ERIE COUNTY WATER AUTHORITY
AUTHORIZATION FORM
For Approval/Execution of Documents
(check which apply)

Contract: HS-001-20001 **Project No.:** 202000134
Project Description: Van de Water Treatment Plant Capacity Expansion Project

Item Description:

- [ ] Agreement
- [X] Professional Service Contract
- [ ] Amendment
- [ ] Change Order
- [ ] BCD
- [ ] NYSDOT Agreement
- [ ] Contract Documents
- [ ] Addendum
- [ ] Recommendation for Award of Contract
- [ ] Recommendation to Reject Bids
- [ ] Request for Proposals
- [ ] Other

Action Requested:

- [X] Board Authorization to Execute
- [X] Legal Approval
- [ ] Board Authorization to Award
- [X] Execution by the Chairman
- [ ] Board Authorization to Advertise for Bids
- [ ] Execution by the Secretary to the Authority
- [ ] Board Authorization to Solicit Request for Proposals
- [ ] Other

Approvals Needed:

APPROVED AS TO CONTENT:

- [X] Other (if Applicable) — Date: 5/12/2020
- [X] Chief Operating Officer — Date: 5/13/2020
- [X] Executive Engineer — Date: 5/12/2020
- [X] Director of Administration — Date: 5/12/2020
- [X] Risk Manager — Date: 5/13/2020
- [X] Chief Financial Officer — Date: 05/13/2020
- [X] Legal — Date: 05/13/2020

APPROVED FOR BOARD RESOLUTION:

- [X] Secretary to the Authority — Date: 05/13/2020

Remarks:

Resolution Date: **Item No:**

ERIE COUNTY WATER AUTHORITY

INTEROFFICE MEMORANDUM

May 12, 2020

To: Terrence D. McCracken, Secretary to the Authority

From: Leonard F. Kowalski, Executive Engineer

Subject: Contract HS-001-2001
Van de Water Treatment Plant
Capacity Expansion Project
ECWA Project No. 202000134

The following material is attached:

- Blue Authorization Form indicating the requested Board action and approvals needed.
- Professional Service Contract for the above referenced project (2 copies) with Hazen and Sawyer, for execution by the Chairman.
- Copy of Interoffice Memorandum from Leonard F. Kowalski, Executive Engineer, dated March 3, 2020, detailing recommendations for the contract assignment after review of Request for Proposals (PN 202000011).

This project will establish the basis of design for the expansion of the Van de Water Treatment Plant including full-scale pilot testing, projections of system demands through the year 2040, new basin and filter location/layout, and equipment performance criteria. The project will also include preliminary design of improvements to the existing filter pipe gallery.

Funds for this project are included in the 2020 Capital Budget under 2515 Engineering and Construction – Van de Water, Item 101526.

Work on the Capacity Expansion Project will start immediately. Completion of basis of design documents is currently projected as April 2021.

LFK:MWW:jmf
cc: K.Prendergast
R.Stoll
M.Wymer
L.Lester

Project No. 202000134
Contract HS-001

PROFESSIONAL SERVICES AGREEMENT
FOR ENGINEERING SERVICES

This is an Agreement effective as of May 21, 2020 ("Effective Date") by and between

ERIE COUNTY WATER AUTHORITY
295 Main Street, Room 350
Buffalo, New York 14203

hereinafter referred to as the "Authority," and

HAZEN AND SAWYER
498 Seventh Avenue, 11th Floor
New York, New York 10018

hereinafter referred to as the "Engineer."

The Authority project, for which engineering services are to be provided under this Agreement, relates to development of basis of design for expansion of the treatment capacity of and improvements to the Van De Water Water Treatment Plant (the "Project").

In consideration of the mutual promises set forth in this Agreement, the Authority and the Engineer agrees as follows:

ARTICLE 1 – THE PROJECT

1.01 The Van de Water Water Treatment Plant (the "WTP") will be utilized for the expansion of the Authority's northern and eastern service areas, which could include a potential increase in the bulk sale of potable water to Genesee County. In order to support this expansion, the Authority desires to complete a series of improvements to increase the capacity of the WTP from its current rated capacity of 49.5 million gallons per day to 82.5 million gallons per day. The Authority also desires to improve the reliability and performance of the existing treatment processes. These improvements are sought after Malcolm Pirnie, Inc. completed a Capital Improvement Project Report in 2010 for the Authority (the "Capital Improvement Project Report") which outlined the necessary improvements required to achieve a treatment capacity rated at 82.5 million gallons per day at the WTP. In order to achieve these improvements, the Engineer will develop the basis of design for the expansion of the treatment capacity at the WTP through three tasks outlined below.

A. **Task 1 – Additional Coagulation Basin and Filters**. Relying on the findings of the Capital Improvement Project Report, the Engineer will identify the necessary improvements and complete basis of design documents for the expansion of the WTP capacity to 82.5 million gallons per day. The basis of design documents will develop plans for construction of a fourth coagulation basin, including flocculation, sedimentation and residuals collection, two additional filters and necessary

improvement to ancillary systems including pumping, piping, chemical feed, finished water storage, residuals and electrical/instrumentation.

B. **Task 2 – Improvements to Filters 1 through 4**. The WTP currently has four existing filters which are each original to the WTP's construction in the 1970s and approaching the end of useful life. The four existing filters utilize water backwash only and do not have any ability for full filter-to-waste capabilities. The Authority intends to upgrade the components of the existing filters to improve the reliability and performance of the filtration process at the WTP. The Engineer will develop basis of design documents to replace all valves and actuators in the existing filters, add filter to waste capabilities in the existing filters, replace the filter underdrain system to provide the ability for an air/water backwash process in the existing filters and replace filter media in the existing filters.

C. **Task 3 – Full-Scale Pilot of Coagulation Basin**. The findings of the Capital Improvement Project Report included that two standards, theoretical detention time and approach velocity below the tube settlers would exceed AWWA recommended sedimentation design standards at a flow of 82.5 million gallons per day with the three existing coagulation basins. Accordingly, the recommendations of the Capital Improvement Project Report included completion of a full-scale pilot to evaluate the performance of the WTP at an increased surface overflow rate. Completion of the full-scale pilot would align the schedule for the construction of the fourth coagulation basin with the anticipated increase in system demand.

ARTICLE 2 – COMPLIANCE STANDARDS

2.01 *Standard of Performance*

A. ***Standard of Care:*** The standard of care for all professional engineering and related services performed or furnished by the Engineer under this Agreement will be the care and skill ordinarily used by members of the subject profession practicing under similar circumstances at the time and in the same locality.

B. ***Technical Accuracy:*** The Authority shall not be responsible for discovering deficiencies in the technical accuracy of the Engineer's services. The Engineer shall correct deficiencies in technical accuracy without additional compensation, unless such corrective action is directly attributable to deficiencies in Authority-furnished information.

2.02 *Compliance with Laws and Regulations, and Policies and Procedures*

A. The Authority and the Engineer shall comply with all applicable federal, state or local laws and regulations and all applicable Authority policies and procedures.

B. The Engineer shall comply with the provisions set forth in Public Authorities Law §§ 2875, 2876, and 2878 of the laws of the State of New York. In response to the

Authority's Request for Proposals, the Engineer submitted and signed Forms A, B, and C, a copy of which is attached to, and incorporated in, this Agreement as Appendix D.

C. By executing this Agreement, the Engineer affirms under the penalties of perjury that there was no collusion in the proposal submitted to the Authority, upon which forms the basis of this Agreement.

D. The Engineer shall comply with the provisions of State Finance Law § 138-L of the laws of the State of New York. In response to the Authority's Request for Proposals, the Engineer submitted and signed the Sexual Harassment Bidding Certification, a copy of which is attached to, and incorporated in, this Agreement, as Appendix D.

E. The Engineer shall comply with the provisions of the Shield Act, codified at General Business Law § 899-aa of the laws of the State of New York.

F. The Authority shall provide the Engineer in writing any and all Authority policies and procedures applicable to the Engineer's performance of services under this Agreement. The Engineer agrees to comply with such policies and procedures to the extent compliance is not inconsistent with professional practice requirements.

G. While on Authority property, the Engineer's employees, representatives and engineers shall comply with the specific applicable security and access rules established by the Authority's Security Officer.

2.03 ***Unknown Conditions***. The Engineer shall not be required to sign any documents, no matter by whom requested, that would result in the Engineer having to certify, guarantee, or warrant the existence of conditions whose existence the Engineer cannot ascertain. The Authority agrees not to make resolution of any dispute with the Engineer for payment on any amount due to the Engineer in any way contingent upon the Engineer signing any such documents.

ARTICLE 3 – SCOPE OF SERVICE

3.01 ***Kick-off Meeting.*** Prior to rendering any professional services, the Engineer will conduct a kickoff meeting with Authority personnel to take place at the same time as the site walkthroughs referenced in § 3.02 paragraph A, subparagraph 2 and § 3.03 paragraph A, subparagraph 2 of this Agreement.

3.02 ***Task 1 – Additional Coagulation Basin and Filters*.** The Engineer shall provide all engineering services necessary to identify the necessary improvements and complete the basis of design documents for the expansion of the WTP to a rated capacity of 82.5 million gallons per day including, but not limited to, the following:

A. In contemplation of the basis of design ("BOD"), the Engineer shall:

1. Review reports, drawings, specifications, and other records furnished by the Authority, including, but not limited to, the assumptions and recommendations from previous work including the Capital Improvement Project Report.

    a. The Engineer shall update § 2 of the Treatment Capacity Requirement Analysis of the Capital Improvement Project Report to include analysis through the year 2040.

    b. The Engineer shall update § 2 of the Treatment Capacity Requirement Analysis of the Capital Improvement Project Report to include potential future bulk sales based on information provided by the Authority.

2. Verify site conditions at the WTP.

    a. Complete a site walkthrough and review of operating records to verify existing conditions and to assist in the preparation of preliminary design documents.

    b. Establish or confirm the process design parameters and criteria existing at the WTP, including any deviations from regulatory requirements.

3. Prepare preliminary design documents for the additional coagulation basin and filters. Preliminary design documents should:

    a. Include final design criteria, including, but not limited to, equipment selection, component capacity, and compliance with applicable regulatory/code requirements and best practices.

    b. Identify sizing, volume, footprints and all major mechanical items for all unit treatment processes.

    c. Determine hydraulic requirements and establish process elevations.

    d. Determine chemical feed requirements, current capabilities and required improvements.

    e. Include preliminary design drawings including:

        i. Overall WTP Process Flow Diagram.

        ii. Plan view of all unit treatment processes.

        iii. Overall Site Plan.

        iv. Hydraulic Profile.

        v. Flocculation Basin 4 Plan.

        vi. Flocculation Basin 4 Sections.

vii. Sedimentation Basin 4 Plans.

viii. Sedimentation Basin Sections.

ix. Filter 5 and 6 Plan.

x. Filter 5 and 6 Sections.

xi. Piping Profiles/Interconnections Details.

f. Include an equipment/motor list for all electrical equipment and identify code compliance requirements for electrical components including requirements for explosion proof outlets, switches, lighting and motors.

g. List the required technical specifications for final design.

h. Describe the construction sequencing in conjunction with the continuation of plant operations.

i. State an opinion of probable project costs.

j. Set forth a Project schedule identifying the duration of final design, bid, and construction phases.

B. The Engineer shall prepare a draft BOD Report, setting the factors considered by the Engineer including, but not limited to, those specifically identified in paragraph A of this section. The Engineer shall supply the Authority with ten (10) copies of the draft BOD Report with supporting documentation, along with a digital .pdf file of the draft BOD Report with supporting documentation.

C. The Engineer shall meet with the Authority to review the draft BOD Report and will incorporate all comments into a final version. The Engineer shall supply the Authority with ten (10) copies of the final BOD Report with supporting documentation, along with a digital .pdf file of the final BOD Report with supporting documentation. The Engineer shall submit the final BOD Report with supporting documentation to the NYSDOH for review and approval.

D. The Engineer will prepare a Project schedule identifying the duration of final design, bid, and construction phases.

E. The Engineer will conduct at least three (3) review meetings with the Authority and at least two (2) review meetings with appropriate regulatory agencies.

3.03 ***Task 2 – Improvements to Filters 1 through 4*****.** The Engineer shall provide all engineering services necessary to identify the necessary improvements and complete the basis of design documents to complete an upgrade of the components of existing Filters 1 through 4 at the WTP, including, but not limited to, the following:

A. In contemplation of the BOD, the Engineer shall:

1. Review reports, drawings, specifications, and other records furnished by the Authority, including, but not limited to, the assumptions and recommendations from previous work including the Capital Improvement Project Report.

2. Verify site conditions at the WTP.

   a. Complete a site walkthrough and review of operating records to verify existing conditions and to assist in the preparation of preliminary design documents.

   b. Establish or confirm the process design parameters and criteria existing at the WTP, including any deviations from regulatory requirements.

3. Prepare preliminary design documents for the additional coagulation basin and filters. Preliminary design documents should:

   c. Include final design criteria, including, but not limited to, equipment selection, component capacity, and compliance with applicable regulatory/code requirements and best practices.

   d. Identify sizing, volume, footprints and all major mechanical items for all filter unit treatment processes.

   e. Determine process elevations, water/air flowrates, and placement/routing of new piping and equipment.

   f. Include preliminary design drawings including:

      i. Process Flow Diagram.

      ii. Site Plan of Filter Improvement Area.

      iii. Overall Filter 1-4 Plan.

      iv. Filter Pipe Gallery Sections.

      v. Typical Filter Plan.

      vi. Typical Filter Sections/Elevations.

      vii. Piping Profiles/Interconnections Details.

   g. Include an equipment/motor list for all electrical equipment and identify code compliance requirements for electrical components including requirements for explosion proof outlets, switches, lighting and motors.

   h. List the required technical specifications for final design.

i. Describe the construction sequencing in conjunction with the continuation of plant operations.

j. State an opinion of probable project costs.

k. Set forth a Project schedule identifying the duration of final design, bid, and construction phases.

B. The Engineer shall prepare a draft BOD Report, setting the factors considered by the Engineer including, but not limited to, those specifically identified in paragraph A of this section. The Engineer shall supply the Authority with ten (10) copies of the draft BOD Report with supporting documentation, along with a digital .pdf file of the draft BOD Report with supporting documentation.

C. The Engineer shall meet with the Authority to review the draft BOD Report and will incorporate all comments into a final version. The Engineer shall supply the Authority with ten (10) copies of the final BOD Report with supporting documentation, along with a digital .pdf file of the final BOD Report with supporting documentation. The Engineer shall submit the final BOD Report with supporting documentation to the NYSDOH for review and approval.

D. The Engineer will prepare a Project schedule identifying the duration of final design, bid, and construction phases.

E. The Engineer will conduct at least three (3) review meetings with the Authority and at least two (2) review meetings with appropriate regulatory agencies.

3.04 ***Task 3 – Improvements to Filters 1 through 4*****.** The Engineer shall provide all engineering services necessary to identify and complete a full-scale pilot study of the sedimentation process at the WTP, including, but not limited to, the following:

A. The Engineer shall develop a Work Plan for the pilot study, which is approved by both the Authority and the NYSDOH. The Work Plan shall include, but not be limited to, the study approach, evaluation criteria, methodology, schedule and report format.

B. The Engineer shall complete the full-scale pilot study utilizing one of the existing sedimentation basins.

C. The Engineer shall prepare a report which summarizes the results of the full-scale pilot study and includes recommendations for new basin ratings and unit capacity.

D. The Engineer shall meet with the Authority to review the summary report identified in paragraph C of this Section. The Engineer will incorporate all comments from the Authority into a final engineering report. The Engineer shall supply the Authority with ten (10) copies of the final engineering report with supporting documentation, along with a digital .pdf file of the final engineering report with supporting

documentation. The Engineer shall submit the final BOD Report with supporting documentation to the NYSDOH for review and approval.

3.05 ***Special Services*****.** The Engineer may employ one or more of the following special services in carrying out the Project, subject to the Authority's approval:

A. Soils investigations including test borings, pavement cores, and the related analysis;

B. Field investigations to support verification of piping or other buried utilities;

C. Detailed mill, shop and/or laboratory inspection of materials and equipment;

D. Land surveys, maps, plates, descriptions and title investigations which may be required to acquire lands, easements, and rights-of-way for the proposed facilities;

E. Preparation of additional copies of reports, contract drawings and documents;

F. Development of detailed drawings outside the technical scope of work of this request for proposals;

G. Air, water, and/or soil sampling, testing, and/or analysis;

H. Hazardous material testing and assessment;

I. Wetlands investigations, delineation, and mitigation;

J. Technical assistance with operation and maintenance manuals;

K. Technical assistance with preparing any necessary documents if required by the New York State Environmental Quality Review Act (SEQRA) for Type I or Unlisted actions;

L. Technical assistance with preparing with Storm Water Pollution Prevention Plans (SWPPP), if required;

M. Assistance with permit and other applications with the New York State Department of Environmental Conservation (DEC);

N. Assistance with grant research, completion of grant applications, and reporting/documentation after award;

O. Laboratory testing, jar testing, and pilot testing;

P. Extra travel and subsistence for the Engineer and its staff beyond that normally required under ordinary circumstances, when authorized by the Authority;

Q. Assistance to the Authority serving as an expert witness in litigation arising from project development or construction;

R. Legal services, as deemed necessary and approved by the Authority's General Counsel, for acquiring lands, easements and rights-of-ways or other Project-related services; or

S. Other services, as deemed necessary by the Authority's Chief Operating Officer and Chief Financial Officers.

3.06 ***Service Timeframe.*** Unless otherwise extended by mutual agreement of the parties, the Engineer will render professional services relating to this Project within the following timeframe:

A. All services under Task 1 – Additional Coagulation Basin and Filters shall be completed and delivered to the Authority within 400 days of the issuance of the Authority's notice to proceed;

B. All services under Task 2 – Improvements to Filters 1 through 4 shall be completed and delivered to the Authority within 240 days of the issuance of the Authority's notice to proceed;

C. All services under Task 3 – Full-Scale Pilot of Coagulation Basin shall be completed and delivered to the Authority within 270 days of the issuance of the Authority's notice to proceed;

D. All other services should be completed by the end of the project with an estimated completion date of June 30, 2021.

ARTICLE 4 – PAYMENT OF PROFESSIONAL SERVICES

4.01 ***Lump Sum Payments:*** The Engineer agrees to accept a lump sum payment for the following services:

A. ***Task 1 – Additional Coagulation Basin and Filters.*** For services described under § 3.02 of this Agreement, the Authority shall pay Engineer a lump sum which will include all expense, labor and cost associated with this service. Payment will be made monthly based on the percentage of completion up to 100% of the total lump sum amount.

B. ***Task 2 – Improvements to Filters 1 through 4.*** For services described under § 3.03 of this Agreement, the Authority shall pay Consultant a lump sum which will include all expense, labor and cost associated with this service. Payment will be made monthly based on the percentage of completion up to 100% of the total lump sum amount.

C. ***Task 3 – Full-Scale Pilot of Coagulation Basin.*** For services described under § 3.04 of this Agreement, the Authority shall pay Consultant a lump sum which will include

all expense, labor and cost associated with this service. Payment will be made monthly based on the percentage of completion up to 100% of the total lump sum amount.

4.02 ***Special Services***: For services described under § 3.05 of this Agreement, the Authority shall pay the Engineer for special services pre-approved by the Authority's Chief Operating Officer in an amount approved by the Authority's Chief Financial Officer.

A. When the Engineer is performing the special services described in § 3.05 of this Agreement, such services will be billed at the fixed rates included in Appendix A of this Agreement.

B. When the Engineer obtains special services from a third party, the Engineer will be reimbursed based on the actual invoice cost paid by the Engineer, plus 5%.

4.03 ***Engineering Cost Schedule***:

A. ***Engineering Costs:***

1. Lump Sum Task 1 Cost	$217,310.00	
2. Lump Sum Task 2 Cost	$156,669.00	
3. Lump Sum Task 3 Cost	$124,574.00	
TOTAL LUMP SUM COST:		$498,553.00

B. Special Services (not to exceed) $50,000.00

4.04 ***Audit***: The Authority reserves the right to audit the Engineer's records to verify bills submitted and representations made. For this purpose, the Engineer agrees to make company records available for inspection upon written notice by the Authority. The Authority shall have two years from the date of the Engineer's final bill to complete its audit. If the audit establishes an overcharge, the Engineer agrees to refund the excess.

ARTICLE 5 – GENERAL PROVISIONS

5.01 ***Subcontract and Assignments*:** The Engineer may not subcontract or delegate any of the work, services, and/or other obligations of the Engineer without the express written consent of the Authority. The Authority and the Engineer bind themselves and their successors, administrators and assigns to the terms of this Agreement. The Engineer shall not assign, sublet or transfer its interest in the Agreement without the written consent of the Authority.

5.02 ***Amendments:*** No modification or variation from the terms of this Agreement shall be effective unless it is in writing and authorized by a resolution of the Board of Commissioners of the Authority and signed by all parties.

5.03 ***Right to Terminate*:** The Authority reserves the right to terminate the Engineer's services at any time, without cause, based on seven (7) days' written notice. The Engineer shall not be

entitled to lost profit and shall perform only such services, after notification of termination, as the Authority directs.

5.04 *Indemnification*:

A. To the fullest extent permitted by law, the Engineer agrees to indemnify and hold the Authority harmless from all third party claims, liabilities, damages and costs (including all reasonable attorney's fees, and cost of defense) to which the Authority, its officers, directors and employees may be subject to, arising out of the death or bodily injury to any person or the destruction or damage to any property to the extent caused by the negligent acts, errors or omissions, or willful misconduct of the Engineer's performance of professional services provided under this Agreement and those of its subcontractors or anyone for whom the Engineer is legally liable.

B. To the fullest extent permitted by law, the Authority agrees to indemnify and hold the Engineer harmless from all third party claims, liabilities, damages and costs (including all reasonable attorney's fees and cost of defense) to the extent caused by the negligent acts, errors or omissions of the Authority, its contractors, engineers, or anyone for whom the Authority is legally liable.

5.05 *Confidential Information*:

A. In order to assist the Engineer in the performance of this Agreement, the Authority may provide the Engineer with confidential information including, but not limited to information relative to the services to be performed. All information received by the Engineer in any fashion and under any conditions resulting from the rendering of the services in consideration of this agreement, are considered confidential. The Engineer shall hold in confidence and not disclose to any person or any entity, any information regarding information learned during the performance of services including but not limited to information relative to the services to be performed.

B. The Engineer shall use at least the same degree of care to protect and prevent unauthorized disclosure of any confidential information as it would use to protect and prevent unauthorized disclosure of its own proprietary information. The Engineer shall use confidential information only in the performance of this Agreement. No other use of the confidential information whether for the Engineer's benefit or for the benefit of others shall be permitted.

C. In no event is the Engineer authorized to disclose confidential information without the prior written approval of the Authority. The Engineer may provide such information to its subcontractors for the purpose of performing the services; or disclose such information, with notice to the Authority, if such information is required to be disclosed by law or court order.

D. The terms of this section shall be binding during and subsequent to the expiration or termination of this Agreement.

5.06 ***Insurance***: The Engineer shall secure and maintain such insurance as will protect itself from claims under the Workers' Compensation Act; claims for damages because of bodily injury, including personal injury, sickness or disease, or death of any of its employees or of any person other than its employees; and from claims for damages because of injury to or destruction of property including loss of use resulting therefrom in the amounts indicated on Appendix B. The Engineer shall provide and maintain insurance that will provide coverage for claims arising out of the negligent performance of its services. The Engineer shall provide Certificates of Insurance certifying the coverage required by this provision.

5.07 ***Copyrights, Trademarks and Licensing*:** All materials produced under this Agreement, whether produced by the Engineer alone or with others, and regardless of whether produced during regular working hours, shall be considered work made for hire and the property of the Authority. The Engineer shall, during and subsequent to the terms of this Agreement, assign to the Authority, without further consideration, all right, title and interest in all material produced under this Agreement. All material produced under this Agreement shall be and remain the property of the Authority whether registered or not.

5.08 ***New York Law and Jurisdiction*:** Notwithstanding any other provision of this Agreement, any dispute concerning any question of fact or law arising under this Agreement which is not disposed of by agreement between the Engineer and the Authority shall be governed, interpreted and decided by a court of competent jurisdiction of the State of New York in accordance with the laws of the State of New York.

5.09 ***Conflicts of Interest*:** The Engineer represents that it has advised the Authority in writing prior to the date of signing this Agreement of any relationships with third parties, including competitors of the Authority, which would present a conflict of interest with the rendering of the services, or which would prevent the Engineer from carrying out the terms of this Agreement or which would present a significant opportunity for the disclosure of confidential information. The Engineer will advise the Authority of any such relationships that arise during the term of this Agreement. The Authority shall then have the option to terminate the Agreement without being subject to further obligations under its terms, except for the payment of services already rendered by the Engineer. So long as the Engineer reports such a conflict as required by this section, the Engineer will have no further obligations for completing the scope of services under the terms of this Agreement.

5.10 ***Additional Conditions*:** The Engineer and the Authority acknowledge that there may be additional conditions, terms and provisions which shall apply specifically to the services to be performed. The parties agree to negotiate in good faith to agree upon such additional terms.

5.11 ***Entire Agreement*:** This Agreement constitutes the entire understanding of the parties and no representations or agreements, oral or written, made prior to its execution shall vary or modify the terms herein. This Agreement supersedes all prior contemporaneous communications, representations, or agreements, whether oral or written with respect to the subject matter hereof and has been induced by no representations, statements or agreements other than those herein expressed. No subsequent agreement made between the parties shall be binding on either party

unless reduced to writing and signed by an authorized officer of the party sought to be bound by such agreement.

5.12 ***Independent Status***:

A. Nothing contained in the Agreement shall be construed to render either the Authority or the Engineer, an owner, member, officer, partner, employee or agent of the other, nor shall either party have authority to bind the other in any manner, other than as set forth in this Agreement, it being intended that the Engineer shall remain an independent contractor responsible for its own actions. The Engineer is retained by the Authority only for the purpose and to the extent set forth in this Agreement.

B. The Engineer is free to choose the aggregate number of hours worked and the scheduling of such hours as it shall see fit at its discretion within the limitations set forth in Article 4.

C. Neither the Engineer nor its employees shall be considered under the provisions of this Agreement or otherwise as having an employee, servant or agency status or as being entitled to participate in any plans, arrangements or distributions of the Authority.

D. In providing the services under this Agreement, the Engineer represents and warrants that it has complied with all applicable federal, state and local laws particularly with respect to licenses, withholdings, reporting and payment of taxes. The Engineer agrees to furnish copies of documentation to the Authority evidencing its compliance with such laws. The Engineer further represents and warrants that any income accruing to the Engineer and its employees from the Agreement shall be reported as such to the appropriate taxation authorities.

5.13 ***Doing Business Status***: The Consultant represents it is qualified to do business in the State of New York and has registered with the New York Secretary of State.

5.14 ***Gratuities*:** The Engineer shall prohibit its agents, employees and consultants from using their positions for personal financial gain, or from accepting any personal advantage from anyone under circumstances which might reasonably be interpreted as an attempt to influence the recipients in the conduct of their official duties. The Engineer or its employees shall not, under circumstances which might be reasonably interpreted as an attempt to influence the recipients in the conduct of their duties, extend any gratuity or special favor to employees of the Authority.

5.15 ***Notice:*** Any notices required by this Agreement or otherwise shall be delivered by United States Postal mail or personal delivery upon the addresses hereinbefore stated. Any change in such addresses shall be required to be in writing to the other party and acknowledged as such.

ARTICLE 6 – SEVERABILITY

6.01 Any provision or part of the Agreement held to be void or unenforceable by a court of competent jurisdiction shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon the parties, which agrees that the Agreement shall be reformed to replace

such stricken provisions or part thereof with a valid enforceable provision that comes as close as possible to expressing the intent of the stricken provision. The validity and enforceability of all other provisions of this Agreement shall not otherwise be affected.

ARTICLE 7 – TERMINATION

7.01 The Authority reserves the right to terminate this Agreement in the event it is found that the Certification filed by the Engineer in accordance with New York State Finance Law §139-k was intentionally false or intentionally incomplete. Upon such finding, the Authority may exercise its termination right by providing written notification to the Engineer in accordance with the written notification terms of this Agreement.

ERIE COUNTY WATER AUTHORITY

By_____
Jerome D. Schad, Chair

HAZEN AND SAWYER

By_____
Matthew Valade, P.E., BCEE, Vice President

STATE OF NEW YORK)
COUNTY OF ERIE) ss:

On the _____ day of _____, in the year 2020, before me personally came Jerome D. Schad, to me known, who, being by me duly sworn, did depose and say that he resides in Amherst, New York, that he is the Chair of the Board of Commissioners for the Erie County Water Authority described in the above instrument; and that he signed his name thereto by order of the Board of Commissioners.

_____
Notary Public

STATE OF NEW YORK)
COUNTY OF NEW YORK) ss:

On the _____ day of _____, in the year 2020, before me personally came Matthew Valade, P.E., BCEE, Vice President, to me known, who, being by me duly sworn, did depose and say that he resides in _____, New York, that he is the Vice President of the Corporation described in the above instrument; and that he signed his name thereto by order of the Board of Directors of said Corporation.

_____
Notary Public

APPENDIX A

FIXED RATES FOR SPECIAL SERVICES

Classification	Billing Rate/hour
Project Officer/Principal in Charge	$271.43
Project Manager	$237.25
Senior Process Engineer	$240.39
Senior Electrical Engineer	$270.84
Senior Structural Engineer	$209.63
Process/Hydraulics Engineer	$151.41
Civil Engineer	$170.17
Electrical/Instrumentation Engineer	$186.30
Structural Engineer	$132.87
Architectural Engineer/Architect	$271.86
Mechanical/HVAC Engineer	$285.98
Senior CADD Technician	$150.00
CADD Technician	$132.87
Administrative Assistant	$108.15

APPENDIX B

INSURANCE REQUIREMENTS
PROFESSIONAL SERVICES CONTRACT
FOR CONSULTING ENGINEERING SERVICES

VAN DE WATER TREATMENT PLANT CAPACITY EXPANSION

ECWA PROJECT No. 202000134 (RFP No. 202000011)

Insurance Specs:

The following minimum insurance requirements shall apply to vendors providing services to the Erie County Water Authority (ECWA). If a service or project, in the opinion of ECWA, represents an unusual or exceptional risk, ECWA may establish additional insurance requirements for that service or project. All insurance required herein shall be obtained at the sole cost and expense of the contractor, including deductibles and self-insured retentions, and shall be in full force and effect on the contract commencement date and for the duration of the contract. These requirements include but are not limited to the minimum insurance requirements.

Insurance Requirements:

a. Workers Compensation:
Part 1: Workers Compensation: Statutory
Part 2: Employers Liability: $1,000,000.
Note: If New York State domiciled employees are used, coverage to be New York Statutory for both Parts 1 and 2

b. **New York Disability Benefits Liability:** Statutory coverage if New York State domiciled employees are used.

c. Commercial General Liability:
- $2,000,000. General Aggregate
- $2,000,000. Products/Completed Operations Aggregate
- $1,000,000. Each Occurrence
- $1,000,000. Personal Injury/Advertising Liability
- Erie County Water Authority to be scheduled as an Additional Insured for both on-going and completed operations (attach Additional Insured endorsement to Certificate of Insurance)
- Insurance to be primary and non-contributory
- Per project aggregate shall apply

d. Automobile Liability:
- $1,000,000. Each Accident
- Erie County Water Authority to be scheduled as an Additional Insured.

e. Umbrella Liability:
- $1,000,000. Each Occurrence

- $1,000,000. Aggregate
- Erie County Water Authority to be scheduled as an Additional Insured
- Per project aggregate shall apply

f. Professional Liability

- $1,000,000 Per Claim
- $1,000,000 Aggregate

Certificates of Insurance to be provided to **ECWA** prior to start of work as follows:

ACORD 25 (Item a-e) including copy of Additional Insured Endorsement Note: If coverage provided for NYS domiciled employees require Forms C 105.2 and DB 120.1 for Workers Compensation and NYS DBL.

Certificates of Insurance, on forms approved by the New York State Department of Insurance, must be submitted to ECWA prior to the award of contract. Renewals of Certificates of Insurance, on forms approved by the New York State Department of Insurance, must be received by ECWA 30 days prior to the expiration of the insurance policy period.

Certificates of Insurance and renewals, on forms approved by the New York State Department of Insurance, must be submitted to ECWA prior to the award of contract. Each insurance carrier issuing a Certificate of Insurance shall be rated by A. M. Best no lower than "A-" with a Financial Strength Code (FSC) of at least VII. The professional service provider shall name ECWA, its officers, agents and employees as additional insured on a Primary and Non-Contributory Basis, including a Waiver of Subrogation endorsement (form CG 20 26 11 85 or equivalent), on all applicable liability policies. Any liability coverage on a "claims made" basis should be designated as such on the Certificate of Insurance. Such insurance shall continue through the term of this Agreement and vendor shall purchase at his sole expense either 1) an Extended Reporting Endorsement (also, known as Tail Coverage); or 2) Prior Acts Coverage from new insurer with a retroactive date back to the date of, or prior to, the inception of this Agreement; or 3) demonstrate through Certificates of Insurance that vendor has Maintained continuous coverage with the same or original insurer. Coverage provided under items; 1), 2), or 3) will continue as long as the law allows.

To avoid confusion with similar insurance company names and to properly identify the insurance company, please make sure that the insurer's National Association of Insurance Commissioners (N.A.I.C.) identifying number or A. M. Best identifying number appears on the Certificate of Insurance. Also, at the top of the Certificate of Insurance, please list the project number.

Acceptance of a Certificate of Insurance and/or approval by ECWA shall not be construed to relieve the outside vendor of any obligations, responsibilities or liabilities.

Certificates of Insurance should be e-mailed to mmusarra@ecwa.org or mailed to Ms. Molly Jo Musarra, ECWA Claim Representative/Risk Manager Erie County Water Authority, 295 Main Street – Room 350, Buffalo, New York 14203-2494, or If you have any questions you can contact Ms. Musarra by e-mail or phone (716) 849-8465.

HAZE&SA-01 KGODWIN

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 3/30/2020

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

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

PRODUCER
Ames & Gough
8300 Greensboro Drive
Suite 980
McLean, VA 22102

CONTACT NAME:
PHONE (A/C, No, Ext): (703) 827-2277 FAX (A/C, No): (703) 827-2279
E-MAIL ADDRESS: admin@amesgough.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Hartford Fire Insurance Company A+ (XV)	19682
INSURER B : Hartford Casualty Insurance Company A+ (XV)	29424
INSURER C : Travelers Indemnity Company of Connecticut A++ (Superior)	25682
INSURER D : Twin City Fire Insurance Company A+ (XV)	29459
INSURER E : Continental Casualty Company (CNA) A, XV	20443
INSURER F :	

INSURED
Hazen and Sawyer, D.P.C.
498 Seventh Avenue
New York, NY 10018

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

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

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X Contractual Liab. GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT X LOC OTHER:	X	X	42UUNBH8062	3/29/2020	3/29/2021	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 1,000,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
B	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY / SCHEDULED AUTOS HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY	X	X	42UENBH7997	3/29/2020	3/29/2021	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Comp./Coll. Ded	$ 2,000,000 $ $ $ $ 1,000
C	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION $ 10,000	X	X	ZUP31N1064A20NF	3/29/2020	3/29/2021	EACH OCCURRENCE AGGREGATE	$ 1,000,000 $ 1,000,000
D	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N: N If yes, describe under DESCRIPTION OF OPERATIONS below	N / A	X	42WBAD0SYE	3/29/2020	3/29/2021	X PER STATUTE / OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
E	Professional Liab.			AEH008231489	3/29/2020	3/29/2021	Per Claim/Aggregate	1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
RE: RFP #202000011 – ECWA PROJ #202000134 – VAN DE WATER TREATMENT PLANT CAPACITY EXPANSION

APPROVED MJM

Erie County Water Authority is included as additional insured with respect to General Liability per form CG 20 26 04 13, Automobile Liability per form HA 99 13 01 87, and Umbrella Liability per form EU 00 01 07 16, when required by written contract. General Liability and Automobile Liability are primary and non-contributory over any existing insurance and limited to liability arising out of the operations of the named insured and when required by written contract. General Liability, Automobile Liability, Umbrella Liability and Workers Compensation policies include a A Waiver of subrogation in favor of the additional insureds where permissible by state law and when required by written contract. Umbrella Liability coverage sits excess over General Liability, Automobile SEE ATTACHED ACORD 101

CERTIFICATE HOLDER

Erie County Water Authority
Attn: Ms. Molly Jo Musarra, ECWA Risk Manager
295 Main St, Room 350
Buffalo, NY 14203

CANCELLATION

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

AUTHORIZED REPRESENTATIVE

AGENCY CUSTOMER ID: HAZE&SA-01 KGODWIN

LOC #: 0

ADDITIONAL REMARKS SCHEDULE

AGENCY		NAMED INSURED
Ames & Gough		Hazen and Sawyer, D.P.C. 498 Seventh Avenue New York, NY 10018
POLICY NUMBER		
SEE PAGE 1		
CARRIER	NAIC CODE	EFFECTIVE DATE: SEE PAGE 1
SEE PAGE 1	SEE P 1	

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: ACORD 25 FORM TITLE: Certificate of Liability Insurance

Description of Operations/Locations/Vehicles:
Liability and Employers Liability coverage. 30-day Notice of Cancellation will be issued for the General Liability, Automobile Liability, Umbrella Liability, Workers Compensation and Professional Liability policies in accordance with policy terms and conditions.

NEW YORK STATE | Workers' Compensation Board

CERTIFICATE OF INSURANCE COVERAGE

under the NYS DISABILITY AND PAID FAMILY LEAVE BENEFITS LAW

PART 1. To be completed by Disability and Paid Family Leave Benefits Carrier or Licensed Insurance Agent of that Carrier

1a. Legal Name & Address of Insured (use street address only)

HAZEN AND SAWYER, D. P. C.
498 SEVENTH AVENUE
11TH FLOOR
NEW YORK NY 10018

Work Location of Insured *(Only required if coverage is specifically limited to certain locations in New York State, i.e., Wrap-Up Policy)*

1b. Business Telephone Number of Insured

212-539-7209

1c. Federal Employer Identification Number of Insured or Social Security Number

132904652

2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder)

ERIE COUNTY WATER AUTHORITY (ECWA)
295 MAIN STREET
ROOM 350
BUFFALO NY 14203-2494

3a Name of Insurance Carrier

HARTFORD LIFE AND ACCIDENT INSURANCE COMPANY

3b Policy Number of Entity Listed in Box "1a"

LNY-616076

3c Policy effective period

01/01/2020 to 12/31/2020

4. Policy provides the following benefits:

- [x] A. Both disability and paid family leave benefits.
- [ ] B. Disability benefits only.
- [ ] C. Paid family leave benefits only.

5. Policy covers:

- [x] A. All of the employer's employees eligible under the NYS Disability and Paid Family Leave Benefits Law
- [ ] B. Only the following class or classes of employer's employees:

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has NYS Disability and/or Paid Family Leave Benefits insurance coverage as described above.

Date Signed 01/03/2020 *Elizabeth Tello*

(Signature of insurance carrier's authorized representative or NYS Licensed Insurance Agent of that insurance carrier)

Telephone Number (212) 553-8074 **Name and Title:** Elizabeth Tello – Assistant Director, Statutory Services

IMPORTANT: If Boxes 4A and 5A are checked, and this form is signed by the insurance carrier's authorized representative or NYS Licensed Insurance Agent of that carrier, this certificate is COMPLETE. Mail it directly to the certificate holder.

If Box 4B, 4C or 5B is checked, this certificate is NOT COMPLETE for purposes of Section 220, Subd. 8 of the NYS Disability and Paid Family Leave Benefits Law. It must be mailed for completion to the Workers' Compensation Board, Plans Acceptance Unit, PO Box 5200, Binghamton, NY 13902-5200.

PART 2. To be completed by the NYS Workers' Compensation Board (Only if Box 4C or 5B of Part 1 has been checked)

State of New York
Workers' Compensation Board

According to information maintained by the NYS Workers' Compensation Board, the above-named employer has complied with the NYS Disability and Paid Family Leave Benefits Law with respect to all of his/her employees.

Date Signed **By**

(Signature of Authorized NYS Workers' Compensation Board Employee)

Telephone Number **Name and Title**

Please Note: Only insurance carriers licensed to write NYS disability and paid family leave benefits insurance policies and NYS licensed insurance agents of those insurance carriers are authorized to issue Form DB-120.1. Insurance brokers are NOT authorized to issue this form.

Additional Instructions for Form DB-120.1

By signing this form, the insurance carrier identified in Box 3 on this form is certifying that it is insuring the business referenced in box "1 a" for disability and/or paid family leave benefits under the New York State Disability and Paid Family Leave Benefits Law. The Insurance Carrier or its licensed agent will send this Certificate of Insurance to the entity listed as the certificate holder in Box 2.

The insurance carrier must notify the above certificate holder and the Workers' Compensation Board within 10 days IF a policy is cancelled due to nonpayment of premiums or within 30 days IF there are reasons other than nonpayment of premiums that cancel the policy or eliminate the insured from coverage indicated on this Certificate. (These notices my be sent by regular mail.) Otherwise, this Certificate is valid for one year after this form is approved by the insurance carrier or its licensed agent, or until the policy expiration date listed in Box 3c, whichever is earlier

This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policy listed, nor does it confer any rights or responsibilities beyond those contained in the referenced policy.

This certificate may be used as evidence of a Disability and/or Paid Family Leave Benefits contract of insurance only while the underlying policy is in effect.

Please Note: Upon the cancellation of the disability and/or paid family leave benefits policy indicated on this form, if the business continues to be named on a permit, license or contract issued by a certificate holder, the business must provide that certificate holder with a new Certificate of NYS Disability and/or Paid Family Leave Benefits Coverage or other authorized proof that the business is complying with the mandatory coverage requirements of the New York State Disability and Paid Family Leave Benefits Law.

DISABILITY AND PAID FAMILY LEAVE BENEFITS LAW

§220. Subd. 8

(a) The head of a state or municipal department, board, commission or office authorized or required by law to issue any permit for or in connection with any work involving the employment of employees in employment as defined in this article, and not withstanding any general or special statute requiring or authorizing the issue of such permits, shall not issue such permit unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that the payment of disability benefits and after January first, two thousand and twenty-one, the payment of family leave benefits for all employees has been secured as provided by this article. Nothing herein, however, shall be construed as creating any liability on the part of such state or municipal department, board, commission or office to pay any disability benefits to any such employee if so employed.

(b) The head of a state or municipal department, board, commission or office authorized or required by law to enter into any contract for or in connection with any work involving the employment of employees in employment as defined in this article and notwithstanding any general or special statute requiring or authorizing any such contract, shall not enter into any such contract unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that the payment of disability benefits and after January first, two thousand eighteen, the payment of family leave benefits for all employees has been secured as provided by this article.

NEW YORK STATE | Workers' Compensation Board

CERTIFICATE OF NYS WORKERS' COMPENSATION INSURANCE COVERAGE

1a. Legal Name & Address of Insured (use street address only) HAZEN AND SAWYER, D.P.C. 498 FASHION AVE FL 11 NEW YORK, NY 10018 Work Location of Insured *(Only required if coverage is specifically limited to certain locations in New York State, i.e., a Wrap-Up Policy)*	1b. Business Telephone Number of Insured 212-539-7090 1c. NYS Unemployment Insurance Employer Registration Number of Insured 1d. Federal Employer Identification Number of Insured or Social Security Number 132904652
2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder) ERIE COUNTY WATER AUTHORITY (ECWA) ATTN: RISK MANAGER: MS. MOLLY JO MUSARRA 295 MAIN STREET - ROOM 350 BUFFALO, NY 14203-2494	3a. Name of Insurance Carrier PROPERTY & CASUALTY INS CO. OF HARTFORD 3b. Policy Number of Entity Listed in Box "1a" 42WBAD0SYE 3c. Policy effective period 3/29/2020 to 3/29/2021 3d. The Proprietor, Partners or Executive Officers are ☒ included. (Only check box if all partners/officers included) ☐ all excluded or certain partners/officers excluded.

This certifies that the insurance carrier indicated above in box "3" insures the business referenced above in box "1a" for workers' compensation under the New York State Workers' Compensation Law. **(To use this form, New York (NY) must be listed under Item 3A on the INFORMATION PAGE of the workers' compensation insurance policy).** The Insurance Carrier or its licensed agent will send this Certificate of Insurance to the entity listed above as the certificate holder in box "2".

The insurance carrier must notify the above certificate holder and the Workers' Compensation Board within 10 days IF a policy is canceled due to nonpayment of premiums or within 30 days IF there are reasons other than nonpayment of premiums that cancel the policy or eliminate the insured from the coverage indicated on this Certificate. (These notices may be sent by regular mail.) **Otherwise, this Certificate is valid for one year after this form is approved by the insurance carrier or its licensed agent, or until the policy expiration date listed in box "3c", whichever is earlier.**

This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policy listed, nor does it confer any rights or responsibilities beyond those contained in the referenced policy.

This certificate may be used as evidence of a Workers' Compensation contract of insurance only while the underlying policy is in effect.

Please Note: Upon cancellation of the workers' compensation policy indicated on this form, if the business continues to be named on a permit, license or contract issued by a certificate holder, the business must provide that certificate holder with a new Certificate of Workers' Compensation Coverage or other authorized proof that the business is complying with the mandatory coverage requirements of the New York State Workers' Compensation Law.

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has the coverage as depicted on this form.

Approved by: Dan Knise
(Print name of authorized representative or licensed agent of insurance carrier)

Approved by:  3/18/2020
(Signature) (Date)

Title: President/CEO

Telephone Number of authorized representative or licensed agent of insurance carrier: 703-827-2277

Please Note: Only insurance carriers and their licensed agents are authorized to issue Form C-105.2. Insurance brokers are NOT authorized to issue it.

C-105.2 (9-17)

APPROVED

www.wcb.ny.gov

Workers' Compensation Law

Section 57. Restriction on issue of permits and the entering into contracts unless compensation is secured.

1. The head of a state or municipal department, board, commission or office authorized or required by law to issue any permit for or in connection with any work involving the employment of employees in a hazardous employment defined by this chapter, and notwithstanding any general or special statute requiring or authorizing the issue of such permits, shall not issue such permit unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that compensation for all employees has been secured as provided by this chapter. Nothing herein, however, shall be construed as creating any liability on the part of such state or municipal department, board, commission or office to pay any compensation to any such employee if so employed.

2. The head of a state or municipal department, board, commission or office authorized or required by law to enter into any contract for or in connection with any work involving the employment of employees in a hazardous employment defined by this chapter, notwithstanding any general or special statute requiring or authorizing any such contract, shall not enter into any such contract unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that compensation for all employees has been secured as provided by this chapter.

APPENDIX C

RESPONSE TO RFP

Hazen and Sawyer
498 Seventh Avenue, 11th Floor
New York, NY 10018 • 212.539.7000

January 24, 2020

Mr. Leonard F. Kowalski, P.E., Executive Engineer
Erie County Water Authority
3030 Union Road
Cheektowaga, New York 14227

Re: Proposal for Project No. 202000011, Van de Water Treatment Plant Capacity Expansion

Dear Mr. Kowalski

Hazen and Sawyer (Hazen) is pleased to submit our proposal for **ECWA Project No. 202000011, Van de Water Treatment Plant Capacity Expansion**. Our firm is a nationally recognized environmental engineering firm, headquartered in New York City. We focus *exclusively* on water and wastewater services and have delivered dozens of successful water treatment plant expansion projects to clients throughout New York State. As described in our proposal, we offer the Authority the following benefits that will lead to the development of a successful plan for expanding the Van de Water Treatment Plant.

Technical Expertise: Hazen has performed treatment capacity evaluations and optimizations for numerous clients with documented success. Our expertise is *unmatched and in-house*, with experts that have guided many clients, such as the NYC Department of Environmental Protection, NY, and the City of Buffalo, NY, to defensible strategies to maximize the usefulness of existing facilities.

An Experienced Team: Our proposed team, including Project Director Matthew Valade, Project Manager Julie Herzner, Task Leaders Kristen Barrett and Jim DeWolfe, and Technical Advisor Bill Becker, has worked together for over twenty years delivering successful water treatment projects in New York State ranging from 2-mgd to 2-bdg. At Hazen, our project teams work closely with our clients to develop the right solutions for each individual project challenge. Our team is structured to assure project efforts are accountable, efficient and meet project targets.

The Right Strategic Approach: As described in more detail in Item 2 of our proposal, we believe Task 3 will be critical to planning for coagulation basin expansion. Our strategy will be to initiate this task in parallel with an audit of filtration facilities, and to confirm demand projections so that the most cost-effective plan is developed to confidently meet system demands with optimized facilities.

As the following proposal demonstrates, **we are providing an expert team with a well-documented history of success.** The Hazen team will provide ECWA with superior service to evaluate current challenges and opportunities for improvements, and recommended strategies for the future that accomplish your goals. We look forward to working with ECWA and serving as your trusted advisor.

Sincerely,

Julie Herzner, PE
Senior Associate | Project Manager

Matthew Valade, PE, BCEE
Vice President | Project Director

1005-505

Van de Water Treatment Plant Capacity Expansion Project

Hazen prides itself on being a trusted advisor to our clients, made possible through our exclusive focus on the water market, our expertise, our ability to provide solutions using the most appropriate technology, and our commitment to always putting our client's interests first.

Item 1

Firm Qualifications

With just over 1,100 employees, Hazen and Sawyer is "right-sized"– offering the best qualities of a small local firm and a national company. Hazen's culture is built on the principles of empowerment at the local office level and minimal bureaucracy, allowing our team to prioritize the Authority's needs and earn a role as your trusted partner. Hazen's "no bureaucracy" approach enhances responsiveness to client needs and allows for unfettered access to our national experts and deep resources. In this era of mergers and acquisitions, Hazen is focused on sustainable and organic growth with a strong commitment to maintaining our core values and firm stability. When you select Hazen, you're selecting a client-focused culture dedicated to providing the highest quality water engineering services in the industry. Many of our clients have retained our services for decades - in some cases for over 60 years - because we put their interests first. Our commitment to achieving client goals coupled with our ability to deliver high quality projects efficiently, on-time and within budget, has earned our firm a repeat client rate of over 90%.

Water Treatment

From designing one of the first declining-rate filters for Detroit in the late 1950s to the largest ultraviolet disinfection facility in the world, Hazen has been an industry leader for 65 years. We have completed several thousand major water/wastewater industry assignments in the United States and abroad for government agencies, utilities, and industrial organizations. These have ranged in scope from simple analyses for small communities to multi-billion-dollar projects for some of the largest cities in the world. We have been working collaboratively with utilities to design new or upgraded treatment works on surface water supplies with capacities totaling over nine billion gallons per day. Our breadth of knowledge and experience of treating river supplies like the Niagara River has enabled clients from Washington, DC to Los Angeles, CA provide safe, affordable drinking water and meet increasingly stringent regulations.

Building a Partnership

We do not believe in a "one-size-fits-all" model when it comes to projects. We know that each client, as well as each project, has unique drivers, circumstances, and goals that must be considered. We pride ourselves on working in close partnership with our clients every step of the way to ensure that the project not only meets but exceeds expectations.

Keys to Successful Delivery

As an industry leader in advanced water treatment, Hazen has decades of experience delivering projects with aspects key to the successful planning, design and construction of the Van de Water Treatment Plant Expansion:

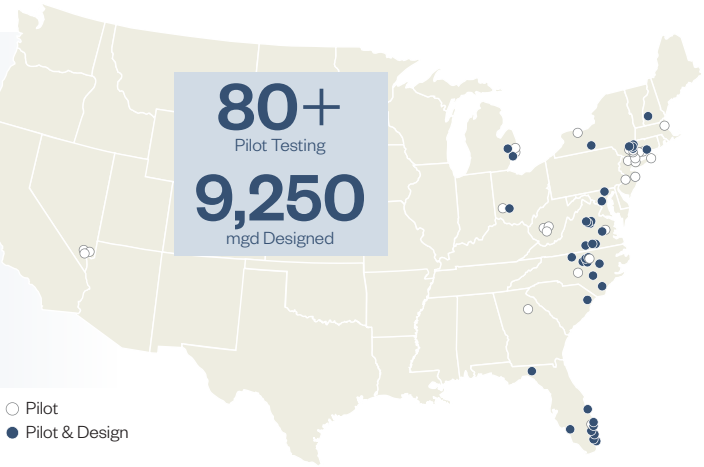
- Increase plant capacity to supply new users
- Maintenance of plant operations
- Regulatory acceptance of full-scale testing

Our staff's treatment experience across the full project life cycle, hands-on approach to fieldwork, and experience as operators ensures the Authority will receive a comprehensive BODR and full-scale testing plan considerate of real world challenges and constraints from design through start-up.

1010-355

NATIONAL EXPERIENCE

Hazen has performed **more than 80 pilot and full-scale tests** for clients across the nation and has designed numerous water treatment facilities with **a total combined capacity of over 9,000-mgd.**



LEAF
Leverage Existing Assets First

Controlling Costs

We also appreciate the importance of budgetary constraint when planning or developing a design. As a standard practice, our team places cost control as a main priority. Our proposed staff are experts at plant optimization and operability and will identify opportunities for improved efficiencies in construction and operations, developing solutions which will provide cost control during construction and throughout the plant's life cycle. We endeavor to Leverage Existing Assets First (LEAF) on each project. We incorporate this approach during evaluations to highlight solutions that 1) can be implemented with existing infrastructure, 2) are synergistic with long term solutions, 3) provide right-sized capacity, and 4) reduce cost and operator complexity.

Site Constraints and MOPO

The existing Van de Water Treatment Plant (VDWTP) has limited access and potential to expand. In order to construct a new coagulation basin on the existing site, innovative ideas related to treatment, construction sequencing and maintenance of plant operations (MOPO) will need to be considered in the BODR. Hazen brings extensive experience working on highly constrained sites including Aquarion's Putnam and Stamford WTPs and the Croton WFP, which is a 290-mgd facility built on only 9-acres of land.

Permitting/Grant Funding

Through Hazen's guidance in manouvering through New York State's grant funding programs, the Village of Ossining recently obtained $3 million in grants to help finance their new drinking water treatment plant.

Hazen regularly assists clients in obtaining funding and our team is well versed in the grant opportunities and associated requirements specific to New York State. As one of New York City's top environmental services firms, Hazen brings expertise in environmental reviews and regulatory compliance/permitting at the State and federal level. This expertise works in concert with our grant writing expertise, as many grants require and/or are informed by successful completion of regulatory and environmental requirements. As a result, we have helped utilities like the Authority obtain millions of dollars in funding, and through the process, have facilitated in their projects' recognition as regional economic priorities.

1010-365

Related Experience

Our team is experienced in designing drinking water solutions, and have worked together to successfully deliver planning, design, and construction of over 30 water treatment plants in the Northeast over the past 20 years. We have reviewed the Authority's Strategic Plan, and will leverage our experience and knowledge of the Authority's priorities to ensure a drinking water system that will serve the Authority's community far into the future.

In the following pages, we describe our teams relevant experience in treatment plant design including capacity expansions, filter rehabilitation and full-scale piloting.

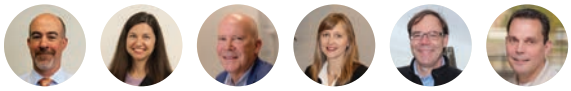
Demonstrated Experience

- Performed extensive filter evaluation and rehabilitations, which includes underdrain repairs and replacement.
- Assessed aging WTP infrastructure, optimizing operations and leveraging assets at existing facilities to realize cost savings.
- Proven ability to partner with clients and operations staff to deliver fast-track water treatment improvements.
- Delivered projects compliant with NYSDOH and aided clients in grant funding totaling more than $6 million in the last two years.
- Industry leader in advanced water treatment and the filtration system design, including innovative space saving alternatives.

Hazen offers the Authority a team with experience across all three tasks.

Key Staff

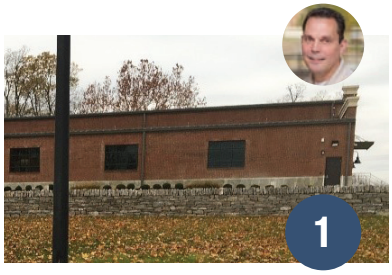
We have proposed several staff members experienced in filter rehabilitation, design and piloting who have delivered projects nationwide.



Matthew Valade | Julie Herzner | Jim DeWolfe | Kristen Barrett | Bill Becker | Bret Casey

Relevant Tasks

1 Task 1 | 2 Task 2 | 3 Task 3



Richmond Road Station WTP Filter Upgrades
Kentucky American Water, KY

Kentucky American Water Company's 25-mgd Richmond Road Station WTP's original filter building was constructed in 1924 with several additions through 1953. Hazen provided design services for a new filter building, including eight dual-media gravity filters, a new baffled 0.5-mg chlorine contact basin, filter backwash storage tank, filter backwash pump station, and a chemical feed vault. **The new facilities were located adjacent to existing facilities within the current plant footprint.**

Southern Indiana Operations and Treatment Center Filter Media and Underdrain Rehabilitation
Indiana American Water, IN

The SIOTC is a ground water treatment plant constructed in 1998 with a firm permitted capacity of 26-mgd. Hazen performed detailed design for retrofit of the 8 gravity filters. The recommended filter media and media support specification for replacement maintained the same filter profile, however minor modifications to the effective size and uniformity coefficient of the selected media were made to maintain a similar clean-bed headloss profile through the media.

George Sweeney Water Treatment Plant Rerate Pilot Study
Municipal Authority of Westmoreland County, NY

The Municipal Authority of Westmoreland County desired to increase the permitted treatment capacity of their George R. Sweeney Water Treatment Plant from 24-mgd to 30-mgd to accommodate growth in western Pennsylvania. In order meet PADEP approval requirements, a 12-month high rate pilot study is required. Hazen is leading the pilot for this expansion project, which includes extensive regulatory and stakeholder coordination, the development of pilot study protocol for approval by PADEP, set-up and commissioning, regular site visits to assure continued compliance, and all required reporting.

PROJECT AT A GLANCE

Clapper Road Water Treatment Plant Modifications

TOWN OF BETHLEHEM, NY

The Town of Bethlehem was struggling with Disinfection Byproduct Rule (DBPR) compliance with their existing Clapper Road Water Treatment Plant and retained Hazen to design a new pretreatment facility. Through bench-testing, process evaluation and pilot-testing, a new clarification system was selected to be constructed upstream of the Town's existing filter building.

Key Project Components

- ✓ Integrated a new clarification system in the hydraulic profile of an existing WTP.
- ✓ Improved waste washwater equalization basins and added capacity to provide operational flexibility.
- ✓ Relocated pretreatment chemical systems.
- ✓ Included Trident filter underdrain and media replacement.

Applicable Solutions

- ✓ Additional clarification allowed the Town to maintain their current filtration system while addressing their treatment challenges.
- ✓ Designed new treatment systems to be constructed within the physical constraints of the existing site.

Relevance to Van de Water Treatment Plant

Issues

- ✓ Existing hydraulic grade line limited options for addition of new clarification pretreatment facility.
- ✓ Existing geologic conditions required creative solutions to minimize footprint of pretreatment facilities.

Insight

- ✓ Considerations early in design allowed integration of new treatment processes within the existing hydraulic grade line.
- ✓ Detailed planning during design limited impact of construction on the operations of the existing treatment facilities.

1010-365

PROJECT DESCRIPTION

The Clapper Road Water Treatment Plant (CRWTP) was struggling to balance meeting DBP regulations with iron and managanese removal. Hazen was selected to perform a benchtop and pilot study to identify feasible options for removing dissolved iron and manganese from the raw water supply while minimizing DBP formation to allow for compliance with the Stage 2 DBP Rule. Pretreatment using DAF clarification was identified as an effective solution.

The Town requested that Hazen provide engineering and construction services to design a 6-mgd pretreatment facility including coagulation, flocculation and DAF clarification system, chemical feed and storage systems, and solids holding and conveyance systems.

Hazen analyzed the most cost efficient way to incorporate the new DAF treatment into the existing hydraulic grade line. The raw water pumps were upgraded and the DAF facility was situated such that water flowed by gravity to the existing facility. Measures to minimize headloss were taken such as replacing the existing static mixer with a new flow-splitting static mixer. A control weir was installed in the DAF effluent channel to control the water level entering the existing WTP building.

Careful attention was given to integrating the new DAF facility's controls with the existing facility's complex controls for proprietary upflow clarification system.

These modifications to the existing CRWTP will enable the facility to achieve consistent compliance with the Stage 2 Disinfection By-Product (DBP) Rule while meeting the Town of Bethlehem's water quality goals. Hazen is currently managing the design services during construction of the Pretreatment Building.

Project Relevance

- Upgrades to existing plant
- Coagulation and clarification expansion
- Incorporating clarification into existing hydraulic grade
- Maintenance of plant operations
- Trident filter rehabilitation

Core Project Team

Julie Herzner, PE
William Becker, PhD, PE, BCEE
Matthew Valade, PE, BCEE
James DeWolfe, PE, BCEE, CWO
Rose Jesse, CPE, ENV SP

Project Profile

Design Completion: 2018
Construction Completion: 2022 (est.)
Construction Value: $16.8M

Reference

George S Kansas, PE
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Delmar, New York 12054
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gkansas@townofbethlehem.org

1010-355

PROJECT AT A GLANCE

Oak Glen Regional Water Treatment Plant

Facing treatment capacity limitations, NJ American Water (NJAW) enlisted Hazen to design the expansion of the Oak Glen WTP to provide increased clarification and filtration treatment capacity. We worked with NJAW to develop robust treatment to meet the challenges of a varying water supply and improve upon the existing vendor-designed clarification system.

Key Project Components

- ✓ Integrated clarification and filters into the existing WTP to increase treatment capacity and process robustness.
- ✓ 50% expansion of treatment capacity.
- ✓ Enhancement of waste washwater treatment.
- ✓ Maintenance of plant operations during construction.

Applicable Solutions

- ✓ Early planning provided seamless operations of existing facilities during construction.
- ✓ Careful consideration during design allowed major expansion of structures without affecting existing structures.
- ✓ Provided operational support through start-up and testing.

Relevance to Van de Water Treatment Plant

Issues

- ✓ Limited treatment capacity requires integration of clarification and new filters.
- ✓ Constrained site will require careful planning to allow seamless operations throughout construction.
- ✓ Expansion of existing facility required seamless integration of new and existing treatment systems.

Insight

- ✓ Optimization of treatment process will allow new facilities to be better integrated into the constrained site.
- ✓ Testing of existing systems prior to design informed approach to hydraulic considerations and treatment capacity.

1010-365

PROJECT DESCRIPTION

Increased water consumption prompted NJAW to expand the Oak Glen Regional WTP (OGRWTP) by adding new clarification and filters to the existing plant. Hazen was hired to design and oversee construction of the 7.5-mgd expansion, which included the construction of a new process building, clarifier, chlorine dioxide generator, office and administrative spaces, and a storage barn.

The new process building was constructed adjacent to the existing building so that the new clarification tanks, filters, and filter gallery lined up with the existing infrastructure. The new building was structurally independent to avoid making modifications to the existing building. The new treatment processes were fully integrated into the existing treatment plant. The existing DAF recycle system was replaced with a new system which served both the existing and new DAF trains. The new filters tied into the existing influent and filtered water piping and use the same backwash system.

The design minimized impacts to the adjacent plant during construction. Plant shutdowns were coordinated up to three months in advance so that work was well coordinated and minimized conflicts.

Hazen provided design services during construction and full-time resident inspection. Hazen's onsite representative oversaw construction to ensure conformance with contract documents and provided daily reports, photographs and review contractor's pay applications. The full-time inspector was a conduit to the project's design team, allowing for quick resolution of unanticipated field conditions.

Project Relevance

- Expansion of existing facility
- Permitting
- Maintenance of plant operations

Core Project Team

Matthew Valade, PE
Kristen Barrett, PE, LEED, AP
Lisa Giroux, PE
Norman Bartley, PE
James DeWolfe, PE, BCEE, CWO
William Becker, PhD, PE, BCEE

Project Profile

Design Completion: 2017
Construction Completion: 2019
Project Cost: $19.6 million

Reference

Adam Kane, PE
New Jersey American Water
3215 Fire Road
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adam.kane@amwater.com

1010-355

PROJECT AT A GLANCE

Indian Brook Water Treatment Plant

The Village of Ossining is undergoing a period of growth resulting in increasing water demands. Following a system expansion study, the Village retained Hazen to design and provide construction services for a new, larger Indian Brook Water Treatment Plant (IBWTP) on the existing IBWTP property. This new facility will ensure that it can reliably meet the water demands of the population it services for the foreseeable future.

Key Project Components

- ✓ New facility of larger capacity designed on the constrained site of the existing water treatment plant.
- ✓ Re-used existing raw water pump station for new chemical facilities.
- ✓ Provided multiple barrier disinfection to ensure treatment if the Village raw water quality degrades in the future

Applicable Solutions

- ✓ A green roof was implemented to meet storm water quality requirements and address neighboring home located on a hill overlooking the new building.
- ✓ New treatment plant designed to allow the Village to maintain their current filter plant in operation throughout the construction period.

Relevance to Van de Water Treatment Plant

Issues

- ✓ Constrained site required creative solutions to meet New York State DEC stormwater requirements.

Insight

- ✓ Identification of site constraints early in project enabled design to progress and limit impacts on operations of existing treatment facilities during construction.

1010-365

PROJECT DESCRIPTION

In response to increased demand and aging infrastructure, the Village of Ossining hired Hazen to design and provide construction administration for a new 7-mgd DAF WTP. Hazen evaluated water quality from their reservoirs and selected the most appropriate water treatment process, which includes pre-oxidation with potassium permanganate, coagulation, flocculation, DAF, gravity filtration, UV disinfection and final disinfection. Hazen presented their experience designing DAF systems for treatment of supplies with similar water quality to regulators resulting in approval to proceed without pilot testing.

Hazen assessed the existing WTP and worked with the Operations team to identify infrastructure which could be reused in the new facility.

The site is very constrained by the existing WTP, extreme topography, and nearby waterways. The new WTP was designed to fit within the available footprint. For example, UV units were installed to minimize the size of the clearwell required to achieve disinfection. The building layout was coordinated with the existing topography to create an easily accessed facility, which minimizes excavation and impacts to nearby waterways.

The new facility is located on the same site as the existing WTP which must maintain operation throughout construction of the new facility. Through careful attention to detail and coordination with neighboring properties, Hazen developed a plan to maintain flow and access to the existing facility during construction of new piping connections.

The construction of the new treatment plant is anticipated to commence in April 2020.

Project Relevance

- Clarification and filter design
- Existing WTP assessment
- Constrained site

Core Project Team

Julie Herzner, PE
Matthew Valade, PE, BCEE
William Becker, PhD, PE, BCEE
Kristen Barrett, PE, LEED, AP
George Markou, PE
Rose Jesse, CPE, ENV SP

Project Profile

Design Completion: 2018
Construction Completion: 2022 (est.)
Project Cost: $35M

Reference

Andrew Tiess
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Atiess@villageofossining.org

1010-355

PROJECT AT A GLANCE

Aquarion Water Treatment Plants

The Aquarion Water Company has entrusted Hazen to design every major water treatment plant upgrade over the past 30 years. These facilities include a new 50 mgd WTP, integration of clarification to expand a facility to 30 mgd and planning for integration of clarification into a 20 mgd WTP.

Key Project Components

✓ Four major projects:
- Easton WTP (20 mgd Plate Settlers)
- Warner WTP (50 mgd Stacked DAFF)
- Stamford WTP Upgrade (30 mgd Stacked DAFF)
- Putnam WTP Upgrade (20 mgd DAF Plate Settlers)

✓ All facilities were built on constrained sites.

✓ Integration of new process at existing plants:
- Stamford project increased capacity by 25%; reused existing chemical systems and clearwell.
- Putnam project will integrate new clarification to replace failing sedimentation system.

Applicable Solutions

✓ Detailed hydraulic studies at the Stamford WTP allowed the plant capacity to be increased by 25% while also raising the hydraulic grade line by 15 feet.

✓ Evaluation of site constraints for the Stamford and Putnam WTPs allows for construction to occur on highly constrained sites with minimal impact to operations.

Relevance to Van de Water Treatment Plant

Issues

✓ Stamford upgrade required integration of new clarification facility into site with existing WTP.

✓ Uncertainty related to future regulations and water quality.

Insight

✓ Close coordination with operations staff starting early in the design phase led to seamless transition to new clarification facility.

✓ Considerations of long-term treatment requirements were integrated into design to allow easy expansion of facilities in future.

1010-365

PROJECT DESCRIPTION

AQUARION WATER TREATMENT PLANTS

13

Aquarion Water Company (AWC) provides water service to a number of communities in Connecticut. Hazen has conducted complete design and construction services for three of Aquarion's plants.

Putnam WTP

The Putnam WTP Alternatives Analysis project is part of Hazen's on-call Task Order Contract with AWC. In 2018, AWC identified a need to upgrade or rehabilitate their existing sedimentation process to improve water quality as well as to address structural issues with the tanks. As they have several successfully operating DAF treatment plants, there was a desire to replace the sedimentation process with DAF. The first phase of the study evaluated the feasibility of replacing the conventional sedimentation basins with DAF. The project required special considerations to allow the plant to remain in service during construction of the DAF process, which due to site constraints, had to go on the footprint of one of the two the existing sedimentation basins. The initial study concluded retrofitting the basins was feasible, and installation of settling tubes in the other basin was recommended to increase the capacity of the basin to remain in service while the DAF was built.

In Phase 2 of this study, Aquarion asked Hazen to evaluate the feasibility of installing new filters on the footprint of the remaining sedimentation basin. As in Phase 1, alternate layouts were developed and the construction phasing closely examined. The study concluded that filters could be constructed within the basin footprint and presented a recommended layout. Phase 3 of the study included an analysis of whether "stacked" DAFF, where the DAF process is directly over the filters. DAFF has a smaller footprint than separate filters and DAF and had promise to save capital costs. An analysis concluded that the construction sequencing needed to keep the plant online was relatively onerous, and as such, the configuration was not expected to produce significant cost savings. Due to minimal savings and increased construction risks, the alternative was deemed unfavorable. This phase also included a high level analysis of whether a new plant at a different location may be more favorable than a retrofit, however, the costs associated with additional transmission main and completely new facilities made the option infeasible.

In each Phase, Hazen developed 3D CAD models to determine the most favorable configuration of the alternatives. Each phase of this project also included water quality evaluation, development of design criteria, constructability, and cost/non cost factors. The study was completed in June 2019, and AWC is currently determining when the design and construction will be implemented.

Project Relevance

- Water treatment evaluation
- Constrained site
- Clarification and filter design

Core Project Team

Matthew Valade, PE, BCEE
William Becker, PhD, PE, BCEE
Julie Herzner, PE
Kristen Barrett, PE, LEED AP
George Markou, PE

Project Profile

Various Completion Dates: 2004-2019

Reference

Yesher Larsen, P.E.
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203-445-7318
YLarsen@aquarionwater.com

1010-355

Hazen designed the new plant with stacked DAF to minimize the building footprint.

Stamford WTP

In service since 1986, the Stamford WTP experienced physical/operational problems and constraints. Hazen evaluated the status of the facility and its capability of meeting current and future regulations, recommended alternative solutions to upgrade the facility, and provided design and construction services for the DAF upgrade which increased capacity from 24 to 30-mgd.

Having gained a clear understanding of the facility and performance needs, we developed facility upgrade proposals calling for phased improvements (short, medium, and long-term). Alternatives were developed to a conceptual design level of detail, including design drawings, process descriptions, and hydraulic grade lines. Estimated construction, operational and life-cycle costs were produced, along with estimated construction schedules - including phasing to ensure continuity of supply. A key requirement was to maintain plant operation during reconstruction, since it is Stamford's sole source of drinking water. Robustness and effectiveness of the treatment processes were explored and evaluated.

As part of our master plan, we also recommended that certain improvements be made immediately to the traveling bridge filters which were not delivering water that met Aquarion's high quality standards.

The alternative of replacing the main process with dissolved air flotation stacked above rapid gravity filters (DAF) was selected as the most cost effective way to meet the goals established during the first phase of the project to upgrade and expand the water treatment plant. The final design and construction progressed on schedule and the award-winning upgraded facility was placed into service.

The Warner WTP was designed using stacked DAF to reduce facility size.

William S. Warner WTP

Hazen designed the new Warner WTP, which has a 50-mgd capacity, and treats an average flow of about 25-mgd. Facilities include a pre-oxidant contact tank for manganese removal, two-stage rapid mix, two-stage flocculation, dissolved air flotation stacked over dual-media filtration, and finished water storage totaling 12 million gallons. Site and hydraulic restrictions necessitated a compact facility, with most of the structure below existing grade. Solids handling includes centrifuge dewatering. The project also included a raw water pumping station near the site of the existing treatment building, and approximately 1,200 feet each of raw and treated water transmission mains.

Filter Rehabilitation Experience

Our firm's experience includes the design and construction oversight of new filters and renovation of existing filters, comprised of evaluation and design of different underdrain systems, troubleshooting of failed underdrains, assessments of existing filter piping, hydraulics, piping, controls, structural conditions, and SCADA upgrades. The following pages highlight our firm's filter rehabilitation experience, which often includes piloting.

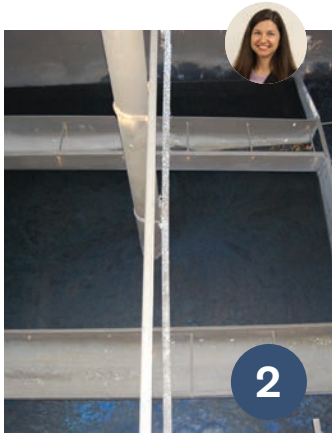
Key Staff

We have proposed several staff members experienced in filter rehabilitation, design and piloting who have delivered projects nationwide.

Matthew Valade | Julie Herzner | Jim DeWolfe | Bill Becker | Bret Casey

Relevant Tasks

1 Task 1 | 2 Task 2 | 3 Task 3



On-Call Engineering Services

Northern Westchester Joint Water Works (NWJWW), NY

As part of a comprehensive plant improvement program, Hazen designed improvements to the chemical storage and feed facilities and the existing filters of the Amawalk WTP. The chemical facilities were modified to meet current standards for chemical-handling, as well as replacing system components that were reaching the end of their useful life. Hazen also provided design services and design services during construction to assist in a filter rehabilitation. The media and troughs were evaluated and an updated design to allow for a deeper media bed and more functional troughs was implemented. During planning, underdrain replacement options were evaluated and a recommendation was presented, but NWJWW decided not to proceed with the underdrain upgrade at the time of the media and trough replacement. As part of these efforts, Hazen prepared an Engineer's Report, plans, and specifications for **new improvements necessary for the safe, reliable operation of the chemical storage and delivery systems and filters.**

EM Johnson WTP Filter Addition & Rehabilitation

Raleigh, NC

E.M. Johnson WTP is an 86-mgd facility serving the City of Raleigh and surrounding communities. Hazen has completed numerous upgrades to the plant, including the addition of new filters and retrofit/rehabilitation of 20 existing filters. The filter project included a major rehabilitation to provide deeper media and air scour in the new and existing filter boxes. Hazen was responsible for the original design of the comprehensive upgrade, new filters and air scour system, including mechanical, structural, HVAC, SCADA, and architectural engineering.

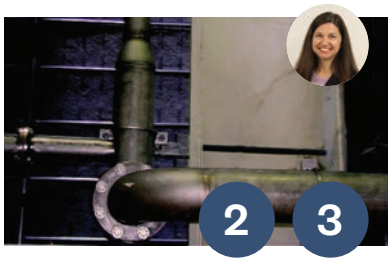
The City staff, prior to Hazen's design efforts, selected porous Wheeler underdrain bottom inserts by Roberts Filter. Due to the nature of the new bottom design, the City conducted, at Hazen's recommendation, a one-year test of the bottom to assess performance. During design, **Hazen worked with plant staff to innovatively design air piping, resulting in an estimated 10% construction cost savings.**

Richard Miller Treatment Plant Filter Rehabilitation

Greater Cincinnati Water Works, OH

The 240-mgd Richard Miller Treatment Plant (RMTP) has 27 filters with a Leopold clay tile and stone/gravel media support system and 20 filters with Leopold plastic underdrains fitted with media-retention porous caps. After the failure of two filters with Leopold underdrains and an inspection of the remaining 18, Hazen was selected to provide engineering services as part of a larger rehabilitation team. As a pilot project, two filters were set aside to be rehabilitated and fitted with new stainless steel lateral underdrain system supplied and installed by AWI. The **final design included reconstruction of all 20 filters with a Leopold low-profile underdrain using stone/gravel for distribution and media support.**

Hazen used CFD modeling and field testing to understand the hydraulic behavior of two types of existing filter underdrains in the century-old facility. Results of CFD modeling, field testing, and structural analysis were used to design new filter underdrain sub-floors and distribution channels. To assist with the design of the new filter underdrains, the impact biological activity had on the media and underdrain was also evaluated.



ACMUA WTP Filter Rehabilitation
Atlantic City, NJ

Hazen was selceted to support the ACMUA's goal of expanding their filtration facilities to allow for: additional capacity; the ability to remove filters from service to perform maintenance; and to meet the proposed turbidity goal of 0.1 ntu. . Project included the rehabilitation of six filters at the 22-mgd WTP. Pilot testing was performed to optimize performance based on filter media configuration and included an evaluation of rehabilitation options for a 1970's custom-built underdrain system.

Swimming River WTP Emergency Repairs, Filter Surveillance and Condition Assessment
New Jersey American Water, NJ

Hazen has been working closely with the NJAW Coastal North team on operations condition assessment, and filter rehabilitation throughout their facilities. Hazen conducted emergency inspections and recommend short-term repairs of Swimming River WTP purification unit (PU). Repairs and fast-track plenum inspections raised concerns about the long-term viability of the units, and Hazen provided filter surveillance and inspected the plenums of all six PUs.

Del-Co Olentangy WTP Plant
Delaware, OH

The primary goal of this project was to expand the plant to 28.8-mgd to meet the Del-Co Water Company's growing demands in southern Delaware County. The initial stage of the project included evaluation of several advanced treatment options including GAC and UV disinfection to meet current and future drinking water requirements. Hazen designed an expansion to the existing Olentangy WTP to increase the capacity of the surface water lime softening plant from 19.2 to 28.8-mgd. To meet Ohio EPA requiremnets, the project included a full-scale demonstration study to high-rate the new filters to 6.25 gpm/ft2 and included design of two new dual-media filters with air scour.

Filter Underdrain Design
NJ Water Supply Authority, NJ

Following a sudden failure of the Hospital Road Treatment Facility's filter underdrain system, Hazen provided emergency response services to investigate the cause of the failure and provided fast-track design and construction administration services for a new underdrain system. Design services included evaluation of underdrain system options.

Pilot Studies to Improve Detroit's WTPs
Detroit Water and Sewer Detroit, MI

Hazen conducted bench studies and designed, built and operated pilot facilities to test improvements at five of Detroit's WTPs: Huron (200-mgd), Northeast (300-mgd), Southwest (220-mgd), Water Works Park (325-mgd) and Springwells (540-mgd). Through this piloting program, the most cost-effective means for upgrading each treatment facility was determined, ranging from rehabilitation of unit processes to complete replacement of a WTP. Hazen worked with DWSD to ensure new facilities would be integrated into existing infrastructure with minimal impact to on-going operations and provide flexibility for future needs.

In addition to the projects led by Hazen in this section, key staff member Jim DeWolfe has direct experience working at the VDWTP and several of our key staff have experience delivering projects throughout the Great Lakes region.

1010-365

Item 2

In 2019, Erie County Water Authority (ECWA) created a long-term strategic plan to identify the Authority's priorities over the next twenty years. ***The four goals articulated in this plan are expansion, redundancy, automation, and investment.*** *This project would help address these goals allowing the Authority to increase the Van de Water Treatment Plant (VDWTP) plant capacity and increase reliability/ redundancy by upgrading systems that are at the end of their useful life.*

Project Understanding

As stated in the Request for Proposal, the VDWTP has a capacity of 49.5-mgd and treats water from the Niagara River. The raw water turbidity to the plant is typically less than 20 NTU, but occasionally spikes to 150 NTU. The total organic carbon is typically around 3 mg/L with a maximum around 10 mg/L. The existing treatment process includes rapid mixing, tube settlers and rapid gravity media filtration with Leopold clay block underdrains.

The plant was constructed in the early 1970s and major process modifications have been made to the rapid mix facilities, filter-to-waste system (1998), filter media replacement (2008), and the coagulation basins and chemical facilities (2012). Although these systems were upgraded, the capacity was not increased to allow expansion to 82.5-mgd.

A hydraulic evaluation of the existing plant and several increased capacity conditions was conducted during a 2010 Capital Improvement Planning project. As a result of this evaluation, we understand that several critical projects are required to increase the VDWTP capacity. These projects include the addition of a second 48-inch raw water pipe and two filters, upgrades to the flocculation/ settling basin inlet pipes, upgrades to the settling basin troughs, and upgrades to treated water piping and pumps.

In order to increase the capacity of the Van de Water Treatment Plant, several modifications will need to be implemented including upgrades to treated water piping.

Various design standards for the VDWTP treatment processes were also examined in the 2010 Capital Improvement Planning project, including standards associated with the operation of the existing coagulation basins at flows up to 82.5-mgd. Two standards - theoretical detention time and approach velocity below the tube settlers - exceed AWWA recommended sedimentation design standards at a flow of 82.5-mgd. One of the greatest challenges faced by water treatment utilities is maximizing the length of service and capacity of major assets. Considerable capital resources are required for the design and construction of unit processes, including clarification. Rather than assume firm capacity is limited to generic design standards and guidelines, the Authority desires to conduct a full-scale pilot as part of Task 3 to empirically evaluate plant performance at surface overflow rates above current permitted values. Once the flow limits are established that achieve acceptable performance, the Authority can then better plan for the addition of a fourth coagulation basin, if required, to achieve the above-mentioned benefits.

Potential Additions to Existing Scope

We also understand that the Authority is a member of the Partnership for Safe Water (PfSW), but has not yet completed Phase III for either water treatment facility. If desired, we will endeavor to work with the Authority to help complete the required assessments and identify performance limiting factors that can contribute to the completion of the Phase III report for the VDWTP. Our staff have worked with dozens of utilities across the nation that are PfSW members, and are keenly aware of the methodologies and benefits gained with this program.

In addition to these projects required to increase the plant capacity, many systems and equipment in the plant were installed during the original construction and are at the end of their useful life. A conditions assessment is required to determine critical assets that should be replaced.

Besides the identified treatment needs, the Authority is expanding their distribution system and customer base and wants to address interconnection water quality impacts – especially with the City of Buffalo. Therefore, treatment must be optimized to meet desired water quality goals, now and in the future.

In order to address the objectives of this project, the Authority has laid out three task for this project:

1. Develop the Basis of Design for Additional Coagulation Basin and Filters
2. Develop the Basis of Design for Improvements to Filters 1 through 4
3. Perform a Full-Scale Pilot of Coagulation Basins

Insights

Hazen has identified the following items as key to the efficient delivery of the Van de Water project:

- Workflow efficiencies
- Early and regular communication with the Authority and plant staff
- Filter design reflective of site constraints and long term goals
- Holistic underdrain improvements
- Staged piloting
- Maintenance of operations
- Grant funding schedule triggers
- Commitment to quality project delivery and communication with the Authority

Technical Approach and Detailed Scope of Services

As discussed in **Item 1,** Hazen's approach to this type of facility upgrade is to **Leverage Existing Assets First (LEAF).** We have incorporated this approach on other projects to highlight solutions that 1) can be implemented with existing infrastructure, 2) are synergistic with long term solutions, 3) provide right-size capacity, and 4) reduce costs and minimize complexity of operations.

We propose commencing components of Task 1 and all of Task 2 simultaneously with Task 3. We feel the Basis of Design (BOD) work associated with the coagulation basin upgrades under Task 1 should wait until the results of the Task 3 full-scale pilot testing of the coagulation basins are complete. We will perform condition assessments of the existing pretreatment components, filters (as part of Task 2) and perform future demands analysis in parallel with full-scale pilot testing of the coagulation basins. This will better inform the development of the BOD for improving the coagulation basins and filters resulting in a better end product for the Authority. The specifics of our tactical approach are presented in the remainder of this section.

Right: The site of the VDWTP is space limited. Innovative approaches will be required to integrate new coagulation basins and filters, while maintaining plant operations throughout construction.

1010-365

Task 1 – Additional Coagulation Basin and Filters

As part of Task 1, we will identify the necessary improvements required for expanding the VDWTP plant capacity from 49.5-mgd to 82.5-mgd, and any improvements required to ensure redundancy and resiliency of the process units and equipment. The final deliverable of Task 1 will be complete BOD documents, which can be used to time infrastructure upgrades with expansion needs to meet the demands of the Western New York Community.

Task 1.1 - Water Demand Analysis

In order to make sure that any treatment capacity upgrades are "right-sized", a water demand analysis will be performed under Task 1. This will ensure the Authority is focusing precious capital dollars in the right place and spending on treatment capacity that is truly needed. Additional demand (flow) and population data will be processed and added to the available historical record to analyze water use trends. At a minimum, these data will be combined with local climatic information to normalize the historical demand data for observed weather. Where available, information on other factors that may have influenced demand trends, such as increased water efficiency and economic development trends, will be collected and tied to the demand data to evaluate the effects of these factors. In light of the new data, Hazen will review the previous demand projections and related assumptions from the 2010 Capital Improvement Planning project and recommend updates to the forecasting procedures and assumptions given the available data.

In collaboration with the Authority, Hazen will produce a reference forecast scenario and up to four additional forecast scenarios, for example by varying future weather conditions away from historical norms, varying per capita usage rates according to different rates of water efficiency, and varying the total and/or regional distribution of population served. An updated Treatment Capacity Requirements Analysis through 2040 will be provided as a Technical Memorandum.

Insights

The Water Demand Analysis will be led by Jack Kiefer, PhD. With 29 years of experience, Dr. Kiefer is an expert in forecasting the demand for potable water.

Task 1.2 - Facility Audit

We will review relevant reports, drawings, specifications, and other records provided by the Authority, and confirm findings of the 2010 Capital Improvement Project Report that summarized necessary improvements to achieve an 82.5-mgd treatment. After the kick-off meeting, **Hazen will meet with plant staff to discuss current operational strategies and challenges, and confirm assessment criteria and assets to be examined prior to commencing the assessment.** Hazen will conduct the conditions assessment to determine the existing condition of critical assets and the need for rehabilitation, remaining life, and eventual replacement.

As part of this assessment we will verify hydraulic requirements by reviewing the results of the 2010 CIP hydraulic evaluation to confirm the process elevations for various flow scenarios and identify potential additional efforts required to establish updates of the process elevations previously identified. **The results of the hydraulic assessment are paramount to determining the upper flow limit used in Task 3** described below. Additionally, we will inspect the tubes installed in 2012, evaluate the requirements and current capabilities of the chemical feed systems and identify potential improvements. **We recognize these inspections will require draining the coagulation basins, and intend to perform these efforts prior to higher demand periods; however, this work could coincide with removing a basin from service to create the condition necessary for Task 3 higher flow testing.**

Insights

Hazen will work closely with the Authority to sequence inspection work with plant operations and other activities on the project in order to minimize impacts to treatment operations.

The condition of coatings, furnishings, plumbing, and HVAC will be evaluated by a mechanical engineer, and electrical equipment and instrumentation will be evaluated by an electrical engineer. We will evaluate the capability of the existing electrical equipment to determine components that need replacement in anticipation of a capacity expansion. To support the Authority with the modernization of their Supervisory Control and Data Acquisition (SCADA) system, we will determine any upgrades required to compete the work under this project as part of the conditions assessment. Based on the information provided, we assume adequate infrastructure exists. If areas appear particularly deficient, critical, or are of special interest to the Authority, Hazen will provide discipline specific inspections as needed.

It is assumed that the Authority currently has an equipment inventory database consistent with typical Asset Management Program standards, and this will not be required to be developed as part of this project. A survey for hazardous materials (e.g., lead, asbestos) and laboratory materials integrity testing is not anticipated to be needed and is not included in our scope.

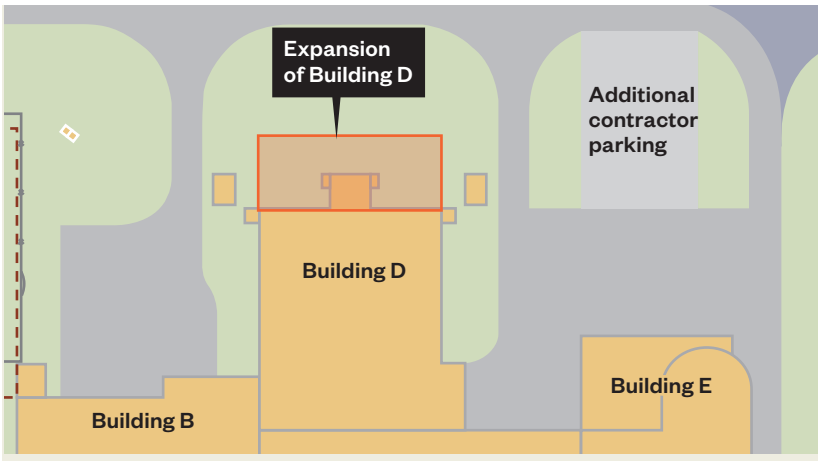
1010-365

Task 1.3 - Basis of Design

Based on a review of the existing information, the conditions assessment, and the results of the full-scale pilot testing of the coagulation basins (Task 3), we will confirm process design criteria and any deviations from regulatory requirements prior to proceeding to developing the BOD drawings. During the BOD phase we will develop the overall process flow diagram, identify sizing, volume, footprints and all major mechanical items and prepare initial equipment/motor list for major electrical equipment.

Once conceptual layouts have been developed and reviewed with the Authority, more detailed BOD documents will be prepared. We will prepare preliminary process, mechanical, structural, architectural, electrical, and Instrumentation and Control diagrams, and a list of specifications that will be included in the Final Design. This information will be presented in a Task 1 - Basis of Design Report (BODR) that will be submitted to the New York State Department of Health (NYSDOH) for review and approval.

The four existing filters are currently rated at 6 gpm/ft2 (16.5-mgd per filter); therefore 49.5-mgd can be treated with three filters in service and one filter in backwash mode. Since this loading rate is already above traditional values, two new filters will be required to treat 82.5-mgd with the appropriate redundancy for backwashing. The new filters could be located adjacent to the existing filters to facilitate operational integration. To avoid triggering a code review of the existing building, the new building could be designed as a standalone independent structure with opening doors or larger open areas between the new and existing spaces. **This would allow seamless integration of the new and existing spaces without impacting the existing structure.** The new filters would likely have the same media configuration as determined for the media replacement conducted as part of Task 2; however, the addition of new filters allows some flexibility to consider GAC media if warranted through further review with the Authority.



Left: Potential location for new filters to allow VDWTP expansion to 82.5 MGD.

Task 1.3 Drawing List

At minimum, the BOD drawings of the modifications to the existing facility (i.e., the new coagulation basin, filters, and connecting piping) will include:

- Overall Site Plan
- Hydraulic Profile
- Process Flow Diagram
- Flocculation Basin 4 Plan
- Flocculation Basin 4 Sections
- Sedimentation Basin 4 Plan
- Sedimentation Basin Sections
- Filter 5 and 6 Plan
- Filter 5 and 6 Sections
- Piping Profiles/Interconnections Details

Our team, led by Ms. Herzner, has worked closely with our clients to gain NYSDOH approval of over a dozen BODRs in the past 20 years. We understand the process and will aid the Authority in maximizing efficiency.

Insights

1010-355

Task 2- Improvements to Filters 1 through 4

Task 2.1 – Filtration System Assessment and Rehabilitation

In Task 2 we will proceed with a condition assessment of the filters in a manner similar to Task 1. As discussed in Task 1.3, we will observe the condition of the filter components and develop a plan for replacing the valves, actuators, underdrain system, piping as needed, and media. Although the current filters include filter-to-waste capabilities, we will evaluate the existing operations and modify to include full-flow filter-to-waste capabilities, including the appropriate controls, in order to provide the Authority with important tools to achieve water quality objectives.

Filter Gallery: Filter-to-waste piping must be evaluated to confirm capabilities.

The existing overall filter box depth is 14 feet and there are 30-inches of mixed media on 8.5-inches of support gravel, which sits on top of a Leopold clay block underdrain system. The gravel media support limits the filter media depth and the depth of the water column over the media. **Alternatives to gain back depth in the filter bed will be evaluated, including low profile underdrain systems.**

The filters do not currently have air-scour, and the BOD will include a plan for adding an underdrain system compatible with this function, and the necessary equipment (e.g., blowers, piping, unloading valve). The new underdrain can be designed to accommodate air scour alone and in combination with low rate backwash water (i.e., combined air scour/ backwash (CASBW)). **Simultaneous air scour plus backwash water at subfluidization rates has been shown to be more effective than separate air scour and backwashing with water alone because it increases abrasions and collisions among media grains throughout the bed.** Blower(s) can be located in the area between the existing and a new filter buildings. Our evaluation will include an assessment of the current backwash system to identify its capability to provide the desired backwash flow rates to achieve desired bed expansions, with the appropriate controls, with the objective of improving filtered water quality and filter run times thereby providing better quality water to your customers at a lower cost.

Filter controls will be upgrade to provide state-of-the-art, fully automated backwash sequencing.

Task 2.2 – Filtration System Basis of Design Report

Based on the filtration system condition assessment, we will evaluate alternatives to replace filter facilities and other related components. The evaluation will consider at minimum, 1) replacement of valves and actuators, 2) upgrades to the filter-to-waste capabilities, 3) underdrain alternatives, 4) media replacement, and 5) addition of air scour capability. We will coordinate the rehabilitation recommendations with the proposed location of the new filters facilities including all applicable elements of the existing site (piping, valves, backwash systems including the proposed addition of air scour facilities).

As a major filter upgrade can be disruptive to plant operations, Hazen will work with the Authority during the development of the BODR to determining the optimal sequencing of work in order to minimize impacts to operations and avoid any disruption of water quality or quantity.

1010-365

Once conceptual layouts have been developed and reviewed with the Authority, BOD documents will be prepared and will include a list of specifications that will be included in the Final Design. This information will be presented in a Task 2 - Basis of Design Report (BODR) that will be submitted to the NYSDOH for review and approval.

Task 3- Full-Scale Pilot of Coagulation Basin

Task 3 is critical to the Authority to identify optimal sequencing of all improvements, and maintain plant operations to meet production goals up to the time that a firm 82.5-mgd capacity is needed. The intent is to plan for the full-scale trial at the onset of the project, since regulatory approval is needed prior to commencing the piloting. It is reasonable to assume that some increase in capacity is possible, with appropriate changes in pretreatment chemical feed, up to the maximum limit imposed by hydraulic constraints, determined in Task 1, and the maximum loading rates of the filters.

The most likely scenario to achieve an evaluation of higher rates will be possible by removing one of the coagulation basins from service, which could coincide with inspection of the offline basin. This would then allow for an evaluation of one or two basins operating at surface overflow rates (SOR) higher than 2.0 gpm/sf, up to a maximum of 22-mgd flow for each basin, which equates to 3.0 gpm/sf. If successfully demonstrated, this would allow a total flow of 66-mgd with the three existing basins in service. The 3.0 gpm/sf loading rate was identified as a target in the 2010 Capital Improvement Project Report, largely based on prior work at the Sturgeon Point Treatment Plant, where the NYSDOH approved this value.

Therefore, our initial assessment is that a 1 to 2-mgd incremental flow increase, up to a maximum of 22-mgd per basin, is a possible goal. The increment will be selected that is most likely to distinguish performance from the previous flow. The upper flow limit will depend on system demand at the time of the full-scale pilot. **The full-scale pilot could be performed three times, alternating the coagulation basin removed from service, and each scenario could occur when a basin is removed from service to inspect tubes as described in Task 1.2.**

While possible, achieving three tests may not be probable. We will leverage the results of the hydraulic and demand assessments to further refine this approach. The duration of tests at each incrementally higher flow rate will be no less than 72 hours to fully assess treatment on all aspects of basin operation at the targeted flow. It is assumed that the highest flow will be mostly determined by stability of settled water turbidity, in conjunction with Partnership for Safe Water (PfSW) goals. Irrespective of settled water quality and overall basin operation, filter operations will also be monitored to ensure the quality of filtered water is not compromised, and they continuously achieve PfSW goals.

Task 2.2 Drawing List

At minimum the BOD drawings for the filtration system rehabilitation will include:

- Site Plan of Filter Improvement Area
- Process Flow Diagram
- Overall Filter 1-4 Plan
- Filter Pipe Gallery Sections
- Typical Filter Plan
- Typical Filter Sections/Elevations
- Piping Profiles/Interconnections
- Details

Our team, including Ms. Herzner, Mr. Valade and Mr. DeWolfe, worked with two clients to rerate their existing treatment plants. The Town of New Castle gained NYSDOH acceptance of a higher treatment capacity and we are currently working with the Municipal Authority of Westmoreland County to re-rate their treatment works.

Insights

It is important to note that the impact on flocculation conditions will also be evaluated, as flocculation is coupled to sedimentation. A key aspect will be reduced detention time, which can impact floc agglomeration and chemical reactions to achieve the desired floc formation, as well as total organic carbon (TOC) removal. Seasonal conditions can also affect overall process performance, so it will be important to consider variables associated with those conditions – especially temperature. Therefore, the overall duration of these studies will attempt to capture these conditions.

Further refinement to the full-scale test can be made by performing jar tests, which can be very helpful in determining any chemical adjustments that may be needed in conjunction with higher flows through the basins, and placing upper limits on the maximum flow to be evaluated.

Key performance parameters for the full-scale study will include, but not limited to:

- Settled water quality – turbidity, residual aluminum, TOC, and meeting required TOC removal requirements.
- Floc formation through the end of flocculation
- Floc shear induced by higher velocities
- Solids removal using the existing solids removal equipment

The scope of this task of the project will be to identify and complete a full-scale pilot study of the sedimentation process that will gain acceptance of re-rating the plant by NYSDOH. Elements of this task include::

4. Hydraulic assessment of the existing process, including a verification of the area covered by tubes, and the condition assessment of equipment (Task 1).
5. Review of historical data and interviews with operations staff to identify perceived and quantified process limitations
6. Jar testing to help guide treatment conditions at higher flows, including chemical dosing and flocculation energies.
7. Development of a report of results and assessments, to be reviewed by the Authority.
8. Development of an ECWA/NYSDOH Work Plan for the pilot study, including but not limited to, study approach, evaluation criteria, methodology, schedule and report format.
9. Completion of the full-scale pilot utilizing the existing sedimentation basins
10. Report summarizing the results of the pilot testing including recommendations for new basin ratings/unit capacity.
11. Preparation of an engineering report, including the information listed above. Submit report to the NYSDOH for review and approval.

Special Services

The Authority may request Hazen to complete one or more special services related to a range of projects. Hazen's multidisciplinary staff is capable of meeting the Authority's varied special services needs listed in the RFP.

Grant Opportunities

To facilitate the Authority's strategic initiative to improve their position to receive federal and state grant funding, **we can flag opportunities and assist in providing the necessary information (e.g., Engineer's Report, conceptual layouts) as required for the grant application.** Hazen has experience reviewing and identifying an array of State and federal grant funding programs for their applicability to drinking water projects. While these grants are often highly competitive, Hazen's strategic planning during the design phase - coupled with our rigorous grant writing approach - has secured millions of dollars in grant funding for our clients in New York State over the past two years alone.

Construction Sequencing

The maintenance of plant operations during implementation of recommended improvements is critical to the Authority and Hazen will provide a detailed plan for upgrading assets, adding filters and potentially a fourth coagulation basin. Based on the information reviewed, the Authority could proceed with design of new filters, construct and commission them, then rehab the existing filters. **This would allow the Authority to maintain their ability to achieve 49.5-mgd, since rehabbing filters first would temporarily derate the facility.** The new filters project would include adding air scour blowers, so that air scour equipment would be commissioned and ready for service prior to rehabbing the existing filters.

The results of Task 3 show that if higher flows are not achievable with the existing basins, the fourth coagulation basins would be designed, constructed and commissioned first, then sequential upgrades to the existing basins will commence. If higher flow rates are possible with the existing basins, upgrades to these basins could occur prior to construction of the fourth coagulation basin.

Cost Estimates

Hazen's dedicated cost estimating group focuses on industry trends and market conditions in order to provide the best possible estimates. Our team will provide a minimum of a Class 4 estimate for Tasks 1 and 2 based on the level of detail in the BOD documents. Contingency, escalation, and appropriate markups will be evaluated and used based on industry standards for best practice.

Expanded Scope Option

We also understand that the Authority is a member of the Partnership for Safe Water (PfSW), but has not yet completed Phase III for either water treatment facility. If desired, we will endeavor to work with the Authority to help complete the required assessments and identify performance limiting factors that can contribute to the completion of the Phase III report for the VDWTP. Our staff have worked with dozens of utilities across the nation that are PfSW members, and are keenly aware of the methodologies and benefits gained with this program.

Insights

Mr. Valade and Ms. Herzner have led advanced water treatment projects together for the past twenty years, and will leverage successful strategies from past projects to manage project controls, provide responsive service, and facilitate open and clear communication to keep the project on track.

Management Framework

The foundation of a successful project approach is a well-organized program led by a well-structured and experienced project management team. Effective project management depends on proven team members who can deliver projects within the Authority's scope, safety, quality, schedule, and budget objectives. Our well-organized team will promote efficient and effective communication between design team members and the Authority. Project Manager Ms. Herzner and Project Director Mr.Valade, will manage the project scope, schedule, and budget according to industry best practices.

Schedule/Budget

Hazen prides itself on meeting planning and design schedules. A proposed project schedule is included in **Item 9**. Based on the proposed approach to the Task 1 BOD of the coagulation basins, we feel the total project duration would be 13 months. This duration assumes an expedited New York State Department of Health review (3 months) of the Task 3 Work Plan, with Full-Scale Pilot of Coagulation Basin testing results available seven months after notice to proceed.

Since we recommend phasing the BODR document preparation associated with the coagulation basins to after Task 3, Task 1 would be complete 13 months after the project commences. All work under Task 2 would be completed and delivered to the Authority within 8 months, and all work under Task 3 shall be completed and delivered to the Authority within 9 months of notice to proceed.

Ms. Herzner will oversee and ensure that project tasks and deliverables contribute to the end goals and program objectives, with regular guidance from Mr. Valade. Through careful project cost tracking and projecting, our team will keep the Authority appraised of the budget and any risks to budget overages throughout the project.

Insights

Maintaining open lines of communication and discussing issues early in the process will yield creative, cooperative solutions to problems.

Project Meetings

To be effective, project meetings will include procedures for accountability and timely follow-up. We will distribute meeting materials in advance of meeting to facilitate participation and inclusion of all team members. Snapshots of technical work will be prepared for review at monthly meetings, along-side a detailed monthly report. Through open communication methods, potential project delays can be mitigated.

We plan to attend 13 monthly meetings with the Authority, which includes the kick-off meeting, to span the duration of Task work. Assuming the Authority would like two separate DOH submission to facilitate the phasing of work, we will also attend five meetings with regulatory agencies (two Task 1 meetings and two Task 2 meetings, and one Task 3 meeting).

1010-365

Item 3

Our staff have performed instrumental roles for projects of similar size, scope, and complexity and will ensure we are able to accomplish all aspects of the scope of work.

Project Staffing

Our proposed **Project Director, Matthew Valade, PE, BCEE,** has over 20 years of drinking water treatment process and plant design experience. Mr. Valade has led some of the largest and most complex clarification and filtration projects in the country, often in close partnership with our proposed **Project Manager, Julie Herzner, PE.** Together, Mr. Valade and Ms. Herzner have delivered a broad range of cutting edge clarification and filtration projects across the state. **Technical Advisors William Becker, PhD, PE, BCEE and Bret Casey, PE, BCEE** will provide added quality oversight. Dr. Becker is a nationally-recognized water quality and process expert who has been involved with more than 100 bench and piloting projects. Mr. Casey has extensive disinfection and filtration design, piloting and construction experience. Our **Task Leads Kristen Barrett, PE, LEED AP and James DeWolfe, PE, BCEE, CWO** will add specialized expertise in water treatment plant operations and clarification design. Our support services staff work together regularly and reflect our understanding of the Authority's project goals.

Hazen offers:

- A proven team of water treatment experts who have worked together to deliver over 2.4 bgd in water treatment projects in New York over the past 20 years.
- Nationally recognized leaders in water treatment process, clarification, filtration, and operations and construction, assuring a robust assessment of available options and innovative solutions to site constraints.
- Key staff with relevant experience in upstate New York, familiar with water quality concerns, regulatory requirements and funding opportunities.
- A team committed to partnering with the Authority, offering a responsive 'hands-on' approach to consensus building and facility assessment.

Key Personnel

Erie County Water Authority

TECHNICAL ADVISORS
Bret Casey, PE
William Becker, PhD, PE, BCEE

PROJECT DIRECTOR
Matthew Valade, PE, BCEE

PROJECT MANAGER
Julie Herzner, PE

TASK 1 LEAD
Kristen Barrett, PE, LEED AP

TASK 2 LEAD
Julie Herzner, PE

TASK 3 LEAD
James DeWolfe, PE, BCEE, CWO

SUPPORT SERVICES

Hydraulics
Christina LaPointe, PE, CDT

Civil
Daniel Sheeran, PE

Electrical
George Markou, PE

I&C
Daniel Ennis, PE

Structural
Lisa Giroux, PE, SECB

HVAC/Plumbing
Norman Bartley, PE

Architectural
Michael Stallone, RA, AIA

Cost Estimating
Rose Jesse, CPE

Scheduling
James Soroush

Permitting
Nicolette Leung, PE

Grant Funding
Ruby Wells

Constructability/MOPO
Michael Broder, PE

Operability
James DeWolfe, PE, BCEE, CWO

Future Demand Analysis
Jack Kiefer, PhD

Resumes for all staff are in Appendix A.

1010-355

Key Personnel Workload and Location

Matthew Valade, PE, BCEE
New York, NY

20% Availability

Project Director Matthew Valade is a recognized expert in water treatment plant design, having been involved in over 40 projects that included piloting, design and construction of new and expanded treatment plants ranging in size from 2-mgd to 2-bgd. Mr. Valade's proven leadership is exemplified by the groundbreaking Cat/Del UV Facility and Croton Water Filtration Plant projects for NYCDEP, where he managed the feasibility studies, conceptual design and led the start-up and operations of this award winning plant. Recently he served as Project Manager for the Aquarion Water Company, Stamford, CT, involving upgrade and expansion of the conventional WTP by integrating a 30-mgd DAF/filter process into the existing facilities.

Julie Herzner, PE
New York, NY

50% Availability

Project Manager and Filter Improvements Task Lead, Julie Herzner, has participated in the planning and design of water treatment and chemical addition facilities ranging in capacity from 4-mgd to 636-mgd, and also has extensive experience in bench and pilot-testing studies. Ms. Herzner brings over 20 years of experience in raw water quality analysis, treatment and piloting for various systems in the NYC watershed area. She served as Project Manager for the Village of Ossining's Indian Brook WTP, the Town of Bethlehem's Clapper Road WTP, and has been integral to a number of other projects such as the Croton WFP. She also participated in the planning and full scale testing for the rerating of the Millwood WTP for the Town of New Castle, NY. Ms. Herzner will manage day to day progress on this project and serve as the Authority's primary contact.

Bret Casey, PE, BCEE
Columbus, OH

10% Availability

Technical Advisor Bret Casey has served as Project Manager and Design Leader on the design, construction administration, and startup of numerous surface water treatment plants projects. His experience covers all aspects of municipal water systems from raw water supply to treatment and distribution. He has had a key role on major water treatment plant improvement and expansion projects across the country, and brings added experience leading the rehabilitation and replacement of filtration systems and associated appurtenances. Mr. Casey regularly advises on large-scale projects with complex sequencing and maintenance of operations requirements.

Bill Becker, PhD, PE, BCEE
Denver, CO

10% Availability

Technical Advisor Bill Becker leads Hazen's Corporate Water Treatment Practice, and is a nationally known leader in the development of drinking water process technology. He has been involved in more than 100 pilot plant projects throughout the US, and has authored more than 200 technical presentations and publications regarding physical chemical treatment technologies. Dr. Becker received the George Warren Fuller award from the NYS AWWA in recognition of his distinguished service to the water industry. Dr. Becker has worked on numerous projects in upstate New York (MCWA, OCWA) and is familiar with challenges of treating Great Lakes through his work with utilities throughout the basin.

Kristen Barret, PE, LEED AP
New York, NY

35% Availability

Additional Coagulation Basin and Filters Task Lead, Kristen Barret, is an experienced Project Manager who specializes in water treatment processes, treatment plant design, hydraulic modeling and pilot testing. She is Hazen's corporate CAD Discipline Group Leader and coordinates the firm's 3D, visualization and BIM capabilities. Her portfolio ranges from small water systems such as the New York American Water Dykeer and Wild Oaks up to large systems such as the NYCDEP Croton WFP, where she led the clarification system design for the 290-mgd treatment plant.

Jim DeWolfe, PE, BCEE, CWO
Denver, CO

60% Availability

Full-Scale Pilot of Coagulation Basin Task Lead and Operability Lead, Jim DeWolfe, is Hazen's Water Treatment Operations Leader and a certified plant operator with over 30 years of experience in filtration piloting, planning and design. He partners directly with plant staff to optimize treatment and operations, from automation to cost saving measures, providing hands-on support and field proven solutions. Mr. DeWolfe oversaw media installation in all filters at the 290-mgd Croton WFP for NYCDEP and managed the filter evaluation for the 32-mgd Bethlehem, PA direct filtration plant. Mr. DeWolfe will apply his experience working at the VDWTP to develop an effective plan for testing the hydraulic capacity of the coagulation basin as Task 3 lead.

1010-365

Item 4

References

Hazen has long maintained a diverse portfolio of drinking water clients across the State of New York, including the City of New York, the Town of Bethlehem, Westchester Joint Water Works, the Town of Carmel, New York American Water, the City of White Plains and the City of Buffalo. We are confident these clients would provide common feedback regarding our responsiveness and technical quality, and the Authority is advised to reach out to the additional references provided under **Item 1.**

Hazen is committed to building a long term partnership with the Authority, and we encourage you to contact our references regarding our responsiveness and dedication to quality project delivery and client service.

The following clients have direct experience working with our key staff on similar projects completed in the past five years:

Aquarion Water Company

Yesher Larsen, PE
Director – Water Quality
505 Huntington Street
Shelton, CT 06484
(203) 445-7318
YLarsen@aquarionwater.com

Projects:

- Stamford WTP
- William S. Warner WTP
- Putnam WTP
- Engineering Design Services (Task Order Contract)

Municipal Authority of Westmoreland County

John Ashton
Assistant Manager
124 Park and Pool Road
New Stanton, PA 15672
(724) 755-5920
jashton@mawc.org

Project: George Sweeney Water Treatment Plant Rerate Pilot Study

Town of Bethlehem

George S Kansas, PE
Commissioner of Public Works
445 Delaware Avenue
Delmar, New York 12054
(518) 439-4955
gkansas@townofbethlehem.org

Projects:

- Clapper Road Water Treatment Plant Modifications
- Clapper Road Water Treatment Plant Bench-Study
- Clapper Road Water Treatment Plant Clarification Pilot Study

PROOF OF LOCAL PROJECT DELIVERY

Hazen prides itself on excellent client service, and our staff are currently working on projects for the City of Buffalo- the Authority is encouraged to reach out to the City regarding our staff's responsive service, technical expertise in water quality, and hands on approach to collecting field data and performing condition assessments.

Peter Merlo, PE
Principal Engineer
City of Buffalo
Rm 602 City Hall
Buffalo, NY 14202
(716) 851-9626
WR01@ch.ci.buffalo.ny.us

1010-355

Items 5 and 6

Work Performed for the Water Authority in 2017, 2018, and 2019 and Current Remaining Workload with the Water Authority

Our proposed team of seasoned experts have the capacity necessary to provide the Authority a focused and dedicated leadership team.

We have not directly performed project work for the Authority in the past three years, nor do we have any current work with the Authority. We view this as a strength that will benefit the Authority, bringing a fresh perspective and dedicated staff with the capacity and technical expertise to respond to the Authority's needs and find right-sized, innovative solutions for the Va de Water Treatment Plant Expansion.

Hazen has developed long-standing relationships with utilities throughout the state based on our reliable and efficient delivery of world-class solutions.

Our proposal has demonstrated our capability to marshal resources for this project, and Hazen has a proven track record of delivering similar projects for other drinking water utilities in New York, the region, and nationally. Selection on this contract would give the Authority access to our technical expertise and not encumber the fulfillment of any other scope. We are excited by the opportunity to partner with you on this critical project.

Item 7

Section 139 of State Finance Law

The completed attachments required for compliance with Section 139 of State Finance Law are provided on the following pages, and includes Forms A-C and Section 139-L.

Item 8

Proof of Insurance in accordance with the Erie County Water Authority Insurance Requirements for Professional Services

Hazen's proof of insurance in accordance with the Authority's requirements follows the Section 139 of State Finance Law forms.

1010-365

FORM A

Offerer's Affirmation of Understanding of, and Agreement to Comply with, the Permissible Contact Requirements During the Restricted Period

Instructions:

The Erie County Water Authority (the "Authority") is a government entity, as that term is defined in State Finance Law §§ 139-j(1)(a) and 139-k(1)(a). The Authority must obtain a written affirmation of understanding and agreement to comply with procedures regarding permissible contacts with the Authority in the restricted period for a procurement contract in accordance with State Finance Law §139–j and §139–k. It is required that this affirmation be obtained as early as possible in the procurement process, but no later than when the Offerer submits its proposal.

Offerer affirms that it understands and agrees to comply with the procedures of the Authority relative to permissible contacts as required by State Finance Law §139–j(3) and §139–j(6)(b).

By: _____ Date: January 16, 2020

Name: Matthew T. Valade, PE, BCEE

Title: Vice President

Contractor Name: Hazen and Sawyer

Contractor Address: 498 Seventh Avenue, 11th Floor, New York, NY 10018

FORM B

Offerer's Certification of Compliance With State Finance Law §139–k(5)

Instructions:

The Erie County Water Authority (the "Authority") is a government entity, as that term is defined in State Finance Law §§ 139-j(1)(a) and 139-k(1)(a). The Authority must obtain a Certification that the information submitted for a procurement contract is complete, true, and accurate regarding any prior findings of non-responsibility, such as non-responsibility pursuant to State Finance Law §139–j. The Offerer must agree to sign the Certification, under penalty of perjury, and to provide the Certification to the Authority. The Certification should be obtained as early as possible in the process, but no later than when an Offerer submits its proposal.

Offerer Certification:

I certify that all information provided to the Authority relating to the awarding of a procurement contract is complete, true, and accurate.

By: _____ Date: January 16, 2020

Name: Matthew T. Valade, PE, BCEE

Title: Vice President

Contractor Name: Hazen and Sawyer

Contractor Address: 498 Seventh Avenue, 11th Floor, New York, NY 10018

FORM C (Continued)

Offerer's Disclosure of Prior Non-Responsibility Determinations

Name of Individual or Entity Seeking to Enter into the Procurement Contract:

Hazen and Sawyer

Address: 498 Seventh Avenue, 11th Floor, New York, NY 10018

Name and Title of Person Submitting this Form: Matthew T. Valade, PE, BCEE

Contract Procurement Number: 202000011

Date: January 16, 2020

1. Has any Governmental Entity made a finding of non-responsibility regarding the individual or entity seeking to enter into the Procurement Contract in the previous four years? (Please circle): (No) Yes

   If yes, please answer the next questions:

2. Was the basis for the finding of non-responsibility due to a violation of State Finance Law §139–j (Please circle): No Yes

3. Was the basis for the finding of non-responsibility due to the intentional provision of false or incomplete information to a Governmental Entity? (Please circle) No Yes

4. If you answered yes to any of the above questions, please provide details regarding the finding of non-responsibility below.

Governmental Entity: _____

Date of Finding of Non-Responsibility: _____

Basis of Finding of Non-Responsibility: _____

(Add additional pages as necessary)

FORM C (Continued)

5. Has any Governmental Entity or other governmental agency terminated or withheld a Procurement Contract with the above-named individual or entity due to the intentional provision of false or incomplete information? (Please circle): (No) Yes

6. If yes, please provide details below.
   Governmental Entity: _____

   Date of Termination or Withholding of Contract: _____

   Basis of Termination or Withholding:

   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____

   (Add additional pages as necessary)

Offerer certifies that all information provided to the Erie County Water Authority with respect to State Finance Law §139–k is complete, true, and accurate.

By: _____ Date: January 16,2020
Signature

Name: Matthew T. Valade, PE, BCEE

Title: Vice President

SECTION 139-L OF THE STATE FINANCE LAW
STATEMENT RELATING TO SEXUAL HARASSMENT POLICY

1. "Bidder" has the same meaning as the term, "Offerer," as that terms is defined in State Finance Law § 139-k(1)(h), and includes anyone who submits a bid or proposal.

2. Every proposal or bid hereafter made and submitted to the Erie County Water Authority, where competitive bidding or a sealed proposal is required by statute, rule or regulation, for work or services performed or to be performed or goods sold or to be sold, shall contain the following statement subscribed by the Bidder and affirmed by such Bidder as true under penalty of perjury:

SEXUAL HARASSMENT BIDDING CERTIFICATION

(a) "By submission of this bid/proposal, EACH BIDDER AND EACH PERSON SIGNING ON BEHALF OF ANY BIDDER CERTIFIES, AND IN THE CASE OF A JOINT BID EACH PARTY THERETO CERTIFIES AS TO ITS OWN ORGANIZATION, under penalty of perjury, that the Bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees. Such policy shall, at a minimum, meet the requirements of Section two hundred one-g of the Labor Law."

3. A bid/proposal shall not be considered for award nor shall any award be made to a Bidder who has not complied with subdivision one of this section; provided, however, that if in any case the Bidder cannot make the foregoing certification, the Bidder shall so state and shall furnish with the bid/proposal a signed statement which sets forth in detail the reasons therefore.

The undersigned CERTIFIES, under penalty of perjury, that he is authorized to make this bid/proposal and execute this statement on sexual harassment; that he is familiar with the statements contained in ¶2(a) of this document, as well as the provisions of State Finance Law §139-L and Labor Law §201-g, and such statements are true and have been complied with by the Bidder.

Hazen and Sawyer, D.P.C.

(Name of Individual, Partnership or Corporation)

By _____

(Person authorized to sign)

END OF STATE FINANCE LAW REQUIREMENTS

HAZE&SA-01 KGODWIN

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 1/7/2020

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

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

PRODUCER Ames & Gough 8300 Greensboro Drive Suite 980 McLean, VA 22102	CONTACT NAME: PHONE (A/C, No, Ext): (703) 827-2277 FAX (A/C, No): (703) 827-2279 E-MAIL ADDRESS: admin@amesgough.com
INSURED Hazen and Sawyer 498 Seventh Avenue New York, NY 10018	INSURER A : Hartford Fire Insurance Company A+ (XV) 19682 INSURER B : Hartford Casualty Insurance Company A+ (XV) 29424 INSURER C : Travelers Indemnity Company of Connecticut A++ (Superior) 25682 INSURER D : Twin City Fire Insurance Company A+ (XV) 29459 INSURER E : Continental Casualty Company (CNA) A+, XV 20443 INSURER F :

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

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

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X Contractual Liab. GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT X LOC OTHER:	X	X	42UUNBH8062	3/29/2019	3/29/2020	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 1,000,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
B	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY / SCHEDULED AUTOS HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY	X	X	42UENBH7997	3/29/2019	3/29/2020	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Comp./Coll. Ded	$ 1,000,000 $ $ $ $ 1,000
C	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION $ 10,000	X	X	ZUP31N1064A19NF	3/29/2019	3/29/2020	EACH OCCURRENCE AGGREGATE	$ 1,000,000 $ 1,000,000 $
D	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N: N If yes, describe under DESCRIPTION OF OPERATIONS below	N / A	X	42WBAD0SYE	3/29/2019	3/29/2020	X PER STATUTE / OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
E	Professional Liab			AEH008231489	3/29/2019	3/29/2020	Per Claim/Agg	1,000,000

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

RE: ECWA PROJ #202000011

Erie County Water Authority is included as additional insured with respect to General Liability per form CG 20 26 04 13, Automobile Liability per form HA 99 13 01 87, and Umbrella Liability per form EU 00 01 07 16, when required by written contract. General Liability and Automobile Liability are primary and non-contributory over any existing insurance and limited to liability arising out of the operations of the named insured and when required by written contract. General Liability, Automobile Liability, Umbrella Liability and Workers Compensation policies include a A Waiver of subrogation in favor of the additional insureds where permissible by state law and when required by written contract. Umbrella Liability coverage sits excess over General Liability, Automobile
SEE ATTACHED ACORD 101

CERTIFICATE HOLDER

Erie County Water Authority
Attn: Ms. Molly Jo Musarra, ECWA Risk Manager
295 Main St, Room 350
Buffalo, NY 14203

CANCELLATION

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

AUTHORIZED REPRESENTATIVE

AGENCY CUSTOMER ID: HAZE&SA-01 KGODWIN

LOC #: 0

ADDITIONAL REMARKS SCHEDULE

AGENCY		NAMED INSURED
Ames & Gough		Hazen and Sawyer 498 Seventh Avenue New York, NY 10018
POLICY NUMBER		
SEE PAGE 1		
CARRIER	NAIC CODE	EFFECTIVE DATE: SEE PAGE 1
SEE PAGE 1	SEE P 1	

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: ACORD 25 FORM TITLE: Certificate of Liability Insurance

Description of Operations/Locations/Vehicles:
Liability and Employers Liability coverage. 30-day Notice of Cancellation will be issued for the General Liability, Automobile Liability, Umbrella Liability, Workers Compensation and Professional Liability policies in accordance with policy terms and conditions.

NEW YORK STATE | Workers' Compensation Board

CERTIFICATE OF NYS WORKERS' COMPENSATION INSURANCE COVERAGE

1a. Legal Name & Address of Insured (use street address only) HAZEN AND SAWYER, D.P.C. 498 SEVENTH AVENUE NEW YORK, NY 10018 Work Location of Insured *(Only required if coverage is specifically limited to certain locations in New York State, i.e., a Wrap-Up Policy)*	1b. Business Telephone Number of Insured 212-539-7090 1c. NYS Unemployment Insurance Employer Registration Number of Insured 1d. Federal Employer Identification Number of Insured or Social Security Number 132904652
2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder) ERIE COUNTY WATER AUTHORITY (ECWA) ATTN: RISK MANAGER: MS. MOLLY JO MUSARRA 295 MAIN STREET - ROOM 350 BUFFALO, NY 14203-2494	3a. Name of Insurance Carrier PROPERTY & CASUALTY INSURANCE COMPANY OF HARTFORD 3b. Policy Number of Entity Listed in Box "1a" 42WBAD0SYE 3c. Policy effective period 3/29/2019 to 3/29/2020 3d. The Proprietor, Partners or Executive Officers are ☒ included. (Only check box if all partners/officers included) ☐ all excluded or certain partners/officers excluded.

This certifies that the insurance carrier indicated above in box "3" insures the business referenced above in box "1a" for workers' compensation under the New York State Workers' Compensation Law. **(To use this form, New York (NY) must be listed under Item 3A on the INFORMATION PAGE of the workers' compensation insurance policy).** The Insurance Carrier or its licensed agent will send this Certificate of Insurance to the entity listed above as the certificate holder in box "2".

The insurance carrier must notify the above certificate holder and the Workers' Compensation Board within 10 days IF a policy is canceled due to nonpayment of premiums or within 30 days IF there are reasons other than nonpayment of premiums that cancel the policy or eliminate the insured from the coverage indicated on this Certificate. (These notices may be sent by regular mail.) **Otherwise, this Certificate is valid for one year after this form is approved by the insurance carrier or its licensed agent, or until the policy expiration date listed in box "3c", whichever is earlier.**

This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policy listed, nor does it confer any rights or responsibilities beyond those contained in the referenced policy.

This certificate may be used as evidence of a Workers' Compensation contract of insurance only while the underlying policy is in effect.

Please Note: Upon cancellation of the workers' compensation policy indicated on this form, if the business continues to be named on a permit, license or contract issued by a certificate holder, the business must provide that certificate holder with a new Certificate of Workers' Compensation Coverage or other authorized proof that the business is complying with the mandatory coverage requirements of the New York State Workers' Compensation Law.

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has the coverage as depicted on this form.

Approved by: Dan Knise
(Print name of authorized representative or licensed agent of insurance carrier)

Approved by:  01/03/20
(Signature) (Date)

Title: President/CEO

Telephone Number of authorized representative or licensed agent of insurance carrier: 703-827-2277

Please Note: Only insurance carriers and their licensed agents are authorized to issue Form C-105.2. Insurance brokers are NOT authorized to issue it.

Workers' Compensation Law

Section 57. Restriction on issue of permits and the entering into contracts unless compensation is secured.

1. The head of a state or municipal department, board, commission or office authorized or required by law to issue any permit for or in connection with any work involving the employment of employees in a hazardous employment defined by this chapter, and notwithstanding any general or special statute requiring or authorizing the issue of such permits, shall not issue such permit unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that compensation for all employees has been secured as provided by this chapter. Nothing herein, however, shall be construed as creating any liability on the part of such state or municipal department, board, commission or office to pay any compensation to any such employee if so employed.

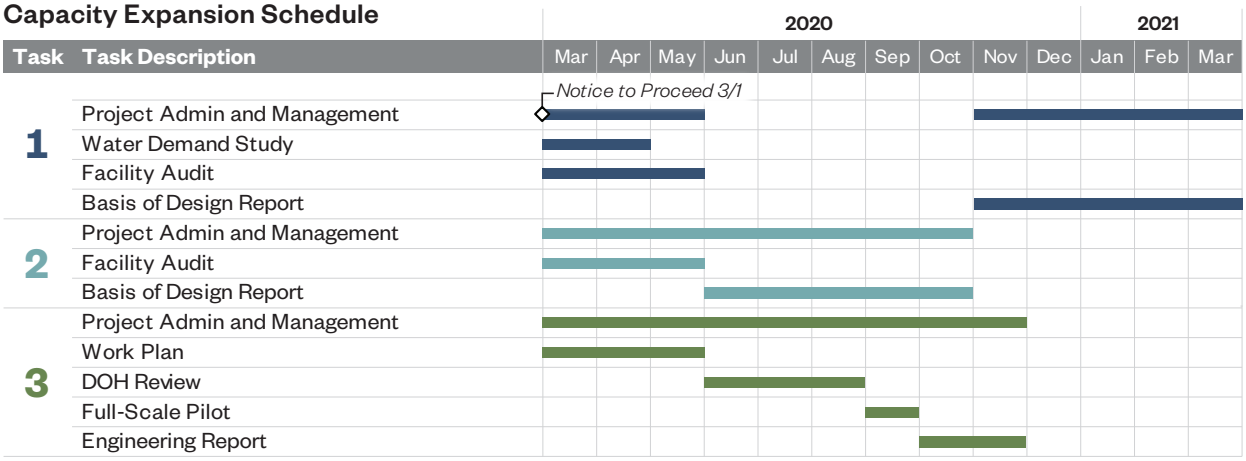
2. The head of a state or municipal department, board, commission or office authorized or required by law to enter into any contract for or in connection with any work involving the employment of employees in a hazardous employment defined by this chapter, notwithstanding any general or special statute requiring or authorizing any such contract, shall not enter into any such contract unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that compensation for all employees has been secured as provided by this chapter.

Item 9

Schedule

The proposed project schedule is shown below. Based on the proposed approach to the Task 1 BOD of the coagulation basins, and the assumption of an expedited NYSDOH review of the Task 3 Workplan, the total project duration would be 13 months. Since we recommend phasing the tasks, Task 1 would be complete 13 months after the project commences. All work under Task 2 would be completed and delivered to the Authority within 8 months, and all work under Task 3 shall be completed and delivered to the Authority within 9 months of notice to proceed

ECWA Van De Water Treatment Plant Capacity Expansion Schedule



Item 10

Fee Proposal

The following summary table of the fee proposal is provided as outlined in the RFP. A breakdown of the of the engineering fees for each task is provided on the following page in our detailed cost estimate. As requested in the RFP, a line item of a lump sum of $50,000 is included for Special Services.

Project 202000011
RFP for Van de Water Treatment Plant
Capacity Expansion

Task 1 – Additional Coagulation Basin and Filters	$ 217,310.00
Task 2 – Improvements to Filters 1-4	$ 156,669.00
Task 3 – Full-Scale Pilot of Coagulation Basin	$ 124,5740.00
SUBTOTAL	$ 498,553.00
Special Services	$50,000.00
TOTAL	**$ 548,553.00**

1010-355

VAN DE WATER TREATMENT PLANT CAPACITY EXPANSION

ECWA Project No. 202000011

		HAZEN																						
Description	**PRINCIPAL IN CHARGE**	**PROJECT MANAGER/ TASK 2 LEAD**	**TECHNICAL ADVISOR**	**TECHNICAL ADVISOR**	**TASK 1 LEAD**	**TASK 3 LEAD**	**HYDRAULICS**	**CIVIL**	**MOPO**	**ELECTRICAL**	**STRUCTURAL**	**HVAC/ PLUMBING**	**I&C**	**ARCHITECTURAL**	**COST ESTIMATING**	**SCHEDULING**	**GRANT FUNDING**	**PERMITTING**	**MID-LEVEL ENGINEER**	**ASSISTANT ENGINEER**	**TOTAL HOURS**	**TOTAL LABOR DOLLARS**	**OTHER DIRECT COSTS (ODC) EXPENSES**	**TOTAL DOLLARS**
Resource	M. Valade	J. Herzner	B. Casey	W. Becker	K. Barrett	J. DeWolfe	C. LaPointe	D. Sheeran	M. Broder	G. Markou	L. Giroux	N. Bartley	D. Ennis	M. Stallone	R. Jesse	J. Soroush	R. Wells	N. Leung						
Loaded Labor Rate	$271.43	$237.25	$239.14	$305.26	$243.52	$263.70	$151.41	$170.17	$307.98	$270.84	$209.63	$285.98	$186.30	$271.86	$261.82	$181.23	$170.26	$161.92	$132.87	$108.15				
Task 1 - Additional Coagulation Basin and Filters																								
1.1 Project Administration and Management	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	0	96	$16,096		$16,096
1.2 Water Demand Analysis	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	240	250	$28,329		$28,329
1.3 Review Existing Conditions and Data (Items 1-4)	4	6	0	0	8	4	24	0	0	4	0	0	0	0	0	0	0	0	30	0	80	$14,215		$14,215
1.4 Prepare BODR and Spec List (Items 5-9, 11 and 15)	8	16	0	0	40	0	0	4	0	4	4	4	4	4	0	0	16	24	60	70	258	$43,440		$43,440
1.5 QAQC	0	0	4	4	0	0	0	2	0	4	2	2	2	2	0	0	0	0	0	0	22	$5,509		$5,509
1.6 Develop Drawings	0	0	0	0	24	0	0	3	0	5	0	0	3	0	0	0	0	0	152	152	339	$44,903		$44,903
1.7 Identify Construction Sequencing	0	0	0	0	4	12	0	0	8	0	0	0	0	0	0	0	0	0	0	0	24	$6,602		$6,602
1.8 Prepare Cost Estimate	0	0	0	0	4	0	0	0	0	0	0	0	0	0	20	0	0	0	0	40	64	$10,536		$10,536
1.9 Prepare Project Schedule	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	44	$8,223		$8,223
1.10 Review Meetings (Prep and Attendance)	13	46	0	0	46	12	0	0	0	0	0	0	0	0	0	0	0	0	48	0	165	$35,186		$35,186
Sub-Total (Task 1)	**25**	**110**	**4**	**4**	**130**	**28**	**24**	**9**	**8**	**17**	**6**	**6**	**9**	**6**	**20**	**40**	**16**	**24**	**354**	**502**	**1342**	**$213,040**	**$4,270**	**$217,310**
Task 2 - Improvements to Filters 1 through 4																								
2.1 Project Administration and Management	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	0	96	$16,096		$16,096
2.2 Review Existing Conditions and Data (Items 1-5)	4	14	0	0	4	4	8	0	0	4	0	0	0	0	0	0	0	0	30	0	68	$12,717		$12,717
2.3 Prepare BODR and Spec List (Items 6, 7, 9 and 13)	8	60	0	0	0	0	0	4	0	4	4	4	4	4	0	0	0	0	80	50	222	$38,023		$38,023
2.4 QAQC	0	0	4	4	0	0	0	2	0	4	2	2	2	2	0	0	0	0	0	0	22	$5,509		$5,509
2.5 Develop Drawings	0	17	0	0	0	0	0	3	0	5	0	0	3	0	0	0	0	0	119	119	266	$35,138		$35,138
2.6 Identify Construction Sequencing	0	4	0	0	0	12	0	0	8	0	0	0	0	0	0	0	0	0	0	0	24	$6,577		$6,577
2.7 Prepare Cost Estimate	0	4	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	40	64	$10,511		$10,511
2.8 Prepare Project Schedule	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	44	$8,198		$8,198
2.9 Review Meetings (Prep and Attendance)	13	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	107	$20,820		$20,820
Sub-Total (Task 2)	**25**	**181**	**4**	**4**	**4**	**16**	**8**	**9**	**8**	**17**	**6**	**6**	**9**	**6**	**20**	**40**	**0**	**0**	**341**	**209**	**913**	**$153,589**	**$3,080**	**$156,669**
Task 3 - Full-Scale Pilot of Coagulation Basin																								
3.1 Project Administration and Management	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	0	108	$18,108		$18,108
3.2 Develop Pilot Study Work Plan	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	60	60	136	$18,680		$18,680
3.3 Full-Scale Pilot	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	80	0	120	$21,178		$21,178
3.4 Engineering Report of Pilot Test Results - Draft	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	60	60	136	$18,680		$18,680
3.5 Engineering Report of Pilot Test Results - Final	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	20	20	48	$6,930		$6,930
3.6 QAQC	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	$2,178		$2,178
3.7 Review Meetings (Prep and Attendance)	13	36	0	0	0	72	0	0	0	0	0	0	0	0	0	0	0	0	40	0	161	$36,371		$36,371
Sub-Total (Task 3)	**13**	**72**	**4**	**4**	**0**	**152**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**332**	**140**	**717**	**$122,124**	**$2,450**	**$124,574**
TOTAL PROJECT	**63**	**363**	**12**	**12**	**134**	**196**	**32**	**18**	**16**	**34**	**12**	**12**	**18**	**12**	**40**	**80**	**16**	**24**	**1027**	**851**	**2972**	**$488,753**	**$9,800**	**$498,553**
Special Services																								**$50,000**
Project Total with ODCs and Special Services																								**$548,553**

Appendix A: Resumes

Matthew Valade, PE, BCEE

Vice President

Mr. Valade has 25 years of experience in the evaluation, design, construction, and operation of drinking water treatment systems and facilities. He has applied this knowledge on projects involving system evaluations, pilot studies, design, and construction.

Education

MS, University of Massachusetts, Environmental Engineering, 1995

BS, University of Massachusetts, Civil Engineering, 1993, Mechanical Engineering, 1993

Certifications/Licenses

Professional Engineer: CT, NY, ME, MA, NH, NJ, RI, VT, NS

Board Certified Environmental Engineer (BCEE)

Areas of Expertise

- Water treatment facility design and construction
- UV disinfection system evaluation and facility design
- Drinking water regulations
- Dissolved air flotation process design

Experience

- 25 total years
- 25 years with Hazen

Professional Activities

International Water Association

International Ultraviolet Association

University of Massachusetts

- Instructor - Water Treatment Institute

Water Environment Federation

American Water Works Association

Oak Glen Water Treatment Plant (WTP), New Jersey American Water (NJAW), Howell, NJ

Project Director for the design and construction of the expansion to 17.5 mgd. Prior work included the evaluation of the process performance of this 10-mgd DAF plant that was commissioned in 2003 as well as the identification of the design inadequacies. Coordinated design of corrective measures for optimizing plant operational performance. Conducted an optimization study for the plant analyzing raw water quality and recommending improvements for dissolved air flotation (DAF) system performance. Also performed inclined plate settling pilot testing for the facility as an option for managing high turbidity events.

Indian Brook WTP Design, Village of Ossining, NY

Technical Advisor for the planning and design of a 7.0-mgd conventional DAF WTP for the Village of Ossining. A recent Water Demand Study conducted by Hazen found that projected peak monthly and average daily demands are expected to exceed the current 4.0 mgd capacity of the plant. The design will allow for future expansion to 8.0 mgd. The planning phase of the project included a process evaluation to select the appropriate process train.

Clapper Road WTP Study, Town of Bethlehem, NY

Technical Advisor to a study to evaluate feasible options for removing high concentrations of dissolved iron and manganese from the raw water supply while minimizing DBP formation to allow for compliance with the Stage 2 DBP Rule. In addition to evaluating feasible alternatives, investigated short-term solutions for DBP compliance. Evaluated alternatives, including a review of historical water quality data, a review of additional sampling results conducted as part of the study, and bench testing to screen oxidants for iron and manganese removal as well as jar testing to investigate optimizing treatment to reduce dissolved organic carbon. Two processes train improvements were selected as a result of this study and carried into conceptual design.

Hazen

Technical Publications and Presentations

"Controlling DBP/s to Meet Stage 2: Guidelines for Optimization", NYSAWWA 2011.

"Ozone and BAC for DBP and Biologically Stability Control on High Quality Waters," NYAWWA, 1995 (co-author).

"The growing resurgence of dissolved air flotation: advances and applicability for drinking water treatment", Water21 February 2012.

"Madbury Water Treatment Plant: Sustainable by Design" 2012 AWWA Sustainable Water Management Conference.

"UV Reactor Validation and Application to Project" UV Disinfection for the Real World: Back to the Basics Workshop, AWWA 2011.

"New York City Water Supply System", US Military Academy 2011.

"Gigantic, yet Green: New York City's Quest for Sustainable Drinking Water Treatment", IWA 2010.

"Modeling the Largest UV Facility Using ANSYS CFD," ANSYS Regional Conference 2010, Boston, MA.

Approach for Achieving Sustainable Operation of the 2-bgd Catskill/Delaware UV disinfection Facility, IUVA News, December 2009.

"Treatment Selection Guidelines for Particle and NOM Removal," Journal of Water Supply: Research and Technology – AQUA 2009.

"Validating, Controlling and Operating New York City's Catskill/Delaware UV Water Disinfection Facility", IUVA News, July 2008.

"A Review of the Technological Developments of Dissolved Air Flotation" Journal of Water Supply: Research and Technology – AQUA November 2006.

Stamford WTP, Aquarion Water Company, CT
Conducted the on-site investigation and review of the initial study for the rehabilitation and upgrade of the 24-mgd WTP. Also conducted conceptual designs of several alternatives for the upgrade, including replacement of existing filters and integration of DAF into existing filter tanks. Recently served as Project Manager for the design and construction phases, involving upgrade and expansion of the conventional WTP by integrating a 30-mgd DAF/filter process into the existing facilities, and construction of a 7,500 ft 4" sanitary force main.

Swimming River WTP Filter Underdrain Inspection and Emergency Repair Services, NJAW, Colts Neck, NJ
Project Director for the emergency services at the Swimming River WTP. Plant staff discovered a substantial build-up of media within a filter underdrain during a routine inspection and retained the services of Hazen for the detailed inspection of the filter and design for a short term repair. Performed filter inspections on all six of the plants Aldrich-style purification units and assisted in the design of the appropriate repairs. The project was completed within a short time frame during the summer peak production period and quickly restored full capacity to the treatment plant.

Inspection of Purification Units at Jumping Brook WTP, NJAW, Neptune, NJ
Technical Director. Responsible for the inspection and repairs of the purification units at the Jumping Brook WTP following a surface wash manifold failure in PU #1.

Alternatives Analysis for the Putnam WTP, Aquarion Water Company, Putnam, CT
Technical Advisor for an alternatives analysis to retrofit DAF into the sedimentation basins at Aquarion's 22-mgd Putnam WTP. The upgrade was to replace aging infrastructure and provide improved clarification; it also includes an analysis of water quality, coagulation practices, and loading rates for the proposed process. Preliminary footprints were developed along with construction sequencing measures, permitting implications, and capital cost estimate.

Corrosion Control Evaluation/Clearwell CFD Analysis: Finished Water Hydraulics and Chemical Feed Assessment, City of Buffalo, NY
Project Director for source to tap evaluation of the treatment process to evaluate overall corrosion control program. Included a desktop analysis of key water quality data, an evaluation of the City's WTP, lead service line scale analysis, and novel field investigations at households with LSLs. City then extended services to perform additional services recommended by initial study to optimize flow through clearwells and chemical feeds to help assure maximum efficiency and consistency of corrosion control throughout distribution system.

Julie Herzner, PE

Senior Associate

Ms. Herzner has 25 years of experience in water system engineering. She has participated in the planning and design of water treatment and chemical addition facilities ranging in capacity from 4 mgd to 636 mgd, and also has extensive experience in bench and pilot-testing studies.

Education

MS, Environmental Engineering, University of Massachusetts at Amherst, 1994

BS, Environmental Engineering, Rensselaer Polytechnic Institute, 1993

Certification/License

Professional Engineer: NY

Areas of Expertise

- Water treatment pilot plant testing
- Water treatment plant design
- Water storage facility and pump station design
- CFD modeling

Experience

- 25 total years
- 23 years with Hazen

Professional Activities

American Water Works Association

International Ozone Association

New York Sate American Water Works Association

- Education Committee
- Scholarship Committee

Water Expansion Study, Village of Ossining, NY
Managed a water expansion study for the Village to investigate and evaluate both short- and long-term alternatives to expand the Village's water supply system. The study components included a future water demand evaluation, a tiered fee structure evaluation, a water system hydraulic model, and a Condition Assessment of the Village's Indian Brook Water Treatment Plant (WTP). As a result of this study, the Village decided to construct a new water treatment facility, and requested Hazen to provide engineering services for the design and construction of this facility.

Indian Brook WTP, Village of Ossining, NY
Managing the planning and design of a 7.0-mgd conventional DAF WTP for the Village of Ossining. A recent Water Demand Study conducted by Hazen found that projected peak monthly and average daily demands are expected to exceed the current 4 mgd capacity of the plant. The design will allow for future expansion to 8 mgd. The planning phase of the project included a process evaluation to select the appropriate process train. The project is in the final design phase, and the proposed process train will include pre-oxidation, coagulation, flocculation, intermediate chlorination, clarification by DAF, gravity filtration (sand and anthracite), and UV disinfection.

Clapper Road WTP Study and Design, Town of Bethlehem, NY
Managed a process selection study to evaluate feasible options for removing high concentrations of dissolved iron and manganese from the raw water supply while minimizing DBP formation to allow for compliance with the Stage 2 DBP Rule. In addition to evaluating feasible alternatives, short-term solutions to DBP compliance were also being investigated. Two processes train improvements were selected in this study, and conceptual design was developed. The final process selected (aeration, oxidation, coagulation, flocculation and dissolved air flotation (DAF)) was piloted and the Town requested Hazen design the system.

Hazen

Managed the design upgrade and also serving as a technical resource for RFIs and shop drawing review while the facility is being constructed.

Putnam and Mianus Water Treatment Facilities Capital Improvement Planning, Aquarion Water Company, Fairfield, CT
Project Manager for a capital improvement planning project for Aquarion's Putnam and Mianus Water Treatment Facilities. Completed a Facility Status Review of existing facilities with respect to their physical and operating conditions, coupled with the identification of problems at each location. Also evaluated current and near-term future regulations and their impacts on the facilities.

Stamford WTP, Aquarion Water Company, CT
Task Leader on a pilot study during the planning phase of the Stamford WTP expansion. Piloting was conducted to validate design criteria and to evaluate dissolved manganese control options during the planning phase of the Stamford WTP upgrade and expansion of Aquion's conventional WTP by integrating a 30-mgd DAF/filter process into the existing facilities.

On-Call Services, Northern Westchester Joint Water Works (NWJWW) Amawalk WTP, Cortlandt Manor, NY
Managed an on-call services contract for NWJWW. Assignments were focused on design improvements of the Amawalk WTP, a 7.0-mgd conventional treatment plant, and included filter rehabilitation and a chemical system upgrade. The filter rehabilitation included replacing the troughs and the media. The chemical system upgrade provided NWJWW with more operational flexibility and code compliant chemical systems. Additional work included electrical improvements to the Amawalk WTP.

WTP Pilot Study, Atlantic City Municipal Utilities Authority, NJ
Task Leader on a pilot study for the Authority's plant to evaluate various media configurations and determine the feasibility of increasing the current plant filter loading rate. Prepared Pilot Study Report and assisted in the evaluation of the existing filtration facilities, which led to the recommendation to rehabilitate the existing filters instead of building additional filters.

Croton Water Filtration Plant, New York City Department of Environmental Protection, Bronx, NY
Process/Mechanical Discipline Lead during planning (conceptual and preliminary design) phases. During the planning phases, responsible for the design and layouts for the process equipment. Task Leader for final design of the filtration system and associated processes (i.e., recycle system and backwash system), and assisted in DSDC for the filtration and chemical systems.

Bret M. Casey, PE

Associate Vice President

Mr. Casey serves as Hazen's Drinking Water Practice Leader for the Midwest region. He has 30 years of experience in municipal water and wastewater projects, covering all aspects of municipal water systems from raw water supply to treatment and distribution.

Education

BSCE, University of Iowa, 1989

Certification/License

Professional Engineer: OH, IA, IL, MO, IN, KY, TN, NY

Areas of Expertise

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

Experience

- 30 years total
- 8 years with Hazen

Professional Activities

American Water Works Association

American Academy of Environmental Engineers

Southern Indiana Operations and Training Center (SIOTC) Plant Rehabilitation, Indiana American Water, Jeffersonville, IN
Technical Advisor and provided QA/QC for the design of filter underdrain and media rehabilitation at their existing 30-mgd SIOTC Water Treatment Plant.

Richmond Road Station Water Treatment Plant (WTP) Improvements, Kentucky American Water, Lexington, KY
Project Manager for the design of improvements to the 25-mgd water treatment plant. Improvements include a new filter building to replace the existing filter building, a new chlorine contact basin and a new backwash pump station. This was constructed using a construction manager at risk.

Olentangy WTP, Del-Co Water Company, Delaware, OH
Deputy Project Manager for the design of WTP 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 and a 30-mgd high service pumping station 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. Currently serving as Project Manager to expand the plant to 28.8 mgd. The expansion includes a new solids contact clarifier, filter building expansion, addition of UV disinfection, and expansion of the chemical feed facilities.

Upground Water Project, City of Delphos, OH
Project Manager for the design and construction administration of a new 3.75-mgd water plant and 450-mg upground reservoir.

Hazen

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.

Ralph E. Scott WTP, Del-Co Water Company, Delaware, OH
Project Manager for increasing the capacity of the plant from 6.55 mgd surface water lime softening water plant to 14.1 mgd. Evaluating options for increasing the filtration capacity including both conventional filtration and membrane filtration.

Mansfield WTP Evaluation, City of Mansfield, OH
Technical Advisor on evaluation of Mansfield's 25-mgd WTP. Project included evaluation of existing coagulation, flocculation, sedimentation, filtration, and disinfection processes, as well as chemical feed systems. The project resulted in a prioritized list of improvements to address critical and non-critical deficiencies for integration into the City's overall asset management plan and Capital Improvement Plan (CIP).

Seymour WTP Process and Hydraulic Improvements, Indiana American Water, Seymour, IN
Technical Advisor and provided QA/QC for the treatment process, hydraulic gradeline, and filter process evaluation along with the subsequent hydraulic improvements for the 4-mgd WTP in Seymour, IN. The project included replacement of the filter media and underdrains and upsizing the filter effluent piping to increase the reliable capacity of the plant to 5.2 mgd.

Middle Fork WTP Improvements, Indiana American Water, Richmond, IN
Technical Advisor. Involved in early concept planning, treatments alternatives evaluations, and design review. Project included a new 6.7-mgd surface WTP which includes UV disinfection for LT2 compliance. This project is being constructed using progressive design-build.

William Becker, PhD, PE, BCEE

Vice President

Dr. Becker is Hazen's Corporate Drinking Water Practice Leader and a nationally respected water supply and treatment expert. He has consulted for some of the largest utilities in the country on a variety of water quality and treatment process issues.

Education

PhD, Environmental Engineering, The Johns Hopkins University, 1995

MS, Environmental Engineering, Clarkson University, 1981

BS, Civil and Environmental Engineering, Clarkson University, 1979

Adjunct Professor, University of Colorado Boulder

Certification/License

Professional Engineer: NY

Board Certified Environmental Engineer (BCEE)

Areas of Expertise

- Water process technology
- Physical/chemical processes
- Distribution system water quality
- Membrane filtration
- Water reuse technology
- Effect of watershed activities on raw water quality and treatment

Experience

- 39 total years
- 20 years with Hazen

Oak Glen Water Treatment Plant (WTP), New Jersey American Water (NJAW), Howell, NJ

Technical Expert for the evaluation of process performance of a 10-mgd dissolved air flotation (DAF) plant that was commissioned in 2003. Helped to identify design limitations and potential solutions for managing high turbidity events. Directed plate settling pilot testing as an option for managing high turbidity events. Reviewed conceptual design report.

Clapper Road WTP, Town of Bethlehem, NY

Project Director for study that evaluated DBP control options; performed conceptual design of selected alternatives. Study consisted of performing plant wide sampling to evaluate DBP formation, conducting bench-scale experiments to evaluate alternative oxidants for oxidation of Fe/Mn, and optimization of organic carbon removal. Conceptual design of aeration, flocculation, and DAF facilities was conducted.

Indian Brook WTP Design, Village of Ossining, NY

Technical Process Expert on design of a 7-mgd conventional DAF WTP for the Village of Ossining. The planning phase of the project included a process evaluation to select the appropriate process train. The project is in the final design phase and the process train will include pre-oxidation, coagulation, flocculation, intermediate chlorination, clarification by DAF, gravity filtration (sand and anthracite), and disinfection.

Stamford WTP, Aquarion Water Company, CT

Directed the initial facility review, process/pilot studies, and development of a conceptual design report for the upgrade and expansion of a 24-mgd conventional treatment plant to a 30-mgd DAF plant. Water quality issues included elevated levels of disinfection byproduct precursors and season iron and manganese levels.

Hazen

Professional Activities

International Water Association (IWA)

- Program Committee Member for the 7th International IWA Flotation Conference in Toulouse, France.
- Program Committee Member for the upcoming 8th Flotation Conference that will be held in Korea in 2021.

Water Research Foundation

- Member of several WaterRF Project Advisory Committees

American Society of Civil Engineers

American Water Works Association

International Ozone Association

American Chemical Society

Technical Publications / Presentations

Author of more than 200 technical presentations, papers, and WaterRF reports.

Becker, W., Herzner, J., Valade, M. "Treatment Selection Guidelines: Expanding Boundaries of DAF." WQTC, New Orleans, November 2014.

Becker, W., Valade, M., and Edzwald., J. "DAF Versus Settling: Treatment Selection Guidelines for Particle and NOM Removal." Poster preseted at the AWWA ACE, Chicago, IL, June 2010.

Becker, W., Herzner, J., and Odegard, A. "Conventional vs. High Rate DAF (AquaDAF™)". Presented at the 2003 WQTC, Philadelphia, PA, November 2003.

Odegard-Begay, A, Herzner, J., Becker, W., Kavana, S. "Assessment of Two Types of DAF Clarification: Conventional and High-Rate". Proceedings of the Water Quality Technology Conference, San Antonio, TX, November 2004.

Becker, W.C. and O'Melia, C.R.; "Optimizing Ozonation for Turbidity and Organics (TOC) Removal by Coagulation and Filtration," WaterRF Report 90703, 211 pp, Denver, CO, 1996.

Otisco Lake WTP Feasibility Study, Onondaga County Water Authority, NY

Directed a study to determine the feasibility of improvements to the Otisco Lake WTP located in the town of Marcellus in Upstate New York. The Otisco Lake WTP is a 20-mgd direct filtration plant. The goal of the feasibility study was to evaluate improvements to the WTP that will ensure that the facility reliably meets capacity goals as well as current and anticipated future drinking water regulations. A one year pilot study was conducted to compare the effect of installing dissolved air flotation or two additional filters on water quality and plant operations. The feasibility of switching to chlorine dioxide as a preoxidant was also evaluated. The second major goal of the study was to conduct a condition assessment and recommend upgrades to existing equipment and facilities. A basis of design report was prepared that recommended additional filters and chlorine dioxide for zebra mussel and DBP control along with several infrastructure upgrades.

Springwells WTP, City of Detroit, MI

Technical Expert. Responsible for a needs assessment/capital improvement plan for the 540-mgd conventional WTP. Project included filter rehabilitation and auxiliary facilities improvements including pretreatment. Provided expertise for a 1-year pilot plant evaluation designed to examine process alternatives and develop design input for the City's 540-mgd Springwells WTP, the 240-mgd Southwest WTP, and the 160-mgd Northeast WTP.

EM Johnson WTP Conceptual Design/Pilot Studies, City of Raleigh, NC

Technical Expert for the Master Plan and Preliminary Design Considerations project for the expansion of the EM Johnson WTP from 86 to 100+ mgd. Examined appropriate technologies for future implementation. Coagulation, settling technologies, oxidation (raw, intermediate ozone); DAF, bio-filtration, etc. were discussed.

Croton Water Filtration Plant, New York City Department of Environmental Protection, New York, NY

Supervised the development of design criteria and preparation of a conceptual design report for the City's 290-mgd Croton plant. The treatment plan consists of chemical addition followed by a very short 5 minute flocculation period, DAF above granular media filters, UV disinfection, and post-treatment chemical addition. It is the largest DAF plant in the U.S. and the largest underground treatment plant in the world. Also provided process evaluations and directed several water quality related studies, including a DBP study that assisted the City in regaining compliance with the Stage 1 D/DBP Rule and the Lead and Copper Rule.

Kristen Barrett, PE, LEED AP

Senior Associate

Ms. Barrett is Hazen's CAD Discipline Group Leader, coordinating the firm's 3D design. She specializes in the evaluation of water treatment processes and design of treatment plant, pumping systems, and distribution facilities.

Education

MS, University of New Hampshire, Civil Engineering, 1997

BS , Rensselaer Polytechnic Institute, Environmental Engineering, 1995

Certification/License

Professional Engineer: NY

LEED Accredited Professional (AP)

Areas of Expertise

- Water treatment process design
- Reclaimed water treatment process design
- Pump station design
- Water treatment pilot studies
- BIM execution

Experience

- 23 total years
- 20 years with Hazen

Professional Activities

American Water Works Association

Westchester Water Works Association

Oak Glen Water Treatment Plant (WTP), New Jersey American Water, Farmingdale, NJ
Technical Process Mechanical Lead for the design of the new DAF system as part of the 7.5-mgd plant expansion to 15 mgd. Design involved the integration of the existing DAF process, trains, and controls to operate as a single plant.

Alternatives Analysis for the Putnam WTP, Aquarion Water Company, Putnam, CT
Technical Lead for an alternatives analysis to retrofit DAF into the sedimentation basins at Aquarion's 22-mgd Putnam WTP. The upgrade was to replace aging infrastructure and provide improved clarification; it also includes an analysis of water quality, coagulation practices, and loading rates for the proposed process. Preliminary footprints were developed along with construction sequencing measures, permitting implications, and capital cost estimate. Subsequently, performed a similar analysis for a new filter building to replace the existing filters and examined the potential of "stacked" DAF/filtration.

Hillview Reservoir Facility Improvements, New York City Department of Environmental Protection (NYCDEP), Yonkers, NY
Design Manager for this multi-phased project to provide chemical facilities, flow control improvements and facility refurbishment at New York City's 2-bgd Hillview Reservoir. Leading the evaluation of existing systems and design of new chemical addition facilities to consolidate and improve chemical storage and provide flow-paced chemical feed systems. Design of the new chemical addition facilities includes bulk chemical storage, chemical feed systems, process equipment sizing, and operations space programming. Design of facility improvements also includes the rehabilitation of existing 100 year old facilities and improvements provide hydraulic redundancy.

Hazen

Multiple Projects, City of White Plains, NY
Technical Advisor for multiple water system projects including:

- *Orchard Street Pump Station DAF/Filtration Concept Design*: Technical Advisor for the 2.5 mgd DAF/F system package plant and chemical systems.
- *Chemical System Upgrade and Evaluation*: Technical Advisor for design of new bulk fluoride storage systems, review of existing sodium hypochlorite system and site improvements for chemical deliveries spill containment.

William S. Warner Treatment Plant DAF System Evaluation, Aquarion Water Company, Fairfield, CT
Technical Lead for the evaluation of the existing DAF recycle system including the evaluation of the addition of VFDs, new injection nozzles, and control system modifications.

Stamford WTP, Aquarion Water Company, CT
Worked on the upgrade of the WTP from a 24-mgd conventional treatment plant to a 30-mgd DAF plant. Involved specifically in the design of the process mechanical systems and development of the plant operating control strategies.

Rye Lake WTP, Westchester Joint Water Works, Harrison, NY
Project Manager for the 20-mgd submerged membrane microfiltration (MF) WTP design including: an evaluation of membrane systems and the final design bid documents. Involved in the details of the process design coordinated and managed all disciplines. The design included: flocculation, MF, inclined plate settlers, chemical systems and a 20 mgd vertical turbine pumping station.

Catskill/Delaware Filter Plant, NYCDEP, Westchester County, NY
Managed the preliminary design updates for an ozone direct filtration WTP and residuals facility. The preliminary design update, which occurred every two years, included coordinating the filter plant design with other water projects at the same site to assure that the filter plant could be constructed in the future, if necessary.

Croton Water Filtration Plant, NYCDEP, Bronx, NY
Member of the start-up and training team for the 290-mgd plant; conducting in-depth process training workshops for NYCDEP staff; working with contractor to develop plant start-up strategy; involved in planning approach for the New York State Department of Health approval. Design Manager for the alternate design of the digital valve network control loops and field investigations.

James DeWolfe, PE, BCEE, CWO

Senior Associate

Mr. DeWolfe, Hazen's Water Treatment Operations Leader, has guided drinking water utilities towards optimized operations for over 30 years. He understands the importance of sequencing improvements to optimally adapt facilities to new regulatory requirements and capacities, and the consequences of any changes on the skill requirements of operations staff.

Education

MS EnvE, Pennsylvania State University, 1990

BS EnvE, Pennsylvania State University, 1987

United States Navy Nuclear Propulsion Program Submarine Service 1976-1982

Certification/License

Professional Engineer: PA

Board Certified Environmental Engineer (BCEE)

Certified Waterworks Operator, Class A (PA)

Areas of Expertise

- Source water protection
- Water treatment operations and optimization
- Facility commissioning
- Utility management
- Chemical mixing
- Residuals management / benficial use
- Filtration - design, operation and evaluations

Experience

- 31 total years
- 8 years with Hazen

Professional Activities

American Water Works Association

- B100 Standard Committee, Filtering Materials
- Source Water Protection Technical Advisory Workgroup
- Water Utility Council

Treatment Plant Process Upgrades & Assessment of High-Rate Clarification Options, Erie County Water Authority (ECWA), Buffalo, NY

Operations Specialist. Responsible for upgrade of a large conventional treatment facility on the Great Lakes (90 mgd). Evaluated dissolved air flotation (DAF) and Actiflo for pretreatment as a possible retrofit of the existing sedimentation units. Provided costs and conceptual layouts of alternatives. Also evaluated and developed costs for new flocculation equipment, baffle arrangements, and solids removal equipment.

Sturgeon Point Water Treatment Plant Pretreatment Process Evaluation, ECWA, Buffalo, NY

Process Evaluation Lead. Responsible for the evaluation of the Sturgeon Point Water Treatment Plant's (WTPs) existing pretreatment process. The 90-mgd plant's pretreatment system consists of flash mix, flocculation, coagulation, and sedimentation processes. The project entailed evaluation of the operations and equipment involved in each process, followed by recommendation of modifications to improve the efficacy of water treatment and the maintenance/dependability of process equipment.

Corrosion Control Evaluation/Clearwell CFD Analysis: Finished Water Hydraulics and Chemical Feed Assessment, City of Buffalo, NY

Project Manager for source to tap evaluation of the treatment process to evaluate overall corrosion control program. Included a desktop analysis of key water quality data, an evaluation of the City's WTP, lead service line scale analysis, and novel field investigations at households with LSLs. City then extended services to perform additional services recommended by initial study to optimize flow through clearwells and chemical feeds to help assure maximum efficiency and consistency of corrosion control throughout distribution system.

Hazen

Water Works Operators Association of Pennsylvania

Select Publications

Filter Surveillance Techniques for Water Utilities DVD, ISBN: 9781583218655, American Water Works Association, 2013.

Preconference Workshop SUN05, Optimizing Filter Performance – Surveillance, Data Analysis and Maintenance, Annual Conference and Exposition of the American Water Works Association, Denver, CO, June 6-10, 2013.

DeWolfe, J.R. et al, Never a Dull Moment: Meeting Challenges Through Optimization at a West Texas Membrane Water Treatment Plant, American Membrane Technology Association 2012 Annual Membrane Technology Conference & Exposition, Glendale, AZ.

DeWolfe, J.R., Operations Optimization – Improving the Efficiency of Water Treatment, 2010 Annual Conference, Northeast Section Ohio Section AWWA, August 2010.

DeWolfe, J.R., Three Birds with One Project: Enhanced Solids Processing, Stormwater Management, and Groundwater Recharge, presented at the 2008 Water Quality Technology Conference and Exposition, American Water Works Association, Cincinnati OH, November 16-20, 2008.

DeWolfe, J.R., Holistic Healing: Enhancing the Capabilities of the Bethlehem Water Treatment Plant, presented at the 60th Annual Conference of the American Water Works Association, Pennsylvania Section, Valley Forge PA, May 15, 2008.

DeWolfe, J.R., Changing the Diet and Improving the Health of the Western Canyon Regional WTP, presented at the Joint Conference of the Texas Water Environment Association and the American Water Works Association, Texas Section (Texas Water 2008), San Antonio TX, March 25-28, 2008.

Oak Glen Regional WTP Expansion Project, New Jersey American Water (NJAW), Howell, NJ

Start-up and Commissioning Technical Expert guiding verification of design intent and optimization of process variables for DAF system and filters. Project scope included the construction of the $19.3 million expansion of the facility from 10 mgd to 15 mgd, to accommodate increases in demand through the installation of additional DAF process trains, filters, and finished water pumping capabilities.

EM Johnson WTP- Filter Surveillance Workshop and Filter Optimization Services, City of Raleigh, NC

Senior Operations Specialist for hands-on staff training. This training provided staff with the skills to self-perform filter surveillance, which will help them establish a process operational targets and procedures to help assure pretreatment and filter operations are continuously optimized. The workshop demonstrated filter surveillance techniques by Hazen personnel, followed by filter surveillance by EM Johnson personnel under Hazen staff supervision. Subsequent operational changes by staff have resulted in substantial cost savings and more stable operations.

Croton Water Filtration Plant Startup, New York City Department of Environmental Protection, Bronx, NY

Task Leader responsible for the individual unit and overall process performance during start-up and commissioning of the 290-mgd Croton Water Filtration Plant. The project has unique challenges that include coordination of multiple departments in the client's organization, representation of Design Joint Venture Team in operational changes that serve to verify the design intent of the project. Responsible for training to help assure NYCDEP staff have a thorough understanding of the unit processes and complex operating strategies associated with coagulation, abbreviated flocculation, stacked dissolved air flotation and filtration (DAFF), and UV disinfection. Developed Consequence Management Plan to help meet FEMA requirements using the National Incident Management System (NIMS). Provided oversight for media installation in all filters, helped coordinate flushing of the New Croton Aqueduct prior to startup, and guided modifications to the residuals discharge permitting locations.

Filter Inspection & Recommended Improvements - Jumping Brook & Swimming River WTPs, NJAW, Monmouth and Ocean Counties, NJ

Senior Technical Specialist performing filter underdrain and filter media inspections for both the Jumping Brook and Swimming River WTPs owned and operated by NJAW. Services were requested in response to filter performance issues at both WTPs. Established protocols for and performed inspections, coordinating efforts with both client and contractor. Identified causes of performance issues, in both WTPs, due to failure of underdrains. Recovery efforts also included specifications for corrective measures and operator training in filter surveillance practices.

Norman Bartley, PE

Senior Associate

Mr. Bartley has 30 years of mechanical engineering and design experience in the power and water treatment industries. He serves as Hazen's HVAC Department Manager, focusing on HVAC system design for large drinking water treatment and wastewater facilities.

Education

BS, Mechanical Engineering, University of North Carolina at Charlotte, 1988

Certification/License

Professional Engineer: NY, MA, NC, TX, GA, FL, VA, NH

Areas of Expertise

- HVAC
- Power generation
- Fire protection
- Mechanical system design

Experience

- 30 total years
- 11 years with Hazen

Professional Activities

The American Society of Heating, Refrigerating and Air-Conditioning Engineers

National Fire Protection Association

Croton Water Filtration Plant, New York City Department of Environmental Protection (NYCDEP), Bronx, NY
Provided HVAC systems design for a $100M HVAC construction contract, in support of construction of a new 290-mgd water filtration plant. Managed a staff of eight HVAC engineers. Tasks included development of HVAC hydronic and airflow diagrams, process and instrumentation diagrams, finalizing equipment sizing, reviewing submittals, and resolving RFIs from the Contractor. Work included HVAC for chemical storage and feed systems. Also provided engineering support for design and installation of four boilers including stack sizing and boiler sizing; issuing the boiler permit; shop performance test; and developing the control strategy for the hot water system.

Catskill/Delaware Water Treatment Facility, NYCDEP, Westchester County, NY
Provided design services during construction. Effort included responding to Contractor's RFIs related to the HVAC design. Systems included electrical room air conditioning systems, hazardous exhaust systems, plant staff training of HVAC systems, and louver designs.

Peekskill Water Treatment Plant, City of Peekskill, NY
Provided design services during construction for the Peekskill Water Treatment Plant (WTP). Tasks include resolving technical issues related the boiler and hot water system, the dehumidification system, chemical room exhaust systems, and the effluent chamber exhaust system.

Hillview Reservoir, NYCDEP, Yonkers, NY
Provided a detail report and 30% design for chorine gas scrubber system to capture fugitive gas releases. The existing chlorine gas system has small fugitive gas releases inside the chlorine gas dispensing system via various pressure regulating, and pressure relief, and vacuum regulating valves.

Hazen

The preliminary design incorporated alumina impregnated oxide to capture the small releases of chlorine gas that occurred during tank change out.

Saco WTP, Maine Water, Saco, ME
Managing the HVAC and Plumbing designs for a new WTP for the town of Saco, Maine. This plant will be a 12-mgd plant. The designs include HVAC for the process and administrative areas. The heating systems will use propane as the fuel source. The AC units will use water source condensers to maximum efficiency help toward meeting Envision goals. The chemical areas will be provided code-required ventilation, and to prevent fumes from the non-chemical areas.

Manayunk Sewer Basin - Venice Island, City of Philadelphia, PA
Hazen was tasked with designing a 3.75-mg CSO detention facility on Venice Island, in the Manayunk section of the city. Responsible for the design of the HVAC and Odor Control Systems for the Manayunk CSO facility. This included HVAC for the CSO tanks, blower area, and electrical rooms. The design included compliance with NFPA 820 ventilation requirements including hazardous exhaust systems.

Bowery Bay Wastewater Resource Recovery Facility, Queens, NY
Completed final designs and performance testing of a new hot water boiler system for this 150-mgd facility. Installed a heat sink to allow full load boiler testing. Modified the fuel oil delivery system to meet fuel oil quantity requirements. Also modified the draft control and the combustion air systems as needed to obtain the necessary permits from the NYC Department of Buildings and NYCDEP's Division of Air Resources, for emission compliance.

Haskell Street Wastewater Treatment Plant Upgrades, El Paso Water, TX
Performed a condition assessment and smoke tests to determine the efficacy of the HVAC supply and exhaust systems for the Headworks facility and sludge storage tanks covers. The evaluation included carbon and wet scrubber Odor Control Systems. The carbon system served the sludge tank metal covers and the wet scrubbers served the Head Works Facility. The report provided detail design recommendations for the HVAC supply, exhaust, and carbon systems. The report recommended the use of bio-trickling filters to replace the wet scrubbers

Michael Broder, PE

Vice President

Mr. Broder has been responsible for the design and construction of numerous major water infrastructure projects involving water supply and treatment, large hydraulic structures, pumping stations, piping systems, aqueducts and storage facilities. He has provided value engineering and has been instrumental in developing effective construction sequencing and Maintenance of Operations Plans for complex, critical projects.

Education

BS, Civil Engineering, Rensselaer Polytechnic Institute, 1983

Certification/License

Professional Engineer: NY

Areas of Expertise

- Design and construction of water supply, treatment, and distribution facilities
- Facilities inspection and evaluation
- Construction management and estimating

Experience

- 36 total years
- 29 years with Hazen

Professional Activities

American Society of Civil Engineers

American Water Works Association

Construction Management Association of America

National Society of Professional Engineers

Water Environment Federation

Westchester Water Works Conference

William S. Warner Water Treatment Plant, Aquarion Water Company, Fairfield, CT
Provided design of civil/site work, yard piping/utilities, and the dissolved air flotation (DAF) system for this award-winning 50-mgd water treatment plant (WTP).

Croton Water Filtration Plant, New York City Department of Environmental Protection (NYCDEP), Bronx, NY
Constructability and Technical Reviewer for the new 290-mgd Croton Water Filtration Plant. Headed the conceptual design team for the alternative site selection process, led design, and supervised construction of both the special studies pilot plant and the hypolimnetic aeration pilot plant at New Croton Reservoir. Prior to that, served as contractor's Project Manager for construction of the 3-mgd demonstration WTP at Jerome Park Reservoir and ammonia feed facilities at the New Croton Reservoir.

Millwood WTP and Pumping Station, Town of New Castle, NY
Resident Project Representative for the construction of the new 7.5-mgd plant and pumping station. Responsibilities included supervision of the construction, coordination of six prime contractors and their subcontractors, review of shop drawings, and negotiation of change orders. Also involved in selecting and overseeing the installation of the instrumentation facilities for the project. The plant was the first in the US to employ European dissolved air flotation (DAF) technology. Subsequent proof of the DAF process supported rerating of the plant to 10 mgd.

Hazen

Chadwick Lake WTP Clearwell Optimization, Town of Newburgh, NY
Project Manager for clearwell optimization project, which substantially increased the plant's CT disinfection credits. Project was part of the overall plant reconstruction increasing treatment capacity and improving treatment processes.

Catskill-Delaware UV Disinfection Facility (CDUV), NYCDEP, Westchester County, NY
Project Director of Hazen's joint venture for construction management of the CDUV Site Preparation contract. Led design of Catskill and Delaware Aqueduct connections, future tunnel connections, large water conduits up to 144-inch, and hydraulic structures. Performed cost estimating, scheduling, and constructability reviews for what is the world's largest UV disinfection facility, with a capacity of 2,020 mgd.

Catskill-Delaware Filtration Plant, NYCDEP, Westchester County, NY
Lead Civil/Site Designer and Cost Estimator for the water treatment plant. Coordinated site layouts and inter-connection of the treatment processes, designed aqueduct connections and hydraulic control structures, and directed estimates for conceptual designs of a 1,900-mgd filtration plant to treat the combined Catskill and Delaware water supplies.

Hillview Reservoir Rehabilitation, NYCDEP, Westchester County, NY
Leading the design of the operational and flow control improvements, includes the replacement of large sluice gates, valves, and stop shutters over 100 years old; along with flow monitoring among the Catskill and Delaware Aqueducts' inflow, and City Tunnels No. 1, 2 and 3 outflows.

Miscellaneous Design for Reconstruction of Facilities, NYCDEP, Ulster County, NY
Performed constructability and bid document review under the Ashokan Dividing Weir Gate House improvements task assignment. Developed replacement method for large sluice gate bronze anchor bolts that were found to be in unacceptable condition for reuse.

Constructability Review of Various Water Supply and Wastewater Infrastructure Projects/ Rehabilitation of Gatehouse #2 at New Croton Dam, NYCDEP, Westchester County, NY
Performed a constructability review of the rehabilitation project replacing the mechanical release works dating to 1905. Review focused on the proposed schedule and sequencing of work. Resequencing closed an 18-month gap in work between contractor field investigations and construction mobilization.

Daniel Ennis, PE

Associate

Mr. Ennis specializes in I&C design for water and wastewater facilities, applying ISA Standards to all projects. His experience encompasses SCADA and plant control system design, HMI and PLC programming, cybersecurity evaluations, and instrument troubleshooting and calibration.

Education

BS, Environmental Science, Rutgers University, 1998

BS, Environmental Engineering, Rutgers University, 1998

Certification/License

Professional Engineer: PA, MA

Areas of Expertise

- Instrumentation and Control (I&C)
- SCADA

Experience

- 21 total years
- 3 years with Hazen

Decant Facility Replacement, Passaic Valley Sewerage Commission (PVSC), Newark, NJ

Project Engineer. Designed instrumentation and process control for the replacement of the decant facility at PVSC's 330-mgd wastewater treatment plant (WWTP). Project included a new redundant odor control system, repurposing of scum pits as overflow control, replacement of antiquated PLC-based process control panel, a new electrical substation, and relocation of fiber optic remote I/O from areas with flooding potential. Design was completed with special attention to PVSC's Integrated SCADA Master Plan.

Proctors Creek WWTP Centrifuge Dewatering Facility, Chesterfield County, VA

Project Engineer. Designed instrumentation and process control for a new centrifuge facility at this 27-mgd WWTP. Project included a new standalone HMI system, integration of multiple PLC-based equipment control panels with new and existing PLC-based plant control panels, and design for classified hazardous areas. The project also included new centrifuges, significant pressurized sludge piping, gravity centrate and process drain piping, site civil improvements, and required coordination for both site plan and building department approval.

Town of Wallingford Facility Upgrades, Town of Wallingford, CT

Project Engineer for design of SCADA and process control system upgrades to the Town's water treatment and distribution facilities. The design consists of a new PLC-based control system for the Town's 12-mgd Pistapaug Pond Water Treatment Plant (WTP) and new PLC-based control systems for the Town's remote facilities, consisting of a number of groundwater well fields, storage tanks, pump stations, and PRV vaults. Upgrades to HMI hardware and software will include redundancy, historical archiving, additional operator workstations, and large-screen displays to replace existing legacy annunciators and charter recorders at the Pistapaug Pond WTP's main instrument control panel in its central control room.

Hazen

Haskell R. Street WWTP Digester Heating Upgrades, El Paso Water, TX
Project Engineer for this 27.7-mgd WWTP. Designed instrumentation and controls for a new digester heating system, which included integration into a wireless process control system, RTU upgrades, and design for classified hazardous areas.

New Transmission Main Booster Pump Station, Orange County Utilities, Orlando, FL
Project Engineer. Designed a security and access control system for a new high capacity booster pumping station. Included a high speed, microwave radio link for security cameras, card access controls, and process control data, with remote monitoring and software control of all systems.

Security Assessment & SCADA Master Plan, City of White Plains, NY
Performed a detailed evaluation of the SCADA system for the City of White Plains' water supply system. Authored a cybersecurity report with recommendations for security improvements based on published standards by AWWA, NIST, DHS, and others. Authored a separate SCADA master plan with recommendations for ongoing development and improvements to the system.

Experience Prior to Hazen

Pumping Stations Process Control System, Rockland County Water Authority, NY
Led a team of 5 that carried out the design of a wastewater treatment plant process control system and integrated SCADA system for 23 remote pumping stations for the Rockland County Water Authority. Performed and oversaw evaluation, design, and construction administration.

PCS Design and Implementation Project, Ocean Township, NJ
Team Lead for a 7.5-mgd facility. Designed and implemented a PCS and carried out all PCS programming, including redundant iFix servers, redundant PLCs in 4 control areas, a touchscreen panel HMI, fiber optic network, and more. Also performed shop drawing reviews, inspections, startup services management, and client/contractor coordination.

Integrated SCADA System, New York City Bureau of Wastewater Treatment (BWT), New York, NY
Project Engineer for BWT's Citywide collection facilities Integrated SCADA System project. Performed quality assurance, cybersecurity evaluation, and redundant wireless communications testing for a SCADA system encompassing 244 locations.

Lisa Giroux, PE, SECB

Associate Vice President

Ms. Giroux has experience in all facets of structural design, including reinforced concrete, prestressed concrete, structural steel, masonry, and timber structures. She has performed the structural design and construction administration of various water and wastewater facilities for treatment plants ranging in size from 1- to -450 mgd.

Education

MSC, Virginia Polytechnic Institute and State University, 1989

BSCE, North Carolina State University, 1988

Certification/License

Professional Engineer: PA, NJ, NY, NC, FL, MI, CT, WV, MD

Certified in the Practice of Structural Engineering (SECB)

Areas of Expertise

- Structural analysis
- Design of sanitary, commercial, industrial, dam, and residential structures
- Concrete rehabilitation
- Material evaluation

Experience

- 34 total years
- 29 years with Hazen

Professional Activities

American Society of Civil Engineers

American Concrete Institute

- 350 Committee Member
- Subcommittee 350C Chair

Oak Glen Regional Water Treatment Plant Expansion, New Jersey American Water, Farmingdale, NJ

Lead Structural Engineer for expansion of the Oak Glen Water Treatment Plant (WTP) from 10 to 15 mgd. Project consisted of additional dissolved air flotation (DAF) and filter facilities plus construction of additional backwash storage and chlorine dioxide improvements. The expansion will allow the WTP to reliably meet its distribution system requirements on a continuous basis with one of the treatment trains out of service.

Stamford WTP Dewatering and Chemical Unloading Facility, American Water Company, CT

Lead Structural Engineer for feasibility assessment and design of a new dewatering and chemical unloading facility to be located atop existing abandoned sedimentation basins. Space on site is tight and surrounding neighborhood is concerned about truck traffic impacts. Feasibility assessment and design include evaluation of potential facility locations to best reuse existing infrastructure on the tight site, and options for minimizing truck traffic impacts to the immediately adjacent neighborhood.

Croton Water Treatment Facility, New York City Department of Environmental Protection (NYCDEP), Bronx, NY

Lead Structural Engineer for all phases from alternative site selection, conceptual design, final design and construction. Situated in the Bronx, the 290-mgd Croton facility is a predominantly below grade multi-level facility for a minimized footprint beneath the Mosholu Golf Course driving range. The design presented many structural challenges - control of groundwater to prevent uplift, large soil and rock forces (over 110 ft deep in some locations), large heavily loaded clear spans.

Hazen

The plant consists of 16 adjacent and jointed structures to form the 8-acre main process area and pump station facility, which required control of structure stiffness to limit lateral movement and impact on adjacent structure sections. Construction loads were equally challenging to the operational loads for elevated process tankage. Exterior walls were placed immediately against prepared rock excavation using one-sided forms, which exerted large reaction forces on elevated slabs. Concrete truck and crane driving paths on elevated slabs were coordinated with design capabilities to get construction materials quickly and efficiently to successfully achieve the aggressive concrete construction schedule.

Jones Ferry Road WTP, Sedimentation Basin Rehabilitation, Orange Water and Sewer Authority (OWASA), Carrboro, NC
Lead Structural Engineer. Performed condition assessment, structural evaluation and concrete rehabilitation design for the Jones Ferry Road WTP sedimentation basins. The Authority began to observe concrete and metals deterioration in the 70-year old sedimentation basins shortly after changing coagulants to ferric sulfate. Repairs also include the existing basin walkways, where the top 2"-3" of the concrete had been weakened by freeze-thaw damage. Since the walkways act as beams to support the basin walls, repairs are critical to the basin structural integrity.

Wastewater Treatment Plant (WWTP) and WTP Facility Wide Concrete Condition Assessment, OWASA, Carrboro, NC
Lead Structural Engineer. Phased program to perform condition assessments, including confined space entry, plantwide at the Jones Ferry Road WTP, Mason Farm WWTP, and various offsite facilities to assess the concrete condition to inform the owner's capital improvements program for repair needs.

Queen Lane WTP, Philadelphia Water Department, PA
Lead Structural Engineer. Structural rehabilitation of concrete reservoir liner for a 115 year old earthen, raw water basin embankment. Originally constructed using a brick lined embankment overlaying a 12" concrete slab and clay liner, the 177-mg reservoir holds raw water from the Schuylkill River. The liner provides embankment stability, protecting the basin slope. Also designed and constructed waterproofing repairs as part of a filter upgrade at the WTP. Although the filters are housed within the 60-year old filter building, portions of the filters are comprised of structural elements dating back to 1909.

North Durham WWTP, City of Durham, NC
Lead Structural Engineer. Performed emergency condition assessment, structural evaluation, and concrete rehabilitation design of the preliminary treatment facilities which had been damaged by hydrogen sulfide induced corrosion.

Rose Jesse, CPE, ENV SP

Senior Associate

Ms. Jesse has over 20 years of experience managing, directing, evaluating, and performing work in the construction industry, with proven success in the areas of cost estimating, budgeting, scheduling, document control and project controls. She currently provides oversight to the estimating team, providing transparent, defensible cost estimates by utilizing the recommended practices of the AACE, real data on cost, and construction knowledge.

Education

BS, Civil Engineering Technology
Rochester Institute of Technology, 1996

Training/Certification

Envision Sustainability Professional (ENV SP)

American Society of Professional Estimators (CPE)

OSHA 10 & 30 hour Construction Outreach

Risk Management (AACE)

Cost and Schedule Control (AACE)

Earned Value Management (AACE)

GHS/HAZCOM Training

Confined Space Entry Training

NYCDEP Hot Work Training

Lock Out – Tag Out Training

Behavior Based Safety Training

Areas of Expertise

- Construction cost estimating
- Constructability review
- Project management
- Risk assessment
- Construction sequencing/ scheduling

Experience

- 21 total years
- 4 years with Hazen

Professional Affiliations

Project Management Institute

Association for the Advancement of Cost Engineering International

National Association of Women in Construction

New York Water Environment Association

Indian Brook Water Treatment Plant, Village of Ossining, NY
Cost Estimating Manager for new water treatment plant (WTP). Scope of work includes substantial earthwork, retaining walls, buildings, equipment, electrical, and instrumentation. Project value approximately $34 million.

Madbury Backwash Tank and Pump Station, City of Portsmouth, NH
Cost Estimator. The project for the Madbury WTP was a multidisciplinary design initiative. In addition to the pump station, the entire plant was constructed under the City of Portsmouth's sustainability program. The project received LEED silver certification in 2011

Pleasure Bay Crossing and Main Pump Station Replacement, Two Rivers Water Reclamation Authority, Monmouth Beach, NJ
Provided estimating for the construction of two new interceptors with 30" and 54" diameters, a new 50-mgd pump station and 36" forcemain to replace aging facilities and provide added capacity. The 54" interceptor will be constructed under Pleasure Bay at a depth of 90 feet using a tunnel boring machine. Value of the project is estimated to be approximately $50M

Stamford WTP Residual Alternative Analysis, Aquarion Water Company of Connecticut, CT
Provided support and review of estimates for the installation of new lagoons in a greenfield location. The project involved excavation and removal of over 30,000 cy of earth and rock and the installation of pumps and pipe to support dewatering of the facility.

Hazen

Tesoro West Basin Expansion, West Basin Municipal Water District, Carson, CA
Responsible for reviewing and providing cost estimates for the installation of a tertiary-membrane biological reactor at an existing 2-mgd treatment facility. Work included extensive staging and site piping installations.

Water Storage Tanks and Pressure Basin Demolition, City of White Plains, NY
Reviewed and managed cost estimates for two new water tanks and the demolition of the existing pressure basin. Work includes extensive site work, installation of precast concrete tanks, and upgrade of all piping and connection.

New Water Tanks, City of White Plains DPW, NY
Prepared cost estimates for options of installation of water tanks to provide 8 million gallons of water storage.

Third High Reservoir Maintenance & Improvements - Washington Aqueduct, Army Corps of Engineers, Baltimore, MD
Providing estimate support and review for work at the reservoir including structural and mechanical demolition and replacement for influent and effluent valve houses and structural repairs for the existing reservoir.

Demolition of Section 56 Water Main, Massachusetts Water Resources Authority, Lynn, MA
Provided cost estimating for the demolition and replacement of a 20" water main installed on the General Edwards Bridge, a 1300-foot long bridge over the Saugus River in Lynn, Massachusetts.

Piscataway Wastewater Treatment Plant Pump Station Upgrades, Washington Suburban Sanitary Commission, Accokeek, MD
Prepared cost estimate for the construction of a new 60-mgd raw wastewater pump station and force main.

Lift Station Evaluations, City of St. Augustine, FL
Provided guidance for the estimation of the City's 13 impacted lift stations in order to evaluate their existing condition; determine their estimated value based upon current condition; and estimated repair and/or replacement costs.

Jack Kiefer, PhD

Senior Associate

Dr. Kiefer is an expert in forecasting the demand for potable water. In his 29 years, he has acted as an economist and geographer consulting in water resource economics and planning; econometrics; and integrated water demand, supply planning, and management.

Education

PhD, Geography, Southern Illinois University, 2004

MA, Monetary Economics, Southern Illinois University, 1990

BA, Economics, Southern Illinois University, 1988

Areas of Expertise

- Econometric analysis and forecasting
- Water supply reliability planning
- Impact and process evaluation
- Risk and uncertainty analysis
- Water resources planning
- Economic analysis

Experience

- 29 total years
- 12 years with Hazen

Professional Activities

American Water Works Association

American Water Resources Association

Technical Publications

"Creating a Typology of Water Demand Forecasting Methods: Nuances and Implications" Poster presented at American Water Works Association 2018 Annual Conference and Exposition, Las Vegas, NV, June 11-14, 2018.

"Information Needs for Water Demand Planning and Management." J. Kiefer and L. Krentz. 2018. Journal of the American Water Works Association, 110:3.

Long-term Water Demand Forecasts, San Diego County Water Authority, CA

Project Manager of development of five consecutive water demand forecasts and forecast updates for the San Diego County Water Authority, in support of the Agency's periodic development of its Urban Water Management Plan. Original efforts involved the development of econometric models of M&I water demands, which were followed by development of predictive models for agricultural demands. More recent support to the Authority has included the analysis of climate change impacts on water demand and the development and application of risk-based simulation procedures to support long-term supply reliability and capital improvement planning.

Water Demand Study 2050, East Bay Municipal Utilities District, Oakland, CA

Technical Director. The District is in the process of developing an econometric model for forecasting water demands in their service area out to the year 2050. The econometric model will explicitly account weather/climate conditions, anticipated land use changes, development trends, and socioeconomic factors (e.g., water rates, jobs, population growth, income etc.) which have been shown to impact water use. The forecasted demands will be a critical component of the District's 2020 Urban Water Management Plan.

Long-Term Demand Forecasting System (LTDFS) Update, Tampa Bay Water, FL

Technical Director. Leading a team to redevelop all elements of Tampa Bay Water's LTDFS, including estimation of econometric and end use water efficiency models focusing on exploratory data analysis of an expanded time-series and cross-sectional database of water demands in the Tampa Bay region.

Hazen

Water Use in the Multifamily Housing Sector. J. Kiefer and L. Krentz. 2018. Denver, Colo.: Water Research Foundation.

"Urban Water Demand Forecasting: Demand Trends, Drivers, and Uncertainties". Presented at Water Research Foundation Symposium hosted by Metro Vancouver Water, Vancouver, BC, November 29, 2017.

"Developing a Spatially and Sectorally Disaggregate Water Demand Forecasting Tool for Tampa Bay Water" J. Kiefer. Presented at American Water Works Association 2017 Annual Conference and Exposition, Philadelphia, PA, June 11-14, 2017.

Water Demand Forecasting in Uncertain Times: Isolating the Effects of the Great Recession. Kiefer, J., Johns, G., Snaith, S., and B. Dziegielewski. 2016. Denver, Colo.: Water Research Foundation.

Evaluation of Customer Information and Data Processing Needs for Water Demand Analysis, Planning, and Management. J. Kiefer and L. Krentz. 2016. Denver, Colo.: Water Research Foundation.

"Identifying and Adapting to Water Demand Uncertainties." 2016. J. Kiefer. Presented at American Water Works Association 2016 Annual Conference and Exposition, Chicago, IL, June 19-22, 2016.

Uncertainty in Long-Term Water Demand Forecasts: A Primer on Concepts and Review of Water Industry Practices. Kiefer, J., Yoe, C., Clayton, J. and J. Leonard. 2016. Denver, Colo.: Water Research Foundation.

"Research Considerations for Evaluating Water Use among CII Sectors." J. Kiefer. 2016. Presented at American Water Works Association 2016 Sustainable Water Management Conference, Providence, RI, March 2016.

Analysis of Changes in Water Use under Regional Climate Change Scenarios. 2013. J. Kiefer, J. Clayton, B. Dziegielewski, and J. Henderson. Water Research Foundation, Denver.

Applied Research, Water Research Foundation, Fairfax, VA
Principal Investigator for the following:

- ***Long Term Water Demand Forecasting Practices for Water Resources and Infrastructure Planning*** – Performing a review of industry forecasting practices and developing recommendations that will help improve the role and effectiveness of demand forecasting practices, including strategies for more effective communication for planning and decision making.
- ***Uncertainty in Long Term Water Demand Forecasting***– Identifying the chief long-term uncertainties about water demand and how water utilities cope with the risks associated with such planning uncertainties.
- ***Water Use in the Multifamily Sector***– Developing and recommending sound and practical strategies for estimating multifamily water use and more easily allow utilities to categorize, estimate and forecast water use for prominent multifamily water use categories.
- ***Water Demand Forecasting in Uncertain Times: Isolating the Effects of the Great Recession*** – Evaluating the impact of the recent economic down-turn on water demand, including 4 case studies to examine how economic pressures affect demand and how economic indicators may be used to improve water demand forecasting.
- ***Methodology for Evaluating Water Use in Commercial, Institutional and Industrial Sectors*** – Defined best practices for establishing water use bench-marks for the CII sector for the purposes of forecasting, rate-making, water budgeting, and efficiency planning.
- ***Analysis of Changes in Water Use under Regional Climate Change Scenarios*** – Investigated potential impacts of climate change on water demand and principal M&I sectors, including 6 case studies to estimate the potential impact of climate change using regionally downscaled climate scenarios.
- ***Evaluation of Customer Information and Data Processing Needs for Water Demand Planning and Management*** – Tailored collaboration project identifying the data collection and information management needs of water utility managers and planners, as well as the needs of other local, regional, State, and Federal agencies that depend on collection and analysis of municipal water demand data.

Water Conservation Planning Support, New York City Department of Environmental Protection (NYCDEP), New York, NY
Technical Director. Assisted in the development of NYCDEP's Water Demand Management Plan through a series of investigations involving pilot efficiency projects; water reuse at specific facilities; spatial demand profiling; and assessment of large users, drought management, and water pricing strategies.

Christina LaPointe, PE, CDT

Senior Principal Engineer

Ms. LaPointe is Hazen's Midwest Regional Lead for the Distribution Hydraulic Modeling Service group. Her 14 years of experience include serving as design manager and design engineer for many water treatment plant projects throughout the region as well as program management, capital project planning, and analyzing funding strategies.

Education

MSEnvE, Manhattan College, 2012

BSCE, The University of Toledo, 2007

Certification/License

Professional Engineer: VA, NJ, OH

Construction Documents Technologist (CDT)

Areas of Expertise

- Hydraulic modeling and planning
- Distribution system hydraulic modeling and planning
- Project management and development
- Facility planning
- Dynamic rate modeling

Experience

- 14 total years
- 4 years with Hazen

Professional Activities

American Water Works Association

Ohio Water Environment Association

Society of Women Engineers

Olentangy Water Treatment Plant, Del-Co Water Company, Delaware, OH
Project Engineer responsible for process mechanical design elements including design for a new sodium hypochlorite room, zin-orthophosphate modifications, and UV retrofit. Also assisted in preparing preliminary engineering reports to secure USDA funding, and incorporating USDA requirements into contract documents.

Water Distribution Master Plan, Del-Co Water, Delaware, OH
Lead Modeler and Project Engineer for master plan development. Worked closely with team to determine the required capacity of treatment plant upgrades, and conveyance solutions for areas where demand was projected to outpace treatment plant capacity. Prioritized improvements based on cost, criticality, and projected growth in the water distribution system.

Kanawha Valley Water Treatment Plant, UV Disinfection Facility, West Virginia American Water, Charleston, WV
Lead Process Mechanical Engineer for the preliminary design of a new UV facility within the existing 50-mgd water treatment plant.

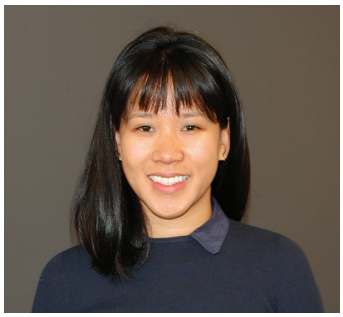
Kokomo Operations Groundwater Treatment Improvements, Indiana American Water, Kokomo, IN
Project Manager and Design Engineer responsible for preliminary through final design of treatment plant modifications in order to maintain compliance with IDEM findings. Project included adding a cover to an existing backwash holding tanks and modifying discharge for the existing sludge lagoons.

Hazen

Tunnel 3, Stage 2 Manhattan Leg Activation, New York City Department of Environment Protection (NYCDEP), New York, NY
Project Engineer for the design and planning for the activation of a new water distribution tunnel in Manhattan for NYCDEP. Assisted in preparing design and construction documents for construction work required to activate the tunnel, including construction of piping, treatment facilities, and online sampling and monitoring equipment. Prepared to bring the tunnel online, including: dewatering considerations, methods to protect equipment from high water pressure, methods for cleaning and disinfecting the tunnel incompliance with NYSDOH requirements, and the integration of the new supply into the existing distribution system.

Vertical Asset Inventory for Cityworks Implementation, City of Cleveland-Division of Water, OH
Project Manager for the collection of all Cleveland Water's vertical assets. Collection includes over 60 asset classes located across four Water Treatment Plants, and 22 additional sites in the distribution system including booster stations and finished water storage, for a total of approximately 15,000 assets. Supported the prime and client regarding the suitability of the schema to support vertical asset inventory and application in Cityworks.

Kingsport Water Treatment Plant Chemical Storage and Feed System Improvements, Kingsport, TN
Project Engineer. Assisted in the preparation of the preliminary engineering report including determining equipment needed for new coagulants, sodium hypochlorite, sodium permanganate, hydrofluosilicic acid, and zinc orthophosphate facilities. Determined bulk and day tank storage sizing, pump sizing, and developed preliminary layouts and associated cost estimates for various alternatives.



Nicolette Leung, PE, GA, ENV SP

Associate

Ms. Leung has 12 years of experience in environmental planning and permitting as well as stormwater management. She has been integral in multiple projects for both the city and state and of New York.

Education

BS, Civil Engineering, University of Virginia, 2008

Certification/License

Professional Engineer: NY

LEED Green Associate (GA)

Envision Sustainability Professional (ENVSP)

OSHA 10-Hour Certification

Areas of Expertise

- Environmental planning and permitting
- Stormwater management

Experience

- 12 total years
- 6 years with Hazen

Professional Activities

Engineers Without Borders

- New York Professionals

Water Environment Federation

East Side Coastal Resiliency Project – Environmental Planning and Permitting, New York City Department of Design and Construction (NYCDDC), New York, NY

The goal of the East Side Coastal Resiliency (ESCR) Project is to reduce the risk of coastal flooding and vulnerability while enhancing waterfront open spaces and public access to the waterfront along the East River waterfront between Montgomery Street and East 25th Street. The project will construct an integrated coastal flood risk reduction system for the FEMA-designated 100-year storm flood hazard area, with sea level rise, between Montgomery Street and East 23rd Street. The ESCR project includes a combination of engineered and landscape berms, floodwalls, and deployable along with other infra-structure improvements that would improve coastal defenses against flooding while improving open spaces and enhancing access to the waterfront. Due to its scale and potential for environmental effects, the ESCR project requires the preparation of an Environmental Impact Statement (EIS). Since the project is to be funded by the US Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery funds, and requires Federal, state, and local approvals and permits, the EIS must be prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), State Environment Quality Review Act (SEQRA) and the city Environmental Quality Review Act (CEQR). Specific duties include assisting with EIS preparation, agency and stakeholder coordination, permit applications, and regulatory compliance, including the development of an Action Plan Amendment to meet HUD grant requirements. Further, the environmental review process is subject to an aggressive schedule with strict deadlines to meet implementation and funding allocations as established by HUD. Hazen, under a joint venture (JV), is coordinating extensively with over 25 federal, state, and local agencies; community stakeholders; and a team of designers throughout the environmental review process under an aggressive schedule to provide a means for decision-makers to consider environmental effects along with other aspects of project planning and design. Hazen is leading the permitting process.

Hazen

Eltingville Pump Station Rehabilitation, New York City Department of Environmental Protection (NYCDEP), Staten Island, NY
Assisted in preparation of environmental review to assess the impacts of rehabilitation of the Eltingville Pump Station building and replacement of a force main to extend the facility's service life by approximately 20 to 30 years. The project is sited within NYCDEP, NYC Parks, and public right-of-way, requiring coordination with multiple City and State stakeholders. Maintained permit tracking tool to identify required permits and approvals and ensure schedule.

Catalum SPDES Permit Modification EIS (Catalum-EIS), NYCDEP, Ulster County, NY
Project Manager. The Catalum EIS will evaluate potential impacts to the environment from alum addition under an existing SPDES permit at NYCDEP's Kensico Reservoir, and from releases to lower Esopus Creek made by NYCDEP to manage downstream flows and redirect turbid water out of the City's water supply system. Coordinated a team of resource specialists to analyze potential impacts of the releases on natural and built environments along a 30-mile reach of lower Esopus Creek under an aggressive Consent Order schedule. Assessments included the analysis of field data, hydraulic and hydrologic models, and desktop studies to evaluate potential impacts to wetlands, hydraulic conditions, stream geomorphology, wildlife, water quality, fish and benthic communities, socioeconomic conditions, and open space and recreation resources. Also ensured the EIS conforms to state and City Environmental Review requirements and coordinated outreach to state officials and a local stakeholder working group.

Experience Prior to Hazen
Environmental Planning and Permitting Program for Infrastructure Projects, NYCDDC, New York, NY
Reviewed the design and environmental planning and permitting documents for stormwater management best management practices (BMPs) and infrastructure projects valued up to $25M for compliance with NYSDEC and NYDEP regulations. Projects included street reconstruction, and construction and improvement of stormwater outlets and management facilities.

George Markou, PE

Senior Associate

For the past 31 years, Mr. Markou has been responsible for the planning and design of electrical distribution, lighting, control, and energy improvement systems for many of the firm's projects. His duties involve coordination with electric utility companies and compliance with the National Electrical Code in tandem with local building codes and industry standards.

Education

MS, Electrical Engineering, Polytechnic University, 1996

BE, Electrical Engineering, City College of New York, 1988

Certification/License

Professional Engineer: NY, PA, CT, MA

Areas of Expertise

- Civil electrical distribution, lighting, SCADA, and control
- Energy conservation and cogeneration

Experience

- 31 total years
- 31 years with Hazen

Professional Activities

American Water Works Association

Institute of Electrical and Electronics Engineers

Stamford Water Treatment Plant (WTP), Aquarion Water Company, CT
Worked on the study evaluating the electrical system. Led the electrical and instrumentation and control design of plant upgrade that included the DAF process.

Warner WTPs, Aquarion Water Company, Fairfield, CT
Provided shop drawing review and design coordination for two new WTPs. The 50-mgd William S. Warner WTP uses the DAF process.

Millwood WTP & Inningwood Pump Station, Town of New Castle, NY
Designed all of the electrical systems and instrumentation and controls, and performed construction management and shop drawing review for the 7.5-mgd Millwood WTP and Inningwood Pump Station. The Millwood WTP was one of the first to use the DAF process in the United States.

Catskill Aqueduct WTP, Northern Westchester Joint Water Works, Cortlandt Manor, NY
Provided electrical engineering services for the 7-mgd Catskill Aqueduct WTP. Services included the design of electrical distribution, lighting, and instrumentation and control systems, as well as construction management and shop drawing review for this DAF Plant.

Hillview Reservoir Improvements, New York City Department of Environmental Protection (NYCDEP), Yonkers, NY
Lead Electrical Engineer responsible for DSDC for upgrades to existing flow control systems and new chemical addition facilities. The work includes the replacement and upgrade of the electrical distribution system including 4,160V switchgear, unit substations, and standby power system, providing redundancy and reliability to a critical NYCDEP facility.

Hazen

John J. Carroll WTP, Massachusetts Water Resources Authority (MWRA), Marlborough, MA
Electrical Lead for a short circuit electrical study and evaluation of protection devices at the MWRA John J. Carroll WTP. Conducted a site visit and inspection followed by relevant calculations and generation of a technical memorandum. Study and evaluation also included the Wachusett Aqueduct Pump Station.

Catskill Aqueduct WTP, Northern Westchester Joint Water Works, Cortlandt Manor, NY
Provided electrical engineering services for the 7-mgd Catskill Aqueduct Water Treatment Plant. Services included the design of electrical distribution, lighting, and instrumentation and control systems, as well as construction management and shop drawing review for this DAF Plant.

Plantwide Replacement of Electrical Power Cables, Passaic Valley Sewerage Commission (PVSC), Newark, NJ
Project Manager for the design and design services during construction including investigation of existing conditions, conceptual designs, final design and shop drawing review of the replacement of 15kV medium voltage cable, low voltage communication system cables including copper and fiber optic cables for SCADA, MIS, CCTV and fire alarm networks damaged during Superstorm Sandy.

Site Assessment and Conceptual Design Report for Decant and Sludge Storage Facilities Project, PVSC, Newark, NJ
Project Engineer for electrical for the field investigation and assessment of existing electrical equipment at the decant facility, sludge storage facilities, and Old Pump Station. Upon completing the initial assessment, prepared a conceptual design for any replacement or modifications necessary to the existing equipment.

Daniel Sheeran, PE

Senior Associate

Mr. Sheeran's is the firm's Northeast Civil Discipline Leader and has 14 years of design experience specifically on water and wastewater facility projects throughout the region.

Education

MS, Civil Engineering, Manhattan College, 2012

BS, Civil Engineering, Manhattan College, 2005

Certification/License

Professional Engineer: NY

Areas of Expertise

- Civil site planning and design
- Permitting and inter-agency coordination
- Design services during construction
- Civil shop drawing review

Experience

- 14 total years
- 11 years with Hazen

Professional Activities

New York Water Environment Association

American Water Works Association

Indian Brook Water Treatment Plant (WTP), Village of Ossining, NY
Civil Site Design Lead for the design of a new 8-mgd DAF WTP to replace the existing Indian Brook facility. Oversaw the civil site design that included extensive coordination of the yard piping within the existing facility's driveway. The constrained site required the stormwater design to consist of a green roof, bioretention cells, and underground storage tanks to meet requirements of the New York State Department of Environmental Conservation's (NYSDEC) SPDES permit.

Croton Water Treatment Facility, New York City Department of Environmental Protection (NYCDEP), Bronx, NY
Assistant Engineer for civil discipline group for the construction of the Croton facility. The project included civil site design and coordination of below grade utilities during construction. Performed shop drawing reviews for civil site design submittals including water main infrastructure, earthwork, and stormwater and sanitary sewer infrastructure. Prepared regulatory submittals and calculations for NYCDEP's Sewer Connection Permit and Cross Connection Control Unit. Also assisted in coordinating modifications to traffic apparatus and builders pavement plan with the New York City Department of Transportation.

Madbury WTP Backwash Tank and Pump Station Upgrade, City of Portsmouth, NH
Civil Site Design Lead for the design of the new finish water pump station and associated yard piping. The project included approximately 600 lf of new water piping routing through the congested utility corridors of the existing Madbury WTP site. The site design also included roadway, drainage, and grading design for the new pump station as well as erosion and sediment control design in accordance with state requirements. Provided QA/QC reviews at each design submittal.

Hillview Reservoir Improvements, NYCDEP, Yonkers, NY
Civil Discipline Lead overseeing staff on the civil site design for the improvements to Hillview Reservoir. Reviewed conceptual site plans layouts of chemical buildings around the site. Reviewed analysis of chemical delivery trucks and their routes around the site. Prepared civil sections of the Facility Plan.

Hazen

White Plains Water Storage Tanks, City of White Plains DPW, NY
Project Manager and Civil Site Design Lead for the design of two 4-mg pre-stressed concrete water storage tanks to replace a 90-year old pressure basin. Coordinated project budgets, oversaw subcontracts for geotechnical investigations, and environmental investigations. Coordinated multi-discipline effort including architecture, structural, mechanical, HVAC, electrical, and instrumentation aspects of the project. Coordinated earthwork analysis of nearly 50,000 CY excavation, largely of bed rock. Oversaw the design of stormwater extended detention basins in compliance with NYSDEC. Coordinated the reforestation and landscaping of site staging area for post construction in the area of a large rock outcropping. Coordinated permitting effort including NYSDEC Environmental Assessment, Army Corps of Engineers Jurisdictional Determination, and NYSDEC Wetland Permitting and Stormwater Pollution Prevention Plan (SWPPP).

STIC Facility Rehabilitation, NYCDEP, Gilboa, NY
Discipline Lead overseeing and coordinating the preparation of civil site design contract documents for the rehabilitation project for the Shandaken Tunnel Intake Chamber (STIC) Facility along the Schoharie Reservoir. Evaluated existing drainage patterns and tributary areas to intermittent streams located in steep slopes to mitigate flooding around the facility. Analyzed existing infrastructure and designed storm drainage and sanitary disposals system to improve the facility's systems. Evaluated stormwater BMP's and proprietary products for the redevelopment of property and expansion of facility parking lot. Evaluated and designed improvements to roadway alignments and parking lot layouts for better access into and around the existing facility. Assisted in the design of the dredging of the intake channel in the Schoharie Reservoir. Coordinated and prepared the SWPPP for compliance with the NYCDEP Watershed Regulations and to obtain NYSDEC General Permit for Stormwater Discharge from Construction Activities. Provided assistance in preparing SEQRA application. During construction provided shop drawing review, QA/QC, and RFI response coordination for site civil items.

Gilboa Dam Projects, NYCDEP, NY
Assistant Engineer for the development and design of various phases of the Gilboa Dam Reconstruction including design for CAT-359, CAT-212A, and CAT-212C contracts. Assisted in the design of erosion and sediment control BMPs, including diversion swales and sediment traps. Performed roadway design including establishment of alignments and design of vertical curbs. Also worked on the grading of roadways in steep slopes around the reservoir.

James Soroush

Senior Field Coordinator

Mr. Soroush has 16 years of experience in construction management with an emphasis in wastewater treatment facilities. He possesses broad knowledge in construction practices including scheduling, project controls and administration, cost estimating, and inspections.

Education

MS, Construction Management, Drexel University, 2015

BS, Public Relations, Oswego State University, 2003

Certification/License

OSHA 30 Hour Class

Primavera 6

Primavera Risk Analysis

Permit Authorizing Individual

Project Management Information System

Automated Procurement Tracking

Expedition

Areas of Expertise

Construction management

CPM scheduling

Risk management

Project controls

Cost estimating

Safety/permitting

ePMIS

Experience

- 16 total years
- 12 years with Hazen

Westchester CSO Modifications, New York City Department of Environmental Protection (NYCDEP), Bronx, NY
Responsible for the project controls, including CPM schedule and delay analysis with associated documentation and reporting, change management and cost control, ePMIS administration, and the safety of the project. Also assisted the resident engineer in submittal and specification review and implementation, safety, and coordination amongst project staff, contractors, and field operations.

PS-287: Eltingville Pump Station, NYCDEP, Staten Island, NY
Project Controls Member during the design phase for this rehabilitation and upgrade of the Eltingville Pump Station which included installation of temporary and permanent force mains, interim pump station, and upgrades to the existing pump station, including wet well, dry well, roof/exterior, electrical and screenings room. Responsible for project controls including planning and development of the construction schedule for design at each stage of design and performing a P80 Risk analysis for risk mitigation during design.

RLCY-BB-01 & RLCY-PR-01: Bowery Bay & Port Richmond Wastewater Resource Recovery Facilities (WRRFs), NYCDEP, Queens/Staten Island, NY
Responsible for project controls during design phase for flood resilient upgrades to Bowery Bay WRRF and Port Richmond WRRF to provide a more flood resilient facility with safe, reliable, sustainable and low maintenance flood protection measures. The project involved elevating existing and/or installing new mechanical and electrical equipment and installing flood protection barriers and reinforced walls throughout the facility. Responsible for Master Project Schedule and reporting from facility planning/design to procurement, construction and close-out phases including P80 Analysis on both schedule and costs, for risk mitigation during design and construction.

Hazen

Multiple Projects, Bay Shore Regional Sewage Authority, Union Beach, NJ
Responsible for project controls, including CPM schedule analysis and reporting and claim and delay mitigation and analysis with associated documentation for Contract 74S – NIRO Incinerator Repairs and Mitigation, 80S – Combined Blower Building and performed feasibility construction schedule for Dorr Oliver Upgrade.

Decant Facility Rehabilitation, Passaic Valley Sewerage Commission, Newark, NJ
Responsible for CPM construction schedule and development of Contract B-149 – Decant Facility Rehabilitation Project and schedule for Regenerative After Burner System Replacement Evaluation feasibility study.

Bay Park Sewage Treatment Plant Program Management Services, Nassau County DPW, East Rockaway, NY
Project Controls Member on the program management team for the Hurricane Sandy Recovery Effort at the Bay Park Sewage Treatment Plant and Related Infrastructure Program in Nassau County, New York. The $830+ million program consists of the design and construction of permanent repairs and rehabilitation to damaged facilities, including potential storm mitigation measures. The affected facilities include: sludge dewatering building, outfall pump station, fire protection building, electrical distribution system including switchgear, substations, and MCCs, effluent screening and disinfection building, grit building, plant-wide odor control systems, final clarifiers including RAS and WAS pumps, sludge and scum collector drives, life safety systems, plant-wide HVAC systems, process air blowers, auxiliary power generation, primary tank scum and sludge collectors and pumps, digester facility, side stream demmonification facility, and related sewage pump stations and collection systems. Responsible for project controls including CPM schedule analysis and reporting and claim and delay mitigation and analysis with associated documentation.

Jamaica WRRF Phase 2 Improvements, NYCDEP, Queens, NY
Responsible for the project controls including CPM schedule and delay analysis with associated documentation and reporting; change management and cost control; permitting; ePMIS administration; and the safety of the project.

Michael Stallone, RA, AIA, NCARB, LEED AP

Senior Associate

Mr. Stallone has over 40 years of experience in architectural planning, design, and construction management of water and wastewater facilities. He serves as the head of architectural design for Hazen's Northeast Region.

Education

BA, Architecture, New York Institute of Technology, 1980

Certification/License

Registered Architect: DC, SC, NH, NJ, NY, VT, MA, PA, CT

LEED Accredited Professional (AP)

American Institute of Architects (AIA)

National Council of Architectural Registration Boards Certified (NCARB)

NYS Certified Code Examining Officer

Areas of Expertise

- Architectural design
- Construction management
- Project budgeting and scheduling
- Restoration and remediation of existing structures
- Building code analysis
- Environmental building design

Experience

- 42 total years
- 21 years with Hazen

Professional Activities

American Institute of Architects

The National Trust for Historic Preservation

NYC Department of Buildings Code Adoption Program

ACE Mentoring

Madbury Water Treatment Plant, City of Portsmouth, NH
Chief Architect responsible for the design of a new 4-mgd DAF facility to treat water from the Bellamy Reservoir, and replace the existing 3.5-mgd plant. Facility achieved LEED Silver certification.

Catskill/Delaware UV Disinfection Facility, New York City Department of Environmental Protection (NYCDEP), Westchester County, NY
Assisted in planning and development of alternate LEED and Sustainability for the facility design strategies and advised on submission documentation for the U.S. Green Building Council.

Peekskill Water Treatment Plant, City of Peekskill, NY
Chief Architect responsible for architectural and related design services during construction.

Manayunk Combined Sewer Overflow (CSO) Facility, Philadelphia Water Department, PA
Led architectural design of a new pump station and watershed management system located in a park. The LEED-Silver design featured a green roof system and numerous other energy-saving measures. The building's green roof swoops low to help it blend in with the park setting. Excavated materials were reused for the aboveground structures and landscaping. Many materials utilized in construction were indigenous to the area; the abundant rocks of mica schist from the site excavations were ground up and mixed into the poured concrete; the ashlar stone walls form a link to the typical historical mill and factory buildings of the region. Green roof technology was employed to keep operating costs down and to limit pollution into the environment.

Hazen

Manhattan Wastewater Pump Station Upgrade, NYCDEP, New York, NY
Lead Architect for complete modernization of facility, which serves the Newtown Creek Wastewater Resource Recovery Facility. This $214 million project was the winner of a Design Excellence Award from the NYC Art Commission as well as the 2003 Kenneth Allen Memorial Award. The design incorporates several "green" architectural elements and features expensive walls of glass to allow light to enter.

PVSC Wastewater Treatment Plant (WWTP) Site Assessment, Passaic Valley Sewerage Commission (PVSC), Newark, NJ
Lead Architect. Project includes a multi-discipline site inspection and analysis of existing data, multiple interactive stakeholder workshops with PVSC to present findings and discuss potential solutions, and the preparation of a detailed report including a criticality risk assessment and a conceptual design for further development in a future detailed design phase. Recommendations were made for future additional investigations and studies necessary for a detailed design phase including two pilot programs for the Decant Facility: one to reduce siloxanes concentrations in the odor control system and the other to reduce the build-up of scale in the Zimpro's oxidized sludge and vapor pipelines.

Rockaway Sludge Facility Assessment, NYCDEP, Queens, NY
Site analysis, planning and infrastructure management for the long term implementation of necessary repairs and future resiliency for the entire wastewater treatment facility.

Rahway WWTP Site Assessment, Rahway Valley Sewerage Authority, NJ
Provided architectural services to prepare a budget feasibility study of various proposed alternatives to determine the most economically feasible alternative for providing improvements to the existing Administration building interior entrance and layout.

Paerdegat CSO Facility, NYCDEP, Brooklyn, NY
Lead Architect for design of a multipurpose building that was designed for needs of both the community and the environment in mind while remembering the heritage of the area. The building is constructed atop new CSO tanks, reducing both footprint and costs and minimizing excavation. The main building houses crew quarters.

Croton Gatehouse #2, 5 and 7, NYCDEP, New York, NY
Responsible for the historic restoration of a 1938 building; required the State Historic Preservation Office and NYC Art Commission approvals.

Ruby Wells

Associate

Ms. Wells has a solid background in environmental science and planning for water supply infrastructure, stormwater, and watershed planning projects. She has worked as a Technical Analyst, Engineer, and Planner on a range of environmental projects and specializes in preparing regional water supply plans and environmental reviews.

Education

BS, Chemical Engineering, University of South Florida, 2004

Areas of Expertise

- Grant funding
- Environmental impact statements (EIS), environmental impact reports, and environmental assessments (EA) - CEQR/ CEQA/SEQRA/NEPA
- Inter-agency coordination and planning
- Permitting
- Water supply planning
- Water quality; air and noise analyses

Experience

- 19 total years
- 8 years with Hazen

Indian Brook Water Treatment Plant, Village of Ossining, NY
The existing Indian Brook Water Treatment Plant (WTP) has provided water to the Village and Town of Ossining's consumers for many years. However, the service area is undergoing a period of growth and, therefore, with implementation of the new WTP, the Village sees to ensure that it can reliably meet the water demands of its population for the foreseeable future. Successfully secured over $3M in grant funding for the project through the Consolidated Funding Application (CFA)/Green Infrastructure Grant Program (GIGP) and the Water Infrastructure Improvement Act (WIIA). From efforts, this project was identified as a priority project by the Mid-Hudson Regional Economic Development Council.

Catalum SPDES Permit Modification EIS, New York City Department of Environmental Protection (NYCDEP), Ulster County, NY
Assisting with management and QA/QC of the EIS currently being prepared for the assessment of potential impacts to environmental and social resources related to releases from NYCDEP's Ashokan Reservoir. Role includes analysis of existing conditions and analysis of impacts to wetlands, hydraulic conditions, stream geomorphology, wildlife, water quality, and fish and benthic communities along 30-mile reach of Lower Esopus Creek, downstream of the Ashokan Reservoir.

CEQR Technical Manual Air Quality Chapter Updates, NYCDEP, New York, NY
Project Manager for task under the BEPA on-call contract to address various new and/or impending regulations through working closely with DEP to formulate and implement each of the proposed updates to the Air Quality chapter of the manual.

Hazen

The main driver for periodically updating the CEQR Technical Manual is the need to incorporate changes in city, state, or federal guidance. In addition, updates provide the opportunity to streamline and clarify various sections.

Water Shortage Rule Environmental Review, NYCDEP, New York, NY
Providing technical oversight for the EA under the BEPA on-call contract to amend the Drought Emergency Rules which are being renamed as the Water Supply Shortage Rules. The proposed rule amendments address the need for NYCDEP to impose water use restrictions whenever there is a water shortage, regardless of whether such shortage is caused by hydrological conditions or by other circumstances.

On-Call Contract, New York City Department of Design and Construction (NYCDDC), Staten Island, NY
Provided managerial and technical oversight for the contract, which includes preparation and review of EAs, permit applications, and coordination with regulators for New York City sewer, water main, roadway and green infrastructure capital projects. Main role was in a liaison capacity, ensuring the permitting and design aspects of projects are coordinated between NYCDDC and NYCDEP. Also ensured each task order's project management activities, including each task order's project sheets, were continually maintained and distributed. Involved with the interagency coordinated project review between NYCDEP, NYCDOT, the Department of Parks and Recreation, and the New York State Department of Environmental Conservation.

Ashokan-Turnwood Covered Bridge Restoration Project, NYCDEP, Ulster County, NY
Overseeing the environmental review and permitting for the restoration and repair of the Ashokan-Turnwood Covered Bridge. This is a NYCDEP being conducted in order to restore the safe operation of this structure while maintaining its historic integrity.