three water systems including the supervision of field crews responsible for maintenance to water lines, pump stations, tanks, and treatment facilities; as well as all engineering, planning, sampling, permitting, reporting, rate making, budgeting, and operational oversight.

Water Capital Improvement Plans – Warren County Water District, Butler County Water System, Inc., and Simpson County Water District
Development and subsequent implementation of the comprehensive long term capital improvement plans for the three water utilities. Growth and capacity projections, water quality, and system hydraulics were evaluated for the plans. Additionally, treatment plant upgrades were evaluated against to potential wholesale suppliers to determine the best combination of finished water for each utility.

Water Master Plan – Winchester Municipal Utilities
Development and subsequent implementation of a comprehensive water master plan. Growth projections, capacity, water quality, and system hydraulics were evaluated in development of the plan.

Water Designs

Water Treatment Plant Upgrade – Butler County Water System, Inc.
Project manager for the design and construction of the capacity upgrades and sludge handling improvements to the water treatment plant in two phases. Phase 1 included the expansion of an existing filter building and the addition of a new duel media filter. This project also included all required yard piping and upgrades to the chemical storage and feed systems. Phase 2 included the addition of an upflow clarifier with the required yard piping, sludge pump station, and a sludge drying bed.

North Warren Water System Improvements – Warren County Water District
Project manager for the design and construction of 12.5 miles of 12" and 20" water lines and two water pumping stations ranging from 750 gpm to 2,600 gpm. Project 19 – Warren County Water District. Project manager for the design and construction of 1 mile of 10" and 20" water line, a 1,200 gpm water pump station, and a 2.0 MG composite water tank.

Miscellaneous Water Storage Projects – Butler County Water System, Inc.:

- **Aberdeen Tank** – Project manager for the design and construction of a 500,000 gallon ground storage tank.
- **Hwy 79S Tank** – Project manager for the design and construction of a 150,000 gallon elevated storage tank.
- **Logansport Tank** – Project manager for the design and construction of a 50,000 gallon elevated storage tank.

Areas of Specialization

- Utility Management and Operation
- Collection and Distribution Systems Planning and Design
- Treatment Plant Planning and Design
- Booster Pump Station Design
- Bidding and Construction Administration Services

Academic Credentials

MSEnvE	Georgia Institute of Technology
BSE	Georgia Institute of Technology

Professional Certifications

Professional Engineer: Kentucky

Employment Record

Present		Hazen and Sawyer, P.C.
2004-2011	-	Warren, Butler, and Simpson County Water Districts
1999-2004	-	HDR/Quest
1995-1999	-	Winchester Municipal Utilities
1993-1995	-	HDR/Quest
1985-1989	-	United States Army

Professional Affiliations

- National Society of Professional Engineers
- Water Environment Federation
- American Water Works Association
- Kentucky Rural Water Association

Selected Presentations:

"When and How to do Phosphorus Removal", KY/TN Water Environment Association Annual Conference, May, 1995.

"A System Approach to Infrastructure Renewal", KY/TN Water Environment Association Annual Conference, May, 1997

- **Hwy 411 Tank** – Project manager for the design and construction of a relocation and elevation of an existing 50,000 gallon elevated storage tank.
- **Reedyville Tank** – Project manager for the design and construction of a 50,000 gallon ground storage tank.

Miscellaneous Water Transmission and Distribution Projects – Butler County Water System, Inc.:

- **Project 15** –Project manager for the design and construction of 11.5 miles of 6", 8" and 12" water line; 3 water pumping stations; and 2 control valve stations.
- **Project 16** – Project manager for the design and construction of 8.5 miles of 4", 6", and 8" water line and two control valve stations.
- **Project 17** – Project manager for the design and construction of 2 miles of 4", 6", and 8" water line.

Miscellaneous Water Transmission and Distribution Projects – Simpson County Water District:

- **Project 11** – Project manager for the design and construction of 12.5 miles of 6" and 8" water distribution line.
- **Project 12** – Project manager for the design and construction of 4 miles of 6" and 8" water line and the upgrade of two water pumping stations.
- **Project 13** – Project manager for the design and construction of 12.5 miles of 4", 6", and 8" water line.

Russellville Road Water System Improvements – Warren County Water District

Project manager for the design and construction of 2 miles of 8" and 12" water line and relocation of one pumping station.

Cemetery Road Water System Improvements – Warren County Water District

Project manager for the design and construction of 5.5 miles of 16" water line and a 1,500 gpm water pumping station.

HAZEN AND SAWYER
Environmental Engineers & Scientists

Alana B. Loughlin, P.E.

Process/Mechanical

Professional Record

During her time with Hazen and Sawyer, Ms. Loughlin has participated in the design of both water and wastewater treatment facilities. Her experience includes chemical storage and feed, effluent filtration, ultraviolet disinfection, and hydraulic analysis. The following are a select number of projects demonstrating Ms. Loughlin's experience in water treatment facility design.

Illinois American Water, Granite City WTF – Granite City, IL

Design Engineer for clearwell addition to 15-mgd Granite City WTF. Responsibilities include design of the clearwell and modifications to chemical feed systems.

Indiana American Water, Hidden Lake WTF – Warsaw, IN

Design Engineer for design/build of the new 7.5-mgd Hidden Lake WTF. Responsibilities included preparation of basis of design memorandum for project; design of chemical feed facilities, including on-site sodium hypochlorite generation system and facilities for sodium permanganate, fluoride, phosphate, and polymer storage and feed; and preparation of procurement packages for permitting and bid of clearwell and mechanical equipment.

Illinois American Water, Mattis Avenue WTF – Champaign, IL

Design Engineer for recently completed design/build of upgrade of 23-mgd Mattis Avenue WTF. Responsibilities included preparation of basis of design memorandum for the upgrade, design of new clearwells for the facility, and design of improvements to existing lime feed system.

Illinois American Water, Streator WTF – Streator, IL

Design Engineer for recently completed design/build of improvements to the 4.2-mgd Streator WTF. Responsibilities included design of powdered activated carbon feed system, sedimentation basin solids removal facilities, and new filter with backwash pumps and air scour; preparation of start-up plan for new equipment; and preparation of operation and maintenance manual for new facilities.

Illinois American Water, Bradley Avenue WTF – Champaign, IL

Design Engineer for recently completed design/build of the new 15-mgd Bradley Avenue WTF. Responsibilities included design of chemical facilities, including on-site sodium hypochlorite generation system and facilities for lime, carbon dioxide, ferric chloride, fluoride and phosphate storage and feed; design of filters with backwash pumps and air scour; and preparation of start-up plan for plant.

West Virginia-American Water Company, Bluestone and Weston Water Treatment Plants – Bluestone and Weston, WV

Design Engineer for the new 5-mgd Bluestone WTP and the new 2-mgd Weston WTP. Responsibilities included design of chemical storage and feed facilities and residuals handling facilities.

Johnston County, Johnston County WTP – Johnston County, NC

Design Engineer for upgrade of the 14-mgd Johnston County WTP. Responsibilities included design of new ferric chloride and caustic storage and feed facilities for new MIEX treatment train and design of upgrades to existing sodium hypochlorite, ferric chloride, caustic, fluoride, phosphate, and gaseous ammonia storage and feed systems.

City of Raleigh, E.M. Johnson WTP – Raleigh, NC

Design Engineer for the 50-mgd Finished Water Pump and Backwash Pump Addition project for the 86-mgd E. M. Johnson WTP. Responsibilities included design of modifications to existing sodium hypochlorite, caustic, and ammonia feed systems required for disinfection by chloramination. Also provided preliminary design of chemical feed facilities for the 120-mgd expansion study for the plant.

Areas of Specialization

- Chemical storage and feed facility design
- Effluent filter design
- Ultraviolet disinfection system design
- Hydraulic analysis and design

Academic Credentials

MCE	North Carolina State University, 1994
BSChE	North Carolina State University, 1990

Professional Certifications

Professional Engineer:
North Carolina

Employment Record

- 1994 – Present Hazen and Sawyer, P.C.
- 1993 – 1994 Dept. of Civil Engineering NCSU, Research Assistant
- 1990 – 1992 Combs & Associates

Professional Affiliations

- American Water Works Association
- Water Environment Federation
- NC Waterworks Operators Association
- NC AWWA/WEA
  - Membership, former Chair
  - Local Arrangements, former Chair
  - Student Activities, former Chair
  - Public Education, former Chair
  - Nominating Committees, former Chair
  - 5-S Society, member
- Mathematics Instructor at NC Waterworks Operators Association Regional Training Schools

Selected Presentations

Loughlin, Alana B., et. al., On-Site Sodium Hypochlorite Generation: A Look at the Numbers, South Carolina Environmental Conference, 2010.

Loughlin, Alana B., et. al., Considerations for Design and Operation of On-Site Hypochlorite Generation Facilities, NC AWWA/WEA Conference, 2009.

Greater Cincinnati Water Works, Richard Miller WTP – Cincinnati, OH
Project Engineer for the Modifications to Alum Storage and Feed Facilities for the 220-mgd Richard Miller WTP. Responsibilities included design of modifications to existing alum storage and feed facilities.

PWC of Fayetteville, Glenville Lake and P.O. Hoffer WTFs – Fayetteville, NC
Design Engineer for chemical storage and feed modifications for the 16-mgd Glenville Lake and 40-mgd P.O. Hoffer WTFs.

City of Myrtle Beach, Myrtle Beach WTP – Myrtle Beach, SC
Design Engineer for the upgrade and expansion of the 29.5-mgd Myrtle Beach WTP. Responsibilities included hydraulic analysis and design of chemical feed systems.

Professional Record

Mr. Fulghum joined Hazen and Sawyer in 2010 as a process mechanical engineer in the firm's Nashville office. His experience includes preliminary planning and detailed design of water and wastewater treatment processes and pumping stations. He has worked with both municipal and industrial clients to develop and evaluate process alternatives and upgrade solutions.

Water Treatment Plant Expansion to 30 MGD, Clarksville Gas & Water, Clarksville, TN

Technical manager/lead engineer for a 30-MGD membrane water treatment facility in Clarksville, Tennessee. The project consisted of replacing out-dated granular filters with pressure membranes and improvements to pumping and chemical feed systems. The microfiltration system features a dead-end arrangement treating settled water from existing sedimentation basins. Site constraints required membrane feed pumps, indoor chemical tanks for the CIP process, and all other ancillary equipment to be located in a new 13,000 SF building. Chemical feed modifications consisted of new storage, transfer, and peristaltic dosing pumps for coagulant, phosphate, and fluoride and the addition of a 1,200 ppd on-site hypochlorite generation system. Responsibilities included preliminary planning, detailed design, regulatory approval, and bidding assistance.

Membrane Pilot Study, Clarksville Gas and Water, Clarksville, TN

Technical manager/lead engineer for a 5-month membrane pilot study at an existing conventional water filtration plant. The purpose of the study was to demonstrate successful performance and to determine physical design parameters that would provide a basis on which a full-scale operation may be designed. Participants in the study were owner-selected and consisted of Pall Corporation (polymeric) and Kruger/Metawater (ceramic). Pilot testing was conducted on both treated raw water and settled water. Responsibilities included protocol development, pilot system set-up, data evaluation, preparation of study report, and regulatory approval.

Membrane Pilot Study, White House Utility District, White House, TN

Project engineer for a pilot study designed to determine the cause of membrane fouling and reduced performance at an existing 4-MGD facility. The membrane system was still under warranty at the time and the results of the study were used to validate a warranty claim which ultimately resulted in the replacement of several membrane modules and other improvements at no cost. Responsibilities included pilot system set-up, review of the manufacturer's protocol, and data evaluation.

Water Treatment Plants Capacity and Siting Study, Metro Water Services, Nashville, TN

Project manager for the evaluation of treatment capacity and reliability needs for the Metro Nashville area. Water quality, capacity, and reliability goals were established to provide a benchmark for future capital improvements projects. Alternatives for achieving these goals were developed and included the expansion of one or more facilities and/or the construction of a new facility. Potential new WTP sites were identified and evaluated for suitability based on a number or qualitative and quantitative criteria. Conceptual layouts and preliminary capital and O&M costs were developed for each of the capacity alternatives. The Study resulted in a consensus to plan for the design of a 25-MGD membrane filtration facility.

Water Treatment Plant Expansion to 51 MGD, Contract H, Harpeth Valley Utilities District, Nashville, TN

Lead engineer for a 12-MGD WTP expansion for the Harpeth Valley Utilities District in Nashville, Tennessee. The project included raw water pumping modifications, a 4-stage flocculation basin, four sedimentation basins equipped with plate settlers, four dual media filters rated at 6 gpm/sf, and various improvements to

Areas of Specialization

- Water Treatment Process Design
- Wastewater Treatment Process Design

Academic Credentials

BSCE 2005	Georgia Institute of Technology,
BS	University of Tennessee, 1999

Professional Certifications

Professional Engineer: Tennessee

Employment Record

2010 - Present	Hazen and Sawyer, P.C.
2005 - 2010	Jordan, Jones & Goulding

Professional Affiliations

- KY/TN Water Environment Association
- Water Environment Federation
- American Water Works Association

Selected Publications

"A Blessing in Disguise? Clarksville's Dewatering Operations After the Flood", Kentucky-Tennessee Water Professionals' Conference, Covington, Kentucky, July 2012

"Ceramic or Polymeric Membranes: What's your Application?", Kentucky-Tennessee Water Professionals' Conference, Nashville, Tennessee, July 2010

chemical feed systems such as coagulant, carbon, phosphate, chlorine gas, and dechlorination. Responsibilities included preliminary planning and the development of treatment alternatives, regulatory approval, preparation of plans and specifications, and construction phase engineering services.

Disinfection and Chemical Feed Improvements, Frankfort Plant Board, Frankfort, KY

Lead engineer for chemical feed system improvements at an 18-MGD WTP in Frankfort, Kentucky. Design elements consisted of a 3,000 ppd on-site hypochlorite generation system and associated peristaltic dosing pumps and ammoniators for the facility's chloramination system. Other improvements included new chemical storage, transfer, and dosing systems for sulfuric acid, fluoride, phosphate, sodium hydroxide, and coagulant. Clearwells were also retrofitted with baffles to improve disinfection CT. Responsibilities included preliminary planning, detailed design, and construction phase engineering.

Needs Assessment for the Omohundro Water Treatment Plant, Metro Water Services, Nashville, TN

Project engineer for the evaluation and needs assessment of the Omohundro Water Treatment Plant in Nashville, Tennessee. An assessment of existing unit processes was performed in order to provide recommended improvements for treatment optimization capable of meeting current and future capacity, reliability, and water quality needs.

Omohundro and K.R. Harrington WTPs Clarifier Improvements, Metro Water Services, Nashville, TN

Lead engineer and project manager for the design of clarifier improvements at the Omohundro WTP and K.R. Harrington WTP to improve turbidity removal. Conducted an evaluation of high rate settling devices, prepared plans and specifications, and provided construction phase engineering services.

Optimization for Removal of Taste and Odor Compounds, Metro Water Services, Nashville, TN

Performed bench-scale testing at two WTPs for Metro Water Services in Nashville, Tennessee to assist the client in selecting the optimal carbon product, dosage and contact time for MIB and geosmin removal. Responsibilities included developing the study protocols, executing the studies, and preparing the reports to document the findings of the studies.

Treatability and Tracer Studies, Upper Oconee Basin Water Authority, Bogart, GA

Performed bench-scale testing at the Bear Creek WTP to optimize chemical addition and treatment performance. The treatability study included test matrices to determine the optimum coagulant, coagulant dose, pH, pre-oxidant dose, and mixing speeds. In addition, a post-treatment tracer study was performed to determine the minimum chlorine residual required to meet disinfection CT values. Responsibilities included developing the study protocols, executing the studies, and preparing the reports to document the findings of the studies.

Professional Record

Mr. Laliberte has 25 years of experience in the field of environmental engineering. He is a technical specialist in the areas of advanced water treatment facilities and has experience with well supply systems. Mr. Laliberte currently serves as Project Manager for Illinois American Water's Granite City WTF Clearwell Addition Project. Mr. Laliberte's experience includes project management of the design/bid/build 16-mgd Alton WTP, and design/build delivery for the new 6-mgd Hidden Lake WTF and Borman Park Backwash Recycling and Residual Management Facility for Indian American Water, and the new 15/20-mgd Bradley Avenue WTP, 6-mgd Streator WTP Improvements and 22-mgd Mattis Avenue WTP Improvements, all for Illinois American Water. He has performed numerous project management and construction administration roles including the 5/15-mgd Bluestone WTP and 2/4-mgd Weston WTP for West Virginia American Water.

He served as Project Manager for the 6-mgd City of Durham Williams Water Treatment Plant Caustic Feed Improvements. He also served as Project Manager for the City of Durham Brown and Williams WTP Chemical Improvements. He also served as a Project Engineer on the 9-mgd San Koty WTP, also for American Water.

He has been involved with studies and pilot plant projects using innovative methods related to drinking water, organic contaminants, disinfection, disinfection byproducts, and corrosion control for lead and copper. Projects have included pilot scale treatability studies and full-scale implementation for compliance with SDWA Amendments. He has designed and operated on-site pilot scale testing facilities including alternative pretreatment chemicals prior to forced-draft aeration, flocculation prior to reverse osmosis treatment, ion exchange treatment, electrodialysis reversal (EDR) treatment and membrane softening, and reverse osmosis treatment for Orlando, FL; Sarasota, FL; Collier County, FL; Vero Beach, FL; Pompano Beach, FL; Hallandale Beach, FL; and City of Fort Lauderdale, FL; and Lee County, FL.

He conducted construction administration and operator training of advanced water treatment facilities including the 12-mgd Membrane Softening North Collier County Water Treatment Facility, Collier County, FL; 6-mgd Reverse Osmosis Water Plant, Vero Beach, FL; and 10-mgd Membrane Softening Water Treatment Plant, City of Pompano Beach, FL.

Mr. Laliberte's experience in the design and construction administration of advanced water treatment facilities includes: design of the 20-mgd Forced Draft Aeration Eastern Regional Water Supply Facility, Orange County, FL; design of the 12-mgd expandable to 20-mgd Membrane Softening North Collier Water Treatment Facility; design of the 6-mgd Reverse Osmosis Water Treatment Plant, Vero Beach, FL; and design of the 12-mgd expandable to 20-mgd Eddie D. Edwards Membrane Softening Water Treatment Plant, Fort Myers, FL.

He was recently responsible for technical management and construction administration of several advanced water treatment plants in Florida. These facilities include the 9-mgd City of Hallandale Beach Membrane Softening Water Treatment Plant in the City of Hallandale Beach, FL, and 12-mgd Reverse Osmosis Facility in Collier County. Mr. Laliberte also performed the construction management of the City of Lynchburg for their College Hill WTP Chemical Feed Facility and related improvements.

Mr. Laliberte has published and presented several papers for American Water Works Association (AWWA) and Southeast Desalting Association (SEDA) on advanced water treatment for drinking water.

Areas of Specialization

- Design and construction administration of water treatment
- and distribution facilities
- Operation of advanced water treatment processes (i.e., ion exchange
- and reverse osmosis processes)
- Operation of conventional processes (i.e., lime softening, sedimentation/filtration and iron/manganese processes)

Academic Credentials

BSCE University of Central Florida, 1987

Professional Certifications

Professional Engineer:
Ohio, Iowa, Illinois, Missouri, Indiana

Employment Record

1995 – Present	Hazen and Sawyer, P.C.
1987 – 1995	Boyle Engineering Corporation

Professional Affiliations

- American Water Works Association
- Southeast Desalting Association

HAZEN AND SAWYER
Environmental Engineers & Scientists

Professional Record

Mr. Leadbitter is an Associate at Hazen and Sawyer, P.C. and is currently the lead structural engineer for the company's Midwest Region. He is responsible for coordinating and supervising all structural work in the region and also manages a growing staff of structural engineers. His recent work has been directed toward the structural design, drafting and construction administration of water/wastewater treatment facilities and collection system infrastructure. He has acted as the lead structural engineer on multiple plant upgrade and infrastructure improvement projects. Additionally, within that scope of work, he has significant experience in structural inspection, condition assessment, retrofit of existing structures and concrete repair. He has a bachelor's degree in civil engineering with an emphasis in structural design and analysis with 16 years of total experience and is a licensed engineer in eleven states.

Infrastructure Inspection and Assessment, Concrete Repair Experience

Mr. Leadbitter has performed inspection, structural assessment and repair design for multiple structures in recent years. The scope of those inspections includes evaluation of existing reinforced concrete structures, precast concrete elements, masonry buildings, structural steel framing, pre-engineered metal buildings and miscellaneous metals including platforms, stairs and pipe supports. That work includes:

- **Moores Creek WWTP, Charlottesville, VA** – Multiple inspections as part of a full plant assessment including Clarifiers, Equalization Basins, Settling Basins, and Solids Handling Building. Provided multiple reports to the owner and incorporated critical repairs into the $40M plant upgrade.
- **City of Fayetteville Public Works Commission, P.O. Hoffer WTF, NC** – Performed multiple inspections to assess the condition of the 12 MG Clearwater Reservoirs. The work included review of contract drawings for original construction of the facilities built in 1967 and 1974, structural assessment and inspection of previous repairs.
- **Goose Creek WTP, Fairfax, VA** – Performed visual inspection of Sedimentation Basins and Flocculation Channels including all exposed concrete surfaces and mechanical appurtenances. The corrosive effects of ferric sulfate used in the treatment process were evaluated as part of the inspection. Provided full memorandum to the owner.

City of Winchester, KY – Lower Howards Creek Influent Pump Station and WWTP

Mr. Leadbitter has recently served as the Lead Structural Engineer for design and construction of the facility. The project involves more than a dozen structures as part of a new 10 mgd plant and is currently being built. Structures include an Administration Building, Electrical Building, Selector Tanks, Oxidation Ditches, three Clarifiers, RAS-WAS Pump Station, Effluent Facility, Sludge Storage Building, Sludge Dewatering Building and an Odor Control Facility.

Frederick County, MD – New Design Road WTP Expansion

Mr. Leadbitter has previously served as the Lead Structural Engineer for a major upgrade to the plant that resulted in a capacity increase from 8.8 mgd to 25 mgd. The project occurred over a two year construction period and was completed in mid 2010. The upgrade included design and construction of a two-story Chemical/Residuals Building, three Pump Stations, an Equalization Basin, a 70 foot diameter Gravity Thickener and a Chemical Feed Vault. Ten new chemical feed systems were added as part of the project, ranging from power activated carbon to aqueous ammonia. The most significant portion of the structural design is the Chemical/Residuals Building, consisting of a two-story concrete moment frame with a total square footage of 30,000 allowing for storage of over ten different chemicals and operation of two belt filter presses.

Areas of Specialization

- Structural design related to water and wastewater treatment facilities, collection systems, bridges and architectural structures
- Structural condition assessment of existing infrastructure
- Construction administration and field inspection
- Concrete repair and rehabilitation

Academic Credentials

BSCE North Carolina State University, 1997

Professional Certifications

Professional Engineer: Ohio, Kentucky, Tennessee, Indiana, North Carolina, Maryland, Virginia, New Hampshire, Massachusetts, Pennsylvania, Minnesota

Employment Record

1997 - Present	Hazen and Sawyer, P.C.
1996 - Summer	NC Department of Transportation
1994 – 1995	Blythe Construction, Inc.

Professional Affiliations

- American Concrete Institute (ACI)
- Structural Engineers Association of Ohio (SEAoO)

City of Rockville, MD – Rockville WTP Improvements

Mr. Leadbitter has acted as the Structural Engineer of Record for several projects at the plant. That work includes both the Rockville WTP Rehabilitation Project and Residuals Handling/Air Scour Upgrade Project. The Rehabilitation Project involved the design and construction of a Clarifier Gallery, Fluoride Storage Facility and structural repairs to an existing Filter. The Residuals Handling/Air Scour Project included design of a new 30 foot diameter Gravity Thickener, miscellaneous drainage structures, a crane and monorail system and a support pad for new blowers.

HAZEN AND SAWYER
Environmental Engineers & Scientists

Patrick D. Thiedeman, P.E., SE
Structural

Professional Record

Mr. Thiedeman has a diverse background in Structural Engineering. Currently, he serves as Senior Principal Engineer at Hazen and Sawyer. His design experience includes prestressed and reinforced concrete, masonry, structural steel and aluminum structures. In addition to experience in the design of water and wastewater treatment plants, he also has extensive bridge design experience. His previous experience includes work as a Structural Engineer on numerous NCDOT projects including precast girder and steel plate girder spans. He has provided structural engineering services on the following projects:

Phase 1 – Reliability Improvements, P.O. Hoffer Water Treatment Facility, Public Works Commission of the City of Fayetteville, NC
Design of a new raw water meter vault, rapid mix facility, and design of flocculation improvements including support platforms for new variable speed vertical mixers. Condition assessment and development of concrete repair and coating specifications for existing flocculation basins, sedimentation basins and filter rehabilitation including concrete spall repairs, thimble replacement, liner installation, etc.

Granite City Water Treatment Facility, Granite City, IL
Serving as the lead structural engineer for the 2-mg Clearwell Addition project at the 15-mgd Granite City Water Treatment Facility in Granite City, IL for Illinois American Water.

Borman Park Water Treatment Plant, Gary, IN
Served as the lead structural engineer for the recently-completed Backwash Recycling and Residual Management Facility design/build project at the 54-mgd Borman Park Water Treatment Plant in Gary, IN, for Indiana American Water.

East River Station Water Treatment Plant, Davenport, IA
Served as a structural engineer for the flocculation improvements project at the 30-mgd East River Station Water Treatment Plant in Davenport, IA for Iowa American Water.

Examples of other water projects include: **Catskill/Delaware Water Treatment Ultraviolet Light Disinfection Facility** and the **Rye Lake Water Treatment Plant in the State of NY**. Both projects were designed to provide underground reinforced concrete processing chambers vaulted by a structural steel superstructure. Mr. Thiedeman also served as lead structural designer on the Westchester Joint Waterworks for Westchester County, NY, and the Water Project Plan DWRF Project No. 7130 for Adrain, MI.

Areas of Specialization

- Structural design, analysis and construction of industrial, sanitary,
- and waterfront facilities
- Structural condition assessments of environmental
- and waterfront structures
- Behavior of deep foundations and soil-structure interaction
- Prestressed concrete and plate girder bridge design

Academic Credentials

MS	North Carolina State University, 1998
BA	Davidson College, 1994

Professional Certifications

Professional Engineer:
North Carolina, Illinois

Employment Record

2004 – Present	Hazen and Sawyer, P.C.
1998 – 2004	Moffatt & Nichol Engineers
1997 – 1998	NCSU
1996 – 1997	Wang Engineering

Professional Affiliations

- American Society of Civil Engineers

HAZEN AND SAWYER
Environmental Engineers & Scientists

William H. Russell, AIA, LEED AP

Architectural

Professional Record

Mr. Russell has experience in the architectural design of water treatment plants, wastewater treatment plants, maintenance buildings, laboratories, and other industrial facilities. As Architect, his responsibilities include preliminary and final design, technical specifications, cost estimation and project administration during construction. Mr. Russell utilizes computer applications during all phases of architectural design.

Roanoke Regional Water Pollution Control Plant

Provided architectural design of administration, maintenance, primary treatment, and biosolid treatment structures. The structures are designed to blend with the current structures which are heavily influenced by colonial motifs. The buildings have a structural frame with masonry infill and cast stone accents.

Henrico Water Reclamation Facility

Expansion and upgrade of the 75 mgd Henrico WRF. Provided architectural design services for the dewatering building and several other process related facilities. The dewatering facilities were designed to fit within a composting facility that was out of service. Modifications were made to allow the installation of centrifuges and conveyors systems to transport the biosolids to drying beds. Acoustical treatments were added to limit the sound levels within the building.

Blue Plains Influent Screening Facilities Upgrade Project, District of Columbia Water and Sewer Authority (DC Water), Washington, DC

Mr. Russell provided architectural assistance for design of upgrades to the 1 billion gallon per day (bgd) influent screen facilities at DC WASA's Blue Plains Advanced WWTP. Project includes 13 fine (1/4") screens, and completely mechanized and redundant screenings collection and conveyance systems. Architectural work included modifications to the existing facilities including reroofing, providing skylights for access, and providing additional walls for separation of hazardous and non-hazardous spaces in accordance with NFPA 820. Mr. Russell additionally provided office construction administration during construction.

Greensboro Water Reclamation Facility

Provided architectural design several modifications over the years to process and administration buildings at the TZ Osborne plant. Modifications have included several modifications to the dewatering facilities including removing existing belt filter process equipment and replacing with centrifuges and other building and chemical modifications. Designed modifications to the incinerator portion of the dewatering building.

City of Raleigh Neuse River Wastewater Treatment Plant Upgrade

Provided architectural design for the upgrade and expansion of the Neuse River WWTP. Projects have included work on several process buildings including the dewatering structure. Centrifuges and a conveyors were added to the dewatering facility. The facility was designed to harmonize with the existing structures in the vicinity.

Greensboro Water Reclamation Facility

Provided architectural design several modifications over the years to process and administration buildings at the TZ Osborne plant. Modifications have included several modifications to the dewatering facilities including removing existing belt filter process equipment and replacing with centrifuges and other building and chemical modifications. Designed modifications to the incinerator portion of the dewatering building.

City of Raleigh Neuse River Wastewater Treatment Plant Upgrade

Provided architectural design for the upgrade and expansion of the Neuse River WWTP. Projects have included work on several process buildings including the dewatering structure. Centrifuges and a

Areas of Specialization

- Programming and design of Water, Wastewater Facilities,
- Laboratories and industrial facilities
- Sustainable Design of Water and Wastewater Facilities
- Utilization of computer applications in the design of water, wastewater and industrial facilities

Academic Credentials

BArch Clemson University, 1984

Professional Certifications

Registered Architect: North Carolina, Virginia, Illinois, Maryland, Connecticut, New York, Texas, New Hampshire

Employment Record

2000 - Present	Hazen and Sawyer, PC
1997 - 2000	O'Neal Inc.
1992 - 1997	Hazen and Sawyer, PC
1985 - 1992	Piedmont Olsen Inc.
1985	Freeman, Wells & Major
1984 - 1985	Jno. Lambert Architects & Planners

Professional Affiliations

- American Institute of Architects
- Steel Structures Painting Council
- International Code Congress
- National Fire Protection Association

conveyors were added to the dewatering facility. The facility was designed to harmonize with the existing structures in the vicinity.

North Durham Water Reclamation Plant, Durham, NC
Architectural design for a new solids handling building and renovations of existing control.

Hominy Creek WWTP, Wilson, NC
Architectural design of structures. The project included a new administration and laboratory building, digester building modifications, solids handling building with conveyors to load out area or to the covered sludge drying beds.

Haw River Water Pump Station for the Department of Water Resources, Greensboro, North Carolina
Provided architectural design and construction administration services for rehabilitating the Haw River Water Pump Station. Work included cleaning and repairing existing masonry, providing new openings, reroofing and refinishing all interior surfaces.

Frederick P. Griffith, Jr. WTP Raw Water Facilities, Fairfax County Water Authority, Virginia
Provided construction administration services for the Frederick P. Griffith, Jr. WTP Raw Water Facilities. Work included shop drawing review, inspection and responding to RFIs.

Falls Lake Raw Water Pumping Station, Raleigh, North Carolina
Provided architectural QA/QC for the Raw Water Pump Station Improvements for the Falls Lake Raw Water Pumping Station.

Deer Creek Pumping Station, Baltimore, Maryland
Provided architectural design for the upgrade of the Deer Creek Pumping Station. Working included providing new openings in the exterior masonry, renovation of the interior spaces, new insulation and roofing system, and a single story 3,400 square foot addition housing electrical equipment.

HAZEN AND SAWYER
Environmental Engineers & Scientists

David A. Atkinson, P.E., LEED AP

Electrical

Professional Record

Mr. Atkinson serves as a project electrical engineer specializing in the design of electrical power distribution systems for pump stations and water treatment plants.

Granite City Water Treatment Facility, Granite City, IL

Serving as the electrical engineer in responsible charge for the 2-mg Clearwell Addition project at the 15-mgd Granite City Water Treatment Facility in Granite City, IL for Illinois American Water. The electrical design included the relocation of liquid-filled transformers, addition of a switchboard, addition of variable frequency drives, modifications to existing switchgear, and many other electrical modifications and updates around the plant. The project is currently under construction, and Mr. Atkinson is overseeing shop drawing review and addressing any construction issues as they come up.

Borman Park Water Treatment Plant, Gary, IN

Served as the lead electrical engineer for the recently-completed Backwash Recycling and Residual Management Facility design/build project at the 54-mgd Borman Park Water Treatment Plant in Gary, IN, for Indiana American Water. The electrical upgrades included the addition of variable frequency drives, panelboards, lighting fixtures, and controls.

Bradley Avenue Water Treatment Facility, Champaign, IL

Responsible for the design/build of the electrical distribution system for the facility. The facility is entirely new and rated for up to 20 mgd. The electrical system includes a 2000kW standby engine-generator set, 3000A automatic transfer switch, 3000A switchboard, and 300hp variable-frequency drives. Seven off-site well pump stations and their associated electrical equipment and SCADA systems are also included as part of the design/build. This facility recently attainted LEED Certification.

Hidden Lake Water Treatment Facility, Warsaw, IN

Served as the lead electrical engineer for a new 6-mgd water treatment plant design/build project. The electrical system includes variable frequency drives, standby engine generator sets, switchgear, and controls. Remotely located groundwater wells will communicate with the water treatment plant SCADA system wirelessly. This facility will be applying for LEED certification and Mr. Atkinson is responsible for achieving a number of electrical-related credits towards this certification.

Goose Creek Water Treatment Plant, Fairfax, VA

Responsible for the design of the electrical distribution system expansion for the disinfection improvements project. The Goose Creek Water Treatment Plant is rated at 12 mgd, and the disinfection improvements included the addition of aqua ammonia, ferric sulfate, and caustic storage and feed systems. Electrical improvements included the addition of panelboards, DC SCR drives for chemical metering pumps, motor controls, fire alarm system, lighting, and additions to the existing plant control system.

Water Treatment Plant Upgrade and Elevated Storage Tank Addition, Town of Westernport, MD

Responsible for the electrical improvements for the plant upgrade which consisted of the replacement of a chlorine gas system with a bulk hypochlorite feed system, addition of pumping facilities, and a new filter backwash system. The electrical improvements included the addition of a new electric utility service, motor control centers, an automatic transfer switch, a diesel standby engine-generator set, and a control system that allows the plant to run most of the day without the need to be staffed.

Abingdon Water Treatment Plant Expansion Project, Harford County, MD

Lead Electrical Engineer responsible for the design of the electrical distri-

Areas of Specialization

- Low and medium voltage power distribution, lighting, motor controls, fire alarm systems, access control systems, closed circuit television systems, and variable frequency drives
- Computer analysis and design of electrical power systems using SKM Power Tools and ETAP software, computer-aided design using AutoCAD, networking and database applications

Academic Credentials

BSEE Rose-Hulman Institute of Technology, 2003

Professional Certifications

Professional Engineer:
North Carolina, Kentucky, Virginia, Maryland, Indiana, Iowa, New Hampshire, Massachusetts

Employment Record

2003 - Present Hazen and Sawyer, P.C.

bution system upgrades. This expansion will bring the plant from a capacity of 10 mgd to 20 mgd, with the electrical system being designed for a near-future upgrade to 40 mgd. The system consists of plant-owned, low-voltage switchgear served by two independent utility supplies. A second low-voltage switchgear assembly and a 2000kW standby engine-generator set configured for parallel operation with a second future generator are to be installed. Mr. Atkinson is currently responsible for the electrical construction administration duties on the project. Approximate total construction cost is $62 million.

Water Treatment Plant, City of Rockville, MD

Responsible for the electrical facility evaluation and report for the WTP. The plant currently operates at a maximum capacity of 8 mgd and major electrical upgrades will be made to bring it up to 14 mgd and improve overall system reliability. Mr. Atkinson was also responsible for the design of an ongoing upgrade at the plant. The electrical upgrades currently in progress include the addition of a 1250kW standby diesel engine/generator set and 5kV class switchgear with automatic transfer controls. Mr. Atkinson is currently responsible for a power systems study for the plant including protective devices coordination and arc flash evaluation studies.

Wilder's Grove Service Center for the City of Raleigh, NC

Responsible for the electrical distribution system design. This facility has applied for a LEED Gold status, and has begun construction. The facility includes daylight harvesting lighting control systems, low power consumption light emitting diode (LED) technology for the very expansive parking areas, and a ground source heat pump system. Mr. Atkinson is intimately involved in the construction administration and commissioning of the facility.

HAZEN AND SAWYER
Environmental Engineers & Scientists

Professional Record

Jason V. Advani, PE is a Principal Engineer in the firm's Columbus, Ohio office and has over seven years of water and wastewater control system design and support experience. His responsibilities include the design of controls systems, telemetry systems and network security, and preparation of construction specifications for water and wastewater treatment facilities. He has experience providing construction administration (CA) services as it pertains to instrumentation and control. These activities include shop-drawing review and approval, PLC programming, field checkout, start-up, commissioning, and troubleshooting, as well as supervising construction staff. Mr. Advani also has in-depth information technology (IT) experience with databases, computer networks, hardware and software design and implementation and integration of systems.

Northern Kentucky Water District, KY – Taylor Mill Treatment Plant Advanced Treatment Improvements

Lead engineer for addition of new Granular Activated Carbon Facility and Preliminary Treatment process. Supported the efforts of four different design consultants.

Columbus, OH – Division of Sewerage and Drainage Documentation

Made significant contributions to the City of Columbus Instrumentation and Control System Design Guidelines versions 5.00 and 5.10—a publication for I&C coordination and design recommendation for engineering firms that do work for the City of Columbus Division of Sewerage and Drainage. Additional work involved updating the City of Columbus instrumentation and control systems master specifications for primary sensors and field instruments, control panel instruments and devices, uninterruptible power supplies, network devices and workstation hardware and software.

Columbus, OH - T. Marzetti, Allen Division – pH Flow Equalization Pretreatment

Provided PLC and OIT programming, start-up, and training services for a pH and flow-rate equalization basin retrofitted at an existing food manufacturing facility. The control system monitored effluent pH, dosed chemical when necessary and metered facility effluent to the sanitary sewer while logging data for future retrieval.

Indianapolis, IN – Belmont Ozone Enhanced Ultraviolet Disinfection Facility

Lead instrumentation and controls engineer for the addition of a large ultraviolet disinfection system for partial-plant-flow disinfection. The design consists of seven new two-bank UV disinfection channels, integration of their existing ozone disinfection system to aid with pre-ozonation and replacement of the instrumentation controls for the existing Sodium Hypochlorite and Sodium Bisulfite wet-weather disinfection system.

Valparaiso, IN – Valparaiso CSO Disinfection Facility Design

Lead instrumentation and control engineer for new a CSO disinfection facility utilizing three existing equalization basins. Integrated existing equipment and instrumentation with the new facility's sampling and chemical systems. Provided assistance with CA services during construction.

Newark, OH – High Rate Treatment System and Facilities Design

Lead instrumentation and controls engineer for the design of a new Krüger new high rate treatment system, along its chemical feed systems, and integration of the facility in to the existing plant SCADA system. Tasks also included replacement of the main plant's influent pump variable speed drives, coordination with numerous vendor control systems and design of a plant-wide video surveillance system.

Areas of Specialization

- Instrumentation and Control Evaluation
- Planning, Design and Startup for WWTP/WTP
- Telemetry System Design
- Networking Design & Security
- PLC Programming (Allen Bradley)
- HMI Programming (Wonderware & iFix)
- Low-voltage Electrical Design

Academic Credentials

BSECE The Ohio State University, 2004

Professional Certifications

Professional Engineer: Ohio

Certified Construction Documents Technologist (CDT)
CompTIA A+ Certification
Microsoft Certified Professional

Employment Record

2012 - Present	Hazen and Sawyer, PC
2006-2012	ARCADIS US

Selected Publications

Advani, J.V., "PLCs & HMIs: A Guide to Wastewater Control," presented at the SW Section Meeting of the Ohio Water Environment Association (SWOWEA), Greene County OH, March 18, 2010.

Greene County, OH - Sugarcreek Water Resource Facility Reclamation Improvements Design
Lead instrumentation and controls engineer for a major plant upgrade that among other tasks included design of alum and polymer storage and automatic feed systems. Over twenty-two new PLCs were installed for packaged vendor control systems and for integration purposes. Total I/O points were over 1000 The County's existing telemetry system was leveraged and expanded for communications to two remote sites. Led the incorporation of a proprietary Schreiber biological nutrient removal (BNR) and Turblex blower installation to provide BNR in continuously rotating circular aeration basins.

HAZEN AND SAWYER
Environmental Engineers & Scientists

Alan Vestal, P.E., LEED AP

HVAC/Plumbing

Professional Record

Mr. Vestal has 28 years of mechanical design experience as a consulting engineer. His responsibilities include project management, HVAC, plumbing, and fire protection design. He has experience with new building construction, additions, and renovations. Mr. Vestal's experience includes an extensive range of projects working with municipal, commercial, educational, and industrial buildings. He has obtained his LEED Accredited Professional status in 2006 from the USGBC.

City of Columbus, Hap Cremean WTP, Filters A and B Improvements/Columbus OH

Lead Project Engineer for the design of HVAC ventilation improvements with the addition of two suspended air handling units, replacement interlocking exhaust fans, new pipe gallery dehumidifier, and entire replacement of the steam and condensate piping systems , steam radiators and unit heaters throughout.

City of Columbus, Hap Cremean WTP, PAC Facility/Columbus OH

Lead Project Engineer for the HVAC design for the PAC building. Design and construction administration of a powdered activated carbon (PAC) facility for the 125-mgd plant. The purpose of the facility is to remove atrazine and other agricultural chemicals from the drinking water.

City of Columbus, Hap Cremean WTP, Bulk Chemical Building/Columbus OH

The original design for the Bulk Chemical Building was completed in 1989 and did not include any ventilation per Ten States Standards and consisted of gas-fired unit heaters. Several years later it became apparent to current staff members that the environment was creating advancing rapid corrosion issues and the HVAC systems required an evaluation leading to improvements. I did the initial evaluation, recommendation and subsequent design leading to the addition of the current ventilation and exhaust systems and removal of the gas-fired unit heaters. Gas appliances installed within chemical facilities created acids when combusted and condensable by products drain back into the heat exchangers. Budgetary decisions led to the decision to use PVC coated ductwork throughout. This was an improvement to the previous galvanized steel duct, but not as corrosion resistant as FRP which would be recommended for any new ductwork.

R.C. Wilson Water Treatment Plant, Phase IV Improvements, Hagerstown, MD

These improvements included HVAC, plumbing and Fire Protection design for a chemical feed building and pump building. HVAC exhaust ductwork and fans were all fiberglass construction, interlocked with custom air handling units. Fire protection included both wet pipe sprinklers and clean agent.

City of Nashua, CSO Screening and Disinfection Facility/Nashua, NH

HVAC and plumbing design for a disinfection facility which uses sodium hypochlorite (NaOCl) bulk containers and 8% NaOCl solution. Dechlorination with sodium bisulfite (NaHSO3). HVAC ductwork and fans were all aluminum or coated steel construction, interlocked with motor actuated louvers. The electrical room was served via a wall mounted packaged AC unit and the general space heated by stainless steel unitary heaters. Plumbing consisted of emergency shower and eyewash stations coupled with a tempered water system in addition to a small restroom.

North Olmsted WWTP Improvements, City of North Olmsted, OH

Project Engineer for the design of HVAC improvements to existing WWTP expanded to a peak flow capability of plant to 40 MGD. New facilities included Pre treatment Building with odor control and continuous ventilation of 12 ACH per NFPA 820 standards for declassification, precision air conditioning of electrical rooms throughout the plant, and ventilation and heating in new RAS-WAS and

Areas of Specialization

- Water/Wastewater Ventilation
- HVAC
- Odor Control

Academic Credentials

BAgE The Ohio State University, 1984

Professional Certifications

Professional Engineer: Ohio, Kentucky, Virginia, North Carolina, Tennessee

Employment Record

2010 - Present	Hazen and Sawyer, P.C.
2008-2010	Karpinski Engineering .
1999-2008	Burgess & Niple, Inc.
1997-1999	AEC Services
1987-1997	Malcolm Pirnie, Inc
1985-1987	Larsen Engineering

Professional Affiliations

- American Society of Heating, Refrigerating, and Air-Conditioning Engineers
- United States Green Building Council – Central Ohio Chapter Member

plant effluent buildings. Existing sludge storage, solids handling and chemical building HVAC systems were also replaced.

Clarksville WWTP Electrical Building and HVAC Improvements and Overall Plant Improvements, City of Clarksville, TN

Design of precision control HVAC cooling systems for all electrical rooms throughout the plant damaged by flooding (entire plant). Replacement and improvements to HVAC systems throughout the plant site meeting NFPA 820 requirements. Improvements included HVAC and plumbing design for a new headwork's facility, new disinfection infrastructure, new administration building and laboratory with fume hoods (destroyed by the flood), new primary electrical distribution building (destroyed by the flood), new chemical building, improvements to sludge dewatering , solids handling, and various other buildings throughout the entire plant.

Fairfax 50/66 Main Pump Station HVAC improvements for the 50/66 Main Pumping Station located in Fairfax County, VA

These improvements included replacement of wet well side Odor Control equipment at a 5.5 peak flow mgd pump station and HVAC improvement to meet NFPA 820 standards on the drywell side utilizing a new at grade exterior custom air handling unit and interlocked exhaust system with stainless steel duct.

Neuse River WWTP Expansions, Phase II - City of Raleigh, North Carolina

HVAC system design to cool 55 tons of sensible load from electrical gear located within a new 2,200 SF electrical building. Tandem multi circuited cooling units were used with built-in capacity redundancy.

City of Columbus, Jackson Pike WWTP Improvements, Project J190 and subsequent improvements projects to Blower Building and Pump Station Improvements

Lead Project Engineer for the design of HVAC and plumbing improvements to existing WWTP at Jackson Pike in Columbus, OH from 1991 – 2003. Involved in multiple ongoing plant improvement projects over a span of over 12 years. Majority of the plant HVAC and plumbing systems were upgraded during these ongoing improvement projects.

Akron Mud Run Pump Station/ Akron OH

Design of replacement HVAC systems for an existing 12 MGD pump station originally built in 1938 and expanded several times over the last 75 years. Replacement and improvements to HVAC systems will include new custom gas-fired air handling units with an evaluation for lifecycle payback for the addition of heat recovery. The existing HVAC systems provided the proper amount of air change rate for classified areas per NFPA 820, but did not meet chapters 8 and 9 for control safeties, shut-down alarming, and monitoring of airflow. New systems also will be in compliance with the requirement to keep classified spaces negative and adjacent unclassified areas positive in pressure relationship with each other.

Newark Water Treatment Plant, Water Treatment Plant Improvements Phases I & 2– Newark, OH

Phase I included a new Finished Water Pump Station heated by hot water unit heaters and a high efficiency tandem of pulse boilers with rooftop exhaust fans for heat removal of the pump heat generation. Phase 2 design included replacement of the central heating system with new high efficiency low thermal shock boilers, and replacement of the cooling systems with a centralized packaged chiller. Building improvements involved entirely new HVAC systems in the control building, filter building and chemical facilities. Centralized dehumidification was added to the plant for the first time.

Professional Record

Mr. Steinmetz has 30 years of experience in the design and management of a wide range of projects, including storm and sanitary sewer systems, hydraulic analyses, storm water management, pump stations, flood studies, and environmental permitting.

Scott County Water Main Extensions – Kentucky American Water
Route studies and designs related to the construction of approximately 20 miles of water transmission mains for Kentucky American Water, including stream crossings and the preparation of numerous permanent easements.

US 68 Water Main Relocations – Kentucky American Water
Preparation of design plans and specifications for the relocation of Kentucky American Water's facilities along Harrodsburg Road (US 68) impacted by pending roadway improvements.

Toyota Tsusho America, Georgetown, KY
Metal Recovery Facility, Steel Warehouse, Logistic Building, ARK Building, parking lot expansion, grading and drainage systems, erosion control plan, and railroad spur extensions. The total site development encompassed approximately 600,000 square feet of building area.

Alumni Office Park, Lexington, KY
Preparation of development plan, site, grading, and storm water management for a 7-parcel, 12-acre office park.

Monessen Hearth Systems, Paris, KY
Preparation of site, grading, and drainage plans for the 13-acre parcel in the Paris-Bourbon County Industrial Park.

Barbourville Utilities Office Building, Barbourville, Kentucky
Project management, site plans, grading plans, bidding and construction administrating services for a new 5,500 square foot office building.

Columbia Hospital Office Building, Lexington, Kentucky
Preparation of site plans, grading and erosion control plans, storm water management, site utilities, and related details for a new 50,000 sf, 3-story building on 3.1 acres.

Water Supply Study, Winchester, KY
Scoping study to identify and evaluate alternatives related to increasing the supply of potable water for Winchester, to meet increased demands due to growth, and address problems associated with droughts. The alternatives included connection to the nearby Kentucky American Water system, connection to a potential Bluegrass Water Supply Commission system, and construction of a new water treatment plant, with associated raw water and transmission mains.

Athens-Boonesboro Road Water Main Relocations – Kentucky American Water
Relocation of an existing water transmission main to accommodate the widening of Athens-Boonesboro Road in Lexington, KY from Jacobsen Park to Interstate 75. The project included water main plan and profile, interconnections, and the development of permanent and temporary easements.

Lebanon Industrial Park Sanitary Sewer Extension, Lebanon, KY
Preparation of construction plans to extend sewer service to two separate industrial park sites in Lebanon.

Derby Estates Subdivision, Scott County, Kentucky
Preparation of subdivision plat, roadway designs, storm and sanitary sewer designs, water main extensions, and grading plans for a large subdivision in Scott County.

Cardinal Hill Hospital Expansion, Lexington, Kentucky
Services related to construction conflict resolution for a new Pediatric Center.

Areas of Specialization
- Stormwater Management
- Hydraulic Modeling
- NPDES Permitting
- Drainage Systems Planning and Design
- Collection System Planning and Design
- Infiltration and Inflow Studies
- Sewer System Rehabilitation
- Pump Stations
- Bidding and Construction Administration Services

Academic Credentials
- BSCE University of Kentucky, 1982

Professional Certifications
Professional Engineer:
Kentucky, Ohio, Tennessee

NASSCO Pipeline Assessment Certification Program
PACP Certification No. 04-7430

Specialized training in hydraulic modeling, NPDES Permitting. XP-SWMM, PIPE 2000, HEC-RAS, Natural Stream Design

Professional Affiliations
- American Society of Civil Engineers
- National Society of Professional Engineers
- Water Environment Federation
- American Water Works Association

HAZEN AND SAWYER
Environmental Engineers & Scientists
150 E. Campus View Blvd.
Suite 150
Columbus, Ohio 43235

Jeff,
Attached you will find a High Level Design Report Request For Proposal for the replacement of Kentucky American Water's 25 MGD Filter Building located at our Richmond Road Station Water Treatment Facility. Attachments listed in the RFP will arrive with a follow-up, hard copy. If you do have any questions, comments or concerns please do not hesitate to contact me. Furthermore, if you are unwilling or unable to submit a proposal for the aforementioned project please notify me at your earliest convenience.

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

Jun 25, 2013 9:35:07 AM

From: Green, Robert < rgreen@hazenandsawyer.com >
To: "zachery.dukes@amwater.com" < "zachery.dukes@amwater.com" >
Subject: **Visit to Richmond Road Station WTP**

Zach,

I am hoping to schedule a little time with you, Thursday June 27th, for a brief visit to the plant to follow up on our initial visit during the pre-proposal meeting.

Please let me know if you or others have availability to accommodate us on Thursday.

Thank you for your time.

Robert A. Green, P.E., Associate
HAZEN AND SAWYER
313.304.6614 (cell)

Attachments:

Jun 27, 2013 10:14:43 AM

From: Zachery B. Dukes/KAWC/AWWSC < Zachery.Dukes@amwater.com >
To: "Bryan, Alan" @AWX < "Bryan, Alan" @AWX >
Subject: **Re: New Filter Bldg RFP**

It can not be taken off line for inspection.

Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

"Bryan, Alan" ---06/24/2013 09:29:07 AM---Hello Zach, Is there any way to take the clearwell off line or bypass for inspection?

From: "Bryan, Alan" <ABryan@grwinc.com>
To: "zachery.dukes@amwater.com" <zachery.dukes@amwater.com>
Cc: "Smallwood, Bob" <BSmallwood@grwinc.com>
Date: 06/24/2013 09:29 AM
Subject: New Filter Bldg RFP

Hello Zach,

Is there any way to take the clearwell off line or bypass for inspection?

Alan A. Bryan, P.E.
GRW Engineers, Inc.
801 Corporate Drive
Lexington, KY 40503
(859) 223-3999
(859) 223-8917 fax

Attachments:

Jul 3, 2013 3:58:13 PM

From: Ronald K Kruchinski/KAWC/AWWSC < Kevin.Kruchinski@amwater.com >
To: Zachery B. Dukes/KAWC/AWWSC@AWW < Zachery.Dukes@amwater.com >
Subject: **Re: Proposal Review - RRS Filter Building Study**

Thanks for the explanation!

So that us non engineers are scoring consistently- if it appears a firm doesn't provide the data, score them a 0?

****
Kevin Kruchinski
Production Superintendent
Kentucky American Water
2300 Richmond Rd Lexington, KY 40502
r.kruchinski@amwater.com
P 859-335-3418 M 859-361-1770

For quality and value, tap water is the clear choice.

Zachery B. Dukes---07/03/2013 03:35:24 PM---1.3C - May be a stretch but I left this in because some reports may speak to life of the filter buil

From: Zachery B. Dukes/KAWC/AWWSC
To: Ronald K Kruchinski/KAWC/AWWSC@AWW
Cc: Brent E O'Neill/SERVCO/AWWSC@AWW, David Shehee/KAWC/AWWSC@AWW
Date: 07/03/2013 03:35 PM
Subject: Re: Proposal Review - RRS Filter Building Study

1.3C - May be a stretch but I left this in because some reports may speak to life of the filter building during design/construction and possible modifications required.
1.3D - This is to compare the firms' comprehension of the performance required from the filter building.
3B - This is to compare rates associated with each position in a firm to assure we aren't surprised if addition work is requested/needed and we move into paying billable hours for the firm's additional work.
4F - This is to check that a firm has adequate QA/QC i.e. that all work isn't done by one individual in the firm with no quality assurances or control.

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water

Attachments:

May 23, 2013 2:30:07 PM

From: Zachery B. Dukes/KAWC/AWWSC < Zachery.Dukes@amwater.com >
To: George.Woolwine@hdrinc.com < George.Woolwine@hdrinc.com >
Subject: **KAW - RRS Filter Building RFP**

George,
Attached you will find a High Level Design Report Request For Proposal for the replacement of Kentucky American Water's 25 MGD Filter Building located at our Richmond Road Station Water Treatment F follow-up, hard copy. If you do have any questions, comments or concerns please do not hesitate to contact me. Furthermore, if you are unwilling or unable to submit a proposal for the aforementioned project

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

Attachments:
KAW - RRS Filter Building RFP.pdf

May 23, 2013 2:31:13 PM

From: Zachery B. Dukes/KAWC/AWWSC < Zachery.Dukes@amwater.com >
To: jsteinmetz@hazenandsawyer.com < jsteinmetz@hazenandsawyer.com >
Subject: **KAW - RRS Filter Building RFP**

John
Attached you will find a High Level Design Report Request For Proposal for the replacement of Kentucky American Water's 25 MGD Filter Building located at our Richmond Road Station Water Treatment F follow-up, hard copy. If you do have any questions, comments or concerns please do not hesitate to contact me. Furthermore, if you are unwilling or unable to submit a proposal for the aforementioned project

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

Attachments:
KAW - RRS Filter Building RFP.pdf

May 23, 2013 2:32:17 PM

From: Zachery B. Dukes/KAWC/AWWSC < Zachery.Dukes@amwater.com >
To: jhenry@grwinc.com < jhenry@grwinc.com >
Subject: **KAW - RRS Filter Building RFP**

Joe,
Attached you will find a High Level Design Report Request For Proposal for the replacement of Kentucky American Water's 25 MGD Filter Building located at our Richmond Road Station Water Treatment F follow-up, hard copy. If you do have any questions, comments or concerns please do not hesitate to contact me. Furthermore, if you are unwilling or unable to submit a proposal for the aforementioned project

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

Attachments:
KAW - RRS Filter Building RFP.pdf

May 23, 2013 2:33:14 PM

From: Zachery B. Dukes/KAWC/AWWSC < Zachery.Dukes@amwater.com >
To: KGILLESPIE@hkbell.com < KGILLESPIE@hkbell.com >
Subject: **KAW - RRS Filter Building RFP**

Kelly,
Attached you will find a High Level Design Report Request For Proposal for the replacement of Kentucky American Water's 25 MGD Filter Building located at our Richmond Road Station Water Treatment F follow-up, hard copy. If you do have any questions, comments or concerns please do not hesitate to contact me. Furthermore, if you are unwilling or unable to submit a proposal for the aforementioned project

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

Attachments:
KAW - RRS Filter Building RFP.pdf

Jun 27, 2013 10:16:43 AM

From: Zachery B. Dukes/KAWC/AWWSC < Zachery.Dukes@amwater.com >
To: "Bryan, Alan" @AWX < "Bryan, Alan" @AWX >
Subject: **Re: New Filter Bldg RFP**

Please disregard the "...fee will be negotiated..." statement. I accidentally left that in from a previous RFP. Yes, include in the 10 page limit.

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

"Bryan, Alan" ---06/24/2013 08:58:03 AM---Hello Zach, I have a question about the fee for the RFP on the New Filter Building Study. In Part 3.

From: "Bryan, Alan" <ABryan@grwinc.com>
To: "'zachery.dukes@amwater.com'" <zachery.dukes@amwater.com>
Cc: "Smallwood, Bob" <BSmallwood@grwinc.com>
Date: 06/24/2013 08:58 AM
Subject: New Filter Bldg RFP

Hello Zach,

I have a question about the fee for the RFP on the New Filter Building Study. In Part 3. Scope of Work, it states that a final scope of work and fee will be negotiated with the
Criteria, it states that the Fee proposal is worth 0-10 points. I believe at the pre-proposal meeting you stated that you wanted to see our lump sum fee. Should a lump sum f
after the project schedule?

Alan A. Bryan, P.E.
GRW Engineers, Inc.
801 Corporate Drive

Attachments:

Jun 27, 2013 10:17:01 AM

From: Zachery B. Dukes/KAWC/AWWSC < Zachery.Dukes@amwater.com >
To: "Casey, Bret" @AWX < "Casey, Bret" @AWX >
Subject: **RE: Visit to Richmond Road Station WTP**

Please disregard the "...fee will be negotiated..." statement. I accidentally left that in from a previous RFP. Yes, include in the 10 page limit.

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

"Casey, Bret" ---06/27/2013 09:43:27 AM---Zach, I think Bob Green already asked this question, but to confirm... Please clarify where the lump

From: "Casey, Bret" <bcasey@hazenandsawyer.com>
To: "Zachery.Dukes@amwater.com" <Zachery.Dukes@amwater.com>
Cc: "Green, Robert" <rgreen@hazenandsawyer.com>
Date: 06/27/2013 09:43 AM
Subject: RE: Visit to Richmond Road Station WTP

Zach, I think Bob Green already asked this question, but to confirm...

Please clarify where the lump sum fee should be included in the proposal.

Thank you.

Bret M. Casey, P.E., BCEE
HAZEN AND SAWYER
150 E. Campus View Blvd., Suite 133
Columbus, OH 43235
614-781-9655
614-596-4155 mobile
bcasey@hazenandsawyer.com

Attachments:

Jun 24, 2013 7:56:38 AM

From: Zachery B. Dukes/KAWC/AWWSC < Zachery B. Dukes/KAWC/AWWSC >
To: "David Schrader" < "David Schrader" >
Subject: **Re: KAW - RRS Filter Building RFP**

Good to go. Check in with security up front.

From: David Schrader [dschrader@hkbell.com]
Sent: 06/24/2013 07:20 AM AST
To: Zachery Dukes
Subject: Re: KAW - RRS Filter Building RFP

Zach,
I would like to bring our structural and electrical engineer to your facility this morning to conduct a walkthrough. We will not need to take any of your time this morning oth would like to schedule for around 9:00 - 10:00 a.m. this morning. Please call me when you get to the office.
Thanks,

David F. Schrader, P.E.
Vice President
Bell Engineering
Ph: 1-859-278-5412
Fax: 1-859-278-2911
Cell: 1-859-351-1263
web: www.hkbell.com
e-mail: dschrader@hkbell.com

On Tue, Jun 18, 2013 at 10:33 AM, <Zachery.Dukes@amwater.com> wrote:

> I will have the Professional Services Agreement at the meeting. I will provide a location map afterwards if anyone finds it necessary. See you at 1.
>
> Zach

Attachments:

Jun 25, 2013 6:52:31 AM

From: Zachery B. Dukes/KAWC/AWWSC < Zachery B. Dukes/KAWC/AWWSC >
To: "David Schrader" < "David Schrader" >
Subject: **Re: KAW - RRS Filter Building RFP**

David,
I'm out of town today still. Let me check with our production manager to make sure he will be in town tomorrow morning. Are these not questions you can email to me?
Zach

From: David Schrader [dschrader@hkbell.com]
Sent: 06/24/2013 05:15 PM AST
To: Zachery Dukes
Subject: Re: KAW - RRS Filter Building RFP

Zach,
Thank you for allowing the Bell design team time to conduct a site visit of your filter building. We would like to sit down and go over some of our project concerns with you
Wednesday morning?
Thanks,

David F. Schrader, P.E.
Vice President
Bell Engineering
Ph: 1-859-278-5412
Fax: 1-859-278-2911
Cell: 1-859-351-1263
web: www.hkbell.com
e-mail: dschrader@hkbell.com

On Mon, Jun 24, 2013 at 7:56 AM, <Zachery.Dukes@amwater.com> wrote:

> Good to go. Check in with security up front.

Attachments:

Jun 26, 2013 8:09:10 AM

From: Zachery B. Dukes/KAWC/AWWSC < Zachery.Dukes@amwater.com >
To: "Green, Robert" @AWX < "Green, Robert" @AWX >
Subject: **Re: Visit to Richmond Road Station WTP**

Robert,
Thursday will work for a tour of the Filter Building. My availability will be limited but feel free to come tour the facility.

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

"Green, Robert" ---06/25/2013 09:35:07 AM---Zach, I am hoping to schedule a little time with you, Thursday June 27th, for a brief visit to the p

From: "Green, Robert" <rgreen@hazenandsawyer.com>
To: "zachery.dukes@amwater.com" <zachery.dukes@amwater.com>
Cc: "Schubarth, Jon" <jschubarth@hazenandsawyer.com>, "Casey, Bret" <bcasey@hazenandsawyer.com>
Date: 06/25/2013 09:35 AM
Subject: Visit to Richmond Road Station WTP

Zach,

I am hoping to schedule a little time with you, Thursday June 27th, for a brief visit to the plant to follow up on our initial visit during the pre-proposal meeting.

Please let me know if you or others have availability to accommodate us on Thursday.

Thank you for your time.

Attachments:

Appendix B

AMERICAN WATER

Kentucky American Water Company

Scoring Criteria

Item		Description	Weighting (%)
1		**Project Approach**	**30.0%**
1.1		**Technical**	**5.0%**
	a.	Proposer's understanding of RFP Requirements	2.0%
	b.	Does Proposer understand KAWC High Level Review Requirements	3.0%
1.2		**Project Outline**	**10.0%**
	a.	Adequacy of Study Concept	3.0%
	b.	Adequacy of proposed meetings	4.0%
	c.	Adequate proposed report layout/ structure	3.0%
1.3		**Adequacy of Scope of Work Identified**	**10.0%**
	a.	Adequacy of Facility Inventory Task	1.0%
	b.	Adequacy of Condition Assessment Task	1.0%
	c.	Adequacy of Residual Life Analysis Task	2.0%
	d.	Adequacy of Performance Requirements Review Task	3.0%
	e.	Adequacy of Project Descriptions and Cost Estimate Task	3.0%
1.4		**Identification of Potential Challenges**	**2.0%**
	a.	Acceptability of Potential Challenges and possible solutions	2.0%
1.5		**Alternatives**	**3.0%**
	a.	Acceptability of offered alternatives	3.0%
2		**Project Schedule**	**20.0%**
	a.	Were critical and key milestones identified?	8.0%
	b.	Were adequate approval times included?	6.0%
	c.	Were realistic periods identified?	6.0%
3		**Fee Proposal**	**10.0%**
	a.	Design Costs	6.0%
4		**Project Team**	**20.0%**
	a.	Adequacy of proposed team experience on similar projects	5.0%
	b.	Adequacy of team member disciplines	4.0%
	c.	Adequacy of staffing structure	2.0%
	d.	Qualification of team members	5.0%
	e.	Performance on other AW projects	2.0%
	f.	Proposer's Quality Management Plan	2.0%
5		**Firm's Capabilities**	**20.0%**
	a.	Relevancy of similar projects	10.0%
	b.	Are indicated projects similar in scope and magnitude?	5.0%
	c.	Was project team involved in similar roles in indicated projects?	5.0%
Total			**100.0%**

Appendix C

Reviewer:

Kentucky American Water Company
Richmond Road Station Filter Building Study

TEAM 1	**57.6**	Gannett Fleming
TEAM 2	**51.0**	Hazen & Sawyer
TEAM 3	**61.2**	HDR
TEAM 4	**57.4**	Bell
TEAM 5	**57.0**	GRW

Proposers' Score Table

Scoring criteria & mechanism are on the previous worksheets
See scoring definitions below

Item		Description	Max. Possible Weighted Score (%)	TEAM 1 Gannett Fleming Score	TEAM 1 Weighted Score	TEAM 1 Comments	TEAM 2 Hazen & Sawyer Score	TEAM 2 Weighted Score	TEAM 2 Comments	TEAM 3 HDR Score	TEAM 3 Weighted Score	TEAM 3 Comments	TEAM 4 Bell Score	TEAM 4 Weighted Score	TEAM 4 Comments	TEAM 5 GRW Score	TEAM 5 Weighted Score	TEAM 5 Comments
		COMPOSITE TOTAL	**100.0%**		**57.6**			**51.0**			**61.2**			**57.4**			**57.0**	
1		**Project Approach**	**30%**		**17.2**			**11.6**			**17.2**			**12.6**			**14.6**	
1.1		**Technical**	**5%**		5.0			3.0			5.0			3.0			4.0	
	a.	Proposer's understanding of RFP Requirements	2%	5.0	2.0		3.0	1.2		5.0	2.0		3.0	1.2		4.0	1.6	
	b.	Does Proposer understand KAWC High Level Review Requirements	3%	5.0	3.0		3.0	1.8		5.0	3.0		3.0	1.8		4.0	2.4	
1.2		**Project Outline**	**10%**		6.6			6.0			6.6			6.0			6.6	
	a.	Adequacy of Study Concept	3%	4.0	2.4		3.0	1.8		4.0	2.4		3.0	1.8		4.0	2.4	
	b.	Adequacy of proposed meetings	4%	3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4	
	c.	Adequate proposed report layout/ structure	3%	3.0	1.8		3.0	1.8		3.0	1.8		3.0	1.8		3.0	1.8	
1.3		**Adequacy of Scope of Work Identified**	**10%**		0.6			0.6			0.6			0.6			0.6	
	a.	Adequacy of Facility Inventory Task	1%	3.0	0.6		3.0	0.6		3.0	0.6		3.0	0.6		3.0	0.6	
	b.	Adequacy of Condition Assessment Task	1%	5.0	1.0	MSI Diving	3.0	0.6		5.0	1.0	MSI Diving	2.0	0.4	**Limited Structural Review**	5.0	1.0	**Dive Inspection**
	c.	Adequacy of Residual Life Analysis Task	2%	3.0	1.2		3.0	1.2		3.0	1.2		3.0	1.2		3.0	1.2	
	d.	Adequacy of Performance Requirements Review Task	3%	3.0	1.8		3.0	1.8		4.0	2.4	Screening Method Proposed	3.0	1.8		3.0	1.8	
	e.	Adequacy of Project Descriptions and Cost Estimate Task	3%	3.0	1.8		3.0	1.8		3.0	1.8		3.0	1.8		3.0	1.8	
1.4		**Identification of Potential Challenges**	**2%**		2.0			0.8			2.0			1.2			1.6	
	a.	Acceptability of Potential Challenges and possible solutions	2%	5.0	2.0		2.0	0.8		5.0	2.0		3.0	1.2		4.0	1.6	
1.5		**Alternatives**	**3%**		3.0			1.2			3.0			1.8			1.8	
	a.	Acceptability of offered alternatives	3%	5.0	3.0	3 possilbel alternatives (Admin Storage	2.0	1.2		5.0	3.0	5 possible	3.0	1.8		3.0	1.8	
2		**Project Schedule**	**20%**		**12.0**			**12.0**			**12.0**			**12.0**			**12.0**	
	a.	Were critical and key milestones identified?	8%	3.0	4.8		3.0	4.8		3.0	4.8		3.0	4.8		3.0	4.8	
	b.	Were adequate approval times included?	6%	3.0	3.6		3.0	3.6		3.0	3.6		3.0	3.6		3.0	3.6	
	c.	Were realistic periods identified?	6%	3.0	3.6		3.0	3.6		3.0	3.6		3.0	3.6		3.0	3.6	
3		**Fee Proposal**	**10%**		**4.4**			**4.4**			**5.6**			**7.2**			**4.4**	
	a.	Design Costs	6%	3.0	3.6	59300	3.0	3.6	53600	4.0	4.8	43000	4.0	4.8	25000	3.0	3.6	54500
	b.	Labor Rates	4%	1.0	0.8	no rates	1.0	0.8	No rates	1.0	0.8	no rates	3.0	2.4	provided rates	1.0	0.8	No rates
4		**Project Team**	**20%**		**12.0**			**12.0**			**11.4**			**11.6**			**12.0**	
	a.	Adequacy of proposed team experience on similar projects	5%	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
	b.	Adequacy of team member disciplines	4%	3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4	
	c.	Adequacy of staffing structure	2%	3.0	1.2		3.0	1.2		3.0	1.2		3.0	1.2		3.0	1.2	
	d.	Qualification of team members	5%	3.0	3.0		3.0	3.0		2.0	2.0	No Resumes	3.0	3.0		3.0	3.0	
	e.	Performance on other AW projects	2%	3.0	1.2		3.0	1.2		3.0	1.2		2.0	0.8	**Not aware of Major AW Projects**	3.0	1.2	
	f.	Proposer's Quality Management Plan	2%	3.0	1.2		3.0	1.2		4.0	1.6		3.0	1.2		3.0	1.2	
5		**Firm's Capabilities**	**20%**		**12.0**			**11.0**			**15.0**			**14.0**			**14.0**	
	a.	Relevancy of similar projects	10%	3.0	6.0		3.0	6.0		4.0	8.0	Three Kentucky Projects	4.0	8.0	Kentucky Projects	4.0	8.0	Kentucky Projects
	b.	Are indicated projects similar in scope and magnitude?	5%	3.0	3.0		2.0	2.0		4.0	4.0	Similar in magnitude	3.0	3.0		3.0	3.0	
	c.	Was project team involved in similar roles in indicated projects?	5%	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Score Definitions
5 Far Above Expectations
4 Above Expectations
3 Meets Expectations
2 Below Expectations
1 Far Below Expectations
0 Unacceptable

AMERICAN WATER

Kentucky American Water Company
Richmond Road Station Filter Building Study

Reviewer: David Shehee
Supt, WQ and Env Compliance

TEAM 1	**50.6**	Gannett Fleming
TEAM 2	**48.2**	Hazen & Sawyer
TEAM 3	**52.2**	HDR
TEAM 4	**50.4**	Bell
TEAM 5	**43.2**	GRW

Proposers' Score Table

Scoring criteria & mechanism are on the previous worksheets
See scoring definitions below

Item	Description	Max. Possible Weighted Score (%)	TEAM 1 Gannett Fleming Score	TEAM 1 Weighted Score	TEAM 1 Comments	TEAM 2 Hazen & Sawyer Score	TEAM 2 Weighted Score	TEAM 2 Comments	TEAM 3 HDR Score	TEAM 3 Weighted Score	TEAM 3 Comments	TEAM 4 Bell Score	TEAM 4 Weighted Score	TEAM 4 Comments	TEAM 5 GRW Score	TEAM 5 Weighted Score	TEAM 5 Comments
	COMPOSITE TOTAL	**100.0%**		**50.6**			**48.2**			**52.2**			**50.4**			**43.2**	
1	**Project Approach**	**30%**		**12.6**			**10.8**			**13.8**			**11.0**			**10.2**	
1.1	**Technical**	**5%**		3.0			3.0			3.0			3.0			3.0	
a.	Proposer's understanding of RFP Requirements	2%	3.0	1.2		3.0	1.2		3.0	1.2	General	3.0	1.2	Focused on one option.	3.0	1.2	
b.	Does Proposer understand KAWC High Level Review Requirements	3%	3.0	1.8		3.0	1.8		3.0	1.8	General	3.0	1.8	Focused on one option.	3.0	1.8	
1.2	**Project Outline**	**10%**		6.0			6.0			6.0			5.4			4.6	
a.	Adequacy of Study Concept	3%	3.0	1.8		3.0	1.8	Idea is good	3.0	1.8		2.0	1.2	No discussion of clearwell.	2.0	1.2	No look at renovation potential.
b.	Adequacy of proposed meetings	4%	3.0	2.4	Not sure the minimum is what we need.	3.0	2.4		3.0	2.4		3.0	2.4		2.0	1.6	Too few.
c.	Adequate proposed report layout/ structure	3%	3.0	1.8		3.0	1.8	Very general.	3.0	1.8		3.0	1.8		3.0	1.8	
1.3	**Adequacy of Scope of Work Identified**	**10%**		0.6			0.4			0.6			0.2			0.6	
a.	Adequacy of Facility Inventory Task	1%	3.0	0.6	Electric/SCADA not discussed in any depth.	2.0	0.4	No discussion of CTs	3.0	0.6		1.0	0.2	Listed 24 MGD facility. No CW or CT discussion.	3.0	0.6	
b.	Adequacy of Condition Assessment Task	1%	3.0	0.6	Electric/SCADA not discussed in any depth.	2.0	0.4		3.0	0.6		1.0	0.2	Missed CW. No divers mentioned unless we told them we used them recently.	3.0	0.6	
c.	Adequacy of Residual Life Analysis Task	2%	4.0	1.6	Only one with any information	0.0	0.0	None present.	0.0	0.0	None present.	0.0	0.0	None present	0.0	0.0	None
d.	Adequacy of Performance Requirements Review Task	3%	3.0	1.8		3.0	1.8		3.0	1.8		2.0	1.2	None present	2.0	1.2	None
e.	Adequacy of Project Descriptions and Cost Estimate Task	3%	3.0	1.8	No breakout of labor costs	3.0	1.8	Not broken out at all.	3.0	1.8	General	3.0	1.8	General	3.0	1.8	
1.4	**Identification of Potential Challenges**	**2%**		1.2			0.8			1.2			1.2			0.8	
a.	Acceptability of Potential Challenges and possible solutions	2%	3.0	1.2	No evaluation of potential new building sites or issues associated with this.	2.0	0.8	Unknown	3.0	1.2		3.0	1.2		2.0	0.8	Not performed.
1.5	**Alternatives**	**3%**		1.8			0.6			3.0			1.2			1.2	
a.	Acceptability of offered alternatives	3%	3.0	1.8	Doesn't include GAC contactors.	1.0	0.6	None.	5.0	3.0	Added plate settler's too.	2.0	1.2	None offered	2.0	1.2	Only 2.
2	**Project Schedule**	**20%**		**12.0**			**10.8**			**10.8**			**13.2**			**9.6**	
a.	Were critical and key milestones identified?	8%	3.0	4.8		3.0	4.8		3.0	4.8		3.0	4.8		3.0	4.8	Not well.
b.	Were adequate approval times included?	6%	3.0	3.6		2.0	2.4	1 week for whole thing.	2.0	2.4	1 week.	3.0	3.6		2.0	2.4	4 days.
c.	Were realistic periods identified?	6%	3.0	3.6	Rapid turnaround needed.	3.0	3.6		3.0	3.6	Review not adequate.	4.0	4.8		2.0	2.4	See review time.
3	**Fee Proposal**	**10%**		**3.6**			**3.6**			**3.6**			**8.0**			**3.6**	
a.	Design Costs	6%	3.0	3.6		3.0	3.6	Said no piloting needed.	3.0	3.6	2nd lowest.	4.0	4.8	Lowest with no piloting.	3.0	3.6	
b.	Labor Rates	4%	0.0	0.0	None identified.	0.0	0.0	None identified.	0.0	0.0	None identified.	4.0	3.2	Only one provided.	0.0	0.0	None identified.
4	**Project Team**	**20%**		**10.4**			**12.0**			**12.0**			**10.2**			**10.8**	
a.	Adequacy of proposed team experience on similar projects	5%	3.0	3.0		3.0	3.0		3.0	3.0	No resume's	2.0	2.0	Smaller facilities.	3.0	3.0	Really only one similar project.
b.	Adequacy of team member disciplines	4%	2.0	1.6	Electrical, HVAC, and SCADA not identified.	3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4	
c.	Adequacy of staffing structure	2%	2.0	0.8	Seems light to me for this size of project unless the engineers listed are multi disciplined.	3.0	1.2		3.0	1.2		3.0	1.2		2.0	0.8	HVAC?
d.	Qualification of team members	5%	3.0	3.0	A lot of good background even if not exactly on a project of this nature.	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
e.	Performance on other AW projects	2%	2.0	0.8	Used on several. Part of KRS 1 Intake team.	3.0	1.2	Used on several.	3.0	1.2	Design Pool 3	2.0	0.8	Unknown.	2.0	0.8	Poor intake at KRS 1.
f.	Proposer's Quality Management Plan	2%	3.0	1.2	QA/QC Reviewer	3.0	1.2	Technical reviewer	3.0	1.2	Technical and QA review	2.0	0.8	None identified.	2.0	0.8	None identfied.
5	**Firm's Capabilities**	**20%**		**12.0**			**11.0**			**12.0**			**8.0**			**9.0**	
a.	Relevancy of similar projects	10%	3.0	6.0	Too many not relevant but AW projects.	3.0	6.0		3.0	6.0	Bill extremely happy with NK renovations.	2.0	4.0	Smaller but similar.	2.0	4.0	Only one really the same.
b.	Are indicated projects similar in scope and magnitude?	5%	3.0	3.0	Too many that are not relevant scale.	3.0	3.0		3.0	3.0		2.0	2.0	Smaller but similar.	2.0	2.0	Only one really the same.
c.	Was project team involved in similar roles in indicated projects?	5%	3.0	3.0		2.0	2.0	Many new employees.	3.0	3.0		2.0	2.0	Many not.	3.0	3.0	

Score Definitions
5 Far Above Expectations
4 Above Expectations
3 Meets Expectations
2 Below Expectations
1 Far Below Expectations
0 Unacceptable

Appendix C

Reviewer:

AMERICAN WATER

Kentucky American Water Company
Richmond Road Station Filter Building Study

TEAM 1	**52.2**	Gannett Fleming
TEAM 2	**51.8**	Hazen & Sawyer
TEAM 3	**55.0**	HDR
TEAM 4	**54.8**	Bell
TEAM 5	**51.2**	GRW

Proposers' Score Table

Scoring criteria & mechanism are on the previous worksheets

See scoring definitions below

Item	Description	Max. Possible Weighted Score (%)	TEAM 1 Gannett Fleming Score	TEAM 1 Weighted Score	TEAM 1 Comments	TEAM 2 Hazen & Sawyer Score	TEAM 2 Weighted Score	TEAM 2 Comments	TEAM 3 HDR Score	TEAM 3 Weighted Score	TEAM 3 Comments	TEAM 4 Bell Score	TEAM 4 Weighted Score	TEAM 4 Comments	TEAM 5 GRW Score	TEAM 5 Weighted Score	TEAM 5 Comments
	COMPOSITE TOTAL	**100.0%**		**52.2**			**51.8**			**55.0**			**54.8**			**51.2**	
1	**Project Approach**	**30%**		**12.6**			**12.2**			**13.8**			**12.8**			**11.6**	
1.1	**Technical**	**5%**		3.0			3.0			3.0			3.0			3.0	
a.	Proposer's understanding of RFP Requirements	2%	3.0	1.2	Meets most requirements	3.0	1.2		3.0	1.2	Didn't submit resumes, but did provide	3.0	1.2		3.0	1.2	
b.	Does Proposer understand KAWC High Level Review Requirements	3%	3.0	1.8		3.0	1.8		3.0	1.8		3.0	1.8		3.0	1.8	
1.2	**Project Outline**	**10%**		6.0			6.0			6.6			6.6			6.0	
a.	Adequacy of Study Concept	3%	3.0	1.8		3.0	1.8		3.0	1.8		3.0	1.8		3.0	1.8	
b.	Adequacy of proposed meetings	4%	3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4	
c.	Adequate proposed report layout/ structure	3%	3.0	1.8		3.0	1.8		4.0	2.4		4.0	2.4		3.0	1.8	
1.3	**Adequacy of Scope of Work Identified**	**10%**		0.6			0.6			0.6			0.6			0.6	
a.	Adequacy of Facility Inventory Task	1%	3.0	0.6		3.0	0.6		3.0	0.6		3.0	0.6		3.0	0.6	
b.	Adequacy of Condition Assessment Task	1%	1.0	0.2	Pg 5	3.0	0.6		4.0	0.8		2.0	0.4	Lighting in filter gallery not accurate???	3.0	0.6	
c.	Adequacy of Residual Life Analysis Task	2%	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		3.0	1.2	
d.	Adequacy of Performance Requirements Review Task	3%	3.0	1.8		3.0	1.8		3.0	1.8		3.0	1.8		3.0	1.8	
e.	Adequacy of Project Descriptions and Cost Estimate Task	3%	3.0	1.8	3 Options	3.0	1.8		4.0	2.4	5 options	3.0	1.8		3.0	1.8	
1.4	**Identification of Potential Challenges**	**2%**		1.2			0.8			1.2			0.8			0.8	
a.	Acceptability of Potential Challenges and possible solutions	2%	3.0	1.2		2.0	0.8	Not explicity identified	3.0	1.2		2.0	0.8	Lacking details	2.0	0.8	
1.5	**Alternatives**	**3%**		1.8			1.8			2.4			1.8			1.2	
a.	Acceptability of offered alternatives	3%	3.0	1.8		3.0	1.8	Spoke to KDOW discussion for	4.0	2.4	very adequate	3.0	1.8	Very high level discussion	2.0	1.2	
2	**Project Schedule**	**20%**		**12.0**			**12.0**			**12.0**			**12.0**			**12.0**	
a.	Were critical and key milestones identified?	8%	3.0	4.8		3.0	4.8		3.0	4.8		3.0	4.8		3.0	4.8	
b.	Were adequate approval times included?	6%	3.0	3.6		3.0	3.6		3.0	3.6		3.0	3.6		3.0	3.6	
c.	Were realistic periods identified?	6%	3.0	3.6		3.0	3.6		3.0	3.6		3.0	3.6		3.0	3.6	
3	**Fee Proposal**	**10%**		**3.6**			**3.6**			**4.8**			**7.2**			**3.6**	
a.	Design Costs	6%	3.0	3.6	59,300	3.0	3.6	53,600	4.0	4.8	43500, excludes material testing	4.0	4.8	25,000 plus 1750/wk pilots. Unclear if struct	3.0	3.6	54,500 includes divers
b.	Labor Rates	4%	0.0	0.0	Not provided	0.0	0.0	Not provided	0.0	0.0	Not provided	3.0	2.4		0.0	0.0	Not provided
4	**Project Team**	**20%**		**12.0**			**12.0**			**12.4**			**10.8**			**12.0**	
a.	Adequacy of proposed team experience on similar projects	5%	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
b.	Adequacy of team member disciplines	4%	3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4	
c.	Adequacy of staffing structure	2%	3.0	1.2		3.0	1.2		3.0	1.2		3.0	1.2		3.0	1.2	
d.	Qualification of team members	5%	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	Appears very qualified	3.0	3.0	
e.	Performance on other AW projects	2%	3.0	1.2	KRS2 went well but mixed review on others	3.0	1.2	Confirm with Brent	4.0	1.6	Good experience on pipeline and small projects	0.0	0.0	Unaware of past AW projects	3.0	1.2	K2 and RRS good
f.	Proposer's Quality Management Plan	2%	3.0	1.2		3.0	1.2		3.0	1.2		3.0	1.2		3.0	1.2	
5	**Firm's Capabilities**	**20%**		**12.0**			**12.0**			**12.0**			**12.0**			**12.0**	
a.	Relevancy of similar projects	10%	3.0	6.0	2 projects	3.0	6.0		3.0	6.0		3.0	6.0		3.0	6.0	
b.	Are indicated projects similar in scope and magnitude?	5%	3.0	3.0	Somewhat different	3.0	3.0	Somewhat different	3.0	3.0		3.0	3.0		3.0	3.0	
c.	Was project team involved in similar roles in indicated projects?	5%	3.0	3.0		3.0	3.0		3.0	3.0	Difficult to determine	3.0	3.0		3.0	3.0	

Score Definitions

5 Far Above Expectations
4 Above Expectations
3 Meets Expectations
2 Below Expectations
1 Far Below Expectations

Appendix C

Reviewer:

Kentucky American Water Company
Richmond Road Station Filter Building Study

TEAM 1	**53.1**	Gannett Fleming
TEAM 2	**49.6**	Hazen & Sawyer
TEAM 3	**55.2**	HDR
TEAM 4	**51.6**	Bell
TEAM 5	**50.7**	GRW

Proposers' Score Table

Scoring criteria & mechanism are on the previous worksheets
See scoring definitions below

Item	Description	Max. Possible Weighted Score (%)	TEAM 1 Gannett Fleming Score	TEAM 1 Weighted Score	TEAM 1 Comments	TEAM 2 Hazen & Sawyer Score	TEAM 2 Weighted Score	TEAM 2 Comments	TEAM 3 HDR Score	TEAM 3 Weighted Score	TEAM 3 Comments	TEAM 4 Bell Score	TEAM 4 Weighted Score	TEAM 4 Comments	TEAM 5 GRW Score	TEAM 5 Weighted Score	TEAM 5 Comments
	COMPOSITE TOTAL	**100.0%**		**53.1**			**49.6**			**55.2**			**51.6**			**50.7**	
1	**Project Approach**	**30%**		**13.9**			**11.6**			**14.6**			**12.3**			**12.3**	
1.1	**Technical**	**5%**		3.5			3.0			3.5			3.0			3.3	
a.	Proposer's understanding of RFP Requirements	2%	3.5	1.4		3.0	1.2		3.5	1.4		3.0	1.2		3.3	1.3	
b.	Does Proposer understand KAWC High Level Review Requirements	3%	3.5	2.1		3.0	1.8		3.5	2.1		3.0	1.8		3.3	2.0	
1.2	**Project Outline**	**10%**		6.2			6.0			6.3			6.0			5.8	
a.	Adequacy of Study Concept	3%	3.3	2.0		3.0	1.8		3.3	2.0		2.8	1.7		3.0	1.8	
b.	Adequacy of proposed meetings	4%	3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4		2.8	2.2	
c.	Adequate proposed report layout/ structure	3%	3.0	1.8		3.0	1.8		3.3	2.0		3.3	2.0		3.0	1.8	
1.3	**Adequacy of Scope of Work Identified**	**10%**		0.6			0.6			0.6			0.5			0.6	
a.	Adequacy of Facility Inventory Task	1%	3.0	0.6		2.8	0.6		0.0	0.6		2.5	0.5		3.0	0.6	
b.	Adequacy of Condition Assessment Task	1%	3.0	0.6		2.8	0.6		3.8	0.8		2.0	0.4		3.5	0.7	
c.	Adequacy of Residual Life Analysis Task	2%	2.5	1.0		1.3	0.5	No real discussion	1.5	0.6		1.5	0.6		2.3	0.9	
d.	Adequacy of Performance Requirements Review Task	3%	3.0	1.8		3.0	1.8		3.3	2.0		2.8	1.7		2.8	1.7	
e.	Adequacy of Project Descriptions and Cost Estimate Task	3%	3.0	1.8		3.0	1.8		3.3	2.0		3.0	1.8		3.0	1.8	
1.4	**Identification of Potential Challenges**	**2%**		1.4			0.8			1.5			1.1			1.1	
a.	Acceptability of Potential Challenges and possible solutions	2%	3.5	1.4		2.0	0.8	No real discussion	3.8	1.5		2.8	1.1		2.8	1.1	
1.5	**Alternatives**	**3%**		2.3			1.2			2.7			1.7			1.5	
a.	Acceptability of offered alternatives	3%	3.8	2.3	Very detailed and creative	2.0	1.2	No real discussion	4.5	2.7	Five well developed alternatives	2.8	1.7		2.5	1.5	
2	**Project Schedule**	**20%**		**12.0**			**11.7**			**11.7**			**12.3**			**11.4**	
a.	Were critical and key milestones identified?	8%	3.0	4.8		3.0	4.8		3.0	4.8		3.0	4.8		3.0	4.8	
b.	Were adequate approval times included?	6%	3.0	3.6		2.8	3.3		2.8	3.3		3.0	3.6		2.8	3.3	
c.	Were realistic periods identified?	6%	3.0	3.6		3.0	3.6		3.0	3.6		3.3	3.9		2.8	3.3	
3	**Fee Proposal**	**10%**		**3.6**			**3.6**			**4.2**			**4.5**			**3.6**	
a.	Design Costs	6%	3.0	3.6		3.0	3.6		3.5	4.2		3.8	4.5		3.0	3.6	
4	**Project Team**	**20%**		**11.6**			**12.0**			**12.0**			**11.1**			**11.7**	
a.	Adequacy of proposed team experience on similar projects	5%	3.0	3.0		3.0	3.0		3.0	3.0		2.8	2.8		3.0	3.0	
b.	Adequacy of team member disciplines	4%	2.8	2.2		3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4	
c.	Adequacy of staffing structure	2%	2.8	1.1		3.0	1.2		3.0	1.2		3.0	1.2		2.8	1.1	
d.	Qualification of team members	5%	3.0	3.0		3.0	3.0		2.8	2.8		3.0	3.0		3.0	3.0	
e.	Performance on other AW projects	2%	2.8	1.1		3.0	1.2		3.3	1.3		1.5	0.6	Not sure about this	2.8	1.1	
f.	Proposer's Quality Management Plan	2%	3.0	1.2		3.0	1.2		3.3	1.3		2.8	1.1		2.8	1.1	
5	**Firm's Capabilities**	**20%**		**12.0**			**10.8**			**12.8**			**11.5**			**11.8**	
a.	Relevancy of similar projects	10%	3.0	6.0		2.8	5.5	Not very relavent	3.3	6.5		3.0	6.0		3.0	6.0	
b.	Are indicated projects similar in scope and magnitude?	5%	3.0	3.0		2.5	2.5	Not same scale or scope	3.3	3.3		2.8	2.8		2.8	2.8	
c.	Was project team involved in similar roles in indicated projects?	5%	3.0	3.0		2.8	2.8		3.0	3.0		2.8	2.8		3.0	3.0	

Score Definitions
5 Far Above Expectations
4 Above Expectations
3 Meets Expectations
2 Below Expectations
1 Far Below Expectations
0 Unacceptable

Reviewer:

Kentucky American Water Company
Richmond Road Station Filter Building Study

TEAM 1	**53.1**	Gannett Fleming
TEAM 2	**49.6**	Hazen & Sawyer
TEAM 3	**55.2**	HDR
TEAM 4	**51.6**	Bell
TEAM 5	**50.7**	GRW

Proposers' Score Table

Scoring criteria & mechanism are on the previous worksheets
See scoring definitions below

Item	Description	Max. Possible Weighted Score (%)	TEAM 1 — 2.0 — Gannett Fleming			TEAM 2 — 5.0 — Hazen & Sawyer			TEAM 3 — 1.0 — HDR			TEAM 4 — 3.0 — Bell			TEAM 5 — 4.0 — GRW		
			Score	Weighted Score	Comments	Score	Weighted Score	Comments	Score	Weighted Score	Comments	Score	Weighted Score	Comments	Score	Weighted Score	Comments
	COMPOSITE TOTAL	**100.0%**		**53.1**			**49.6**			**55.2**			**51.6**			**50.7**	
1	**Project Approach**	**30%**		**13.9**			**11.6**			**14.6**			**12.3**			**12.3**	
1.1	**Technical**	**5%**		3.5			3.0			3.5			3.0			3.3	
a.	Proposer's understanding of RFP Requirements	2%	3.5	1.4		3.0	1.2		3.5	1.4		3.0	1.2		3.3	1.3	
b.	Does Proposer understand KAWC High Level Review Requirements	3%	3.5	2.1		3.0	1.8		3.5	2.1		3.0	1.8		3.3	2.0	
1.2	**Project Outline**	**10%**		6.2			6.0			6.3			6.0			5.8	
a.	Adequacy of Study Concept	3%	3.3	2.0		3.0	1.8		3.3	2.0		2.8	1.7		3.0	1.8	
b.	Adequacy of proposed meetings	4%	3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4		2.8	2.2	
c.	Adequate proposed report layout/ structure	3%	3.0	1.8		3.0	1.8		3.3	2.0		3.3	2.0		3.0	1.8	
1.3	**Adequacy of Scope of Work Identified**	**10%**		0.6			0.6			0.6			0.5			0.6	
a.	Adequacy of Facility Inventory Task	1%	3.0	0.6		2.8	0.6		3.0	0.6		2.5	0.5		3.0	0.6	
b.	Adequacy of Condition Assessment Task	1%	3.0	0.6		2.8	0.6		3.8	0.8		2.0	0.4		3.5	0.7	
c.	Adequacy of Residual Life Analysis Task	2%	2.5	1.0		1.3	0.5		1.5	0.6		1.5	0.6		2.3	0.9	
d.	Adequacy of Performance Requirements Review Task	3%	3.0	1.8		3.0	1.8		3.3	2.0		2.8	1.7		2.8	1.7	
e.	Adequacy of Project Descriptions and Cost Estimate Task	3%	3.0	1.8		3.0	1.8		3.3	2.0		3.0	1.8		3.0	1.8	
1.4	**Identification of Potential Challenges**	**2%**		1.4			0.8			1.5			1.1			1.1	
a.	Acceptability of Potential Challenges and possible solutions	2%	3.5	1.4		2.0	0.8		3.8	1.5		2.8	1.1		2.8	1.1	
1.5	**Alternatives**	**3%**		2.3			1.2			2.7			1.7			1.5	
a.	Acceptability of offered alternatives	3%	3.8	2.3		2.0	1.2		4.5	2.7		2.8	1.7		2.5	1.5	
2	**Project Schedule**	**20%**		**12.0**			**11.7**			**11.7**			**12.3**			**11.4**	
a.	Were critical and key milestones identified?	8%	3.0	4.8		3.0	4.8		3.0	4.8		3.0	4.8		3.0	4.8	
b.	Were adequate approval times included?	6%	3.0	3.6		2.8	3.3		2.8	3.3		3.0	3.6		2.8	3.3	
c.	Were realistic periods identified?	6%	3.0	3.6		3.0	3.6		3.0	3.6		3.3	3.9		2.8	3.3	
3	**Fee Proposal**	**10%**		**3.6**			**3.6**			**4.2**			**4.5**			**3.6**	
a.	Design Costs	6%	3.0	3.6		3.0	3.6		3.5	4.2		3.8	4.5		3.0	3.6	
4	**Project Team**	**20%**		**11.6**			**12.0**			**12.0**			**11.1**			**11.7**	
a.	Adequacy of proposed team experience on similar projects	5%	3.0	3.0		3.0	3.0		3.0	3.0		2.8	2.8		3.0	3.0	
b.	Adequacy of team member disciplines	4%	2.8	2.2		3.0	2.4		3.0	2.4		3.0	2.4		3.0	2.4	
c.	Adequacy of staffing structure	2%	2.8	1.1		3.0	1.2		3.0	1.2		3.0	1.2		2.8	1.1	
d.	Qualification of team members	5%	3.0	3.0		3.0	3.0		2.8	2.8		3.0	3.0		3.0	3.0	
e.	Performance on other AW projects	2%	2.8	1.1		3.0	1.2		3.3	1.3		1.5	0.6		2.8	1.1	
f.	Proposer's Quality Management Plan	2%	3.0	1.2		3.0	1.2		3.3	1.3		2.8	1.1		2.8	1.1	
5	**Firm's Capabilities**	**20%**		**12.0**			**10.8**			**12.8**			**11.5**			**11.8**	
a.	Relevancy of similar projects	10%	3.0	6.0		2.8	5.5		3.3	6.5		3.0	6.0		3.0	6.0	
b.	Are indicated projects similar in scope and magnitude?	5%	3.0	3.0		2.5	2.5		3.3	3.3		2.8	2.8		2.8	2.8	
c.	Was project team involved in similar roles in indicated projects?	5%	3.0	3.0		2.8	2.8		3.0	3.0		2.8	2.8		3.0	3.0	

Score Definitions
5 Far Above Expectations
4 Above Expectations
3 Meets Expectations
2 Below Expectations
1 Far Below Expectations
0 Unacceptable