CITY COUNCIL **The City of Orange Township, New Jersey**

DATE February 21, 2023 **NUMBER** 92-2023

TITLE:

A RESOLUTION AUTHORIZING MOTT MACDONALD, 111 WOOD AVENUE SOUTH, ISELIN, NEW JERSEY 08830 TO PROVIDE PROFESSIONAL ENGINEERING SERVICES TO SUPPORT THE WATER UTILITY COMMENCING JANUARY 1, 2023 THROUGH DECEMBER 31, 2023 IN AN AMOUNT NOT TO EXCEED $200,000.00.

WHEREAS, the City of Orange Township did duly advertise on November 22, 2022, for Request for Qualifications for Consulting Engineering Services; and

WHEREAS, on December 7, 2022, the City of Orange Township received ten (10) qualification proposals; and

WHEREAS, pursuant to the fair and open process, and based upon review of the qualifications and recommendations therefore, certain professionals are qualified to provide engineering services on an "as need" basis by the City of Orange Township; and

WHEREAS, the Director of Public Works & Engineering evaluated all proposal submitted based upon qualifications, experience with similar projects, and project understanding; and

WHEREAS, Municipal Council of the City of Orange Township, did hereby approve by Resolution #508-2022 the ten (10) bidders to provide professional consulting engineering services to the City of Orange Township on an "as needed" basis for the period of January 1, 2023 through December 31, 2023; and

WHEREAS, by Resolution #508-2022, did not establish a contract with any of the ten (10) bidders selected to provide professional consulting engineering services to support the Water Utility for the City of Orange Township on an "as needed" basis for the period of January 1, 2023 through December 31, 2023; and

WHEREAS, a separate resolution is needed to enter into a contract for professional engineering services to support the Water Utility; and

WHEREAS, the Director of Public Works & Engineering have agreed to select Mott MacDonald from the approved list of qualified professionals to provide engineering services to support the Water Utility; and

WHEREAS, the Chief Financial Officer of the City of Orange Township has prepared the necessary Certificate of Availability of Funds, a copy of which is attached hereto certifying that funds will be available for this purpose in Account No. 3-05-55-502-192-519, contingent upon Council approval and inclusion of said item in the Temporary Budget and adopted 2023 Budget, there will be sufficient funds to contract Mott MacDonald.

APPROVED AS TO FORM, SUFFICIENCY AND LEGALITY

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Orange Township, New Jersey as follows:

1. The Mayor is hereby authorized and directed to execute the attached Agreement with Mott MacDonald in an amount not to exceed $200,000.00.

2. Notice of this action shall be printed in the Orange Transcript as required by law within ten (10) days of its passage.

3. The agreement herein and this resolution are contingent upon certification of funds appropriate funding to render payment for services provided within.

Adopted: February 21, 2023

Joyce L. Lanier	Tency A. Eason
City Clerk	Council President

AGREEMENT

This is an agreement, made on _____, **2023** between the City of Orange Township, "City" with an address at 29 North Day Street, Orange, New Jersey 07050, and Mott MacDonald, 111 Wood Avenue South, Iselin, New Jersey 08830.

RECITALS

WHEREAS, the City of Orange is a municipal corporation of the State of New Jersey, and has its principal place of business at 29 North Day Street, Orange, New Jersey 07050.

WHEREAS, the City hereby retains and employs the services of **Mott MacDonald to provide professional engineering services to support the Water Utility.**

WHEREAS, the "Consultant" is duly licensed to practice in the State of New Jersey and desires to render engineering services for the City as provided in the agreement.

NOW, THEREFORE, the City engages the services of the "Consultant" and in consideration of the recitals and the mutual promises contained in this agreement, the parties agree as follows:

1. This agreement shall be effective commencing on January 1, 2023 through December 31, 2023 as per **Resolution #_____-2023** of the City Council of the City of Orange Township, and shall continue in effect until completion of the project, unless sooner terminated by the City by giving ten (10) days written notice to the other party.

SERVICES

2. The "Consultant" shall render professional engineering services in accordance with its proposal, a copy of which is attached here to.

USE OF AGENTS OR ASSISTANTS

3. To the extent reasonably necessary for the **"Consultant"** to perform the duties under this contract, the **"Consultant"** is authorized to engage the services of any agents or assistants that it deems reasonably necessary. Further, the **"Consultant"** may employ, engage, or retain the services of any other person or corporation to aid or assist in the proper performance of **"Consultant"** duties. The cost of services of these agents or assistances will be borne by the **"Consultant"** and any expenses incurred by the **"Consultant"** in engaging any agents or assistants shall be borne by the "Consultant".

THE COST OF SUPPLIES AND EQUIPMENT

4. The cost of supplies, equipment and facilities necessary for the **"Consultant"** to meet its obligations under the term of this agreement shall be solely borne by the Consultant.

FEE

5. For services to be rendered under this agreement, the **"Consultant"** shall be entitled to a fee in the amount not to exceed $200,000.00

DEVOTION OF TIME

6. The **"Consultant"** shall devote sufficient time to the performance of the duties under this agreement as is reasonably necessary for a satisfactory performance. Should the City require additional services not included in this agreement, the **"Consultant"**, shall subject to Paragraph 5, make a reasonable effort to perform these additional services without decreasing the effectiveness of the performance of the duties requires by this agreement.

INSURANCE

7. The **"Consultant"** (1) shall be an independent contractor and not an employee of the City under this agreement; (2) shall maintain a policy of liability insurance in the minimum amount of $1,000,000.00 to cover any claims arising out of the performance of the services under this agreement; and (3) shall further indemnify, save harmless, and defend the City from any claims arising from any act or omission of the **"Consultant"** of the agents.

NON-DISCRIMINATION AND AFFIRMATIVE ACTION

8. Non-Discrimination and Affirmative Action – The Consultant shall comply with the requirements of all statutes, laws and regulations regarding non-discrimination and affirmative action in the employment of workers. In particular, the Consultant will be required to comply with the requirements of New Jersey P.L. 1975, c. 127. (N.J.A.C.17:27).

PRIOR AGREEMENT SUPERSEDED

9. This agreement constitutes the sole agreement of the parties and supersedes any and all prior understandings or written or oral agreements between the parties to this agreement with respect to its subject matter. No other agreement, statement, or promise relating to the subject matter of this agreement that is not contained in it shall be valid or binding.

ASSIGNMENT

10. Neither this agreement nor any duties or obligations under this agreement shall be assigned or delegated by the **"Consultant"** without the prior written consent of the City except provided in Paragraph 3. In the event of an assignment and/or delegation by the **"Consultant"** to which the City has consented, the assignee or the assignee's legal representative shall agree in writing with the City personally to assume, perform, and be bound by the covenants, obligations, and agreements contained in this agreement.

PARTIES BOUND

11. This agreement shall be binding on and inure to the benefit of the parties to this agreement and their respective heirs, executors, administrators, legal representatives, successors, and assigns unless expressly prohibited by this agreement.

ATTORNEY'S FEES

12. If any action at law or in equity is brought to enforce or interpret the provisions of this agreement, the prevailing party shall be entitled to reasonable attorney's fees in addition to any other relief that may be available.

GOVERNING LAW

13. The validity of this agreement and of any of its terms or provisions, as well as the rights and duties of the parties to this agreement, shall be governed by and construed in accordance with the laws of the State of New Jersey.

AMENDMENT

14. This agreement only be amended or modified by writing executed by both parties to this agreement.

LEGAL CONSTRUCTION

15. In case any one or more of the provisions contained in this agreement shall for any reason be held to be invalid, illegal, or unenforceable in any respect, the invalidity, illegality, or unenforceability shall not effect any other provision of this agreement and this agreement shall be construed as if such invalid, illegal, or unenforceable provision had never been contained in it.

NOTICE

16. All notice and other communications shall be sent by certified mail, return receipt requested, and shall be deemed to have been given when sent to the parties at their respective addresses as set forth above, unless a different address has been selected after the execution of this agreement and has been duly communicated to the party giving notice.

IN WITNESSED WHEREOF, the parties execute this agreement on the day and year first written above.

Attest:

City of Orange Township

Joyce L. Lanier
Municipal Clerk

Dwayne D. Warren, Esq.
Mayor

Attest:

Mott MacDonald
111 Wood Avenue South
Iselin, New Jersey 08830

Approved as to Form and Sufficiency

Gracia R. Montilus, City Attorney

CITY OF ORANGE TOWNSHIP
FINANCE DEPARTMENT

CERTIFICATION OF FUNDS
NEXT WATER OPERATING BUDGET

I, Nile Clements, Chief Financial Officer for the City of Orange Township, do hereby confirm that based on the Quote or RFP, RFQ, bid results or "extraordinary unspecifiable services" without competitive bids for 2023 service contract, and the resolution to be presented to the Council for approval, and contingent upon Council approval and inclusion of said item in the Temporary Budget and adopted 2023 Budget, there will be sufficient funds to contract with:

Vendor Name: Mott Macdonald

Address: 111 Wood Ave South

City: Islein
State: New Jersey
Zip Code: 08830-4112

Purpose: Professional enginnering services for multiple waterprojects

Vendor ID: HATCH010

Fund: Water Operating Fund
Line Description WTR - Water Operating - Professional Services
Account Numbers(s): CY'23 3-05-55-502-192-519 $ 200,000.00

Purchase Order # : 23-00482

Amount not to exceed: $ 200,000.00

Division Head Date

Nile Clements 2/9/2023

Chief Financial Officer Date

CITY COUNCIL **The City of Orange Township, New Jersey**

DATE December 20, 2022 **NUMBER** 508-2022

TITLE:

A RESOLUTION APPROVING QUALIFIED CONSULTANT ENGINEERS TO PROVIDE CONSULTING ENGINEERING ON AN "AS NEEDED" BASIS FOR ONE (1) YEAR COMMENCING JANUARY 1, 2023 THROUGH DECEMBER 31, 2023.

WHEREAS, the City of Orange Township did duly advertise on November 22, 2022, for Request for Qualifications for Consulting Engineering Services; and

WHEREAS, on December 7, 2022, the City of Orange Township received ten (10) qualification proposals; and

WHEREAS, pursuant to the fair and open process, and based upon review of the qualifications and recommendations therefore, certain professionals are qualified to provide consulting engineering services on an "as needed" basis by the City of Orange Township; and

WHEREAS, the Director of Public Works Engineering having evaluated all proposals submitted based upon qualifications, experience with similar projects, and project understanding; and

WHEREAS, this is not a contract and is only a list of qualified professionals. Another resolution shall be needed to enter a contract setting forth the rates and terms.

NOW, THEREFORE, BE IT RESOLVED that the Municipal Council of the City of Orange Township does hereby approve those listed below to provide professional consulting engineering services to the City of Orange Township on an "as needed" basis for the period of January 1, 2023 through December 31, 2023:

1. Remington & Vernick Engineers
   2059 Springdale Road
   Cherry Hill, New Jersey 08003

2. Pennoni Associates
   24 Commerce Street, Suite 300
   Newark, New Jersey 07102

3. Lewis Consulting Group
   2604 Atlantic Avenue, Suite 600
   Wall, New Jersey 07719

4. T&M Associates
   1455 Broad Street, Suite 250

APPROVED AS TO FORM, SUFFICIENCY AND LEGALITY

A. Mizrahi

Bloomfield, New Jersey 07003

5. Neglia Engineering
   34 Park Avenue
   Lyndhurst, New Jersey 07071

6. Mott MacDonald
   412 Mt Kemble Avenue Suite G22
   Morristown, New Jersey 07960

7. Matrix New World Engineering
   26 Columbia Turnpike
   Florham Park, New Jersey 07932

8. CP Engineers
   11 Park Lake Road
   Sparta, New Jersey 07871

9. Colliers Engineering & Design
   331 Newman Springs Road, Suite #203
   Red Bank, New Jersey 07701

10. Frank J. Rotonda, P.E., P.P., C.M.E., LLC
    5383 Gagnon Terrace
    North Port, FL 34291

BE IT FURTHER RESOLVED that a copy of this resolution shall remain on file in the Office of the Municipal Clerk of the City of Orange Township.

Joyce L. Lanier
City Clerk

Tency A. Eason
Council President

REQUIRED EVIDENCE
AFFIRMATIVE ACTION REGULATIONS
P.L. 1975, C. 127 (N.J.A.C. 17:27-3.2)

Before being awarded a contract, bidders are required to comply with the requirements of P.L. 1975, C.127, (N.J.A.C. 17:27-3.2). Within seven (7) days after receipt of the notification of intent to award the contract or receipt of the contract, whichever is sooner, the contractor should present one of the following to the Purchasing Agent:

1. **A photocopy of a valid letter from the U.S. Department of Labor that the contractor has an existing federally-approved or sanctioned Affirmative Action Plan (good for one year from the date of the letter);**

OR

2. **A photocopy of approved Certificate of Employee Information Report issued in accordance with N.J.A.C. 17:24-4;**

OR

3. **An initial Employee Information Report (Form AA302) provided by the Affirmative Action Office and completed by the bidder in accordance with N.J.A.C.17:27-4;**

OR

4. **All successful construction contractors must submit within three days of the signing of the contract an Initial Project Workforce Report (AA201) for any contract award that meets or exceeds the Public Agency bidding threshold (available upon request) in accordance with N.J.A.C.17:27-7.**

NO FIRM MAY BE ISSUED A CONTRACT UNLESS IT COMPLIES WITH THE AFFIRMATIVE ACTION REGULATIONS OF P.L. 1975, C.127.

The following questions must be answered by all bidders:

1. **Do you have a federally-approved or sanctioned Affirmative Action Program?**

   Yes_____ **No** X

   If yes, please submit a copy of such approval

2. **Do you have a Certificate of Employee Information Report Approval?**

   Yes X **No**_____

   If yes, please submit a copy of such certificate

The undersigned contractor certifies that he is aware of the commitment to comply with the requirements of P.L. 1975, C.127 and agrees to furnish the required documentation pursuant to the law.

Company: Mott MacDonald, LLC **Signature:** Stephen B. Polen

Title: Senior Vice President

Certification 2062

CERTIFICATE OF EMPLOYEE INFORMATION REPORT
RENEWAL

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of 15-AUG-2021 to 15-AUG-2024

MOTT MACDONALD, LLC
111 WOOD AVE. SOUTH, 5T FLOOR
ISELIN NJ 08830

ELIZABETH MAHER MUOIO
State Treasurer

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE
N.J.S.A. 10:5-31 et seq. (P.L. 1975, C. 127)
N.J.A.C. 17:27
GOODS, PROFESSIONAL SERVICE AND GENERAL SERVICE CONTRACTS

During the performance of this contract, the contractor agrees as follows:
The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union of the contractor's commitments under this chapter and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

The contractor or subcontractor agrees to make good faith efforts to meet targeted county employment goals established in accordance with N.J.A.C. 17:27-5.2.

The contractor or subcontractor agrees to inform in writing its appropriate recruitment agencies including, but not limited to, employment agencies, placement bureaus, colleges, universities, and labor unions, that it does not discriminate on the basis of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex, and that it will discontinue the use of any recruitment agency which engages in direct or indirect discriminatory practices.

The contractor or subcontractor agrees to revise any of its testing procedures, if necessary, to assure that all personnel testing conforms with the principles of job-related testing, as established by the statutes and court decisions of the State of New Jersey and as established by applicable Federal law and applicable Federal court decisions.

In conforming with the targeted employment goals, the contractor or subcontractor agrees to review all procedures relating to transfer, upgrading, downgrading and layoff to ensure that all such actions are taken without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex, consistent with the statutes and court decisions of the State of New Jersey, and applicable Federal law and applicable Federal court decisions.
The contractor shall submit to the public agency, after notification of award but prior to execution of a goods and services contract, one of the following three documents:

Letter of Federal Affirmative Action Plan Approval

Certificate of Employee Information Report

Employee Information Report Form AA302 (electronically provided by the Division and distributed to the public agency through the Division's website at www.state.nj.us/treasury/contract_compliance)

The contractor and its subcontractors shall furnish such reports or other documents to the Division of Public Contracts Equal Employment Opportunity Compliance as may be requested by the office from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Public Contracts Equal Employment Opportunity Compliance for conducting a compliance investigation pursuant to Subchapter 10 of the Administrative Code at N.J.A.C. 17:27.

Vendor Signature: _____ **Date:** December 1, 2022

Stephen B. Polen, Senior Vice President

BUSINESS ENTITY DISCLOSURE CERTIFICATION
FOR NON-FAIR AND OPEN CONTRACTS
Required Pursuant To N.J.S.A. 19:44A-20.8
CITY OF ORANGE TOWNSHIP, NEW JERSEY

Part I – Vendor Affirmation
The undersigned, being authorized and knowledgeable of the circumstances, does hereby certify that

Mott MacDonald LLC **(Contractor)**

has not made and will not make any reportable contributions pursuant to N.J.S.A. 19:44A-1 et seq. that, pursuant to P.L. 2004, c. 19 would bar the award of this contract in the one year period preceding the date of reorganization to any of the following named candidate committee, joint candidates committee; or political party committee representing the elected officials of the *CITY OF ORANGE TOWNSHIP* as defined pursuant to N.J.S.A. 19:44A-3(p), (q) and (r).

Dwayne D. Warren	
Kerry J. Coley	
Clifford Ross	
Weldon M. Montague, III	
Tency A. Eason	
Quantavia L. Hilbert	
Adrienne Wooten	
Jamie Summers-Johnson	

Part II – Ownership Disclosure Certification
☒ I certify that the list below contains the names and home addresses of all owners holding 10% or more of the issued and outstanding stock of the undersigned.

Check the box that represents the type of business entity:
☐Partnership ☐Corporation ☐Sole Proprietorship ☐Subchapter S Corporation
☐Limited Partnership ☒Limited Liability Corporation ☐Limited Liability Partnership

Name of Stock or Shareholder	Home Address
SEE ATTACHED OWNERSHIP DISCLOSURE STATEMENT	

Part 3 – Signature and Attestation:
The undersigned is fully aware that if I have misrepresented in whole or part this affirmation and certification, I and/or the business entity, will be liable for any penalty permitted under law.

Name of Business Entity: Mott MacDonald LLC

Signed: _____ Title: Executive Vice President

Print Name: Philip LiVecchi Date: December 1, 2022

Subscribed and sworn before me the 1ST day of December, 2006 2022

My Commission expires: Karen Marcotullio

_____
(Affiant)

Mark O'Connor, Asst. Secretary
(Print name & title of affiant) (Corporate Seal)

KAREN MARCOTULLIO
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Oct. 24, 2025

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name:	MOTT MACDONALD LLC
Trade Name:	
Address:	111 WOOD AVENUE SOUTH ISELIN, NJ 08830-4112
Certificate Number:	1169109
Effective Date:	August 01, 2005
Date of Issuance:	July 25, 2016

For Office Use Only:

20160725083242072

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give Form to the requester. Do not send to the IRS.

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.
Mott MacDonald Group, Inc.

2 Business name/disregarded entity name, if different from above
Mott MacDonald, LLC

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☑ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) 5

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.
111 Wood Avenue South

Requester's name and address (optional)

6 City, state, and ZIP code
Iselin, NJ 08830

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number: ___ - ___ - ____

or

Employer identification number: 22-3789761

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ [signature] Date ▶ 1/6/2020

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

MOTT MACDONALD

Water System Consulting Engineer

Qualifications for Professional Services for Calendar Year 2023

February 2023

City of Orange

MOTT MACDONALD

Mr. Christopher Hartwyk
Business Administrator
City of Orange
29 N. Day St
Orange, NJ 07050

Qualifications for 2023 Professional Services
Water System Consulting Engineer
City of Orange, New Jersey

February 1, 2023

412 Mt. Kemble Avenue
Morristown, NJ 07960
United States of America

T +1 (908) 730-6000
F +1 (973) 267-2890
www.mottmac.com

Dear Mr. Hartwyk,

As an official of the City of Orange, you understand the challenges of providing vital services to the people of New Jersey, and protecting their health and safety. Delivering vital services and maintaining public works infrastructure while protecting a community's health, safety, and welfare and controlling costs is a universal challenge. Mott MacDonald understands those challenges. Our roots are in New Jersey, our headquarters are here, and we are proud to have delivered hundreds of successful projects to municipalities across the state.

New Jersey has some of the oldest communities in the country, with some of the oldest infrastructure. In a state where residents already pay some of the highest taxes in the US, controlling costs is essential. With practice areas that include aviation, bridges, environmental remediation, highways, tunnels, and water and wastewater systems, Mott MacDonald is well qualified to meet your engineering needs.

We invite you to review our staff's qualifications and experience information herein. We look forward to working with you. If you have any question, please contact me directly.

Very truly yours,

MOTT MACDONALD, LLC

Earl Schneider, PE
Senior Vice President
Water Supply Group
T 973.912.2574 F 973.376.1072
earl.schneider@mottmac.com

Contents

Executive summary

Mott MacDonald would be pleased to provide Water Commission Services to the City of Orange in accordance with the Request for Qualifications.

With a lineage stretching back over a century including involvement in the design and construction of the most ambitious infrastructure projects and a multi-disciplined staff with comprehensive engineering skills, Mott MacDonald possesses the practical knowledge and experience needed to meet the technical challenges of any given project. Our approach is strictly client-focused with a corporate commitment to engineering excellence.

Mott MacDonald would like to be considered for the following services:

- **Water Systems Consulting Engineer**

Mott MacDonald's services to the Town will be administered and conducted from our office located in Morris Township with support from our Corporate headquarters in Iselin New Jersey. Our more than 400 professional engineers, scientists, construction managers and supporting resources in our New Jersey offices will deliver the nationally recognized technical staff specifically matched to your project's needs.

We have structured our proposal to be fully responsive to the Town's Request for Qualifications (RFQ) and as such, offer the following:

- In Section 1, we have provided our Statement of Qualifications, which includes a brief company background and our Engineering Services Profile.
- In Section 2, we have provided a listing of Relevant Experience & References which includes our Annual Services Summary.
- In Section 3, we have provided an organizational chart that illustrates the managerial structure of our team and the resumes of key individuals that will assist Mr. Earl Schneider in completing required tasks as required by the Town.
- In Section 4, we have provided our fee schedule which sets forth an hourly fee for the requested services and additional services beyond the scope of regular services.
- In Section 5, the Required Documents section, we have provided the Town with executed forms, documents and our standard form of contract as required by the RFQ.

If selected as Water System Consulting Engineer for the Water Commission, Mott MacDonald will perform water system engineering consulting services including but not limited to; Water distribution system, treatment system, hydrogeological, resource, mechanical, electrical, civil & site engineering, construction administration and inspection services as needed; annual water engineering consulting services including but not limited to; services related to water availability and water reservation reviews, future water demand forecasts, water audits, Public Supply Improvement (PSI) Plan, regulatory compliance services including but not limited to updating Emergency Response Plans, Cybersecurity Programs, submittal action compliance with the existing Water Allocation Permit, and Water Quality Accountability Act (WQAA) requirements and general water services is it relates to preparing RFQ and bid packages for various capital improvement projects for the DWC; Instrumentation & control system design, PLC programing and HMI Programing, SCADA system

development and maintenance for water treatment and distribution system; Engineering & inspection services for water storage tanks not limited to inspection & evaluation of existing tanks and inspections of coatings and modifications during rehabilitation; Performs bridge engineering and inspection services not limited to design, construction and inspection services.

1 Statement of Qualifications

Delivering New Jersey's water

New Jersey's varied terrain poses challenges to water source availability and accessibility, requiring innovative water treatment and distribution design and construction solutions. New Jersey's coastal communities contend with saltwater intrusion from the Atlantic Ocean, while historically industrial counties deal with sources impacted by complex discharges.

#33

among *Engineering News-Record's* Top 500 Design Firms

Providing safe and reliable drinking water requires planning above all else. Source availability and quality, demand projections, system analysis, constructability, and capital improvement costs must be evaluated in conjunction with system sustainability, resilience, and adaptability to climate change.

Mott MacDonald has been providing planning services for New Jersey water utilities for 80 years. Our knowledge of the interconnected nature of water systems throughout the state, and the associated regulatory requirements, is unparalleled.

Every project presents unique opportunities for Mott MacDonald's staff to provide innovative customized solutions, whether for long-term projects, annual agreements, or immediate and specific needs. Our solutions consider site-specific environmental and groundwater conditions that affect treatment and/or construction methods.

At the core of our capabilities is the ability to implement the solutions recommended through planning efforts. Our full range of expertise — preliminary/detailed design, permitting, construction engineering, and facility commissioning — allows us to deliver projects involving sources of supply, treatment, transmission and distribution, storage, and residuals.

$350 M

NJ Drinking Water Revolving Fund

For every solution, Mott MacDonald considers local economic requirements, particularly the need to maintain system operations and minimize construction impacts to traffic, public health, and safety. This is particularly critical for the buried infrastructure that transports and distributes drinking water throughout the state. Our construction experts select methods conducive to the setting, ranging from congested urban settings to open space.

Employing visual and analysis tools including condition-based assessments, surveys, and geographic information systems (GIS), Mott MacDonald helps clients safeguard existing components and prioritize capital improvements. Our hydraulic and computational fluid dynamics modeling and GIS specialists employ specialized tools to optimize design efficiency

Across New Jersey, Mott MacDonald's clients depend on our dedicated staff of engineers, hydrogeologists, scientists, and management professionals to develop innovative solutions to their complex water source and supply challenges.

Our project managers and staff look forward to working as a dedicated partner with clients like you.

Opening opportunities with connected thinking

Our clients face some of the planet's most intricate challenges. As a global engineering, management, and development firm, Mott MacDonald faces them with you.

Management – Our network of experts, active in 150 countries, finds opportunities in complexity, turning obstacles into elegant, sustainable solutions. By looking at problems from a fresh angle, we aim to add value at every stage, for our clients — you — and the lives you touch every day.

Consulting – Mott MacDonald (www.mottmac.com) is one of the world's largest employee-owned companies, with 16,000 employees and over 180 offices delivering sustainable outcomes worldwide. We work on projects in the transportation, buildings, power, oil and gas, water and wastewater, environment, education, health, international development, and digital infrastructure sectors.

Mott MacDonald in North America is a vibrant infrastructure development and engineering company with over 60 offices and 2,400 staff in the United States and Canada.

Markets – Mott MacDonald offers services to its clients in the following areas:

- Aviation
- Buildings
- Coastal
- Digital infrastructure
- Education
- Environment
- Health
- Highways and bridges
- Industry
- International development
- Municipal Engineering
- Oil and gas
- Ports
- Power
- Rail and transit
- Survey
- Transportation planning
- Transportation technology
- Tunnels
- Urban development
- Water and wastewater

Mott MacDonald partners with clients to fund, plan, design, and deliver projects to meet and sustain their strategic goals. We're connected across sectors and geographies, with global and regional sector leaders providing expertise and sharing knowledge and solutions, giving clients access to exceptional breadth and depth of expertise and experience.

Our focus on innovative approaches and corporate dedication to quality has been widely recognized with accolades from our clients and numerous industry awards. We strive to provide customer satisfaction through professional excellence.

Better

Economic development
Social outcomes
Environmental outcomes
Return on investment

Our approach

Your project's unique requirements shape our project approach. Our engineers, architects, and scientists work with our in-house specialty groups to seamlessly integrate all of the required disciplines for a successful project. Such collaboration provides efficiency and consistency based on knowledge and experience gained from previous projects. Mott MacDonald staff hold positions in many professional societies and organizations, so we stay abreast of applicable changes in regulations and building codes.

Funding your project

However important and well-designed your project is, without funding it may never be realized. As part of our mission of delivering solutions, Mott MacDonald helps clients access millions of dollars in grants and low-interest loans from federal, state, and local agencies. This funding has enabled our clients to expand the reach of their projects, or to implement projects that would otherwise be impossible. Our Project Managers know the relevant funding sources, deadlines, and requirements, and have guided clients through multiple grant processes.

Achieving excellence

Mott MacDonald is committed to the professional development of our staff, which is accomplished through learning and development programs, professional excellence initiatives, knowledge sharing, mentoring, and career development reviews.

Our CLASS (Communication, Leadership, Assurance of quality, Supervision, and Staff competence) program integrates many of our management principles to continually guard against systemic risks. Our management drives a safety culture throughout the organization, supported by full-time safety specialists, safety committees, training programs, awareness campaigns, and rigorous monitoring.

Risk management

Managing risk is a vital component of responsible infrastructure project delivery. The key is to identify and evaluate potential risks that may be associated with your project during planning, design, construction, commissioning, and long-term operation. The earlier risks are identified, the greater the opportunity to develop mitigation measures and strategies to offset or avoid the potential consequences.

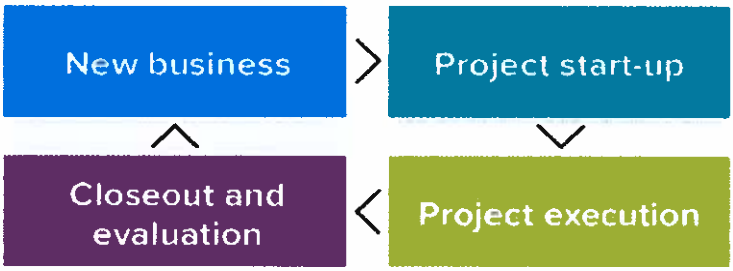
Project management and project control

Mott MacDonald is committed to the quality of the services we provide, and to the implementation of a process of continual improvement. We provide quality services based on skill, care, and diligence.

The Mott MacDonald approach to Project Management is based on employing modern management techniques to achieve defined objectives of scope, schedule, cost, quality, and participant satisfaction. Our Project Managers are responsible for ensuring that all areas defining scope of work are covered and agreed upon by stakeholders, and that a written scope of work is prepared based on an agreed-upon statement of requirements. We employ sophisticated and highly functional software to set up budgets for projects and monitor costs as the work progresses.

Quality

Mott MacDonald employs a proprietary Business Management System (BMS) that complies with ISO 9001:2008 – Quality Management, and operates in conjunction with other management functions including the Mott MacDonald Environmental and Safety Management System.



Our BMS brings you value in the execution of each service provided, and instills a culture of progressive improvement. As a fully integrated part of the administration, project management, business, and design processes, the BMS also provides a venue for your feedback. The BMS program is audited internally and externally each year by an independent, accredited, external auditor to ensure compliance with the ISO standard.

Upholding ethics

Mott MacDonald was the first consulting firm to be certified to BS 10500, an antibribery management standard recognized as the most stringent in the world. Adherence to our Corporate Code of Conduct is a requisite of employment, helping to ensure that all employees uphold this standard, protecting our reputation. Mott MacDonald is committed to the highest standards of business ethics and conduct. Our ethical standards are at the heart of our identity.

Protecting health and safety

Safety is of utmost importance to our projects, as outlined in our Injury & Illness Prevention (IIP) Program. Our Group Health and Safety Policy reflects this importance with a commitment to complying with statutory standards and incorporating reasonable practical standards for minimizing risk to our employees. Our IIP Program establishes a common framework for executing safety protocols in these areas:

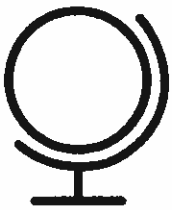
- Responsibility
- Compliance
- Communication
- Hazard assessment
- Accident/exposure investigation
- Hazard correction
- Training and instruction
- Recordkeeping

Delivering sustainable solutions

Mott MacDonald engineers help clients build infrastructure projects. Many of these, by design, are intended to mitigate environmental impacts. Our external focus is to consider feasible sustainable elements in all of our projects, seeking third-party certifications where applicable or desired (LEED, STARS, etc.). Our leadership in sustainability with ENVISION certified staff has helped to safeguard natural resources, win public recognition, and generate funding for our clients.

#15

2016 ENR Top 100 Green Building Design Firms



Since incorporating sustainability principles must be done deliberately, we have developed a proprietary guide that provides our staff with a process that is implemented at project inception to assure that sustainability principles are considered at an early stage, and throughout the development of the project. Our "Sustainability Guide" is part of our work process, and incorporates the use of a number of tools designed to assess the impact and footprint of a project and alternatives at the planning stage.

Corporate citizenship

At Mott MacDonald, we wish to be contributing members of the communities in which we live and work. Our Corporate Social Responsibility (CSR) program involves giving back to these communities — participating in charitable and social programs to benefit those less fortunate than ourselves. Our CSR program relies on branch office representatives across North America who coordinate and promote local and regional community, civic, professional, and charitable events.

Taking PRIDE in our work

Our approach to serving our clients and communities can be summed up in one word: PRIDE.

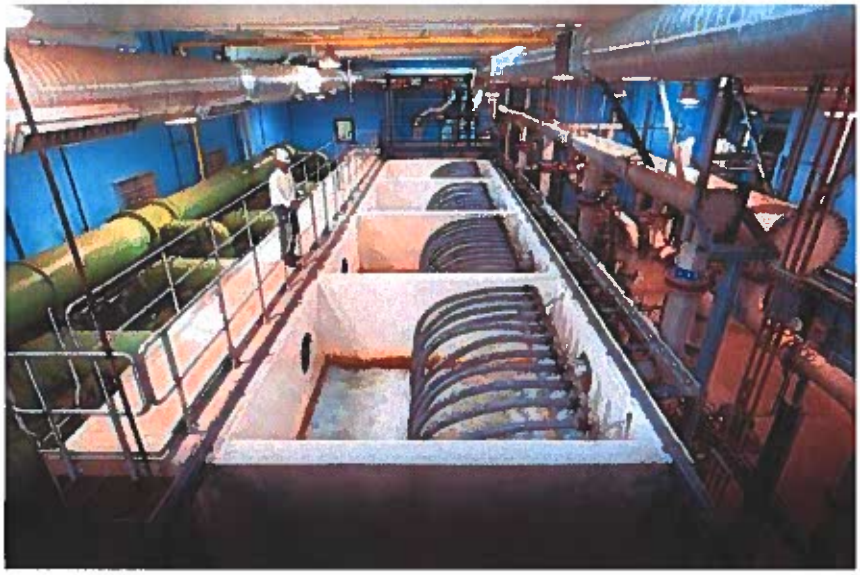
Progress. We embrace change and continuous improvement. We seek sustainable outcomes for our stakeholders and the environment. We actively support the development of our staff and our professions.

Respect. We respect the environment and the communities in which we work. We value all peoples and cultures equally. We treat everyone with respect.

Integrity. We deliver on our promises. We behave ethically and do not tolerate bribery or corruption. We promote a safety culture, targeting zero harm to all.

Drive. We aim to exceed our clients' expectations. We encourage teamwork and deliver to the best of our ability. We work hard for professional and commercial success.

Excellence. We uphold leading-edge technical, professional, and safety standards. We develop innovative, efficient solutions that create value for our clients. We are proud of our heritage and our achievements.

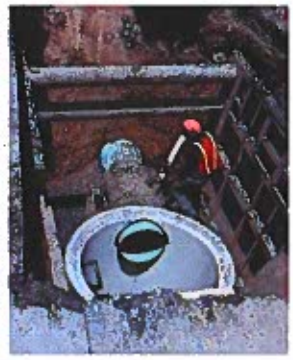


Utilities

Mott MacDonald is a proven leader in the field of water, water resources, and wastewater engineering, with some of our client relationships dating back over five decades. Drawing upon our vast resources and talented professionals in these areas of practice, we have the experience and expertise to effectively meet the needs of our municipal utility and regional utility authority clients.

Utilizing our strengths in water system planning, hydraulic analysis, water supply, treatment, distribution, and storage, Mott MacDonald performs design, permitting, and construction management services for projects of all magnitudes and complexities. Equally experienced in wastewater planning and management, our engineers design and implement projects involving wastewater collection, conveyance, and treatment facilities of all types and sizes. On a municipal level, we specialize in sanitary sewer master planning, evaluations, sewer metering, and infiltration/inflow identification, and reduction programs. In addition, our services include combined sewer overflow (CSO) storage and conveyance facilities; sanitary sewer, pump station, and treatment system rehabilitation; as well as design and construction management related to new wastewater facilities.

At Mott MacDonald, we are keenly aware of the regulations that govern wastewater planning and design, and are successful in aiding municipalities with compliance despite the ever-changing regulatory policies, procedures, and requirements. In addition, our firm is experienced in helping municipalities to identify funding sources and obtain low-interest loans and grants through various state and federally backed programs.



2 Relevant Experience & References

Experience with the City of Orange

Mott MacDonald presently provides the City with professional engineering services on for the water and sewer utilities. Our staff of professionals is keenly aware of the issues and the needs of the City, and it is in line with the direction that the City is moving to improve life and culture conditions for its diverse group of residents and businesses.

Mott MacDonald is currently providing engineering services to the City on the following projects/appointments:

- Master Permit for Water Main Certification
- Campbell's Pond Regulatory Compliance
- Developer Reviews for Water and Sewer
- Cybersecurity Plan for Water System for WQAA Compliance
- Lead Service Line Inventory and Regulatory Compliance Support
- Surveying Support

Experience with Similar Tasks

Mott MacDonald has been providing services as water engineer for clients in New Jersey for decades. We can provide engineering services relating to planning, design, permitting and engineering services during construction, for an array of projects that could be encountered in a municipality like the City of Orange. We are a full-service engineering company who employs staff in a variety of specialty areas including hydrogeology, geology, environmental science, landscape architecture, planning, and all disciplines of engineering.

We maintain a fully qualified group of engineers, surveyors, draftsmen and scientists with significant experience in the completion of the tasks proposed by the Township. We are a full-service engineering firm with the ability to provide professional inspection using qualified individuals acceptable to the Township for the completion of the work in a timely and professional manner. We maintain a complete staff of structural, electrical, architectural, HVAC and instrumentation engineers, all with experience in water and wastewater facilities design and rehabilitation.

We provide water engineering services to a number of municipalities, utility authorities and private agencies throughout New Jersey including:

- Borough of Avalon (Cape May)
- Township pf Denville (Morris)
- Borough of Florham Park (Morris)
- Township of Freehold (Monmouth)
- Gordon's Corner Water Company (Monmouth)
- Hackettstown Municipal Utilities Authority (Warren)
- Jackson Township Municipal Utilities Authority (Ocean)
- Jersey City Municipal Utilities Authority (Hudson)
- Borough of Keyport (Monmouth)
- Lakewood Township Municipal Utilities Authority (Ocean)

- Monroe Township Utility Department (Middlesex)
- New Brunswick City (Middlesex)
- Newark City (Essex)
- Borough of Sea Girt (Monmouth)

3 Location & Qualifications

We maintain and operate a regional office in Morristown New Jersey. This regional office maintains a staff of 15+ employees and would be the primary service center for provision of professional services to the City of Orange.

Our Morristown Office is 13 miles from the Town's Administration Building, allowing us to provide attentive, efficient, and effective service.

Morristown Office
412 Mt. Kemble Avenue
Suite G22
Morristown, NJ 07960
Phone: 908.730.6000 / Fax: 973.267.2890

Municipal Engineering Point of Contact
Earl Schneider, PE
Cell Phone: 973.641.5264
Email: earl.schneider@mottmac.com

Key personnel assigned to serve the Town will be available to attend any required meetings and will provide emergency assistance 24 hours a day, 7 days a week.

We have demonstrated our availability during off-hours on numerous occasions with regard to emergency response services, attendance at municipal, county, or authority board meetings for numerous clients, and off-hour construction administration and inspection services.

NJ Office Staff Count

Iselin (HQ) – 407

Morristown – 23

Freehold – 43

Cape May - 12

Staff Qualifications

Mott MacDonald is a full-service engineering firm with the ability to provide professional engineering services using qualified individuals for the completion of the work in a timely and professional manner.

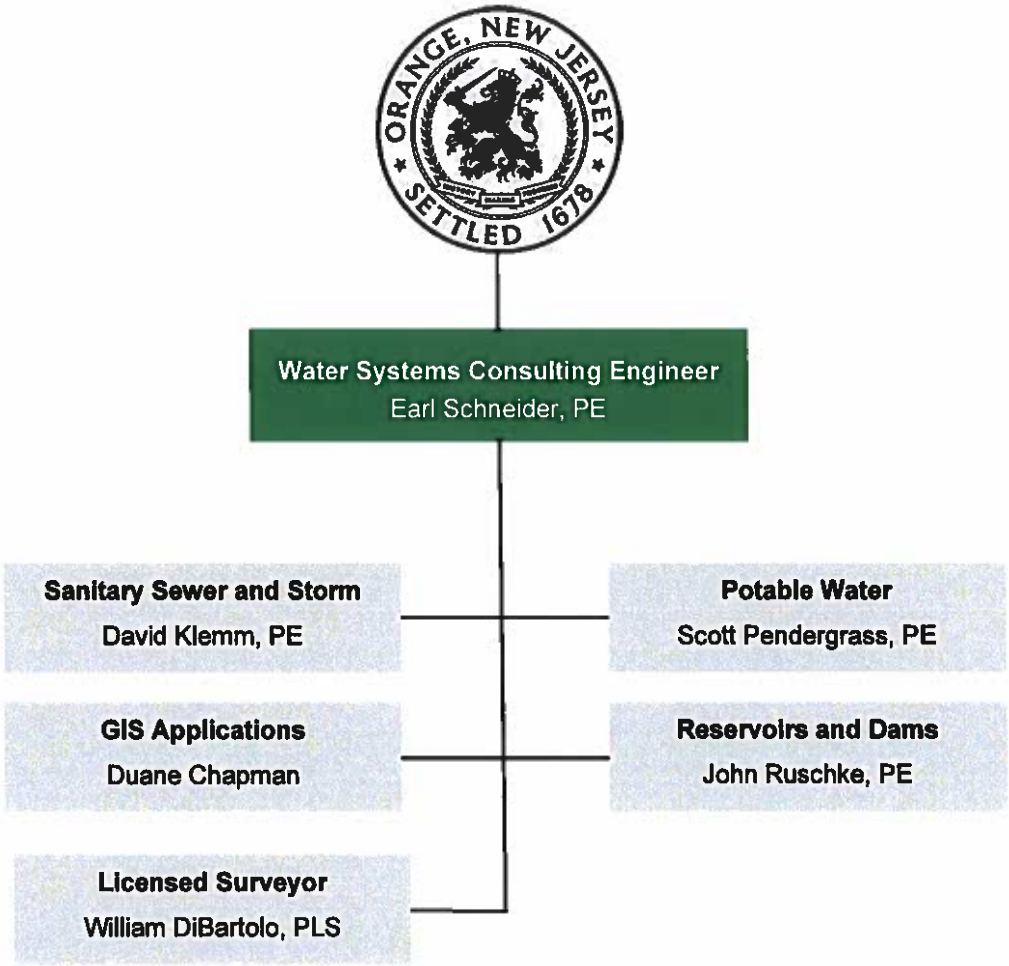
We have presented the Town with the below table detailing the various professional licenses held by employees of Mott MacDonald in the State of New Jersey and the number of each. Further, we also maintain surveyors, draftsmen and scientists with significant experience in the completion of tasks that may arise during this appointment.

License	# of Individuals
NJ Professional Engineer	144
Professional Engineer (outside New Jersey)	472
NJ Professional Planners	10
NJ Professional Land Surveyors	3
Professional Land Surveyor (outside New Jersey)	16
NJ Certified Municipal Engineer	22
NJ UST Certified Professional	5
Licensed Professional Geologist	12
Licensed Asbestos Inspectors	3
Licensed Landscape Architects	3
NJDEP Licensed Site Remediation Professional	18
Certified Flood Plain Managers (CFM)	9
LEED® Accredited Professional	47
Board Certified Environmental Engineer	16

Mott MacDonald proposes Mr. Earl Schneider, PE, to provide the Town with consulting engineering services related to the water commission. Mr. Schneider is a licensed Professional Engineer in the State of New Jersey and has extensive experience in in the planning, design, permitting, and construction of potable water supply projects, including surface and groundwater supply, treatment, transmission, pumping, and storage facilities. In addition to his extensive design experience, Mr. Schneider has focused a significant portion of his career on strategic planning, master planning, asset management practices, and information management system development for water and wastewater clients throughout the United States.

Organizational Chart

2023 Water Systems Consulting Engineering Services
City of Orange



4 Rate Schedule

MOTT MACDONALD

City of Orange
2023 Rate Schedule

Principals / Principal Project Managers / Principal Engineers	$221.00 to $313.00
Sr. Project Engineer / Sr. Project Architect / Sr. Project Manager / Sr. Project Geologist / Sr. Project Scientist	$167.00 to $286.00
Sr. Specialist V / Sr. Designer V	$151.00 to $216.00
Sr. Inspector IV/V / Sr. Surveyor IV/V	$140.00 to $221.00
Project Engineer / Engineer IV / Project Architect / Architect IV / Project Manager	$151.00 to $246.00
Project Geologist / Geologist IV / Project Scientist / Scientist IV	$124.00 to $198.00
Engineer II/III / Architect II/III	$119.00 to $200.00
Specialist III/IV / Designer III/IV.	$ 97.00 to $178.00
Scientist II/III / Geologist II/III	$ 86.00 to $144.00
Engineer I / Architect I	$ 92.00 to $138.00
Scientist I / Geologist I	$ 81.00 to $108.00
Inspector III / Surveyor III / Specialist I/II	$ 86.00 to $137.00
Assistant Surveyor I/II / Assistant Inspector I/II	$ 91.00 to $106.00
Technicians	$ 71.00 to $103.00
Administration / Project Support	$ 76.00 to $135.00

*** Hourly rates for special consultations and services in conjunction with litigation are available on request.**

EXPENSES

Personal Auto / Company Auto	$0.625[1] / mile
Company Vans / Company Pick-Up	$0.625[1] / mile
Photocopies & Offset Reproduction	Variable
UPS / Federal Express /Postage /Messenger Service	Variable
Subcontractors (including Contract Laboratory)	Direct + 15%
Mobile Devices	Variable
Field Equipment	Variable
Travel / Lodging Per Diem	As Incurred

[1]per IRS standard mileage rate (rate as of July 1, 2022 is shown – subject to change)

Invoices are payable within 30 days of invoice date.
Delinquent bills are subject to finance charges of 1.5% per month.
The client shall pay attorney fees, court costs, and related expenses incurred in the collection of delinquent accounts.

5 Resumes

MOTT MACDONALD

Earl C. Schneider, PE

Personal summary

Education:

MS, Civil Engineering, Rutgers University, 2000

BS, Civil Engineering, Lehigh University, 1988

Registrations:

Professional Engineer

NJ #24GE03939700, 1995
NY #095794, 2015
CA #C64951, 2003

RAM-W Training, Haestad Methods, 2002

OSHA Confined Space Entry

Years with Mott MacDonald:

32

Years with other firms:

2

Professional memberships:

New Jersey American Water Works Association

Mr. Schneider has experience in the planning, design, permitting, and construction of potable water supply projects, including surface and groundwater supply, treatment, transmission, pumping, and storage facilities. In addition to his extensive design experience, Mr. Schneider has focused a significant portion of his career on strategic planning, master planning, asset management practices, and information management system development for water and wastewater clients throughout the United States.

Employment history

1990 – Present	Mott MacDonald
1988 – 1990	Turner Construction
1986 – 1987	Torcon, Inc.

Selected projects

Water/Wastewater Infrastructure Replacement Planning (Contract 1154) Basic Ordering Agreement (BOA), Washington Suburban Sanitary Commission (WSSC), Laurel, MD: Project Director for the study, design, and permitting support for a variety of water/wastewater infrastructure replacement projects. The scope of the task orders has included wastewater force mains, gravity sewers, sewage pumping stations, and water transmission mains. (2018 – present)

PFAS Treatment Facilities, Ridgewood Water, Bergen County, NJ: Project Director for the design of multiple PFAS treatment facilities. The overall project involves design, permitting, bid, and construction phase services. (2020 – present)

PFAS Treatment Facilities, Livingston Township, Essex County, NJ: Project Director for the design of multiple PFAS treatment facilities. The overall project involves design, permitting, bid, and construction phase services. (2020 – present)

Hydraulic Model Development, City of Newark, Essex County, NJ: Project Director for the development and calibration of a new hydraulic modeling being built from the updated geographic information system (GIS) database. Project includes various analyses of the water distribution system in order to develop a capital investment plan. (2020 – present)

Hydraulic Model Development and Analysis, Pittsburgh Water and Sewer Authority (PWSA), Allegheny County, PA: Project Manager overseeing the development of transmission main flushing models using the WaterGEMS hydraulic model, involving identification of flushing sequences and durations to prepare system for introduction of orthophosphate corrosion inhibitor. Model analysis related to proper configuration of modeling elements at the Highlands 1 Reservoir and membrane treatment facility, including CT calculations and water age to first customers.

Hydraulic Model Development and Analyses, District of Columbia Water and Sewer Authority (DC Water), Washington, DC: Project management for the development of a Geographic Information System (GIS) and hydraulic model for seven gradient zones of the water system using Bentley's WaterGEMs. Work involved development of a 60,000 pipe system-wide model from the GIS. The model was calibrated using available SCADA information, pipeline coefficient tests, and additional hydrant flow tests. Ongoing services include analyses to support valve replacement projects, and Capital Improvement Program (CIP) planning. Responsibilities included development of a training manual and classroom training for hydraulic modeling. (2010 – present)

Raritan and Passaic System Hydraulic Models, New Jersey American Water (NJAW), Essex, Mercer, Morris, Middlesex, Somerset, and Union Counties, NJ: Project Director for the development and calibration of a model combining two large regional systems with an average daily demand of approximately 140 MGD. The model was developed from NJAW geodatabases and calibrated using the SCADAConnect feature in Bentley Systems WaterGEMS. The model was calibrated using hundreds of SCADA inputs to achieve tight tolerances for tank levels, pressures, and flow for a 24-hour maximum day demand extended period simulation (EPS). (2017)

Bryant Street Pump Station and Transmission Systems Transient Analysis, District of Columbia Water and Sewer Authority (DC Water), Washington, DC: Transient analysis for

four water transmission systems supplied by the 100 MGD Bryant Street Pump Station as part of a pump station rehabilitation effort. Analysis included Surge 2000 (University of Kentucky) model development, transient analysis, and recommendations for surge control devices. (2013)

Hydraulic Model Development, Ridgewood Township, Bergen County, NJ: Project Director for the development of a new, all-pipe hydraulic model of the water system developed from the Bentley Geographic Information System (GIS) database. Tasked with developing and calibrating a model, and providing water quality simulation to support the conceptual feedpoints for a corrosion inhibitor into the system to achieve compliance with the Lead and Copper Rule. The project included hydraulic modeling evaluation of a proposed interconnection to increase supplies to the water system during peak demand periods.

Hydraulic Model Development, New Jersey American Water (NJAW), Essex, Mercer, Morris, Middlesex, Somerset, Union, Burlington, Monmouth, and Ocean Counties, NJ: Project management for the development, calibration, and documentation of hydraulic models for NJAW's Burlington, Coastal North, and Raritan-Passaic water systems. These models were built from a Geographic Information System (GIS) database (also developed by HMM), and includes WaterGEMS models ranging in size from 37,000 to 120,000 pipes. Each modeling effort was fully documented with a Model Build Report. (2009)

Hydraulic Model Development and Analysis, Lakewood Township Municipal Utilities Authority, Ocean County, NJ: Project management for the development, calibration, and analysis of a water system model in support of the Authority's Master Plan.

Hydraulic Model Development and Analysis, Madison Borough, Morris County, NJ: Project management for the development, calibration, and analysis of a water system model. The model was converted from existing Geographic Information System (GIS) datasets and calibrated with hydrant flow tests. Basic pressure and fire protection analyses were performed.

Hydraulic Study for Harbortown Development, Harbortown Terrace, Perth Amboy, NJ: Managed an hydraulic analysis for sizing of water mains within the development to provide supply at adequate pressure and with adequate fire protection.

Water System Hydraulic Study, City of Perth Amboy, Middlesex County, NJ: Managed a comprehensive hydraulic study of the existing water system utilizing a WaterCAD model to investigate recommended water system improvements for existing and projected future water demands.

City of Elizabeth Mapping and Modeling, New Jersey American Water (NJAW), Union County, NJ: Prepared detailed mapping and developed a 5,000-pipe CYBERNET and EPANET hydraulic model of water system infrastructure for the City of Elizabeth (Liberty Water Company). Included field flow tests for calibration of model. Demand data entered into model through geocoding process within ArcView.

Feasibility Study of the Potable Water System's Fire Protection Capability, US Department of the Navy, Naval Facilities Engineering Command, Lakehurst, NJ: Constructed and calibrated a 300-pipe CYBERNET model of Naval Air Engineering Station (NAES) for the existing fire protection and potable water systems. Performed analysis on eliminating existing river water booster station for fire protection while maintaining adequate fire protection with potable water elevated storage system.

Water Supply and Treatment Study, Middlesex Water Co./Tidewater Utilities, New Castle County, DE: Constructed and calibrated a 300-pipe CYBERNET model of pumped storage system. Modeled hydropneumatic tanks and booster pumping from ground level storage to assess existing fire protection capacity. Interconnected independent water systems to determine combined fire protection capacity. Evaluated impact of fast-growing water demands on existing fire protection. Determined size and location for elevated storage tank. Evaluated variable speed pumping to provide constant pressure system.

Evaluation of Proposed Transmission Main and Interconnection, New Jersey American Water (NJAW), Morris County, NJ: Utilized existing KYPIPE model of the Southeast Morris County Municipal Utilities Authority (SMCMUA) to determine the impact of wheeling water from NJAW through the SMCMUA system to move water back into the southern portion of the NJAW system. Performed EPS and steady-state analyses to determine the impact to pressures and tank storage in SMCMUA's system. Sized booster station pumping requirements and HGL profile for 60,000 lf of proposed 30-inch diameter pipeline.

Report on Distribution System, Modeling, and Analysis for the Sunset Ridge Development, Livingston Township, Essex County, NJ: Constructed and calibrated a 400-

pipe model of the Township's high service gradient. Utilized the model to evaluate existing low pressure and tank-emptying problems and determine the impact on existing fire protection for proposed demands for future development. Made recommendations for reinforcing pipelines.

Phase III System Hydraulic Study, New Jersey American Water (NJAW), Plainfield, NJ: Extensive hydraulic study performed using a 7,500-pipe skeletal model of Phase III system. Study evaluated alternatives for increasing transmission capacity and pressure from the Raritan-Millstone and Canal Road Treatment Plants.

Salt Water Grid Hydraulic Study, Tosco Refinery, Perth Amboy, NJ: Hydraulic study of the 100 MGD cooling water system.

St. Charles District Hydraulic Study, MO-American Water Co., St. Charles, MO: Water system analysis using WaterCAD hydraulic model. Recommended water system improvements to the year 2020.

Perth Amboy Hydraulic Study, Utility Service Affiliates Perth Amboy, Middlesex County, NJ: Computer modeled hydraulic study to determine cost effective solutions for improving pressure and fire protection within the City.

Perfluorinated Chemicals (PFAS) Master Plan Study, Village of Ridgewood, Bergen County, NJ: Project Director for the development of a master plan to address elevated levels of PFOA and PFOS in over 50 groundwater wells and 30 points of entry. Study evaluated raw water quality, interim strategies for system operation, current treatment technologies using granular activated carbon (GAC) or AIX resins, site feasibility, and hydraulic analysis. Resulted in the development of a capital plan for a five-year program to build 14 centralized treatment facilities at a cost near $100 million.

Southeast Pennsylvania (SEPA) Source of Supply Development Plan, Aqua Pennsylvania, Delaware County, PA: Project Director for a comprehensive study to evaluate future water demands for the SEPA system and nearby satellite systems, evaluate future surplus/deficits, and identify and prioritize capital investments to increase future sources of supply to meet the demands in the system for the next 15 years. Identified over $70 million of future investment associated with approximately 26 capital investment projects. (2017)

2018 Comprehensive Planning Studies, San Diego and Ventura Water Systems, California American Water, CA: Project Director for updates to master plans for two systems supplying over 20 MGD to determine capital improvements over a 15-year planning period. Provided assistance in geographic information system (GIS) development, hydraulic model development from the GIS, model calibration from SCADA, water demand projections, surplus/deficit analysis, review of source of supply and production facilities, and evaluation of distribution and storage components. The project included a detailed condition assessment of numerous booster stations, and GIS-driven analysis of prioritized pipe replacement for buried infrastructure. (2017 – 2018)

Water System Master Plan, Town of Dover, Morris County, NJ: Project Director for the development of a 10-year capital improvement master plan. Work included geographic information system (GIS) development, hydraulic model development, calibration, and analysis, demand projections, regulatory compliance review, condition assessment of facilities and renewal planning, and document preparation to satisfy NJ Water Quality Accountability Act requirements. Plan resulted in identification of over 20 capital projects worth $16 million. (2017)

Comprehensive Planning Study, West Virginia American Water/City of Huntington, WV: Project Director for the development of a master plan for the distribution and storage components of the Huntington system, including detailed condition assessments of the booster station and buried assets in the system. Services included water demand projections, hydraulic model development, and analysis to support the recommended capital improvement program. (2014 – 2015)

Facility Plan, District of Columbia Water and Sewer Authority (DC Water), Washington, DC: Project management oversight for the development of the customer and demand projections for the 2014 Facilities Plan. Provided technical oversight for the reliability and redundancy analysis of transmission system improvements, including hydraulic and criticality modeling using Bentley Systems' WaterGEMS (2014)

Ten-Year Strategic Business and Capital Improvement Program (CIP), City of Newark, Essex County, NJ: Prepared a comprehensive Water System Master Plan, including the development of a WaterCAD hydraulic model integrated with the Geographic Information System (GIS). Project Manager for the development of a Strategic Business Plan based upon a

self-assessment of the Attributes of Effective Utility Management as promoted by the USEPA and other stakeholder groups. Prepared an Asset Management Plan based upon guidelines established in the International Infrastructure Manual. Developed a $500 million, 10-year water and sewer CIP. (2010 – 2011)

State-wide Comprehensive Planning Studies, California American Water (CAW), Various Sites, CA: Project Director for the performance of comprehensive planning studies for 13 of the 16 CAW water systems. Managed a team of more than a dozen engineers preparing planning documents to support an annual capital investment program of approximately $50 million statewide. (2010 – 2011)

Water Master Plan, Livingston Township, Essex County, NJ: Project Manager for the development and preparation of a Water System Master Plan. This effort included a review of water demand projections, source of supply analysis, condition assessment of well facilities, and condition assessment and hydraulic modeling of transmission and distribution infrastructure in order to develop the recommended 10-year Capital Improvement Program (CIP). The project included an Operations and Maintenance Evaluation, and the development of a Strategic Plan for the Water Utility.

Water Distribution System Master Plan and Geographic Information System (GIS) Mapping, Trenton Water Works, Mercer County, NJ: Project Manager for the development of a distribution system master plan to identify short-term and long-term capital improvements over a 15-year planning period. The effort includes customer and demand projections, assessment of pumping, transmission, distribution, and storage facilities, evaluation and recommendations for a formal asset management program, hydraulic modeling, and prioritized capital improvement project (CIP) recommendations. The GIS mapping effort included a field survey of approximately 5,200 existing system valves and 1,300 hydrants along 190 miles of roadway within the City limits. Field survey data was reconciled with existing AutoCAD water main maps, and drafted onto a new City-wide topographic land-base using ESRI's ArcGIS. (2008)

Water System Master Plan, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Manager for the development of a water utility master plan to identify short-term and long-term capital improvements over a 25-year planning period. The Authority provides water supply to a population of over 500,000, including both retail and wholesale customers. The Master Plan effort includes customer and demand projections, assessment of source, treatment, transmission, distribution, and storage facilities, evaluation and recommendations for a formal asset management program, hydraulic modeling, and prioritized capital improvement program (CIP) recommendations. (2006 – 2007)

Comprehensive Planning Studies, California American Water, Sacramento, CA: Project Manager for the development of three master plan studies for the Antelope, Lincoln Oaks, and Larkfield water systems. The planning effort included demand projections, source of supply analysis, production, distribution, and storage, and prioritized capital improvement program (CIP) for a 15-year planning period. These studies were developed under an accelerated schedule.

Comprehensive Planning Study, MO-American Water, Jefferson City, MO: Task Manager for the development of the demand projection and distribution and storage sections of the planning study. Effort included detailed analysis of anticipated customer and demand growth for a 15-year planning period. A hydraulic model was developed and calibrated to assist in the assessment of the distribution system.

Water Distribution System Master Plan, Passaic Valley Water Commission, Passaic County, NJ: Detailed analysis of water demands, interconnection, and pump station capacity for an 85 MGD water system. Prepared report detailing recommendations for water system improvements and capital expenditures over the next 50 years. Developed an 8,000-pipe CYBERNET hydraulic and water quality model. Development of detailed georeferenced mapping and Geographical Information System (GIS) for water distribution system (prepared in ARC/INFO and ArcView format). Review of open reservoir storage and chlorination and chloramination practices in water system. (2000)

Water System Master Plans, Tidewater Utilities, Odessa, DE: Performed detailed water demand analysis for present and future water needs for customers within the Camden, Rehobeth/Lewis, and Northwest service districts. Included development of hydraulic models for velocity and pressure analysis, fire protection analysis, and storage analysis.

Water System Master Plan, Southeast Morris County Municipal Utilities Authority, Morris County, NJ: Assisted in the preparation of a comprehensive report which provided an overview of the water distribution system, including past, present, and future production and consumption. The report also included a five-year water system improvement program targeted to achieve future demand requirements. Duties included interconnection evaluation, pumping efficiency evaluation (off-peak pumping), and extensive hydraulic modeling utilizing KYPIPE computer analysis.

Master Plan Update, Southeast Morris County Municipal Utilities Authority, Morris County, NJ: Constructed and calibrated a 3,000-pipe model utilizing CYBERNET 3.0 to replace the existing KYPIPE model. The model was used to determine fire protection, pump sizing, developer pipe sizing, trouble-shooting, and water quality analysis. This model includes 10 wells, eight booster stations serving eight service gradients, and 16 storage tanks.

Master Plan, South Brunswick Township, Middlesex County, NJ: Constructed and calibrated a 1,000-pipe CYBERNET model of the Township's water system. Based on the model, analyzed existing system pressures and velocities, fire protection, and tank balancing. Estimated the effect of the cleaning and lining program on fire protection, and modeled planned improvements including new well facilities and interconnections with neighboring purveyors. Performed EPS analysis.

Technical/Economic Feasibility Study to Improve Regional Resiliency of Northern New Jersey's Water Supply Infrastructure, North Jersey District Water Supply Commission, Passaic County, NJ: Project Director for a study and preliminary design to evaluate the resiliency of three regional and interdependent water systems providing 190 MGD to a population of approximately 1.4 million in 30 municipalities. The study covered the concept and preliminary design and cost estimates related to a new 150 MGD ultraviolet (UV) disinfection facility to treat water in a 600-MG uncovered finished water reservoir, optimizing reservoir yields through potential raw water transfers, drought mitigation solution by transferring up to 30 MGD between major watershed basins, and evaluating a 20 MGD interconnection between the three water systems. (2017)

Water System Improvements, Livingston Township, Essex County, NJ: Project Director for the design, permitting, bid, and construction phase services for an interconnection upgrade with the City of East Orange, SCADA improvements at well and tank facilities, and an upgrade for standby power at the North Hillside Booster Station. (2015 - 2017)

Interconnection Upgrades, Livingston Township, Essex County, NJ: Project Director for the design and construction of two new below-grade, prefabricated meter chambers and one meter chamber rehabilitation, for the New Jersey American Water wholesale sources of supply to the NJAW High Zone of the Township. New interconnections included flow control pressure regulating valves, which allow for pressure reduction and setting desired flow points. The new valves relieved an over-pressure issue in the High Zone during the winter, when the gradeline from NJAW is higher than the normal operating level of the Township tanks.

260-A Zone Modifications, City of Newark, Essex County, NJ: Project Manager and Lead Hydraulic Modeler for study and design phase to perform system modifications allowing additional gravity flow into this zone of the system in lieu of existing pumping operations. Project design will allow for short payback period on investment and reduces overall operation expenses of the water utility.

International Trade Center Water System Improvements, New Jersey American Water, Mount Olive, NJ: Project management for the design of approximately 18,000 feet of 16-inch diameter transmission main for various water system improvements to expand the system and provide interconnections with adjacent purveyors.

Core Revitalization Project, Trenton Water Works, Mercer County, NJ: Conducted a comprehensive water system study including field testing, hydraulic computer model calibration and analysis, and evaluation of the distribution system's ability to provide adequate fire flows throughout the "Core" area. Responsibilities included recommendations for system improvements and preparation of a water system study report. Prepared plans and specifications for the cleaning and lining of approximately 21,500 lf of existing water distribution mains, as well as the design of water service, valve, and hydrant replacements. Prepared plans and specifications for the replacement of approximately 4,500 lf of existing undersized water mains.

Water System Study and Water System Improvements, Caldwell Borough, Essex County, NJ: Assisted in a comprehensive water system study including field testing, hydraulic computer model calibration and analysis, and evaluation of the distribution system's ability to provide adequate fire flows throughout the system. Responsibilities included recommending improvements and preparation of a water system study report. Prepared plans and specifications for the cleaning and lining of approximately 20,000 lf of existing water distribution mains, as well as design of water service, valve, and hydrant replacements. Prepared plans and specifications for approximately 5,850 lf of 12-inch diameter transmission main.

1991-1999 Water System Improvements, Southeast Morris County Municipal Utilities Authority, Morris County, NJ: Prepared annual plans and specifications for water system improvements to the Authority's distribution system in accordance with the recommendations made in the Water System Master Plan. Duties included design of water main extensions, replacements, and abandonments, transmission main design, and valve chamber modification design.

Water System Improvements, Trenton Water Works, Lawrence and Hamilton Townships, NJ: Water system study including field testing and hydraulic model (CYBERNET) to evaluate water system improvements to increase fire protection. Prepared plans and specifications for 40,000 feet of cleaning and cement-mortar lining and 8,000 feet of water main replacement.

Water System Divestiture Study, Confidential Client, NJ: Project Director for a study to determine the capital improvement requirements to separate an existing municipal system from several other municipalities which are part of the current service area. Work involved a detailed source of supply versus water demand analysis to determine the potential surplus or deficit in each municipality based upon separating the systems. A hydraulic model was developed and calibrated to determine the required future system configuration and improvements required to separate the systems. The study evaluated various separation alternatives, including construction cost estimates for each alternative. (2017)

Pipeline Renewal Prioritization Study, Lynbrook and Merrick Systems, New York American Water, Nassau County, NY: Project Director for the development of geographic information system (GIS), hydraulic model, and pipeline renewal methodology and tools for the Lynbrook and Merrick Systems, which deliver 40 MGD of supply through a network of 1,200 miles of transmission and distribution piping. Pipeline renewal selection process prioritized using risk analysis, performance analysis, and coordination opportunity using numerous input criteria leverage using GIS. (2015)

Condition-Based Assessments of Buried Infrastructure, California American Water, Various Sites, CA: Developed a method of assessing the renewal needs for buried infrastructure in various water systems, including the Sacramento District, Monterey District, Coronado District, and Los Angeles District. The assessment is based upon a review of operation, maintenance, physical, and environmental datasets and hydraulic models within a GIS environment compared to the risk, performance, economic life, and opportunity associated with pipeline infrastructure. Provided expert testimony on renewal technologies to the California Public Utilities Commission. (2010)

Belleville Pump Station Feasibility Study, North Jersey District Water Supply Commission (NJDWSC), Essex County, NJ: Project Manager for a feasibility study for a pump station which would increase the capacity of the existing Elizabethtown/Newark/NJDWSC interconnection. The study was undertaken in response to an Administrative Consent Order (ACO) issued by the NJDEP during the 2002 drought emergency, with the objective of increasing the capacity for the transfer of water from the Raritan Basin to the Passaic Basin. During the same drought emergency, assisted with coordination of the testing of the Virginia Street Pump Station, and development of a plan to place the station into operation to maximize transfer through the interconnection.

Water Main Renewal Program, Journal Square North, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Director for the design of approximately 22,000 feet of pipeline renewal, including replacement and non-structural (cleaning and cement-mortar lining) and structural (polyurea and cured-in-place-pipe (CIPP)) rehabilitation methods. Design included the development of detailed plan drawings and specifications, and support for New Jersey Environmental Infrastructure Trust (NJEIT) funding.

Large Diameter Valve Replacements – Phase II, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Director for the design, permitting, New Jersey Environmental Infrastructure Trust (NJEIT) funding, bid, and construction phase services for the replacement

of 40 valves (ranging from 24-inches to 48-inches in diameter) in the City and along the Aqueduct. Work included alternative evaluation of using butterfly valves on the Aqueduct in lieu of double disc gate valves, providing a significant cost savings. Design considerations include an evaluation of required shutdowns, traffic control, and construction sequencing in a congested urban environment. (2017)

Relocation of Water Mains in Brick Sewers, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Director for the design and construction phase services to relocate water mains ranging from 8-inch to 24-inch diameter that were constructed within large brick sewers. Design included both water main relocation and replacement of brick sewer sections with low profile elliptical sections to separate the water and sewer systems.

Water Transmission Main Improvements, Bergen/Lafayette Wards, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Manager for the design of approximately 30,000 feet of cleaning and cement mortar lining and miscellaneous water main replacements. Design included the development of detailed plan drawings and specifications.

Water Transmission Main Slip Lining, Newark Avenue, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Manager for the design of a 30-inch diameter fused PVC slipline in a heavily congested area of the City in response to a failing section of approximately 6,000 feet of 36-inch diameter main. Effort included the evaluation of various rehabilitation techniques, design of replacement piping at a railroad crossing, railroad permitting, design and construction of a replacement utility bridge, and preparation of plans and specifications.

72-inch Diameter Main Phase I, New Jersey American Water, Franklin Township, NJ: Project management for the study and design of approximately 8,000 feet of 72-inch diameter and 48-inch diameter PCCP water transmission main. Project involved route evaluation, detailed field survey, route alignment, utilities relocation, pipe design, and permitting.

Fayette Street and High Street Water Main Extension, Utility Service Affiliates Perth Amboy, Middlesex County, NJ: Design and permitting for 8,000 feet of 20-inch diameter transmission main within the City.

Oak Lane Main Extension, Trenton Water Works, Mercer County, NJ: Prepared plans and specifications for an 1,100 lf 8-inch diameter main extension. Responsible for survey, layout, and design of main extension.

Bunker Hill Road Main Extension, Trenton Water Works, Mercer County, NJ: Prepared plans and specifications for a 2,000 lf 12-inch diameter main extension. Responsible for survey, layout, and design of main extension.

Mendham Interconnection, New Jersey American Water, Morris County, NJ: Prepared plans and specifications for a 14,000 lf 8-inch and 12-inch diameter main extension. Responsible for survey, layout, and design of main extension.

Halls Mill Road Water Main Extension, Freehold Township, Monmouth County, NJ: Prepared plans and specifications for a 6,000 lf 16-inch diameter main extension. Responsible for survey, layout, and design of main extension.

South River Basin Transmission Main Section B, Middlesex Water Company, Middlesex County, NJ: Assisted in the preparation of plans and specifications for a 23,000 lf 48-inch diameter transmission main. Duties included survey, layout, and design of transmission main.

Water System Improvements, Jersey Avenue to Park Avenue Water Main Extension, City of New Brunswick, Middlesex County, NJ: Prepared plans and specifications for a 5,600 lf 16-inch diameter water main extension. Responsible for survey, layout, and design of main extension.

Lakewood-Howell Route 9 Pipeline, New Jersey American Water, Monmouth and Ocean Counties, NJ: Contract administration for the construction of 8,000 feet of 16-inch diameter pipeline. Duties included shop drawing review, evaluation of horizontal directional drill for stream crossing, pay estimates, and field inspector coordination.

Morris/Somerset Transmission Improvements, New Jersey American Water, Morris and Somerset Counties, NJ: Prepared plans and specifications for 20,000 feet of 12-inch through 20-inch diameter water transmission main. Duties included layout, design, and permitting of transmission mains.

Water Geographic Information System (GIS), Passaic Valley Water Commission, Passaic County, NJ: Project Director for the survey of approximately 75,000 water utility assets utilizing

sub-centimeter GNSS Global Positioning System (GPS) equipment, and field verification of the Commission's retail customer database. Coordinated field crews, sub-consultants, and GIS staff for the successful completion of the project within a 7 month time frame. (2013 – 2014)

Water Geographic Information System (GIS), Trenton Water Works, Mercer County, NJ: Project Director for the creation of an enterprise geodatabase of water distribution utility assets. Coordinated weekly activities of field crews, sub-consultants, and GIS staff to produce a seamless database for the assets within the City boundary. The geodatabase will be leveraged for asset management, planning activities, and field operations. (2013 – 2014)

Water Distribution Utility Geographic Information System (GIS) Mapping, Middlesex Water Company, Iselin, NJ: Project Director for the creation of an ArcGIS enterprise geodatabase. Coordinated in-house and sub-consultant staff in the conversion of 1,500 miles of water distribution infrastructure from approximately 10,000 individual source records (system maps, valve cards, as-builts, workbooks, databases, etc.). Extensive QA/QC procedures were developed and implemented to meet client specifications.

Water Distribution System Asset Management, City of Wilmington, DE: Project Manager overseeing updates to the water system Geographic Information System (GIS) and the development of a new hydraulic model from the GIS. Managed the subsequent preparation of an Asset Management Plan for the distribution system. (2012)

Geographic Information System (GIS) Re-Engineering Study, Washington Suburban Sanitary Commission, Laurel, MD: Project Director for the development of a GIS Re-Engineering Study which included a needs assessment of current GIS practices (the "as-is" state) and, based upon a review of data, data processes, business processes, and GIS application needs, developed a plan for the future (the "to-be" state). (2007)

Storm and Sanitary Sewer Geographic Information System (GIS) Development, Hanover Township, Morris County, NJ: Project Manager for the development of a web-based storm and sanitary sewer GIS mapping and maintenance application. Work included a Global Positioning System (GPS) field survey of approximately 75 miles of storm and 80 miles of sanitary sewer features using Right-to-Know (RTK) survey for centimeter accuracy. Utilities were mapped to 100-scale topographic landbase and deployed through internet using ArcIMS.

Geographic Information System (GIS)/Information Management Systems (IMS) Needs Assessment and Mapping, East Windsor Municipal Utilities Authority, Mercer County, NJ: Developed needs assessment and master plan for IMS and GIS. Project included conversion of record plans for water and sewer system into a web-based GIS mapping system.

Phase I Geographic Information System (GIS)/Information Management Systems (IMS) Applications, East Windsor Municipal Utilities Authority, Mercer County, NJ: Based upon the GIS/IMS master plan, developed Phase I applications (first-year), including integration of GIS and Datastream's MP2 Maintenance Management software, development tracking system, water system hydraulic model integration with GIS, geodatabase, and data model, and training and setup on GIS.

Water and Sewer Geographic Information System (GIS) Mapping, Randolph Township, Morris County, NJ: Project Manager for the development of 200-scale water and sewer system GIS databases in ArcView. The project involved data conversion of paper copies of record plan information and field Global Positioning System (GPS) survey of facilities to develop the GIS database.

Water System Reliability Study, New Jersey American Water, Union County, NJ: Project Manager for the development of a Geographic Information System (GIS) database including the location and operating information for facilities within a 400 square mile service area, including pump stations, treatment facilities, well stations, tanks, and wholesale and emergency interconnections. Also developed a flow model for emergency response analysis.

Geographic Information System (GIS) Mapping, Rockaway Valley Regional Sewerage Authority, Morris County, NJ: Project Manager for the development of GIS mapping presenting spatial datasets within the Authority's service area to indicate that proposed development was consistent with the State's Redevelopment Plan.

Water Tunnel Geotechnical Evaluations, New York City Department of Environmental Protection, Queens, NY: Development of ArcView Geographic Information System (GIS) document management tool for the City's potable water supply tunnel system. Document management for more than 600 rock core boring locations, valve chambers, and tunnel shafts

with photos, boring logs, and additional design data. Development of geologic maps for over 25,000 feet of the Queens Water Tunnel.

Water and Sewer Geographic Information System (GIS) Mapping, Hackettstown Municipal Utilities Authority, Warren County, NJ: Development of planimetric landbase and capture of water and sewer features using Global Positioning System (GPS) mapped into ArcView. Data conversion of existing as-built documents. Development of hydrant maintenance database and customer database linkages to ArcView.

Water System Map Update, Southeast Morris County Municipal Utilities Authority, Morris County, NJ: Mapping of the existing water system on a new 40 square mile AutoCAD topographic landbase, with integration to Haestad Methods' WaterCAD software. Development of Visual Basic hydrant database application within AutoCAD.

Sewer System Geographic Information System (GIS), Franklin Township Municipal Sanitary Authority, Westmoreland County, PA: Project management for the development of GIS mapping for the sanitary sewer system. Mapping prepared or parcel basemap fit to digital orthophotography.

Sewer System Geographic Information System (GIS), Breakneck Creek Regional Authority, Butler County, PA: Project management for development of GIS mapping for the sanitary sewer system. Mapping prepared from digital topographics, as-built record drawings, and digital orthophotography.

Non-Point Source Pollution Loading Analysis, East Windsor Municipal Utilities Authority, Mercer County, NJ: Geographic Information System (GIS) analysis to determine the additional loading of non-point source pollution to the watershed based upon projected development.

Water and Wastewater Geographic Information System (GIS), West Virginia American Water, Charleston, WV: Project Director for the creation of an enterprise geodatabase of water distribution and sanitary sewer utility assets. Coordinated activities of data conversion sub-consultants and GIS staff to produce a seamless database for the assets within the Company's service areas. The geodatabase will be integrated with the Company's CMMS database for asset management, planning activities, and field operations. (2012 – 2013)

Geographic Information System (GIS) and Hydraulic Model Development and Analysis of Geysers Well Injection System, Calpine, Sonoma County, CA: Project Manager for the development of a GIS and hydraulic model of the existing well injection system for the Geysers 750 megawatt geothermal facilities. The injection system conveys approximately 40 MGD of treated wastewater effluent and return condensate through an elaborate network of piping; sedimentation basins, power plants, and pumping stations to approximately 60 active injection wells. The hydraulic model is a holistic model of the injection system, replacing older, separate models of the system, and used to perform various troubleshooting and ad hoc analysis of the system.

Asset Management Plan and Improvements, South Branch Pumping Station, New Jersey Water Supply Authority, Hunterdon County, NJ: Project Manager for a complete condition assessment and asset management plan development for a pump station with 10 40 MGD raw water pumps with 2,000 hp motors. The condition assessment included onsite mechanical and electrical performance testing of equipment and review of process components. Project included development of plans and specifications for pump baseplate replacement, and pump and motor rehabilitation. Plan resulted in a 10-year plan of prioritized capital improvement projects. (2011 – present)

Asset Inventory and CMMA Implementation, Hackettstown Municipal Utilities Authority, Warren County, NJ: Project Manager for the development of a CMMS using eMaint for vertical assets and responsible for developing a Geographic Information System (GIS) database of all water and sewer assets. Used the GIS database to assign original, depreciated, and replacement costs to all assets. Effort included research into the original dates of installation of assets, which were input into the GIS database. (2008)

Water System Vulnerability Assessment, North Jersey District Water Supply Commission, Passaic County, NJ: Project Manager and Team Leader for RAM-W and RAM-D assessments of a regional water supply system serving an area populated by approximately 2 million people.

Water System Vulnerability Assessment, City of Trenton, Mercer County, NJ: Project assistance for the RAM-W assessment of the City's water system, which supplies approximately 30 MGD to a population of over 225,000 in five municipalities.

Water System Vulnerability Assessment, City of Elizabeth, Union County, NJ: Project assistance in the vulnerability assessment of the water system for this urban community with a population of over 100,000.

Water System Vulnerability Assessment, East Windsor Municipal Utilities Authority, Mercer County, NJ: Project Manager for VSAT security assessment of the water utility to assess risks and determine risk reduction strategies for critical assets.

Well #6 Volatile Organic Compound (VOC) Removal Facility, Livingston Township, Essex County, NJ: Project Director for the design, permitting, bid, and construction phases for a 350 gpm packed tower aeration facility to remove contaminants from an existing well. Prepared an application to the State spill-fund to receive grant funding to cover the costs of the treatment facility construction. (2017)

Water Treatment Plant Upgrades and New Wells, Wells Nos. 3, 4, 5, and 8, Livingston Township, Essex County, NJ: Project Director for the design and construction phase services associated with upgrading existing volatile organic compound (VOC) removal treatment plants (packed tower and diffused bubbler), increasing capacity at the 3 MGD 3/5 treatment plant, and the design and construction of two 1,000 gpm backup screened wells in glacial deposits.

Water System Improvements/Treatment Facilities, Wells Nos. 3, 4, 5, 8, and 9, Livingston, Essex County, NJ:

Assisted in the preparation of plans and specifications for the design of four Volatile Organic Compound (VOC) removal facilities ranging in capacity from 0.36 to 2.88 MGD. Two of the facilities were designed utilizing packed tower aeration, and two were designed utilizing diffused bubbler aeration. Duties included hydraulic analysis and design, process design, site design, and preparation of State and local permits.

Wells A and B Volatile Organic Compound (VOC) Removal Facility, Madison Borough, Morris County, NJ: Prepared plans and specifications for a packed tower Volatile Organic Compound (VOC) removal facility with a maximum capacity of 3.0 MGD. Duties included CYBERNET hydraulic analysis and design, instrumentation, process design, site design, transmission main design, and preparation of State and local permits.

Residuals Handling Upgrades, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Director for the design, permitting, bid, and construction phase services to install a new centrifuge, residuals conveyance, and pump upgrades for the 80 MGD surface water treatment facility. Work included pilot of centrifuge equipment to finalize design specifications for specific equipment requirements. (2017)

Sodium Permanganate Chemical Feed System, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Director for the design and construction of a sodium permanganate feed system to provide treatment for flows of up to 100 MGD from the Boonton Reservoir to the water treatment plant. Treatment is needed to oxidize manganese that is encountered seasonally when water is drawn from the lower levels of the reservoir to avoid algae blooms near the top of the reservoir. The oxidized manganese forms a precipitate that is then removed through conventional sedimentation and filtration.

Water Treatment Plant Upgrade, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Manager for design upgrades and construction phase services at an existing 80 MGD surface water treatment plant. The upgrade consisted of a new backwash supply tank, new fiber optic SCADA communication system, refurbishment of existing backwash separators and gravity thickeners, filter valve replacements, installation of new filter air scour system, and new raw water metering.

Shorrock Street Water Treatment Plant, Lakewood Township Municipal Utilities Authority, Ocean County, NJ: Project Manager for the design and permitting of a centralized water treatment facility designed to remove iron, manganese, radon, and volatile organic compounds (VOCs) from six wells at a maximum design capacity of 3 MGD. The design process utilized greensand pressure filters and packed tower aeration. The design also included chemical feed facilities for sodium hypochlorite, lime, potassium permanganate, and sodium aluminate feed systems.

Volatile Organic Compounds (VOC) Removal Facility, Essex County Utilities Authority, Essex County, NJ: Project Manager for the design and permitting for a centralized water treatment facility designed for the removal of Volatile Organic Compounds (VOCs), utilizing packed tower aeration, from four wells with a maximum capacity of approximately 1 MGD.

Black Brook Backwash Holding Tank, Southeast Morris County Municipal Utilities Authority, Florham Park, NJ: Assisted in the preparation of plans and specifications for the design of a backwash holding tank and sanitary force main for the handling of residual waste generated during the existing treatment plant (4.0 MGD) filtering process. Duties included hydraulic design, process design, force main design, and site design.

Robert Frost Treatment Plant Settling Lagoons, Garden State Water Company-Hamilton District, Hamilton Township, NJ: Prepared plans and specifications for settling lagoons designed for the handling of residual waste generated during the existing treatment plant (1.0 MGD) filtering process. Duties included hydraulic design, instrumentation, process design, and site design.

Chemical Feed Facility, New Jersey American Water, Short Hills Operations Center, Florham Park, NJ: Prepared plans and specifications for a chemical feed facility providing rechlorination for a 36-inch diameter transmission main as part of an overall WaterSource Project. Duties included process design, instrumentation, site design, and preparation of State and local permits.

Mechanical Dewatering Facility, Trenton Water Works, Mercer County, NJ: Assisted in the preparation of plans and specifications for the on-site residuals belt press dewatering facility, capable of removing residuals from the 40.0 MGD surface water plant located on the Delaware River. Duties included process design, site plan design, and hydraulic design. Assisted with resident engineering and start-up of facility.

Canoe Brook Treatment Plant Residuals Disposals Study, New Jersey American Water, Short Hills, NJ: Prepared a study identifying the volume of residual waste disposed of at the on-site reservoir. Developed design of floating baffle wall system to contain residuals in the reservoir. Prepared permits for disposal of residuals. Conducted investigation to determine the presence of residuals in the groundwater supply and migration of residuals to surrounding river surface supply.

Mansfield Water Supply Facilities Basis of Design Report, New Jersey American Water, Burlington County, NJ: Assisted in the preparation of the report for a proposed 8.0 MGD iron and manganese removal facility. Duties included preliminary design of process layout, well pump sizing, filter sizing, instrumentation, residual waste disposal system, and chemical feed systems.

Boonton Reservoir Gravity Water Supply Improvements, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Director for the design of 1,800 feet of 72-inch and 84-inch diameter pre-stressed concrete cylinder pipe (PCCP) raw water main, new 100 MGD rapid mix basin, upgraded fiber optic-ethernet SCADA system, and upgrading the chemical feed system to allow water to flow through a gravity bypass for approximately 9 months of the year in lieu of employing up to five 20 MGD pumps with 250-HP motors, resulting in substantial savings. Bypass piping developed under this project also allowed for the performance of scheduled maintenance and upgrades for the existing 100 MGD raw water pump station.

Boonton Reservoir Gravity Water Supply Study, Jersey City Municipal Utilities Authority, Hudson County, NJ: Performed an investigative study to determine whether gravity flow could be achieved from the reservoir in lieu of pumping at the existing raw water pump station. The study determined that electrical costs could be reduced from approximately $600,000 to $200,000 annually by constructing an 84-inch diameter pipeline from the lower gate house directly to the settling basins for an estimated construction cost of $6 million. The project reduces overall operating costs (including repayment of debt service on the loan) in the first year.

Ground Level Storage Tank, Lakewood Township Municipal Utilities Authority, Ocean County, NJ: Project Manager for the design and permitting of a 3 MG ground-level water storage tank. Design included process layout for utilization as pumped storage, including pumping system and underground valve chamber for filling the tank from the system during off-peak demand periods.

Marlboro Road Elevated Storage Tank, Woodhaven Village, Inc., Middlesex County, NJ: Project Manager for the design and permitting of a 2 MG elevated storage tank. The project

included the design of a rechlorination facility and interconnection facilities between the Old Bridge Municipal Utilities Authority and the Middlesex Water Company.

West Jersey Water System Improvements, New Jersey American Water, Mount Olive, NJ: Design, permitting, and construction contract administration for the installation of a 100 gpm well pump and treatment facilities for Well No. 2 at the Academy Lane well site.

International Trade Center Well BR-5, New Jersey American Water, Mount Olive, NJ: Design, permitting, and construction contract administration for the installation of an 800 gpm well pump and treatment facilities for Well BR-5.

Jefferson Village Wells Study, Jefferson Township, Morris County, NJ: Managed a comprehensive study, including proposed well testing plans, to support a water allocation permit application and conceptual design of well pumping and treatment facilities.

Moore Estates Well and Manganese Removal Facility, Southeast Morris County Municipal Utilities Authority, Morris Township, NJ: Provided construction management and field inspection services for a 0.8 MGD manganese removal facility. Duties included shop drawing review, field inspection, start-up and testing, and preparation of record plans and the operation and maintenance manuals.

Todd Well Treatment Facilities, Southeast Morris County Municipal Utilities Authority, Morris Township, NJ: Provided construction management and field inspection services for a 1.6 MGD volatile organic compound (VOC) removal facility utilizing packed tower aeration. Duties included shop drawing review, field inspection, start-up and testing, and preparation of record plans and the operation and maintenance manuals.

Princeton Avenue Booster Station Upgrades, Town of Dover, Morris County, NJ: Project Director overseeing the design upgrades and construction phase for this 6 MGD mission critical booster station that conveys all sources of supply to customers via two gradient zones. Developed construction sequencing to maintain station in service during upgrades of pumping, electrical, instrumentation, and HVAC systems.

Crane Hill Booster Station Upgrades, Town of Dover, Morris County, NJ: Project Director overseeing the design upgrades and construction phase for this 2 MG booster station supplying the High Zone of the water system. Developed construction sequencing to maintain station in service during upgrades of pumping and electrical equipment, and installation of new standby generator.

Bryant Street Pump Station Condition Assessment, District of Columbia Water and Sewer Authority (DC Water), Washington, DC: Project Manager for the investigation and condition assessment of large capacity vertical turbine pumps and motors that were experiencing vibration and noise issues. Assessment included an evaluation of valving arrangements for surge relief (spill) header, and identification of locations for new flow metering equipment.

South Beverwyck Road Well and Booster Station Upgrades, Parsippany-Troy Hills Township, Morris County, NJ: Project Director for the design, permitting, bid, and construction phase services for the replacement of an existing 1,500 gpm booster station with a new prefabricated station. The design includes the additional of onsite pipe detention time in order to achieve 4-log inactivation of viruses and allows the reactivation of an existing well. The project involves upgrades to the electrical equipment at three wellhouses, and rehabilitation and painting of an on-site steel tank. (2017)

Francisco Avenue Pump Station Upgrades, Cedar Grove Township, Essex County, NJ: Project Director for a detailed condition assessment of the 3 MGD pump station facility, including a wire-to-water efficiency analysis of existing equipment. Developed recommendations for $750,000 of investment to upgrade the 30-year old facility, and identified 10% potential savings in electrical costs using more efficient pumps and motors. Provided design, permitting, bid, and construction phase services.

Jockey Hollow Booster Station Upgrades, Southeast Morris County Municipal Utilities Authority, Morris County, NJ: Project Manager for the design upgrades of an existing 1 MGD booster station, including diesel generator replacement, motor control center replacement, instrumentation and controls upgrades, and design of a new chlorination feed system.

Park Road Booster Station Upgrade, Parsippany-Troy Hills Township, Morris County, NJ: Project management for the design, permitting, and construction phases for rehabilitating and upgrading a 4 MGD pump station. Replaced constant speed pumps with larger pumps with

variable frequency drives, new radio-based instrumentation, upgrade of electric service, addition of onsite diesel standby generator, and new security system.

Florida Grove Booster Station Upgrade, Utility Service Affiliates Perth Amboy, Perth Amboy, NJ: Project management for the design and construction phases that included the replacement of two constant speed, centrifugal pumps with three new vertical turbine pumps of 1.5 MGD, 3.5 MGD, and 4.5 MGD capacities. The pumps and motors were designed with variable frequency drives to maintain a steady discharge pressure from the pumped storage facility. The design also included an interconnection with the Middlesex Water Company to allow water transfer in both directions. Based upon the criticality of the booster station, a new generator in an outside, sound-attenuated enclosure was provided. In addition, significant architectural, heating, and ventilation upgrades were designed, resulting in a state-of-the-art facility.

Oak Street Booster Station Expansion, Woodhaven Village, Inc., Middlesex County, NJ: Project Manager for the design and permitting for the upgrade and expansion of an existing booster station, including a new 4.5 MGD booster pump. The booster station is owned by the Old Bridge Municipal Utilities Authority and required upgrading in order to serve the new development. The project included the design of interconnection facilities with the Middlesex Water Company and a rechlorination facility.

Park Avenue Pump Station, Southeast Morris County Municipal Utilities Authority, Florham Park, NJ: Provided construction management and field inspection services for a pump station with maximum capacity of 6.0 MGD. Duties included shop drawing review, field inspection, start-up and testing, and preparation of record plans and the operation and maintenance manuals.

Shongum and Malapardis Booster Station Modifications, Southeast Morris County Municipal Utilities Authority, Morris County, NJ: Prepared plans and specifications for improvements to two existing 1.0 MGD water booster stations including pump selection and design, facility layout, instrumentation, site design, and permitting.

Lakewood Sewer System Comprehensive Planning Study, New Jersey American Water, Ocean County, NJ: Project Manager for the development of an American Water Standard format Comprehensive Planning Study (CPS) to identify short-term and long-term capital improvements for a 3 MGD sewer system serving a population of 30,000. The work included customer and demand projection, Global Positioning System (GPS) field survey, Geographic Information System (GIS) database development, assessment and computer modeling analysis of the sewer system, and alternatives analysis and Capital Improvement Program (CIP) re-conditioning.

Phase I Stormwater Management Plan, Bridgewater Township, Somerset County, NJ: Developed methodology and supervised Geographic Information System (GIS) staff for the development of input parameters for HEC-HMS hydrologic model using GIS tools and datasets to support the Stormwater Management Plan. GIS datasets included digital elevation models, landuse, soils, zoning maps, and hydrography. These datasets were used to generate subwatershed delineation, subwatershed connectivity, curve number, impervious area, longest flow path, and waterslope. Utilizing GIS tools, modeling input parameters were developed quickly and with a high degree of accuracy. Input parameter generation was well documented, and results were easily repeatable for modifications to the datasets (i.e., changes in landuse development).

Watershed Management Areas 3, 4, and 6 Characterization and Assessment, North Jersey District Water Supply Commission, Passaic County, NJ: Supervised Geographic Information System (GIS) staff for the compilation of the GIS database, including compiling existing GIS data layers, identifying data gaps, and creating a series of base maps for the Watershed Characterization and Assessment study. Launched a web-enabled GIS mapping application utilizing ESRI ArcIMS in order to maximize GIS benefit for numerous stakeholders, the public, and advisory committees.

Replacement of Clinton Road Bridge over Mossman's Brook, Passaic County Department of Roads and Bridges, Passaic County, NJ: Supervised Geographic Information System (GIS) staff for the development of input parameters for HEC-HMS, using available GIS datasets, for the Mossman's Brook watershed in support of bridge and roadway designs.

Hopewell-Trenton Sanitary Sewer Force Mains, City of Trenton, Mercer County, NJ: Project management for the design of approximately 20,000 feet of dual 10-inch and 14-inch diameter sanitary sewer force mains from Hopewell Township to the City of Trenton.

Presentations

Aqua Pennsylvania - Long Term Source of Supply Development and Capital Plan for 150 MGD Utility, presented at the Annual Conference of the American Water Works Association, New Jersey Section, 2017

Jersey City MUA - Structural Lining of Distribution Mains in Urban Centers, presented at the Annual Conference of the American Water Works Association, New Jersey Section, 2016

Asset Renewal Case Studies for Pump Station Condition Assessment, presented at the Annual Conference of the American Water Works Association, New Jersey Section, 2015

Jersey City MUA - Gravity Pipeline Lowers Electrical Costs at 100 MGD WTP, presented at the Annual Conference of the American Water Works Association, New Jersey Section, 2015

New Jersey Water Supply Authority - Asset Management Plan for the South Branch Pump Station, presented at the Annual Conference of the American Water Works Association, New Jersey Section, 2012

Master Planning: Traditional and Enhanced Planning Techniques Using Asset Management, presented at the Spring Technical Conference of the American Water Works Association, Southeast Pennsylvania Section, 2008

Capital Planning and Asset Management, presented to the American Water Works Association, New Jersey Section, 2007

Cost Effective Information Management for Industries & Small to Medium Sized Utilities, presented at the Technology Transfer Seminar of the New Jersey Water Environment Association, 2002

Information Management Systems for Water Utilities, presented to the American Water Works Association, New Jersey Section, 2001

GIS Solutions for HEC-HMS Precipitation-Runoff Modeling: A Case Study, presented to the Silver Lake Watershed, Morris County, NJ at Rutgers University, 2000

GIS for Drinking Water and Wastewater Applications, presented at Cook College, Rutgers University, 2000 - 2004

GIS for Water Utilities, presented to the American Water Works Association, New Jersey Section, 2000

GIS for Wastewater Utilities, presented to the New Jersey Water Environment Association, 2000

MOTT MACDONALD

David L. Klemm, PE, BCEE

Personal summary

Education:

MS, Environmental Engineering, New Jersey Institute of Technology, 1993

BS, Civil Engineering, Worcester Polytechnic Institute, 1990

Registrations:

Professional Engineer

NJ #24GE03867200, 1994
PA #PE055317E, 1999

Board Certified Environmental Engineer, AAEE #11-20032, 2011

OSHA Confined Space Entry

Wastewater Infrastructure Security Training: Large Utility, 2003

Years with Mott MacDonald:

30

Years with other firms:

0

Professional memberships:

American Society of Civil Engineers

Association of Environmental Authorities

Chi Epsilon

Tau Beta Pi

Water Environment Federation

Mr. Klemm has extensive experience as Project Director, Project Manager and/or Lead Design Engineer for the planning, design, permitting, and construction of municipal wastewater and water supply facilities. These have included wastewater treatment plant improvements, wastewater pumping stations, individual sewage grinder pumping stations, gravity sanitary sewers, force mains, low-pressure sewers, force mains, infiltration/inflow (I/I) evaluations, potable water wells and well houses, and water transmission mains. His project duties routinely include hydraulic analysis of pipelines, pumping systems, and treatment facilities, pump selection, process design, cost estimation, and design coordination. As Project Director and Project Manager, Mr. Klemm has been responsible for the management of design and construction projects. He has significant experience in construction methods and procedures, project coordination, and quality control.

Mr. Klemm has provided consultation services, including design, permitting, and construction project management services, to various municipalities and regional authorities. His responsibilities have included primary client contact, project administration, and attendance at public meetings.

Mr. Klemm has also performed construction inspection and provided engineering support services for various wastewater, water, and stormwater projects. He has performed numerous annual inspections of wastewater treatment facilities and vulnerability assessments of wastewater facilities. He has prepared permit applications to regulatory agencies for various projects, and worked on projects that involve financial assistance from State Revolving Funds.

Employment history

1987 – Present	Mott MacDonald
1986 – 1987	Somerset County (intern)

Selected projects

General Water and Wastewater Consulting Services, East Windsor Municipal Utilities Authority, Mercer County, NJ: Project Manager and Client Contact for water and wastewater utility general consulting services, including attendance at monthly Authority meetings, preparation of monthly Engineer's report, design and construction phase services for capital improvement projects, infiltration/inflow evaluations, sewer capacity evaluations, performance of Engineer's annual inspection of water and wastewater facilities, and developer reviews of applicants requesting water and sanitary sewer service from the Authority. Developer reviews include review of Applicant's drawing to ensure compliance with Authority standards and sound engineering practice and calculation of projected flows. (2018 – present)

General Wastewater Consulting Services, Morris Township, Morris County, NJ: Project Manager and Client Contact for wastewater utility general consulting services, including meeting attendance as required, planning, preliminary design, and cost estimates for various projects, developer reviews, permit reviews, plant performance reviews, and facilities inspections. (2008 – present)

Engineer's Annual Inspection and Report of Water and Wastewater Facilities, Hackettstown Municipal Utilities Authority, Warren County, NJ: Poject Manager of the Engineer's annual inspection of the Authority's water and wastewater facilities and prepared Engineer's Report. The facilities inspected include five water supply wells, four water storage tanks, a 3.3 MGD wastewater treatment plant, and three raw sewage pumping stations. (2007 – present)

Engineer's Annual Inspection and Report of Wastewater Facilities, East Windsor Municipal Utilities Authority, Mercer County, NJ: Performed Engineer's annual inspection of the Authority's wastewater facilities and prepared Engineer's Report. The facilities inspected included one wastewater treatment plant and 10 wastewater pumping stations. Project Manager for the 2017 Engineer's annual inspection of the Authority's water and wastewater facilities and preparation of Engineer's Report. (2003 – 2011. 2017 – present)

Engineer's Annual Inspection and Report of Wastewater Facilities, Warren Township Sewerage Authority, Somerset County, NJ: Performed Engineer's annual inspection of the

Authority's wastewater treatment facilities and prepared Engineer's Report. The facilities inspected included three wastewater treatment plants. (1992 – 2008)

General Water and Wastewater Consulting Services, Hackettstown Municipal Utilities Authority, Warren County, NJ: Project Manager and Client Contact for water and wastewater utility general consulting services, including attendance at monthly Authority meetings, preparation of monthly Engineer's report, construction phase services, performance of Engineer's annual inspection of water and wastewater facilities, and preparation of Inspection Report. Responsibilities include the preparation of the Wastewater and Water Flow Projections Report, review of Wastewater Management Plans, review and update of standard specifications and details for water and sewer construction, and developer reviews of applicants requesting water and sanitary sewer service from the Authority. Developer reviews include review of Applicant's drawing to assure compliance with Authority standards and sound engineering practice and calculation of projected flows. 2007 – present)

General Wastewater Consulting Services, Bayshore Regional Sewerage Authority, Monmouth County, NJ: Project Manager and client contact for general consulting services including attendance at monthly Authority meetings, construction management engineering services, flow analyses and flow calculations, and performance of/preparation of Engineer's Annual Inspection Report of the Authority's wastewater facilities.

Norton Pump Station Upgrades, Branchburg Township, Somerset County, NJ: Project Manager for the design, bid, and construction phases for the upgrades to the Township's existing dry pit submersible wastewater pump station to accommodate future flows, The project includes installation of new pumps with greater capacity (300 gpm), larger diameter individual pump discharge force main, generator, electric service, pump control panel, site restoration, and related upgrades. (2020 – present)

Norton Pump Station Evaluation, Branchburg Township, Somerset County, NJ: Project Manager for the evaluation of the existing dry pit submersible wastewater pump station to accommodate existing and future flows. The pump station has a capacity of 170 gpm with one pump in service and one pump as standby. The project included site inspection of the pump station by Process and Electrical engineers, capacity evaluation, hydraulic calculations, preliminary pump selection under various flow scenarios, capacity evaluation and condition evaluation of pump station to meet existing and future flows, preliminary construction cost estimates, and the preparation of summary reports with pump station upgrade recommendations. (2019 – 2020)

Brandywine Pump Station Evaluation, Branchburg Township, Somerset County, NJ: Project Manager for of the evaluation of the existing submersible wastewater pump station to accommodate existing and future flows. The pump station has a capacity of 325 gpm with one pump in service and one pump as standby. The project included site inspection of the pump station by Process and Electrical engineers, capacity evaluation, hydraulic calculations, preliminary pump selection under various flow scenarios, capacity evaluation and condition evaluation of pump station to meet existing and future flows, preliminary construction cost estimates, and preparation of a summary report with pump station upgrade recommendations. (2020)

Shared Sewage Pump Station, East Windsor Municipal Utilities Authority, Mercer County, NJ: Project Director for the design and permitting phases for the new 400 gpm sewage pump station located on Wyckoff Mills Road, which will serve five commercial properties. The pump station will be a masonry building with dry well and wet well and will include three suction lift pumps, sewage grinder, variable frequency drives (VFDs), and stand-by generator. The project will also include 1,600 of sewage force main that will discharge into an existing 14-inch diameter force main, Design phase services included preparation of plans and specifications for public bid, hydraulic calculations for pumps, gravity sewer, and discharge force main as well as preparation of permit applications (NJDEP Treatment Works Approval (TWA), Wetlands, and Soil Erosion and Sediment Control Certification), Project is currently under design and project is scheduled to be complete and ready for public bid in mid-2019. (2018 – present)

Passaic Avenue Sewage Pump Station Upgrades, Livingston Township, Essex County, NJ: Project Manager for the design, permitting, bid, and construction phases for the upgrades to the sewage pump station. Upgrades include replacement of two existing pumps with larger pumps (each rated for 2.1 MGD), variable frequency drives (VFDs), electric panels, standby generator, influent gravity sewer, and discharge force main to accommodate additional sewage

flows from proposed developments. Plans and Specifications were prepared for public bid. Design phase services included hydraulic calculations for pumps, gravity sewer, and discharge force main as well as preparation of permit applications (NJDEP Treatment Works Approval (TWA), Wetlands, and Flood Hazard Area permits), Bid phase services included addressing questions during bid period and preparation of the bid report with recommendation of contract award. Construction phase responsibilities include client contact, supervision of field inspectors and office engineers, shop drawing review, preparation of payment applications, and project coordination. Project is currently under construction and is scheduled to be completed in early 2019. (2017 – present)

Passaic Avenue Sewage Pump Station, Gravity Sewer and Force Main Upgrades, Livingston Township, Essex County, NJ: Project Manager for the design, permitting, bid, and construction phases for the upgrades to the force main, downstream gravity sewer, and upstream gravity sewer with larger diameter pipes to accommodate additional flows from proposed and potential developments (full build-out flows). Plans and specifications were prepared for public bid. Design phase services included hydraulic calculations for the gravity sanitary sewer and discharge force main as well as preparation of permit applications (NJDEP Treatment Works Approval (TWA), Wetlands, and Flood Hazard Area permits and Soil Erosion and Sediment Control Certification), Bid phase services included addressing questions during bid period and preparation of the bid report with recommendation of contract award. Construction phase responsibilities include client contact, supervision of field inspectors and office engineers, shop drawing review, preparation of payment applications, and project coordination. Project is currently under construction and is scheduled to be complete in late 2018. (2017 – present)

Moore Estates Pump Station Upgrades, Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for the upgrades to the sewage pump station. The project includes the replacement of existing pumps, valves, individual pump discharge piping, and section of influent gravity sewer. Responsibilities include the preparation of plans and specifications, hydraulic calculations, client contact, and overall project management. Project is scheduled to bid in early 2019. (2018 – present)

Naylon Avenue and Cedar Hill Pump Station Upgrades, Livingston Township, Essex County, NJ: Project Manager for the design, bid, and construction phases for the replacement of the existing pump control panels. The project included the replacement of the existing pump control panels located below grade in the dry wells of both wastewater pump stations with new above grade control panels located. Responsibilities during the design phase included preparation of plans and specifications, construction cost estimate, and coordination among design team members. Construction phase responsibilities included project team coordination, client contact, shop drawing review, coordination and oversight of field inspectors, design clarifications, and preparation of payment applications. (2013 – 2015)

Mount Bethel Pump Station, Warren Township Sewerage Authority, Somerset County, NJ: Project Manager for the design phase for the replacement of the existing Smith & Loveless packaged pump station with a new submersible pump station. Responsibilities included the preparation of plans and specifications, site investigation, determination of design flows for the pump station, hydraulic calculations for pumps and sewage grinder, temporary bypass pumping plan, sizing and selection of submersible pumps, sewage grinder, and davit crane, and coordination among design team members. (2010 – 2012)

Equipment Replacement, Kearny Point and Harrison Avenue Pumping Stations, Kearny Municipal Utilities Authority, Hudson County, NJ: Project Manager for the design phase for the equipment replacement at the Kearny Point and Harrison Avenue wastewater pump stations. The work at the Kearny Point pump station included the replacement of four dry pit submersible pumps (17 MGD rated capacity with 3 pumps operating), valves, and piping within the pump station. The work at the Harrison Avenue pump station included replacement of the existing mechanical bar screen and bar screen control panel. Responsible for coordination and oversight of the design team, selection of pumps and bar screen, hydraulic calculations, the preparation of plans and specifications for public bid, and the preparation of construction cost estimate. (2009 – 2010)

Gaston Road Sewage Pump Station and Force Main Replacement, Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for the replacement of the existing raw sewage pumps and force main for the Gaston Road pump station. The project includes the replacement of the two existing 95 gpm submersible pumps,

pump control panel, discharge valves, and the 2,100 lf of 4-inch diameter force main. Responsibilities included coordination and oversight of the design team, client contact, selection of the submersible pump, hydraulic calculations, preparation of plans and specifications for public bid, and preparation of the construction cost estimate. Provided bid phase services, including attendance at the bid opening and the preparation of the Bid Report. Served as Project Manager for construction phase, responsible for project team coordination, client contact, shop drawing review, coordination and oversight of field inspectors, design clarifications, preparation of payment applications, and conducting project progress meetings. (2009 – 2011)

West Keansburg Pump Station, Bayshore Regional Sewerage Authority, Monmouth County, NJ: Designed a 6.0 MGD raw sewage pump station including preparation of plans and specifications. Responsibilities included hydraulic calculations, selection of all pumps, transient surge analysis, potassium permanganate solution odor control system, potassium permanganate fume absorber odor control system, sizing of valves, comminutor, and flow meters, and coordination with other disciplines.

Matawan Pump Station, Bayshore Regional Sewerage Authority, Monmouth County, NJ: Designed modifications to a 6.9 MGD raw sewage pump station including preparation of plans and specifications. Responsibilities included hydraulic calculations, pump selection, potassium permanganate solution odor control system, fume absorber odor control system, flow meter sizing, modifications to City and well water piping, and comminutor and valve selection.

Canterbury Court Pump Station, Force Main, and Gravity Sewer, Warren Township, Somerset County, NJ:

Designed a raw sewage pump station, gravity sewer, and force main to serve 14 homes. Responsibilities included preparation of plans and specifications, sizing of submersible grinder pumps, wet well, and valve chamber, hydraulic calculations, site layout, gravity sewer and force main design, and preparation of permit applications.

Pump Station Renovations, Monmouth County Bayshore Outfall Authority, Union Beach and Belford, NJ: Performed hydraulic analysis on existing force mains, which included investigation of parallel pumping through two force mains tied together by sharing a common discharge force main. Performed pump selection for the upgrading of the existing pumps at both pump stations.

Rocky Brook Pumping Station No. 1 Replacement, East Windsor Municipal Utilities Authority, Mercer County, NJ:

Provided construction inspection and engineering support during the construction of a new 4.7 MGD pump station that replaced an existing pump station located at the same site. Responsibilities included shop drawing review, field inspection, conducting weekly project progress meetings, preparation of payment applications, and miscellaneous project coordination. Prepared record plans and an Operation and Maintenance Manual for the new pump station.

Dey Road Pump Station, Cranbury Township, Middlesex County, NJ: Designed a 2.2 MGD raw sewage pump station including preparation of plans and specifications. Responsibilities included hydraulic calculations, pump selection, sizing and selection of hydraulic-driven sewage screening/grinder unit, valves, flow meter, and piping, preparation of Engineer's Report for TWA permit application, and coordination with other disciplines.

Keasbey Rear Pump Station and Carborundum Pump Station, Woodbridge Township, Middlesex County, NJ:

Provided construction inspection and engineering support services during the construction of two raw sewage pump stations. Responsibilities included shop drawing review, field inspection, payment applications, miscellaneous project coordination, and preparation of Record Drawings. Responsibilities also included performance of bid services consisting of attendance at the bid opening and preparation of report on bids.

Stiles Road Pump Station Replacement Parts, Warren Township Sewerage Authority, Somerset County, NJ: Prepared plans and specifications for the installation of replacement parts for two existing pumps, valves, and piping for an existing manufactured "canned" raw sewage pump station. Responsibilities included preparation of plans and specifications, performance of bid services consisting of conducting the bid opening and preparation of report on bids, including recommendation of award of contract. Also provided construction inspection and engineering support services during the installation of the replacement parts for the

existing pumps, valves, and piping. Responsibilities included shop drawing review, field inspection, payment applications, and miscellaneous project coordination.

Satellite Monitoring Stations, Passaic Valley Sewerage Commissioners, Newark, NJ: Lead Design Engineer for the design of seven satellite monitoring stations which take raw sewage samples from 10 different locations. Responsibilities included preparation of plans and specifications, hydraulic calculations, sizing, selection, and layout of pumps, pump chambers, pre-cast concrete sampling enclosures, piping, and valves, and coordination with other disciplines.

Crescent Cove Pumping Station, Hopatcong Borough, Sussex County, NJ: Lead Design Engineer for the design of a new 2.1 MGD raw sewage pump station. The pump station is a three-level cast-in-place concrete pump station with wet well and dry well housing three raw sewage pumps, generator, sewage screening/grinder unit, and associated controls and appurtenances. Responsibilities included preparation of plans and specifications, hydraulic calculations, pump selections, design of liquid bioxide odor control system, carbon odor control system, sewage screening/grinder unit, valves, flow meter, and coordination with other disciplines. Responsibilities also included assistance in the permitting and State Trust Funding phases of this project. Served as Project Manager during the construction phase. Responsibilities included client contact, supervision of field inspectors and office engineers, and contractor coordination, as well as conducting job progress meetings, shop drawing review, preparation of payment applications and change orders, O&M manual, and NJDEP Authorization to Activate submittals, project coordination, and project administration.

Carteret Road Pumping Station, Hopatcong Borough, Sussex County, NJ: Lead Design Engineer for the design of a new 300 gpm submersible raw sewage pump station. The pump station facility includes a sewage grinder manhole, wet well manhole housing two submersible pumps, pre-cast concrete valve chamber with a carbon odor control system, pre-cast concrete flow meter chamber, and a slab-on-grade masonry generator building housing the stand-by generator, liquid bioxide odor control system, and associated controls and appurtenances. Responsibilities included preparation of plans and specifications, hydraulic calculations, pump selection, design of liquid bioxide odor control system, carbon odor control system, sewage grinder unit, valves, flow meter, and coordination with other disciplines. Responsibilities also included assistance in the permitting and State Trust Funding phases of this project. Served as Project Manager during the construction phase. Responsibilities included client contact, supervision of field inspectors and office engineers, and contractor coordination, as well as conducting job progress meetings, shop drawing review, preparation of payment applications and change orders, O&M manual, and NJDEP Authorization to Activate submittals, project coordination, and project administration.

Nitrification System Upgrades, Hackettstown Municipal Utilities Authority, Warren County, NJ: Project Director for the evaluation and preliminary design, detailed design, bid, and construction phases for the upgrades of the nitrification system at the 3.30 MGD water pollution control plant. The design includes the replacement of existing swingarm diffusers with ceramic diffusers with membrane disk dome diffusers in the two existing nitrification tanks. Responsibilities included the preparation of plans and specifications, evaluation, selection, and design of diffusers, and coordination among design team members. Bid phase services included distribution of contract documents, and preparation of the bid report with recommendation for contract award. Responsibilities during the construction phase include client contact and supervision of field inspectors and office engineers as well as shop drawing review, preparation of payment applications, project coordination, and project administration. The project is currently under construction and is expected to be completed in mid-2019. (2017 – present)

General Water and Wastewater Consulting Services, East Windsor Municipal Utilities Authority, Mercer County, NJ: Project Manager and Client Contact for water and wastewater utility general consulting services, including attendance at monthly Authority meetings, preparation of monthly Engineer's report, performance of Engineer's annual inspection of water and wastewater facilities including preparation of Inspection Report, and requested tasks. Responsibilities include developer reviews of applicants requesting water and sanitary sewer service from the Authority. Developer reviews include review of Applicant's drawing to ensure compliance with Authority standards and sound engineering practice and calculation of projected flows. (2017 – present)

Primary Digester Upgrades at Wastewater Treatment Plant and Project Manager for the construction phase, Livingston Township, Essex County, NJ: Project Director for the design and bid phases for the upgrades to the existing primary digester. The project includes the rehabilitation of the existing primary digester steel cover, replacement of primary digester "Pearth" mixing system, replacement of digester piping and valves, replacement/rehabilitation of cover structural members, and abrasive blasting and painting of interior and exterior of the digester cover. Plans and specifications were prepared for public bid. Bid phase services included addressing questions during bid period and preparation of the bid report with recommendation of contract award. Construction phase responsibilities include client contact, supervision of field inspectors and office engineers, shop drawing review, preparation of payment applications, and project coordination. Project is currently under construction and is scheduled to be complete in late 2019. (2017 – present)

Clarifiers Upgrades, Butterworth Sewage Treatment Plant (STP), Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for the clarifiers upgrades at the 3.3 MGD sewage treatment plant. The project included upgrades to three existing clarifiers, including replacement of clarifier drives and appurtenances and painting of mechanisms. Plans and specifications were prepared for public bid. Bid phase services included addressing questions during bid period and preparation of the bid report with recommendation of contract award. Construction phase responsibilities included client contact, supervision of field inspectors and office engineers, shop drawing review, preparation of payment applications, and project coordination. (2016 – 2018)

Wastewater Treatment Plant Upgrades, Marcel Lakes Wastewater Treatment Plant, Pennsylvania American Water, Pike County, PA: Lead Design Engineer for the design of upgrades to the existing wastewater treatment plant. The project includes replacement of headworks, raw sewage pump station, sequencing batch reactor (SBR) decanters, aerobic digesters, and ultraviolet (UV) disinfection system as well as conversion of the existing final clarifier to equalization basin. Responsibilities included preparation of plans and specifications, basis of design report, construction cost estimate, permit applications, and coordination among design team members. (2015 – present)

Control Panels Replacements, Butterworth Sewage Treatment Plant (STP), Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for the Township's Control Panel Replacements project at the 3.3 MGD Butterworth and 2.0 MGD Woodland plants. The project included the replacement of two gravity belt thickener control panels and rehabilitation of the HCl gas distribution control panel at the Butterworth STP, and the construction of a new natural gas booster pump at the grit building at the Woodland STP. Plans and Specifications were prepared for public bid. Bid phase services included addressing questions during bid period and preparation of the bid report with recommendation of contract award. Construction phase responsibilities included client contact, supervision of field inspectors and office engineers, shop drawing review, preparation of payment applications, and project coordination. (2015 – 2017)

Tertiary Sand Filter Upgrades, Woodland Sewage Treatment Plant, Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for the upgrades/rehabilitation of the existing tertiary sand filters at the 2.0 MGD sewage treatment plant. Portions of the two existing 16-feet wide 66-foot bed length filters, installed in 1991, were in need of replacement. The rehabilitation of the existing filters consisted of the replacement of the porous plates, filter media, wear strip and backwash shoes, rails and rail caps, festoon components, pumps, pump suction, and discharge piping and valves and drive bearings. Plans and specifications were prepared for public bid. Bid phase services include addressing questions during bid period and preparation of the bid report with recommendation of contract award. Construction phase responsibilities included client contact, supervision of field inspectors and office engineers, shop drawing review, preparation of payment applications, and project coordination. (2015 – 2017)

Tertiary Sand Filter Upgrades, Butterworth Sewage Treatment Plant, Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for the upgrades/rehabilitation of the existing tertiary sand filters at the 3.3 MDG sewage treatment plant. Portions of the two existing 16-feet wide 85-foot bed length filters, installed in 1991, were in need of replacement. The rehabilitation of the existing filters consisted of the replacement of the porous plates, filter media, backwash shoes, rail caps, festoon components, drives, shafts, wheels, and bearings. Plans and specifications were prepared for public bid. Bid phase

services included addressing questions during bid period and preparation of the bid report with recommendation of contract award. Construction phase responsibilities included client contact, supervision of field inspectors and office engineers, shop drawing review, preparation of payment applications, and project coordination. (2014 – 2015)

Washwater Pipes Replacements, Butterworth and Woodland Sewage Treatment Plants, Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for miscellaneous replacements, which included the replacement of the existing spray and washwater piping at the oxic tanks and final clarifiers at the Butterworth plant and the replacement of the existing spray and washwater piping located at the oxic tanks, anaerobic/anoxic tanks, and final clarifiers at the Woodland plant. Plans and specifications were prepared for public bid. Bid phase services included addressing questions during bid period and preparation of the bid report with recommendation of contract award. Construction phase responsibilities included client contact, supervision of field inspectors and office engineers, shop drawing review, preparation of payment applications, and project coordination. (2013 – 2014)

Ultraviolet (UV) Disinfection Facilities, Woodland Sewage Treatment Plant, Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for the replacement of the ultraviolet (UV) disinfection equipment which had reached the end of its useful life with new UV disinfection equipment. Design phase responsibilities included the preparation of plans and specifications, hydraulic calculations, selection and layout of UV equipment, and coordination with other disciplines. Bid phase services included addressing questions during bid period, attendance at the bid opening, and preparation of the bid report with recommendation of contract award. Construction phase responsibilities included client contact, supervision of field inspectors and office engineers, and contractor coordination, as well as shop drawing review, preparation of payment applications, and project coordination. (2011 – 2012)

Wastewater Treatment Plant Upgrades, Woodland Sewage Treatment Plant, Morris Township, Morris County, NJ: Project Manager for the design, permitting, bid, and construction phases for upgrades to the treatment plant. The project includes construction of a new grit building with vortex grit separators and classifier, new biofilter odor control facilities, installation of mechanical bar screen, submersible mixers, replacement raw sewage pumps, replacement of process piping and valves, incorporation of new equipment into the existing SCADA system, and site work. Design phase responsibilities included preparation of plans and specifications, review of calculations and equipment selection, coordination with other disciplines, and coordination with client. Project was funded by the New Jersey Environmental Infrastructure Trust (NJEIT) Loan Program. Responsibilities included preparation and submittal of permit applications and NJEIT Loan Program submittals. Bid phase services included responding to Requests for Information (RFIs), attendance at the bid opening, and preparation of the bid report, including a recommendation of contract award. Construction phase services included client contact, supervision of field inspectors and office engineers, and contractor coordination, as well as shop drawing review, monthly progress meetings, preparation of payment applications, change orders, Operation & Maintenance (O&M) Manual, and record plans, and project coordination. (2011 – 2016)

Water Pollution Control Plant Process Blower Replacement, Hackettstown Municipal Utilities Authority, Warren County, NJ: Project Manager for the design, bid, and construction phases for the replacement of process aeration blowers at the 3.30 MGD water pollution control plant. The design includes the replacement of two of the four existing aeration blowers with high energy efficient turbo blowers in order to save energy as well as to replace two of the blowers that were 20 years old and at or near the end of their useful life. Responsibilities included the preparation of plans and specifications, site investigation, determination of design aeration flows for blowers, sizing and selection of the blowers, and coordination among design team members. Bid phase services included distribution of contract documents, attendance at bid opening, and preparation of the bid report with recommendation for contract award. Responsibilities during the construction phase included client contact and supervision of field inspectors and office engineers as well as shop drawing review, preparation of payment applications, project coordination, and project administration. (2011 – 2012)

Wastewater Treatment Plant Blower Motor Control Center Replacement, Livingston Township, Essex County, NJ: Project Manager for the design, bid, and construction phases for the replacement of the existing blower motor control centers (MCC) at the Township's water

pollution control facility. Responsibilities included the preparation of plans and specifications and coordination among design team members. Bid phase services included distribution of contract documents, attendance at the bid opening, and preparation of the bid report. Construction phase responsibilities included supervision of field inspectors and office engineers, as well as shop drawing review, preparation of payment applications, project coordination, and project administration. Client liaison from design through construction phases. (2010 – 2011)

Filter Influent Sluice Gate Replacement, Butterworth Wastewater Treatment Plant, Morris Township, Morris County, NJ: Project Manager for the design phase for the replacement of the existing sluice gates at the influent to the tertiary sand filters. The project included the construction of two openings in the existing concrete slabs covered with new FRP grating to provide better access for cleaning of the filters. Responsibilities included the preparation of plans and specifications. (2010 – 2011)

Wastewater Treatment Plant Denitrification Process Modifications, Livingston Township, Essex County, NJ: Project Manager for the design, bid, and construction phases for the modifications to the wastewater treatment plant to provide for denitrification. The project includes the installation of a mechanical mixer in each of the existing nitrification aeration tanks. Responsibilities included selection of mechanical mixer, preparation of plans and specifications for public bid, preparation of the construction cost estimate, and preparation of the Treatment Works Approval (TWA) permit application with Engineer's Report. Responsibilities also included bid phase services, including attendance at the bid opening and preparation of the Bid Report. Construction phase responsibilities included shop drawing review, field inspection, conducting project progress meetings, design clarifications, payment applications, and miscellaneous project coordination. (2009 – 2011)

Wastewater Treatment Plant Oxidation Ditch/Clarifiers Evaluation, Warren Township Sewerage Authority, Somerset County, NJ: Project Manager for the inspection and evaluation of the existing (20-year old) oxidation ditch/clarifiers at the Stage IV wastewater treatment plant. The manufacturer of the Oxidation Ditch/Clarifiers and process, structural and electrical engineers from Hatch Mott MacDonald performed an inspection of the existing equipment and developed a prioritized list of items to replace. Responsibilities included project coordination, inspection, prioritization of the items to be replaced, preparation of construction cost estimates, and preparation of the report summarizing recommendations for future projects to replace/upgrade components of the oxidation ditch/clarifiers. (2010 – 2011)

Raw Sewage Influent Pump Station, Stage V Wastewater Treatment Plant, Warren Township Sewerage Authority, Somerset County, NJ: Project Manager for the design phase for the replacement of the existing three raw sewage pumps at the raw sewage influent pump station at the Stage V wastewater treatment plant. The project included the replacement of the existing pumps, piping, valves, and sewage grinder within the pump station. Responsibilities included the preparation of plans and specifications, site investigation during the design phase, hydraulic calculations for pumps and sewage grinder, temporary bypass pumping plan, sizing and selection of submersible pumps, sewage grinder, and davit crane, and coordination among design team members. (2009)

Ultraviolet (UV) Disinfection Facilities, Butterworth Wastewater Treatment Plant, Morris Township, Morris County, NJ: Project Manager for the construction phase for the replacement of ultraviolet (UV) disinfection facilities at the wastewater treatment plant. The project included the replacement of the existing UV disinfection equipment that had reached the end of its useful life with new UV disinfection equipment. Responsible for client contact, supervision of field inspectors and office engineers, and contractor coordination, as well as shop drawing review, preparation of payment applications, processing of change orders, record plans, and project coordination. (2008 – 2009)

Ultraviolet (UV) Disinfection Facilities at Stage I-II and Stage V Wastewater Treatment Plants, Warren Township Sewerage Authority, Somerset County, NJ: Lead Design Engineer for the design of ultraviolet (UV) disinfection facilities at the Stage I-II and Stage V wastewater treatment plants. The UV facilities replaced chlorination/dechlorination facilities. Responsibilities included preparation of plans and specifications, hydraulic calculations, selection and layout of UV equipment, site piping modifications, and coordination with other disciplines. Responsibilities also included preparation of State permit applications and Engineer's Report. Served as Project Manager for bid and construction phases, responsible for client contact, supervision of field inspectors and office engineers, and

contractor coordination, as well as conducting job progress meetings, shop drawing review, preparation of payment applications, processing of change orders, Record Plans, and project coordination (2002 – 2006).

Tertiary Filter No. 1 Replacement at Stage I-II Wastewater Treatment Plant, Warren Township Sewerage Authority, Somerset County, NJ: Lead Design Engineer for the design of replacement Tertiary Filter No. 1 at the Stage I-II wastewater treatment plant. The replacement sand filter had a larger capacity than the existing sand filter. Responsibilities included preparation of plans and specifications, hydraulic calculations, selection and layout of sand filter equipment, site piping modifications, and coordination with other disciplines. Responsibilities also included preparation of State permit applications and Engineer's Report. Served as Project Manager for bid and construction phases, responsible for client contact, supervision of field inspectors and office engineers, contractor coordination, shop drawing review, preparation of Record Plans, and project coordination (2002 – 2004).

Treatment Plant Expansion and Sludge Incineration Facilities, Bayshore Regional Sewerage Authority, Union Beach, NJ: Provided construction phase services including shop drawing review and permit application reviews for expansion of the facilities from 8.0 to 16.0 MGD.

Wastewater Treatment Plant Expansion and Upgrading, Hanover Sewerage Authority, Morris County, NJ: Provided construction phase engineering services including contractor coordination, shop drawing review and tracking, preparation of payment applications, and review of manufacturer's O&M Manuals.

Wastewater Facilities Improvements, New Providence Borough, Union County, NJ: Provided construction inspection and engineering support services during construction of major modifications to the Borough's wastewater treatment plant and Summit Pump Station. Responsibilities included shop drawing review, field inspection, design clarifications, design of proposed change orders, payment applications, and miscellaneous project coordination.

Stage V Dechlorination Facilities, Warren Township Sewerage Authority, Somerset County, NJ: Provided construction inspection and engineering support services during the construction of dechlorination facilities. The dechlorination facilities utilized sulfur dioxide to dechlorinate the plant effluent. Responsibilities included shop drawing review, field inspection, payment applications, and miscellaneous project coordination.

Trout Run Water Pollution Control Center, Upper Merion Township Municipal Authority, King of Prussia, PA: Designed chlorination system for disinfection of plant effluent and pretreatment at various unit processes throughout the treatment facilities. Plans and specifications were prepared for the chlorination system as one part of the major treatment plant expansion. Provided engineering support services during the construction phase. Responsibilities included providing design clarifications, answering questions from the Contractor and field inspector, shop drawing review, and miscellaneous office support.

Stage IV Wastewater Treatment Plant, Warren Township Sewerage Authority, Somerset County, NJ: Designed replacement clarifier baffle skirts and clarifier spray nozzle system for two existing clarifiers at the Stage IV Wastewater Treatment Plant. Responsibilities included preparation of plans and specifications, site investigation during design phase, hydraulic calculations, sizing and selection of spray nozzles, submersible pump, piping, and baffle skirts, and performance of bid services consisting of conducting bid opening and preparation of report on bids, including recommendation of award of contract. Also provided construction inspection and engineering support services during the construction of the replacement clarifier baffle skirts and the new clarifier spray nozzle system. Responsibilities included shop drawing review, field inspection, project construction progress meetings, payment applications, and miscellaneous project coordination.

Wastewater Treatment Plant Modifications, Livingston Township, Essex County, NJ: Project Engineer responsible for the design of the comminution system for plant influent and modifications to the existing intermediate pumps, including the preparation of plans and specifications. Assisted in the design of the polymer system and alum system. Prepared specifications and finalized contract drawings for modifications to the existing treatment facilities. Responsibilities also included performance of bid services including bid opening and preparation of the bid. Prepared Engineer's Report and TWA Permit application for the modifications to the existing wastewater treatment facilities. Also, served as Project Engineer for the construction phase services for the treatment plant modifications. Responsibilities

included shop drawing review, field inspection, conducting project progress meetings, design clarifications, change orders, payment applications, and miscellaneous project coordination.

Asset Management Plan for Water Quality Accountability Act (WQAA) Hackettstown Municipal Utilities Authority, Warren County, NJ: Project Director for the preparation of an Asset Management Plan (AMP) for the Authority's water facilities to comply with requirements of the New Jersey Water Quality Accountability Act. The Authority's water assets include six water wells, four water tanks, two water booster stations, and many miles of water mains. The AMP includes the evaluation of the water supply, treatment, and distribution system components, and the development of a plan to inspect, maintain, repair, and renew its infrastructure, resulting in a prioritized capital improvement program. The preparation of the AMP is currently in progress and is scheduled to be completed in mid-2019. (2018 – present)

Wastewater Master Plan (WMP), Water Pollution Control Facility (WPCF), Livingston Township, Essex County, NJ: Project Manager for the preparation of a Wastewater Master Plan (WMP) for the Township's 4.62 MGD tertiary treatment Water Pollution Control Facility (WPCF). The WPCF WMP included an evaluation of the treatment facility and recommendations for replacements and design improvements. The WMP included a 10-Year Capital Improvement Plan (CIP) with prioritized projects to achieve sustainable, energy efficient wastewater treatment while meeting future regulatory requirements. A Risk-Based Asset Management Approach was utilized to evaluate and prioritize the Township's assets to determine which projects to include in the 10-Year CIP. The final WMP was completed in December 2013. (2011 – 2013)

Wastewater Master Plan (WMP), Wastewater Collection System, Livingston Township, Essex County, NJ: Project Manager for the preparation of a Wastewater Master Plan (WMP) for the Township's wastewater collection system, which consists of over 110 miles of gravity sewer and force main pipe ranging in diameter from 4-inches to 42-inches, as well as seven pump stations. The WMP included an evaluation of the condition of the sanitary sewer pipes and pump stations, video inspection of sewers, flow metering, hydraulic modeling of the sanitary sewer system, evaluation and estimation of wet weather extraneous flows, evaluation and recommendations for improvements, preparation of a 10-Year Capital Improvements Plan (CIP) with prioritized projects, and preparation of the Wastewater Master Plan Report. A Risk-Based Asset Management Approach was utilized to evaluate and prioritize the Township's assets to determine which projects to include in the 10-Year CIP. The final WMP was completed in December 2013. (2011 – 2013)

Wastewater Management Plan, Hackettstown Municipal Utilities Authority, Warren County, NJ: Project Manager for the preparation of the Wastewater Management Plan for the Town of Hackettstown. Responsibilities include coordination with the Client, Engineer for the Town of Hackettstown, and the project team, as well as oversight for the preparation of the updated sewer service area and wastewater management plan. (2009 – 2012)

Generator Interconnection at Wastewater Treatment Plant (WWTP) and Claremont Well No. 8 Generator, Hackettstown Municipal Utilities Authority, Warren County, NJ: Project Manager for the design, permitting, bid, and construction phases for the construction of a new generator at Well No. 8 and the interconnection of the two existing 660Kw and 300Kw generators at the WWTP to allow for sharing of plant loads. Responsibilities included preparation of plans and specifications, construction cost estimate, and coordination among design team members. Construction phase responsibilities included client contact, overall supervision of field inspectors, Project Engineer, and other office engineers, review of payment applications and change orders, and project coordination. (2013 – 2014)

HVAC Upgrades at Butterworth and Woodland Sewage Treatment Plants, Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for the upgrades to the existing heating and ventilating equipment at the sewage treatment plants. Responsibilities include preparation of plans and specifications, client contact, and overall project management. Finalizing preparation of plans and specifications for bid, which is scheduled for mid-2019. (2017 – present)

SCADA Systems Evaluation for Wastewater and Water Systems, American Water Military Services, Picatinny Arsenal, Dover, Morris County, NJ: Project Manager for the evaluation of the existing Supervisory Control and Data Acquisition (SCADA) systems for the wastewater and water facilities. The existing SCADA System monitors and controls wastewater lift stations, raw water pumps, service water pumps, and water storage tanks, as well as the water treatment plant. The project included field inspections, computer generated radio path studies,

on-site radio path, radio path testing (for select sites), and evaluation of SCADA equipment and performance for 37 water sites and 22 wastewater sites. A SCADA Systems Evaluation Report was prepared that summarized the evaluations and provided recommendations for upgrades of the existing SCADA system. (2015 – 2016)

SCADA Systems and Bubbler Control Panel Upgrades, Woodland and Butterworth Sewage Treatment Plants, Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for the upgrade of the Supervisory Control and Data Acquisition (SCADA) systems and bubbler control panels at the Township's Woodland and Butterworth sewage treatment plants. Design phase responsibilities included coordination with the design team and Client, preparation of plans and specifications for public bid, and preparation of the construction cost estimate. Bid phase services included attendance at the bid opening and preparation of the bid report. Construction phase services included client contact, supervision of field inspectors and office engineers, and contractor coordination, as well as shop drawing review, preparation of payment applications and change orders, and project coordination. (2011 – 2013)

SCADA System Upgrades, Wastewater Treatment Plant, Verona Township, Essex County, NJ: Project Manager for the design, bid, and construction phases for the upgrade of the Supervisory Control and Data Acquisition (SCADA) system at the Township's treatment plant. The project included the replacement of the existing Programmable Logic Controller (PLC) equipment that had reached the end of its useful life with new equipment. Design phase responsibilities included coordination with the design team and Client, preparation of plans and specifications for public bid, and preparation of the construction cost estimate. Bid phase services included attendance at the bid opening and preparation of the bid report. Construction phase responsibilities included client contact, supervision of field inspectors and office engineers, and contractor coordination, as well as shop drawing review, preparation of payment applications and change orders, and project coordination. (2009 – 2012)

Raw Sewage Pump System Upgrade, Woodland Wastewater Treatment Plant, Morris Township, Morris County, NJ: Project Manager for the design, bid, and construction phases for the upgrade of the raw sewage pump variable frequency drives (VFDs) and Supervisory Control and Data Acquisition (SCADA) system at the wastewater treatment plant. The project included the replacement of the existing raw sewage pump VFDs and Programmable Logic Controller (PLCs) equipment that had reached the end of its useful life with new equipment. Responsibilities included coordination with the design team and Client, preparation of plans and specifications for public bid, and preparation of the construction cost estimate. Responsibilities also included performance of bid phase services, including attendance at the bid opening and preparation of the bid report. Construction phase responsibilities included client contact, supervision of field inspectors and office engineers, and contractor coordination, as well as shop drawing review, preparation of payment applications, and project coordination. (2009 – 2010)

Sanitary Sewer Evaluation, Beaufort Subdivision, Livingston Township, Essex County, NJ: Project Manager for the evaluation of the impact that the proposed 12-house sub-division would have on the Township's existing sanitary sewer collection system and treatment capacity at the Township's Water Pollution Control Facility (WPCF). The project included field survey, visual inspection of manholes, theoretical calculation of sewer flows, hydraulic modeling of sanitary sewer system using InfoworksCS (by Innovyze), manual hydraulic calculations to verify results of hydraulic model, review of WPCF flow records and Capacity Assurance Reports, evaluation of the WPCF's capacity, and preparation of the letter report summarizing the evaluation of the sewer collection system and treatment capacity of the WPCF. (2012)

Sanitary Sewer Trunk Line Evaluation, East and West McClellan Avenues, Livingston Township, Essex County, NJ: Project Manager for the evaluation of 2,700 lf of 8-inch and 10-inch diameter vitrified clay pipe (VCP) sanitary sewer trunk line. The project included flow metering, internal video inspection, sewer cleaning, theoretical calculation of sewer flows, hydraulic modeling, meetings with Township operating and engineering personnel, and construction cost estimates. Responsibilities included project coordination, theoretical calculation of flows, preparation of construction cost estimates, identification of sections of sewer with inadequate capacity, preparation of construction alternatives to increase sewer capacity, meetings with Township representatives, and preparation of the report summarizing the evaluation. (2010 – 2011)

Lindsley Drive Sanitary Sewer Evaluation Study, Morris Township, Morris County, NJ: Project Manager for the evaluation of the feasibility of redirecting the sewage flow on Lindsley Drive that currently flows under the Whippany River via a siphon to the Morristown wastewater treatment plant to the Morris Township Woodland wastewater treatment plant via a new pump station, force main, and gravity sewer. The project included preparation of several alternative designs, construction cost estimates, review of permit requirements, Wastewater Management Plan revision and other regulatory issues, estimation of additional revenue from new customers, evaluation and comparison of the alternatives, and report preparation. Responsible for oversight and coordination of the project team, client contact, development and review of design alternatives, and construction cost estimates and additional revenue. (2009 – 2010)

Council of Affordable Housing (COAH) Sanitary Sewer Capacity Evaluation, Morris Township, Morris County, NJ: Project Manager for the capacity evaluation to determine whether the existing sanitary sewers have sufficient capacity to accept additional flow from a proposed 100-unit COAH project. The capacity of the existing sanitary sewers was calculated, and the existing flows were estimated based on the number of connections. In addition, two flow meters were installed for a four-week period to determine the actual dry weather and wet weather flows. Responsible for oversight and coordination of the project team, client contact, review of calculations and flow metering results, and report preparation. (2009)

Inspection and Evaluation of the United Water Great Gorge Sanitary Sewer System, Vernon Township, Sussex County, NJ: Project Manager for the inspection and evaluation of this United sanitary sewer system in consideration of the Township's purchase of the existing wastewater facilities owned by United Water. Responsibilities include the field inspection and evaluation of seven wastewater pumping stations, gravity sewers and force mains, recommendations of improvements/upgrades, preparation of estimated construction costs, estimation of remaining useful life of equipment and structures, and preparation of the report summarizing the findings of the inspections, evaluations, and cost estimates. (2006)

Extraneous Flow Evaluation, Livingston Township, Essex County, NJ: Project Manager for the extraneous flow evaluation of the 150 mile sanitary sewer collection system, which includes gravity sewer and force mains with pipe diameters ranging from 4-inch to 42-inch, in order to identify specific defects and infiltration/inflow (I/I) sources and provide recommendations to reduce I/I by a minimum of 3.50 MGD to comply with the Township's NJDEP Capacity Assurance Program. The project included dry weather and wet weather investigations (instantaneous weir flow measurements) and wet weather internal video inspection of 60,000 lf of pipe. The project included preparation of a Report summarizing all tasks, findings, and recommendations, including tabulation of field inspection findings, instantaneous flow measurements (dry weather and wet weather), wet weather video inspection findings/reports, and recommended corrective measures to reduce extraneous flows. Project is currently approximately 80% complete. Final Draft Report has been prepared and provided to Township for review. (2014 – present)

Meter Chamber 9B Service Area Infiltration/Inflow (I/I) and Sewer Capacity Study, Branchburg Township, Somerset County, NJ: Project Manager for the performance of an I/I and sewer capacity study for a portion of the Township's sanitary sewer collection system to determine whether the existing sanitary sewer and two existing pump stations have adequate capacity to accommodate existing and future flows. The project included flow metering, wet weather manhole inspections. build-out analysis, sewer capacity evaluation, capacity evaluation for two pump stations, and the preparation of a summary report. (2020)

Fox Hollow and Brandywine Infiltration/Inflow (I/I) and Sewer Capacity Study, Branchburg Township, Somerset County, NJ: Project Manager for the performance of an I/I and sewer capacity study for a portion of the Township's sanitary sewer collection system to determine whether the existing sanitary sewer and two existing pump stations have adequate capacity to accommodate existing and future flows. The project included flow metering, build-out analysis, sewer capacity evaluation, capacity evaluation for two pump stations, and preparation of a summary report. (2019 – 2020)

Inflow and Infiltration (I/I) Program, American Water Military Services, Picatinny Arsenal, Dover, Morris County, NJ: Project Manager for the I/I evaluation of the wastewater collection system, which is operated and maintained by American Water Military Services and includes approximately 36 miles of gravity sewer and force mains and 19 sewage pump stations. The project included pump station inspection and evaluation, inspection of 546 manholes, smoke testing, flow isolation and measurements (instantaneous weir flow measurements), and internal

video inspections of 21,000 lf of pipe. The project also included preparation of a Report summarizing all tasks, findings, and recommendations, including tabulation of field inspection findings, pump station inspections, manhole inspections, instantaneous flow measurements, construction cost estimates of recommended improvements, prioritized project schedule, video inspection findings/reports, and recommended corrective measures to reduce extraneous flows and provide reliable operation of the collection system. (2015 – 2016)

Infiltration/Inflow (I/I) Evaluation, East Windsor Municipal Utilities Authority, Mercer County, NJ: Project Manager for performance of an I/I evaluation of a portion of the sanitary sewer collection system to identify areas of extraneous flows within the drainage basins of four pump stations and provide recommendations for further extraneous flow investigations to identify specific locations of I/I within the collection system. The project included an 11-week flow metering period with eight meters to obtain both dry and wet weather flows. Services included preparation of a Report summarizing the results and evaluation of the flow metering, including tabulation of flow metering data, hydrographs, rainfall derived infiltration/ inflow (RDI/I) analysis, and recommendations for areas within the collection system for additional extraneous flows investigations. (2015 – 2016)

Wastewater Collection System, Butterworth Interceptor/Raynor Project, Randolph Township, Morris County, NJ: Project Manager for the design of improvements to the existing Butterworth sanitary sewer interceptor located to provide additional capacity to the collection system. The improvements include approximately 5,000 lf of 12-inch and 15-inch diameter gravity sewer. Responsibilities included the preparation of plans and specifications, hydraulic calculations, construction cost estimates, project coordination, and the preparation of permit applications for Treatment Works Approval (TWA), Wetlands, and Flood Hazard Area permits, and Soil Erosion and Sediment Control Plan certification. TWA permit time was extended during 2012. Construction phase responsibilities included client contact, supervision of field inspectors and office engineers, shop drawing review, preparation of payment applications, and project coordination. Construction commenced in 2013, and was completed in 2014. (2008 – 2014)

South Roberts Street Sanitary Sewer Improvements, Woodbridge Township, Middlesex County, NJ: Prepared plans and specifications for the replacement of an existing sanitary sewer with 1,800 lf of 8-inch and 12-inch diameter PVC sanitary sewer. Responsibilities included preparation of plans, specifications, and permit applications and performance of bid services consisting of attendance at the bid opening, preparation of canvas of bids, and recommendation of award of contract.

Water Main and Sanitary Sewer Main Crossing, East Windsor Municipal Utilities Authority, Mercer County, NJ: Project Director for the design and permitting phases for the sanitary sewer main crossing of US Route 130/NJ Highway Route 33. This project includes approximately 350 lf of new 8-inch diameter sanitary sewer, 350 lf of new 14-inch diameter water main and 115 lf 8-inch diameter sanitary sewer and 14-inch diameter water main to be installed utilizing trenchless jack-and-bore installation method across Route 130/Route 33. Design phase services include preparation of plans and specifications for public bid. Design phase services also include geotechnical investigation and hydraulic calculations as well as preparation of permit applications (NJDEP Treatment Works Approval (TWA) and Wetlands permits, NJDOT Utility Openings, and Soil Erosion and Sediment Control Certification), Project is currently under design and is scheduled to be ready for public bid in mid-2019. (2018 – present)

Skyline Drive Sanitary Sewer, Morris Township, Morris County, NJ: Project Manager for the design and permitting of new sanitary sewer collection system for approximately 116 residential connections and one commercial connection, including of approximately 7,600 lf of gravity sewer, 4,800 lf of low pressure force main, and 70 grinder pumps. Responsibilities included the preparation of plans and specifications, hydraulic calculations, and design of low-pressure force mains and grinder pump systems. Prepared permit applications including NJDEP Treatment Works Approval (TWA) permit application and Morris County Soil Erosion and Sediment Control Certification. Responsible for the preparation of plans and specifications for bid. Providing construction administration and management services. Managed bid phase activities, including the evaluation of bids and recommendations for construction contract award. (2016 – present)

Wastewater Collection System Phase II, Hopatcong Borough, Sussex County, NJ: Lead Design Engineer for the design of the collection system for approximately 1,100 house

connections, consisting of 10,000 lf of gravity sewer, 2,000 lf of force main, grinder pumps, and 54,000 lf of low-pressure sewer. Responsibilities included the preparation of plans and specifications, hydraulic calculations, and design of low-pressure force mains and grinder pump systems. Prepared permit applications and submittals for NJDEP Environmental Infrastructure Financing program. Served as Project Manager for bid and construction phases, responsible for client contact, supervision of field inspectors and office engineers, and contractor coordination, as well as conducting job progress meetings, shop drawing review, preparation of payment applications, change orders, and NJDEP Authorization to Activate submittals, project coordination, and project administration. Bid phase services included attendance at bid openings and preparation of Addenda, Bid Reports, and submittals for NJDEP Environmental Infrastructure Financing program.

Force Main Improvements, New Providence Borough, Union County, NJ: Prepared plans and specifications for 6,300 lf of 12-inch diameter ductile iron pipe (DIP) force main. Performed transient surge analysis for new force main and two existing force mains.

Residential Development Sanitary Sewer Systems, Warren Township Sewerage Authority, Somerset County, NJ: Project coordination for construction inspection of numerous sanitary sewer residential development projects throughout the Township. Responsibilities included inspection, coordination with contractor, assignment of inspectors to various projects, general project coordination, and client contact. In addition, performed construction inspection of 8-inch diameter PVC sanitary sewer for numerous residential development projects.

Fifth Street Combined Sewer Pump Station Modifications, Bayonne Municipal Utilities Authority, Hudson County, NJ: Lead Design Engineer for the design of modifications to the existing combined sewer pump station which included replacement of three mechanical bar screens and one conveyor. Responsibilities included preparation of plans and specifications, sizing and selection of mechanical bar screens and conveyor, and coordination with other disciplines. Reviewed shop drawings and provided technical assistance during the construction phase of the mechanical bar screen project.

Wastewater System Vulnerability Assessment (VA), East Windsor Municipal Utilities Authority (EWMUA), Mercer County, NJ: Performed a comprehensive wastewater system Vulnerability Assessment (VA) utilizing VSAT (Vulnerability Self-Assessment Tool). VSAT is a computer software program developed by the Association of Metropolitan Sewerage Agencies (AMSA) in collaboration with PA Government Services, Inc. and Scientech, Inc. The Authority's wastewater system consists of a gravity collection system, nine wastewater pump stations and force mains, and a wastewater treatment plant. Responsibilities included the preparation of a Vulnerability Assessment Report, performance of Vulnerability Assessment utilizing VSAT computer program, site investigations, discussions with plant personnel, and development of lists of assets, threats, consequences, vulnerabilities, countermeasures, and risks for the EWMUA's wastewater system. Responsibilities also included the development of prioritized recommendations of new countermeasures which were evaluated by use of the Risk-Cost Analysis feature of the VSAT computer program and with input from EWMUA personnel to reduce the risks to the wastewater system to malevolent acts.

Arthur Terrace and College View Drive Water Transmission Main, Hackettstown Municipal Utilities Authority, Warren County, NJ: Project Manager for the design, permitting, bid, and construction phases for the replacement of approximately 18,000 lf of existing 6-inch and 8-inch diameter unlined cast iron water main with new 8-inch diameter cement-mortar lined ductile iron water main. Responsibilities included preparation of plans and specifications, permit applications, construction cost estimate, and coordination among design team members. Construction phase responsibilities included client contact, overall supervision of field inspectors, Project Engineer, and other office engineers, review of payment applications and change orders, and project coordination. (2013 – 2015)

Claremont Water Transmission Main, Hackettstown Municipal Utilities Authority, Mansfield Township, Warren County, NJ: Project Manager for the design, permitting, bid, and construction phases for the replacement of approximately 3,500 lf of existing 8-inch diameter unlined cast iron water main with new 12-inch diameter cement-mortar lined ductile iron water main. Responsibilities include the preparation of plans and specifications, permit applications, construction cost estimate, and coordination among design team members. Construction phase responsibilities included client contact, overall supervision of field

inspectors, Project Engineer, and other office engineers, review of payment applications and change orders, and project coordination. (2012 – 2013)

Well No. 9 Well House, Hackettstown Municipal Utilities Authority (HMUA), Warren County, NJ: Project Manager for the design, permitting, bid, and construction phases for the construction of the Well No. 9 well house. The project also included the installation of a new 800 gpm vertical turbine pump in the existing well. The project included a chlorine chemical feed system, corrosion control feed system, standby generator, and connection of the well house equipment to the HMUA's existing Supervisory Control and Data Acquisition (SCADA) system. Responsibilities included the preparation of plans and specifications, permit applications, construction cost estimate, and coordination among design team members. Performed construction phase services, including client contact and overall supervision of field inspectors, Project Engineer, and other office engineers, as well as review of shop drawings, payment applications, and change orders, and project coordination. (2012 – 2015)

Rehabilitation of Well Pumps at Wells No. 5 and No. 6, Hackettstown Municipal Utilities Authority, Warren County, NJ: Project Manager for the design, bid, and construction phases for the rehabilitation of the well pumps at Wells No. 5 and No. 6 to restore the pumping capacities to their original pumping rates of 1,000 gpm and 695 gpm, respectively. Responsibilities included the preparation of contract plans and specifications. During the construction phase, responsibilities included client contact and supervision of field inspectors and office engineers, as well as shop drawing review, preparation of payment applications, project coordination, and project administration. Bid phase services included distribution of contract documents, attendance at the bid opening, and preparation of the bid report. (2007 – 2009)

Earth Embankment Dike Haran Circle to Oval Road, Millburn Township, Essex County, NJ: Prepared plans and specifications for the construction of an earth embankment dike on a tributary to the East Branch Rahway River in the vicinity of Greenwood Drive and between Oval Road and Haran Circle. The project also included construction of a submersible stormwater pump station. Responsibilities included preparation of plans and specifications, acquisition of easements, preparation of NJDEP loan program submissions, obtaining approvals for NJDEP loan program, and preparation of bid report with recommendation of award.

Storm Sewer Collection System, Plymouth and MacKenzie Roads, Morris Township, Morris County, NJ: Project Manager for the construction phase for the construction of a storm sewer collection system. The project included approximately 1,500 lf of RCP, HDPE and ductile iron pipe (DIP) storm sewer, ranging in diameter from 8-inches to 36-inches. Responsible for client contact, supervision of field inspectors and office engineers, and contractor coordination, as well as shop drawing review, preparation of payment applications, processing of change orders, Record Plans, project close-out, and project coordination. (2008 – 2009)

Combined Sewer Separation Phase II, City of New Brunswick, Middlesex County, NJ: Prepared plans for the construction of 2,300 lf of storm sewer for Phase II of the City's Combined Sewer Separation project. Responsibilities included field survey, hydraulic calculations, including pipe sizing, and preparation of plans.

Low Flood Walls West Bank of East Branch Rahway River, Millburn Township, Essex County, NJ: Prepared plans and specifications for the construction of reinforced concrete flood walls on the west side of the East Branch Rahway River along Ridgewood Road to Gilbert Place. The project also included drain inlets, underdrains, storm sewer chambers, grouted riprap, and site restoration. Responsibilities included preparation of plans and specifications, acquisition of easements, preparation of NJDEP loan program submissions, obtaining approvals for NJDEP loan program, and preparation of bid report with recommendation of award. In addition, provided assistance in the construction inspection and office support services during the construction phase.

Clearwater Detention Basin, New Providence Borough, Union County, NJ: Resident Engineer for the construction of a 25 acre-foot stormwater detention basin on the Salt Brook. The project utilized an existing railroad embankment that was enlarged to serve as part of the 2,200-foot dam. The section of the new earth embankment dam is 1,000 lf with gabion lining on the spillway. The project also included construction of inlet and outlet headwalls and appurtenances for existing drainage pipes through the railroad embankment. The existing pipes through the railroad embankment were structurally reinforced with pressure grouting. Responsibilities included field inspection, calculation of quantities and payment applications, coordination with geotechnical subconsultant, and miscellaneous project coordination.

Water Pollution Control Facility (WPCF) Combined Heat and Power (CHP) Feasibility Study, Livingston Township, Essex County, NJ: Project Manager for the performance of a feasibility study to evaluate the beneficial use of the methane gas generated by the WPCF's two anaerobic digesters and to determine whether the construction of a combined heat and power project is feasible from an engineering and economic standpoint. The results of the feasibility study should enable the Township to make an informed decision as to whether to proceed with construction of a CHP project. Responsibilities included evaluation and conceptual design of the CHP system utilizing methane gas from anaerobic digesters and preparation of the New Jersey Clean Energy Program Renewable Energy Incentive Program (REIP) Feasibility Study Application submittal and the CHP feasibility study report. (2012 – 2013)

Water Pollution Control Plant Upgrading Feasibility Study, Livingston Township, Essex County, NJ:

Performed feasibility study for the upgrading of a wastewater treatment facility. Responsibilities included flow analysis, plant hydraulics, performance analysis, preliminary design and review of various options, and construction cost estimate. Preliminary design included polymer system, modification of existing pumps, new booster pump, and new site piping.

Papers

NJ Goes Turbo - Operator Experiences a Few Years Later, Water Environment Federation Technical Exhibition and Conference (WEFTEC), 2014

To Burst or Not to Burst: Considerations for ACP Sewer Replacement, Water Environment Federation Technical Exhibition and Conference (WEFTEC), 2011

Low Pressure Sanitary Sewer Systems - A Case Study, Water Environment Federation Technical Exhibition and Conference (WEFTEC), 2010

Presentations

Preliminary Treatment Benefits and Considerations at Five (5) Wastewater Treatment Plants, presented at the Spring Conference of the New Jersey Water Environment Association, 2016

Risk Management Approach Provides Cost Effective Management Solution for an Aging Sanitary Sewer Collection System, presented at the Spring Conference of the New Jersey Water Environment Association, 2015

To Burst or Not to Burst: Considerations for ACP Sewer Replacement, presented at the Technical Exhibition and Conference (WEFTEC) of the Water Environment Federation, 2011

Low Pressure Sanitary Sewer System - NJ Case Study, presented at the Fall Technology Transfer Seminar of the New Jersey Water Environment Association, 2009

MOTT MACDONALD

Scott B. Pendergrass, PE

Personal summary

Education:

MS, Civil Engineering, Rutgers University, 2014

BS, Civil Engineering, University of Delaware, 2008

Registrations:

Professional Engineer DE #18090, 2013

OSHA Confined Space Entry, 2009

OSHA Construction Safety and Health, 2015

Years with Mott MacDonald:

13

Years with other firms:

0

Mr. Pendergrass has developed an increasing range of experience in the area of water treatment, water supply, and wastewater engineering. He has provided extensive assistance in design and preparation of plans and specifications, and provided permitting, construction observation, and construction phase engineering services for water treatment plants, water transmission and distribution mains, and water storage tanks.

Employment history

2008 – Present Mott MacDonald

Selected projects

PFAS Treatment Improvements, Ridgewood Water, Bergen County, NJ: Project Manager responsible for the preliminary designs for four combined PFAS treatment facilities for the Ridgewood Water system. The project includes design of modifications to the existing water system to incorporate new PFAS treatment. The work also includes preliminary site plan development for each of the new facilities, and review and modification to the existing facility process flows, including chemical feed and chlorination requirements. Additionally, the project includes development of preliminary alignments for proposed raw water mains to combine the existing well flows at the new treatment sites and hydraulic analysis to review the impact of the modifications to the distribution system and existing pumping equipment. (2020 – present)

Canoe Brook Water Treatment Plant Volatile Organic Compounds (VOC) Treatment System, New Jersey American Water, Millburn, NJ: Deputy Project Manager and Process Engineer for the design and construction of a new 7.5 MGD groundwater treatment facility. The new facility provides removal of Trichloroethylene (TCE) and Perchloroethylene (PCE) from 10 groundwater wells. The treatment process includes packed tower aeration systems and an intermediate wetwell with vertical turbine pumps. Work also included preliminary design for a future advanced oxidation system for 1,4 Dioxane removal utilizing UV-peroxide and granular activated carbon (GAC) for quenching. The project is being completed with a design-build delivery method and utilizes Building Information Modeling (BIM) technology to develop a 3-dimensional model of the new treatment process. (2017 – 2020)

Water Treatment Plant Residuals Handling System Improvements, Jersey City Municipal Utilities Authority, Parsippany-Troy Hills, NJ: Project Engineer leading the project team for the pilot testing and design of improvements to the residuals handling system for a surface water treatment plant. Project consists of the design of a new centrifuge, cross screw conveyor, and replacement and upgrade of the dewatering polymer feed system to provide greater flexibility and resiliency to the treatment plant. Responsibilities include all design, permitting, bid, and construction phase services. (2014 – present)

Well Supply Manganese Removal Treatment Facility and Water Transmission Mains, Florham Park Borough, Morris County, NJ: Assisted with the design of the manganese removal treatment facility and water mains. Prepared permit applications and assisted with NJDEP State Revolving Fund financing. Assisting in the design of new ductile iron pipe (DIP) water transmission mains to transport water to/from the new treatment plant, distribution system and wells, and a new backwash separator tank and sanitary sewer to handle plant discharge. Engineering services include preparation of plans and technical specifications, permit applications, and treatment option evaluations. (2008 – present)

Water Filtration Plant West Filter Wing Clearwell Piping Evaluation, Trenton Water Works, Mercer County, NJ: Potable Water Project Engineer for the preparation of a technical memorandum addressing the condition of the west filter wing clearwell piping at the water filtration plant. Responsibilities included field reconnaissance and obtaining non-destructive measurements of pipe thicknesses, using ultrasonic gauges, for the development of recommendations for the clearwell piping. (2013)

Water Filtration Plant Sump Pump Systems Replacement and Upgrade, Trenton Water Works, Mercer County, NJ: Assisted with the preliminary design, permitting, final design, bid phase, and construction phase of the project, which consisted of the replacement of sump pump systems to eliminate existing undersized systems in the basement of the water filtration plant. Responsibilities included field reconnaissance, support in preparation of the preliminary design report, final bid documents, coordination with regulatory agencies, bid phase assistance, shop drawing submittal review, responding to contractor's Requests for Information (RFIs),

construction inspection, and potential change order review. Services also included the design of secondary flood pumps to discharge water in the event of a flood. (2012 – 2013)

Residuals Handling Study, Jersey City Municipal Utilities Authority, Parsippany-Troy Hills, NJ: Potable Water Project Engineer for the study and evaluation of the residuals handling system for a surface water treatment plant. Project responsibilities included the collection and synthesis of existing plant data, field reconnaissance of existing plant practices and infrastructure, and development of a report with recommendations for optimization of the facility residuals handling system. (2012 – 2013)

Water Treatment Plant Improvements, Jersey City Municipal Utilities Authority, Parsippany-Troy Hills, NJ: Provided field inspection and construction phase services for the modification of the filter under drain and media replacement performed on an operational water treatment plant. Project responsibilities included field inspection, responding to contractor's Requests for Information (RFIs), conducting monthly project progress meetings, and the development of facility-specific Standard Operating Procedures (SOPs) for the proper backwashing, sterilization, and filter start-up procedures. (2011 – 2013)

Raritan-Millstone Water Treatment Plant, Dry Chemical Feed Improvements, New Jersey American Water, Bridgewater, NJ: Assisted in the evaluation, design, and construction phases for water treatment plant improvements, including the potassium permanganate and powdered activated carbon dry chemical feed systems. Design phase scope of work included the replacement of the carbon feeders and carbon slurry piping, installation of a passive dust collection system for the permanganate hoppers, and the installation of double containment piping with leak detection for the permanganate slurry. Project responsibilities included assisting in the preparation of design documents and bid documents. Construction management activities included shop drawing review and responses to Requests for Information (RFIs). (2010 – 2012)

Wanaque Water Treatment Plant Improvements, North Jersey District Water Supply Commission, Passaic County, NJ: The project involved improvements to the water treatment plant, including modifications to the chemical feed system and filters. Construction phase responsibilities included support of the design of modifications to the lime system, polymer feed system, and other chemical feed systems, issuing clarifications to Requests for Information (RFIs), reviewing shop drawings and change orders, and processing payment applications. (2009 – 2011)

Large Valve Replacement Project - Phase 2, Jersey City Municipal Utilities Authority (JCMUA), Hudson County, NJ: Project Manager for the design, permitting, bid, and construction phases for the replacement of 30 large diameter (16-inch thru 48-inch) gate valves and replacement of nine large diameter (48-inch) valves along the JCMUA's aqueduct. Engineering services include preparation of plans and specifications, submission of permitting applications, assistance with New Jersey Environmental Infrastructure Trust (NJEIT) financing, bid phase services, and construction administration and inspection. (2017 – present)

Rehabilitation of Water Distribution Mains (Contract 11-WS2011), City of Newark, Essex County, NJ: Potable Water Project Engineer during the design phase and Project Manager during the bid and construction phases. Responsible for the preparation of plans and specifications for cleaning and cement-mortar lining of approximately 63,000 lf of existing 6-inch and 8-inch diameter water mains, and the replacement of valves and fire hydrants. The project design also included the preparation of detailed by-pass plans. Additional services include construction administration and construction inspection. (2014 – present)

Hill Road Transmission Main Replacement, Washington Suburban Sanitary Commission (WSSC), Prince George's County, MD: Project Manager for the replacement of 1.9 miles of 30-inch diameter pre-stressed concrete cylinder pipe (PCCP) water main. Work included development of a standardized evaluation method and scoring process to be used in future replacement planning tasks and utilizing this method to evaluate alternatives for the PCCP replacement on Hill Road. Work also included developing conceptual plans of the selected alternative, preliminary engineering report, and 30% design drawings. (2018 – 2020)

Water Main Replacement – Huntington Drive, East Windsor Municipal Utilities Authority, Mercer County, NJ: Project Manager for the design, permitting, bid, and construction phases for the replacement of approximately 4,700 lf of existing 4-inch and 6-inch diameter ductile iron (DI) main with new 10-inch diameter High Density Polyethylene (HDPE) water main. Engineering services included preparation of plans and specifications, submission of permitting

applications, assistance with New Jersey Environmental Infrastructure Trust (NJEIT) financing, bid phase services, and construction administration and inspection. (2018 – 2020)

Water Main Replacement – Enfield Drive and Greenwich Court, East Windsor Municipal Utilities Authority, Mercer County, NJ: Project Manager for the design, permitting, bid, and construction phases for the replacement of approximately 2,410 lf of existing 4-inch and 6-inch diameter ductile iron (DI) main with new 8-inch diameter High Density Polyethylene (HDPE) water main. Engineering services included preparation of plans and technical specifications, preparation of bid documents, and construction administration and inspection. (2017 – 2018)

Water Main Replacement – Twin Rivers Drive North and Nettleton Drive, East Windsor Municipal Utilities Authority, Mercer County, NJ: Project Manager for the final design, bid, and construction phases for the replacement of approximately 1,300 lf of existing 4-inch and 6-inch diameter ductile iron (DI) main with new 8-inch diameter High Density Polyethylene (HDPE) water main. Engineering services included preparation of plans and technical specifications, bid phase services, and construction administration and inspection. (2016 – 2017)

Quabbin Aqueduct Rehabilitation Improvements, Massachusetts Water Resources Authority (MWRA), Hardwick, MA: Project Engineer for the design phase engineering services for the rehabilitation of aqueduct shaft facilities, including a hydropower station. The project includes the installation of an emergency roller gate to isolate the aqueduct, and mechanical, electrical, and architectural improvements to several shaft buildings. (2013 – 2015)

Arthur Terrace and College View Transmission Main, Hackettstown Municipal Utilities Authority, Warren County, NJ: Potable Water Project Engineer during the construction phases for the replacement of 6-inch and 8-inch diameter water distribution main. Project responsibilities included project management, inspection, payment application and change order review, attending construction progress meetings, preparation of as-built drawings, and coordination between the Owner and the contractor. (2014)

Claremont Water Transmission Main, Hackettstown Municipal Utilities Authority, Warren County, NJ: Potable Water Project Engineer inspecting construction phases for the replacement of the 8-inch and 12-inch diameter water transmission main. Project responsibilities included inspection, review of payment applications, change order review, preparation of as-built drawings, and coordination between the Owner and the contractor. (2013)

Ridgedale Avenue Underground Valve and Hydrant Replacement, Florham Park Borough, Morris County, NJ: Potable Water Project Manager during the design, bid, and construction phases for the replacement of approximately 30 project areas along Ridgedale Avenue. Project responsibilities included conceptual and final design of the of valve and hydrant replacements, preparation of plan drawings and technical specifications, and bid and construction phase services. Construction phase services included night-time field inspection, shop drawing, pay application, and change order review, issuing clarifications to Requests for Information (RFIs), attending construction progress meetings, and coordination between the Owner and the contractor. (2013)

Proposed Aqueduct Replacement, Bayonne Municipal Utilities Authority, Kearny, NJ: Project Engineer for the preparation of plans, technical specifications, and cost estimates for the relocation of the existing 48-inch diameter aqueduct. Responsibilities included the design of a new ductile iron pipe (DIP) water aqueduct to replace and connect to the existing steel lock-bar pipe, and the preparation of plans and technical specifications. Project design included pipe thickness design for shallow-buried pipe in accordance with AWWA standards, creation of connection details for large diameter pipe involving dissimilar metals, and feasibility/constructability analysis for determining appropriate restraint measures for large diameter pipe. (2013)

Route 306 Water Main Extension, United Water New York, Rockland County, NY: Assisted with the design and preparation of plans and technical specifications for approximately 3500 lf of 16-inch diameter water distribution main along NY State Highway Route 306 to provide overall system connectivity in the area. The project included the installation of 450 lf of DR18 PVC water main to cross underneath a 20-inch diameter gas main with electric tension wires above. Engineering services also included permit preparation (NYDOH and NYSDOT) and bid documents. (2010 – 2011)

Phase I Aqueduct Rehabilitation, Bayonne Municipal Utilities Authority, Kearny, NJ: Assisted with the evaluation, design, and construction phase engineering for the rehabilitation of approximately 2,600 lf of the 48-inch diameter lock-bar steel pipe aqueduct. The project involves the evaluation of alternatives for interior rehabilitation of the lock-bar steel pipe, including slip lining, epoxy and polymeric reinforced coatings, reinforced cement mortar lining, and replacement. Responsibilities included the preparation of contract documents for an initial internal inspection contract. Assisted with the development of the detailed design of pipe rehabilitation via 36-inch HDPE slip lining, preparation of bid documents, environmental permitting, and construction inspection for internal inspection, slip lining process, and disinfection. (2008 – 2011)

Lakeview Avenue Transmission Main Relocation, New Jersey American Water, Piscataway, NJ: Assisted with the piping layout design of a 36-inch diameter water transmission main relocation under a proposed box culvert, including two linestops and a 20-inch diameter by-pass line. Responsibilities included the preparation of plans and specifications and coordination with the client to provide minimum interruption of water service. (2008)

Well No. 1 – Congressional Generator Replacement, Livingston Township, Essex County, NJ: Project Manager for the design, permitting, bid, and construction phases for SCADA upgrades for the installation of a new 80 kW natural gas generator and all associated electrical components, concrete support pad, and appurtenances at the Well No. 1 Congressional wellhouse. The work also includes installation of new natural gas services and all associated plumbing components, removal of the existing 25 kW generator, removal of an existing 500-gallon diesel underground fuel tank, and reconfiguration of electrical equipment and electrical upgrades within the wellhouse. Engineering services include preparation of plans and technical specifications, preparation of bid documents, and construction administration and inspection. (2018 – present)

Well No. 6 Improvements, Livingston Township, Essex County, NJ: Project Manager leading a design team for the improvements to an existing well facility and construction of a new volatile organic compound (VOC) removal facility. Project consists of the design of a new VOC treatment facility, clear well and high lift pump, chlorination system, packed tower air stripper, electrical and SCADA equipment, and upgrades to the existing well facility. Responsibilities include preliminary and final design, permitting, and bid and construction phase services. (2016 – present)

Well Nos. 8, 9, and 12 Improvements, Livingston Township, Essex County, NJ: Project Manager leading a design team for the final design of improvements to three existing well facilities, including replacement of existing volatile organic compound (VOC) removal equipment. Project includes design of new submersible well and vertical turbine clear well pumps, chlorination systems, new packed tower air stripper equipment, and electrical and SCADA upgrades. Responsibilities include final design and bid and construction phase services. (2016 – present)

Well Facility 1, 2, 4, 7, and 10 SCADA Upgrades, Livingston Township, Essex County, NJ: Project Manager for the design, permitting, bid, and construction phases for SCADA upgrades for five facilities, including design for installation and integration of a new programmable logic controller (PLC) and remote terminal unit (RTU) mobile phone-based communications within the designated Township well and treatment facilities to allow for communication with the Township's SCADA system over the existing Verizon wireless cellular network. Work also included installation of new instrumentation, electrical, process, and SCADA integration work. Engineering services include preparation of plans and technical specifications, preparation of bid documents, and construction administration and inspection. (2017 – present)

East Orange Interconnection SCADA Upgrades, Livingston Township, Essex County, NJ: Project Manager for the design, permitting, bid, and construction phases for SCADA upgrades for an existing interconnection chamber, including the installation and integration of a new programmable logic controller (PLC) and remote terminal unit (RTU) with mobile phone-based communications to allow for communication with the Township's SCADA system over the existing Verizon wireless cellular network. Work also included modification of an existing turbine flow meter to provide an analog signal to the new RTU, and a new flow controller that will be retrofit to an existing Cla-Val pressure control valve, and the installation of a new traffic box to be installed on top of the existing concrete interconnection chamber, which will house the electrical service and associated panelboards. Engineering services included preparation of

plans and technical specifications, preparation of bid documents, and construction administration and inspection. (2017 – 2020)

Catskill-Delaware Interconnection at Shaft 4 (DEL-359), New York City Department of Environmental Protection (NYCDEP), Ulster County, NY: Engineer involved in facility start-up and testing operations, as well as the development of Standard Operating Procedures (SOP) and a facility Operation and Maintenance (O&M) Manual for a newly constructed interconnection to draw water from the pressurized Delaware Aqueduct and direct it into the gravity-flowing Catskill Aqueduct. (2014 – present)

Boonton Reservoir Gravity Water Supply Improvements, Jersey City Municipal Utilities Authority, Hudson County, NJ: Provided assistance for the design of a new rapid mix chamber and associated traveling screens for a new gravity main for an existing water treatment plant. Overall project included 1,800 feet of 72-inch and 84-inch diameter pre-stressed concrete cylinder pipe (PCCP) raw water main, new 100 MGD rapid mix basin, upgraded fiber optic-ethernet SCADA system, and upgrading the treatment plant's chemical feed system. (2012)

Blue Lake – Maplebrook Interconnection, United Water New York, Orange County, NY: Assisted with the evaluation, design, and preparation of plans and technical specifications for approximately 7,700 lf of 12-inch diameter main extension and a pressure regulating valve (PRV) replacement. Engineering services also included the preparation of permit applications and bid documents. (2010)

Water System Improvements, United Water New York and United Water New Rochelle, Rockland County, NY:

Assisted with the design and preparation of plans and technical specifications for four separate United Water UIRP and LTMRP projects. Projects generally included the replacement of undersized mains and main extensions with 8-inch and 12-inch diameter mains. Engineering services included the preparation of permit applications. (2008 – 2010)

2009 Water System Improvements, Southeast Morris County Municipal Utilities Authority, Morristown, NJ: Assisted with the permitting and preparation of plans and specifications for the replacement of approximately 7,200 lf of 6-inch diameter water main with 8-inch diameter water main, including the replacement of approximately 25 fire hydrants. (2008 – 2009)

Crane Hill and Princeton Avenue Pump Station Upgrades, Town of Dover, Morris County, NJ: Project Manager for the design, permitting, bid, and construction phases for the upgrade of two pump stations, including installation of a new centrifugal pump and two new vertical turbine pumps with new variable frequency drive (VFD), process piping, and valve replacements, as well as instrumentation, electrical, architectural, structural, and mechanical/HVAC improvements. Work also includes installation of a new diesel generator, replacement of two tablet chlorination systems, replacement of air blowers, and clearwell cleaning for two air stripping tower facilities Engineering services include preparation of plans and technical specifications, permitting, preparation of bid documents, and construction administration and inspection. (2018 – present)

Standby Generator at Wayne Pump Station (Contract 06-WS2015), City of Newark Department of Water and Sewer Utilities, Passaic County, NJ: Project Engineer during the design phase and Project Manager during the bid and construction phases for the installation of a 1500 kW emergency diesel generator. Work included preparation of plans and specifications for the generator installation, including associated transformers, switchgears, load banks, and all required electrical components, concrete platform. Design phase work also included environmental permitting and securing funding through the New Jersey Environmental Infrastructure Trust (NJEIT). Additional services included bid phase services, construction administration, and construction inspection. (2015 – 2018)

South Beverwyck Road Booster Station, Parsippany-Troy Hills Township, Morris County, NJ: Project Manager leading a design team for the final design of a new prefabricated 1.8 MGD booster station servicing three existing well facilities. Booster station design includes pumps, chlorination system, contact piping for 4-Log Virus inactivation, and electrical and SCADA design. Responsibilities include preliminary and final design, permitting, and bid and construction phase services. (2016 – present)

Raw Water Pump Station Upgrades, City of New Brunswick, Middlesex County, NJ: Potable Water Project Engineer for the evaluation phase, preliminary design, permitting, final

design, bid phase, and construction phase of the project, which consists of the replacement of raw water pumps and traveling screens, as well as electrical and SCADA improvements at the17 MGD D&R Canal and 19 MGD Weston's Mill raw water pumping stations. Responsibilities include assisting with the preparation of preliminary design and final bid documents. (2011 – present)

Mountain Ridge Drive Booster Station, Livingston Township, Essex County, NJ: Assisted with the evaluation phase, preliminary design, permitting, final design, bid phase, and construction phase of the project, which consisted of the installation of a new packaged booster and generator system, and gravity retaining wall, to transfer water from a low pressure service line to a high pressure service line. Responsibilities included field reconnaissance, preparation of preliminary design and final bid documents, preparation of permit applications, bid phase assistance, shop drawing reviews, responding to contractor's Requests for Information (RFIs), and construction inspection. (2011 – 2013)

FEMA SuperStorm Sandy Disaster Support Services, Jersey City Municipal Utilities Authority, Hudson County, NJ: Provided field inspection services for the preparation of applications for FEMA relief following SuperStorm Sandy. Project responsibilities included field reconnaissance of city sewer regulator chambers, netting facilities, and outfalls. (2012 – 2013)

Water Tank Replacement, VA Medical Center, US Department of Veterans' Affairs, Wilkes-Barre, PA: Assisted with design and preparation of plans, technical specifications, and cost estimates for the replacement of the existing 300,000-gallon elevated water storage tank. Project responsibilities include field reconnaissance, preparation of the preliminary design report, preparation of bid documents, and design of a new 400,000-gallon water spheroid tank, as well as shop drawing review and issuing clarifications to Requests for Information (RFIs). (2011 – present)

Plant 13 Storage Tank Evaluation and Rehabilitation, New York American Water, Oceanside, NY: Provided assistance for a potable water project including the evaluation of existing aboveground water storage tanks. Project responsibilities included site visits to assess the existing condition of the tanks, inspection of the tanks' interiors, coordination with testing laboratories, and preparation of portions of the evaluation report. The evaluation report consisted of recommendations for upgrading and/or replacing the tank and its appurtenances along with budgetary cost estimates for implementing each option. (2008 – 2011)

Rehabilitation of Tunnel Walls, Roadway, Drainage, Ceiling, and Fireline Repairs at the Hugh L. Carey Tunnel (Project No. BB-28 Phase II), Triborough Bridge and Tunnel Authority, New York, NY: Project Engineer for the preliminary and final design phases and construction phase of the mechanical engineering portion of the project, which consisted of replacements and upgrades for flood hardening of the tunnel drainage system, including the replacement of the emergency and normal drainage pumps at the Manhattan Blower Building (MBB), Governor's Island Ventilation Building (GIVB), and Brooklyn Plaza Pumping Station (BPPS) facilities following extensive damage from SuperStorm Sandy. Services included performing non-destructive flow metering tests at MBB and BPPS and condition evaluation studies of the equipment at all three facilities, assistance in the preparation of the detailed design of the pumps and associated equipment and piping at all three facilities, and preparation of plans and specifications. Additional services included meetings and deliberation with FEMA regarding compensation and rehabilitation measures for the drainage system elements which were damaged during SuperStorm Sandy. (2013 – 2015)

Northeast Energy District Conceptual Horizontal Directional Drill (HDD) Crossings, Kinder Morgan, Various Sites, PA, NY, MA, NH, and CT: Project Engineer for the conceptual design and preliminary draft preparation of 32 horizontal directional drill (HDD) locations for a gas pipeline extension. Responsibilities included design of site-specific conceptual layouts for the HDD geometries base preliminary draft permitting drawings by collecting data, establishing workspace areas, identifying entrance and exit points, and establishing conceptual horizontal and vertical design for the HDD. (2014 – 2016)

Presentations

A Proactive Approach to Groundwater Contamination Using Design-Build, presented at the Annual Conference of the American Water Works Association, New Jersey Section, 2019

Groundwater System Upgrade Provides Critical Reliability and Redundancy, presented at the Annual Conference of the American Water Works Association, New Jersey Section, 2016

MOTT MACDONALD

Duane S. Chapman

Personal summary

Education:

MS, Natural Resources, University of Rhode Island, 1999

BS, Environmental Management, University of Rhode Island, 1997

Registrations:

ESRI Certified ArcGIS Desktop Professional

Years with Mott MacDonald:

20

Years with other firms:

2

Mr. Chapman has significant experience in the design, development, and management of Geographic Information Systems (GIS). He currently manages the water and wastewater GIS Group, which provides GIS database design and standardization, analysis, data conversion, and implementation services to water and wastewater utility clients in support of regulatory, planning, and asset management activities.

Employment history

2001 – Present	Mott MacDonald
1999 – 2001	University of Rhode Island

Selected projects

Water and Wastewater Asset Inspection System, Freehold Township, Monmouth County, NJ: Project Manager for the development of the Mott MacDonald Field Inspection Tool (MM FIT) Asset Inspection System utilizing ESRI's ArcGIS Online and mobile apps, including Collector for ArcGIS and Survey123. Using mobile devices, the system allows for the collection of utility assets and associated inspection, maintenance, and field operation data. The client realized increased efficiencies by replacing paper workflows with digital processes. (2018)

Water and Wastewater Asset Inspection System, Florham Park Borough, Morris County, NJ: Project Manager for the development of the Mott MacDonald Field Inspection Tool (MM FIT) Asset Inspection System utilizing ESRI's ArcGIS Online and mobile apps, including Collector for ArcGIS and Survey123. Using mobile devices, the system allows for the collection of utility assets and associated inspection, maintenance, and field operation data. The client realized increased efficiencies by replacing paper workflows with digital processes.

Water and Wastewater Geographic Information System (GIS), Manasquan Borough, Monmouth County, NJ: Project Manager for the development of a water and sewer utility GIS by conflating existing paper mapping, utility as-builts, and survey data. (2020 – present)

Water, Wastewater, and Stormwater Geographic Information System (GIS), City of Cape May, Cape May County, NJ: Project Manager for the global positioning system (GPS) survey of utility assets throughout the city. Developed utility GIS by conflating existing paper mapping, utility as-builts, and survey data. Identified areas of low confidence for future field verification. Conducted QA/QC including ESRI PLTS to automated checks to ensure data accuracy and integrity. (2016)

Municipal Geographic Information System (GIS), Mantoloking Borough, Ocean County, NJ: Coordinated and managed the deployment of a municipal GIS including sanitary sewer, storm sewer, cadastral, and environmental resources, and planimetric, topographic, and aerial landbase datasets. Trained Borough personnel in the use of ESRI software and methods to streamline business processes with the use of GIS.

Water and Wastewater Geographic Information System (GIS), West Virginia American Water, Charleston, WV: Project Manager for the creation of an enterprise geodatabase of water distribution and sanitary sewer utility assets. Coordinated activities of data conversion sub-consultants and GIS staff to produce a seamless database for the assets within the Company's service areas. The geodatabase will be integrated with the Company's CMMS database for asset management, planning activities, and field operations. (2012 – 2013)

Wastewater and Stormwater Geographic Information System (GIS), Hanover Township, Morris County, NJ: Coordinated field collection and GIS database development for the Township's sanitary and storm sewer assets. Asset locations were captured using a combination of Global Positioning Software (GPS) and conventional survey techniques. The GIS database was assembled from various local, county, and state databases. Township personnel were trained to access the GIS from ESRI desktop software. (2005 – present)

Water and Sewer Geographic Information System (GIS) Mapping, East Windsor Municipal Utilities Authority, Mercer County, NJ: Project coordination and quality control for data conversion efforts between an off shore subconsultant and the Authority. Produced 200-scale book maps of the system for field personnel. Trained Authority personnel in the use of GIS technologies.

Water and Sewer Geographic Information System (GIS) Mapping, Hackettstown Municipal Utilities Authority, Warren County, NJ: Coordinated efforts between Global

Positioning Software (GPS) survey, topographic land base development, and as-built data conversion. Developed integration strategy with existing GIS and customer databases. Trained Authority personnel in the use of GIS technologies. Utilized the various GIS databases to perform an analysis to assist the Authority in asset management and planning activities.

Water Geographic Information System (GIS) Database Improvements, Jersey City Municipal Utilities Authority, Hudson County, NJ: Project Manager for the update of an existing enterprise GIS database to facilitate engineering and planning needs. The existing data model was updated to accommodate information necessary to support planning and asset management capabilities. Conflated as-built record plans, intersection cards, and overall system maps with the existing data. The database contains approximately 330 miles of water mains and will support engineering, planning, asset management, and daily utility operations. (2015 – present)

Water Geographic Information System (GIS) Database Improvements, New York American Water, Nassau County, NY: Project Manager for the update of the existing enterprise GIS database to facilitate engineering and planning needs. Conflated as-built record plans, water main cards, and overall system maps with the existing enterprise GIS database to update approximately 1,250 miles of water mains. Data was updated to include work order and install year, pipe material, and pipe lining. Database will be utilized to perform hydraulic modeling and pipeline replacement prioritization planning activities. (2015 – present)

Water Utility Geographic Information System (GIS), District of Columbia Water and Sewer Authority (DC Water), Washington, DC: Task Manager for the data conversion of the Authority's existing water distribution system (1,300+ miles of water mains) mapping into an enterprise GIS database. Responsibilities include development of a project work plan, interfacing with the client, providing progress and budget reports, and resolving data conversion issues. Assisted in the support of asset management activities, including water main rehabilitation prioritization, capital improvement project tracking, DDOT project coordination, global fire flow analysis, and other hydraulic modeling assignments. (2001 – present)

Water Geographic Information System (GIS), Passaic Valley Water Commission, Passaic County, NJ: Project Manager for the survey of approximately 75,000 water utility assets utilizing sub-centimeter GNSS Global Positioning System (GPS) equipment, and field verification of the Commission's retail customer database. Coordinated field crews, sub-consultants, and GIS staff for the successful completion of the project within a 7-month time frame. (2013 – 2014)

Lead Compliance, SUEZ NJ, Bergen County, NJ: Provided technical guidance for the development of the lead service line inventory and field data collection workflows. Provided QAQC for the unknown service line material classification analysis. (2019)

Lead Service Line Data Management Plan, Pittsburgh Water and Sewer Authority, Allegheny County, PA: Developed the lead service line (LSL) data management plan that detailed the database design, workflows, and QAQC procedures to be implemented in the development of the Authority's LSL inventory. The inventory is being developed from various inputs, including service line records, curb box inspections, service line replacements, water main replacements, and water quality sampling. (2017)

Water Distribution Utility Geographic Information System (GIS) Mapping, Middlesex Water Company, Iselin, NJ: Project Manager for the creation of an ArcGIS enterprise geodatabase. Coordinated in-house and sub-consultant staff in the conversion of 1,500 miles of water distribution infrastructure from approximately 10,000 individual source records (system maps, valve cards, as-builts, workbooks, databases, etc.). Extensive QA/QC procedures were developed and implemented to meet client specifications.

Water Geographic Information System (GIS), Trenton Water Works, Mercer County, NJ: Project Manager for the creation of an enterprise geodatabase of water distribution utility assets. Coordinated weekly activities of field crews, sub-consultants, and GIS staff to produce a seamless database for the assets within the City boundary. The geodatabase will be leveraged for asset management, planning activities, and field operations.

Wastewater Management Plan, Essex County, NJ: Currently providing Geographic Information System (GIS) analysis and data coordination services in support of the County-wide Wastewater Management Plan. Efforts include data management and coordination among the nine municipalities, seven sewer service providers, and eight water supply purveyors.

Wastewater Management Plan, Clinton Township, Hunterdon County, NJ: Performed data gathering, data creation, and Geographic Information System (GIS) analysis in support of the Township's Wastewater Management Plan. A build-out analysis was performed at the parcel level to determine the future demand of the Township's wastewater needs. Undeveloped/under-developed properties were identified, environmentally constrained areas were removed, and current zoning applied. The built-out properties were assigned wastewater demands, based upon State guidance, and summed with current demands, and surplus/deficits were identified.

Wastewater Geographic Information System (GIS), Rockaway Valley Regional Sewerage Authority, Morris County, NJ: Provided oversight for the implementation of a web-based GIS for the Authority, which serves nine member municipalities. Tasks included mapping interceptor sewer locations, facilities, service areas, and user charge system. Service areas were delineated on a parcel level and integrated with various databases. The GIS database was deployed via the Internet, allowing authorized personnel to access information through a web-browser.

Sanitary Sewer Geographic Information System (GIS), Bergen County Utilities Authority, Bergen County, NJ: Coordinated the data conversion of over 1,600 miles of sanitary sewer alignments owned by the 46 member municipalities and the Authority. The mapping along with field investigation will aid the Authority in determining areas of the system that are experiencing high infiltration and prioritize areas for rehabilitation within the 125-square mile service area. (2004 – 2006)

Geographic Information System (GIS) Re-Engineering Study, Washington Suburban Sanitary Commission, Laurel, MD: Assisted with the assessment of the existing GIS platform in order to make recommendations for improvement. Responsibilities included reviewing GIS data maintenance and conversion procedures and making recommendations for improvement.

Gateway National Recreation Area Geographic Information System (GIS) Implementation Project, National Park Service, Queens and Staten Island, NY, and Sandy Hook, NJ: Developed and implemented a fully functional GIS for natural and cultural resource management. Datasets were compiled from both existing and analog sources into a homogenous coordinate system. Park Service personnel were trained in the use of the GIS system and Global Positioning Software (GPS) data collection techniques.

Critical Resources Atlas for Rhode Island, Environmental Protection Agency, Kingston, RI: Utilized Geographic Information System (GIS) technology and the Internet to create and distribute static maps of the critical natural resources for every town and watershed in the State. The series of maps are designed to assist land use managers in planning and development activities and are easily interpretable for use by the general public.

Geographic Information Systems (GIS) Training Program, University of Rhode Island Cooperative Extension, Kingston, RI: Instructed professionals in the use of ESRI ArcView GIS software. Topics included the fundamentals of working with GIS data, hardware, and software issues for working with ArcView and the Rhode Island Geographic Information System (RIGIS) database.

High Order Global Positioning System (GPS), University of Rhode Island Transportation Center, Kingston, RI: Provided enhanced web-access to high-accuracy, survey grade Global Positioning System (GPS) base station reference files for the transportation planning, engineering, and emergency response communities in Rhode Island. System was configured to conform to NGS CORS specifications and is part of the CORS network.

Critical Lands of Washington County, Rhode Island Department of Environmental Management, Providence, RI: Managed and developed a protocol for local municipalities to prioritize land acquisitions for open space conservation.

Geographic Information System (GIS) Implementation Project, Town of Narragansett, Narragansett, RI: Development of parcel database and implementation of GIS within the Community Planning Department. Digitized 15,000 parcels from antiquated linen plat maps into a geographic coordinate system and coded for linkage to the Town's tax database.

Rhode Island Geographic Information System (GIS) Web-based Distribution System, Rhode Island Department of Administration, Providence, RI: Redesigned web-based access system to the State of Rhode Island's GIS database.

Wastewater Management Plan, East Windsor Township, Mercer County, NJ: Performed data gathering, data creation, and Geographic Information System (GIS) analysis in support of

the Township's Wastewater Management Plan. A build-out analysis was performed at the parcel level to determine the future demand of the Township's wastewater needs compared to the treatment capacity of the Township's treatment plant. Properties were correlated with the sewer billing database, undeveloped/under-developed properties were identified, environmentally constrained areas were removed, and current zoning applied. The build-out properties were assigned wastewater demands, based upon State guidance, and compared with current treatment capacity.

Wastewater Management Plan, Warren Township, Somerset County, NJ: Performed data gathering, data creation, and Geographic Information System (GIS) analysis in support of the Township's Wastewater Management Plan. A build-out analysis was performed at the parcel level to determine the future demand of the Township's wastewater needs for the Township's three treatment plants. Undeveloped/under-developed properties were identified, environmentally constrained areas were removed, and current zoning applied. The build-out properties were assigned wastewater demands, based upon State guidance, and summed with current demands.

Sussex County Wastewater Management Plan Amendment, Vernon Township, Sussex County, NJ: Prepared Geographic Information System (GIS) mapping, per NJDEP Executive Order 109 Environmental Analyses, for amendment to the Sussex County Wastewater Management Plan.

Southeast Pennsylvania (SEPA) Source of Supply Development Plan, Aqua Pennsylvania, Delaware County, PA: Provided geographic information system (GIS) support for a comprehensive study to evaluate future water demands for the SEPA system and nearby satellite systems, evaluate future surplus/deficits, and identify and prioritize capital investments to increase future sources of supply to meet the demands in the system for the next 15 years.

Ten-Year Strategic Business and Capital Improvement Program (CIP), City of Newark, Essex County, NJ: Provided geographic information system (GIS) support for a comprehensive Water System Master Plan, including the development of a hydraulic model and development of a utility GIS database for asset management purposes. Conducted an unbilled property analysis to target potential unaccounted for water. (2010 – 2011)

Potable Water Supply and Wastewater System Capacity Evaluation (Phase 1), New Jersey Highlands Council, Morris County, NJ: Coordinated data gathering and the delineation of over 150 service area water supply and sanitary sewer purveyors in northwestern New Jersey. Delineations served as the basis for a capacity analysis for current demands for each purveyor. (2006 – 2009)

Wellhead and Watershed Protection Plan, Southeast Morris County Municipal Utility Authority, Morris County, NJ: Prepared Geographic Information System (GIS) analysis and mapping for the development of a Wellhead Protection Master Plan. Integrated various State, county, and municipal GIS databases, resolved discrepancies between databases, and developed annual groundwater recharge rates per NJ Geologic Survey Report GSR-32, "A Method for Developing Ground-Water-Recharge Areas in New Jersey."

Phase I Stormwater Managment Plan, Bridgewater Township, Somerset County, NJ: Generated input parameters and base projects for the HEC hydrologic modeling software utilizing Geographic Information System (GIS) techniques. Created map documents for management plan.

Watershed Management Areas 3, 4, and 6 Characterization and Assessment, North Jersey District Water Supply Commission, Passaic County, NJ: Assembled comprehensive seamless Geographic Information System (GIS) database for Federal, State, and county sources for the Passaic River Basin. Tasks included compiling, synthesizing, and documenting existing GIS data layers, identifying data gaps, and creating a series of base maps for the Watershed Characterization and Assessment. Developed a web-enabled GIS mapping application utilizing ESRI ArcIMS to facilitate public outreach, education, and stakeholder input.

Watershed Management Area 7 Geographic Information System (GIS) Mapping, Union County, NJ: Compiled and synthesized GIS database from existing sources for base mapping for an assessment and characterization study of Watershed Management Area No. 7, "The Metropolitan Watershed." Assisted with the development of project website to aid in community outreach and education.

Replacement of Clinton Road Bridge over Mossman's Brook, Passaic County Department of Roads and Bridges, Passaic County, NJ: Using Geographic Information System (GIS) tools and datasets, generated input parameters and base project for HEC-HMS hydrologic modeling of stormwater runoff from Mossman's Brook.

Presentations

Identifying Critical Lands for Conservation in Rhode Island, presented at the Annual Meeting of the Environmental Systems Research Institute, 2000

Ecological Considerations in Prioritizing Lands for Acquisition, presented at the Annual Meeting of the Environmental Systems Research Institute, 1999

GIS and Municipal Planning of the University of the Azores, 1999

GIS Implementation in a National Park: Gateway National Recreation Area, presented at the Intense GIS Conference, 1999

A protocol for the assessment of biodiversity hotspots for Rhode Island municipalities, presented at the 4th Annual Conference of the Rhode Island Natural History Survey, 1998

MOTT MACDONALD

John K. Ruschke, PE, PMP, ENV SP

Personal summary

Education:

MS, Geotechnical Engineering, New Jersey Institute of Technology, 1997

BS, Civil Engineering, New Jersey Institute of Technology, 1988

Registrations:

Professional Engineer

NJ #24GE03714800, 1992
NY #071267-1, 1994
PA #PE044191R, 1993
CT #PEN.0031235, 2015
NH #14916, 2015
MA #52408 (Civil), 2016

Professional Planner NJ #33LI00525400, 1994

Certified Municipal Engineer NJ #0573, 1996
Certified Public Works Manager NJ #M-1698, 2012
Project Management Professional #1793796, 2015
Public Wastewater Collection System (C-2) NJ #0028231
Public Water Distribution System (W-2) NJ #0028365
Public Water Treatment System (T-2) NJ #0028377
Board Certified Environmental Engineer, AAEE, 2007
Envision Sustainability Professional #13778, 2015
Certified Floodplain Manager #US-11-06070, 2011
Certified Construction Manager #8089, 2017
OSHA Confined Space Entry
OSHA Hazardous Waste Site Operations

Years with Mott MacDonald:

34

Years with other firms:

0

Professional memberships:

American Academy of Environmental Engineers
Association of State Floodplain Managers, Inc.
New Jersey Association of Floodplain Management
New Jersey Society of Municipal Engineers
Project Management Institute

Mr. Ruschke has extensive experience in the areas of water and wastewater engineering, roadway and streetscape design, recreational facilities design, and municipal engineering. He provides expert services as Municipal Engineer, Planning Board Engineer, Zoning Board Engineer, and Utility Board Engineer for several municipalities. He has been responsible for day-to-day municipal engineering activities, including planning, budgeting, regulatory compliance, design, public bid solicitation, and construction management services for roadway and streetscape improvements, and parks and recreation facilities, as well as matters related to municipally-owned water, wastewater, and stormwater facilities. Mr. Ruschke has extensive knowledge of state standards and regulatory requirements, and regularly interfaces with the NJDOT, NJDEP, USEPA, and various other local, County, and State agencies.

Mr. Ruschke has designed and managed the construction of improvements to several water treatment facilities, and has provided design, permitting, and construction engineering services for water production wells, transmission mains, and water booster facilities. He also has extensive experience in the design of sanitary sewage pump stations, force mains, and gravity sewers, including various sewer rehabilitation projects resulting in Infiltration/Inflow reduction.

Mr. Ruschke is also experienced in site engineering and design for roadway reconstruction and rehabilitation projects, including infrastructure improvement projects involving grading and drainage system design. He is familiar with permitting, design, and construction procedures for numerous recreational projects, including sports fields, tennis courts, hockey rinks, and skateboard parks.

Mr. Ruschke has also been responsible for providing engineering support and assessment of hazardous waste investigations, environmental site assessments, industrial site investigations, and remediation of various projects related to the Industrial Site Recovery Act/Environmental Cleanup and Responsibility Act (ISRA/ECRA), Underground Storage Tank, Spill Compensation and Control Act, the Water Pollution Control Act, and the Resource Conservation and Recovery Act (RCRA) regulations. He is also experienced in the design and permitting of sanitary landfills, solid waste transfer stations, and recycling facilities.

Mr. Ruschke is currently providing consulting services related to municipal engineering projects for numerous New Jersey municipalities:

Chatham Township, Morris County: Municipal Engineer
Chatham Township, Morris County: Planning Board Engineer
Chatham Township, Morris County: Board of Adjustment Engineer
Chatham Township, Morris County: Alternate Zoning Officer
Chatham Township, Morris County: Wastewater Engineer
Denville Township, Morris County: Municipal Engineer
Denville Township, Morris County: Planning Board Engineer
Denville Township, Morris County: Board of Adjustment Engineer
Denville Township, Morris County: Sewer and Water Engineer
Hamburg Borough, Sussex County: Municipal Engineer
Hamburg Borough, Sussex County: Land Use Board Engineer
Hamburg Borough, Sussex County: Sewer and Water Engineer
Hopatcong Borough, Sussex County: Municipal Engineer
Hopatcong Borough, Sussex County: Land Use Board Engineer
Hopatcong Borough, Sussex County: Sewer and Water Engineer
Hopatcong Borough, Sussex County: Quarry and Landfill Engineer

Employment history

1988 - Present Mott MacDonald

Selected projects

Municipal Engineering Services, Netcong Borough, Morris County, NJ: As Municipal Engineer and Planning and Zoning Board Engineer, perform all municipal engineering functions, including the preparation, review, and analysis of construction design and details of public improvements, including street pavements, curbs, sidewalks, culverts, utilities, inlets, catch basins, and other stormwater facilities. Services include interpreting surveys and

preparing and reviewing site plans, subdivision plans, and stormwater drainage calculations and reports related to stormwater detention facilities, non-structural stormwater run-off best management practices, and green infrastructure techniques, as well as flood mitigation and low-impact development strategies. Prepare, review, and analyze utility, building, and structure layouts and easements. Provide expert testimony at Planning and Zoning Board meetings, and attend Council meetings. Involved with budgeting, capital improvement projects, grant applications, and construction administration.

Planning Board Engineer, Jefferson Township, Sussex County, NJ: Provide engineering services in the areas of planning, land use, and local regulation compliance. Services include review of land development applications for compliance with local ordinances and state regulations governing land development. Substantial emphasis is placed on anticipating environmental, safety, and quality of life concerns so that these can be addressed in the review process, and Board approval or denial based on a thorough understanding of potential development-related impacts. Attend meetings as the Township's consultant. (2018)

General Wastewater Consulting Services, Chatham Township, Morris County, NJ: Responsible for the Township's wastewater system, including plant operations, regulatory compliance, water quality, and distribution system hydraulic analysis. Involved in the design of numerous capital projects to support the growth of the wastewater system. Review of site and subdivision plans for new developments to assure compliance with the adopted master plans and state and local municipal standards.

Board of Health Consulting Services, Chatham Township, Morris County, NJ: Provide engineering services regarding health concerns related to individual subsurface sewage disposal for conformance with local and state standards. Review site evaluations and applications. Attend meetings as the Township's consultant and expert advisor. (2000 – present)

Land Use Board Engineer, Hamburg Borough, Sussex County, NJ: Provide engineering services in the areas of planning, zoning, land use, local regulation compliance, stormwater management, and Land Development review. Substantial emphasis is placed on anticipating environmental, safety, and quality of life concerns so that these can be addressed in the review process and Board approval or denial based on a thorough understanding of potential development-related impacts. Attend meetings as the Township's consultant and expert advisor. (1993 – present)

Land Use Board Engineer, Hopatcong Borough, Sussex County, NJ: Provide engineering services in the areas of planning, zoning, land use, local regulation compliance, stormwater management, and Land Development review. Substantial emphasis is placed on anticipating environmental, safety, and quality of life concerns so that these can be addressed in the review process and Board approval or denial based on a thorough understanding of potential development-related impacts. Attend meetings as the Township's consultant and expert advisor. (2000 – present)

Zoning Board Engineer, Denville Township, Morris County, NJ: Provide engineering services in the areas of zoning and land use that is inconsistent with municipal zoning regulations. Services include review of land development applications for compliance with local ordinances and state regulations. Substantial emphasis is placed on achieving safety and welfare of the community with the objective of conserving the value of property and encouraging the most appropriate use of land throughout the Township. Attend meetings as the Township's consultant and expert advisor. (2010 – present)

Planning Board Engineer, Denville Township, Morris County, NJ: Provide engineering services in the areas of planning, land use, and local regulation compliance. Services include review of land development applications for compliance with local ordinances and state regulations governing land development. Substantial emphasis is placed on anticipating environmental, safety, and quality of life concerns so that these can be addressed in the review process and Board approval or denial based on a thorough understanding of potential development-related impacts. Attend meetings as the Township's consultant and expert advisor. (2010 – present)

Zoning Board Engineer, Chatham Township, Morris County, NJ: Provide engineering services in the areas of zoning and land use that is inconsistent with municipal zoning regulations. Services include review of land development applications for compliance with local ordinances and state regulations. Substantial emphasis is placed on achieving safety and welfare of the community with the objective of conserving the value of property and

encouraging the most appropriate use of land throughout the Township. Attend meetings as the Township's consultant and expert advisor. (2000 – present)

Planning Board Engineer, Chatham Township, Morris County, NJ: Provide engineering services in the areas of planning, land use, and local regulation compliance. Services include review of land development applications for compliance with local ordinances and state regulations governing land development. Substantial emphasis is placed on anticipating environmental and quality of life concerns so that these can be addressed in the review process and Board approval or denial based on a thorough understanding of potential development-related impacts. Attend meetings as the Township's consultant and expert advisor. (2000 – present)

General Wastewater Consulting Services, Hopatcong Borough, Sussex County, NJ: Responsible for the Borough's wastewater system, including sewer operations, regulatory compliance, and maintenance. Project Manager in charge of the design of numerous capital projects to support the growth of the wastewater system. Review of site and subdivision plans for new developments to assure compliance with the adopted master plans and state and local municipal standards.

General Water Supply Consulting Services, Hopatcong Borough, Sussex County, NJ: Responsible for the Borough's water system, including regulatory compliance, water quality, and distribution system hydraulic analysis. Project Manager in charge of the design of numerous capital projects to support the growth of the water system. Review of site and subdivision plans for new developments to assure compliance with the adopted master plans and state and local municipal standards.

General Water and Wastewater Consulting Services, Hamburg Borough, Sussex County, NJ: Project Manager and client contact for general consulting services including attendance at monthly meetings, construction management engineering services, flow analyses and flow calculations, response to customer complaints, and general assistance to the licensed operator.

General Water and Wastewater Consulting Services, Hopatcong Borough, Sussex County, NJ: Project Manager and client contact for general consulting services including attendance at monthly meetings, construction management engineering services, flow analyses and flow calculations, response to customer complaints, and general assistance to the licensed operator.

Municipal Engineering Services, Chatham Township, Morris County, NJ: As Municipal Engineer and Planning and Zoning Board Engineer, perform all municipal engineering functions on an as-needed basis related to budgeting, planning, funding assistance, capital improvement projects involving water, roadway, streetscape, and stormwater improvements, and professional review. Responsible for the preparation, review, and analysis of construction design and details of public improvements, including street pavements, curbs, sidewalks, culverts, utilities, inlets, and catch basins. Services also include interpreting surveys and preparing and reviewing site plans and subdivision plans for the Planning and Zoning Boards, as well as interpreting the layout of existing utilities, buildings, or structures and the location of proposed buildings in relation to green infrastructure techniques, low impact development strategies, and environmental design.

Municipal Engineering Services, Denville Township, Morris County, NJ: As Municipal Engineer and Planning and Zoning Board Engineer, perform all municipal engineering functions, including the preparation, review, and analysis of construction design and details of public improvements, including street pavements, curbs, sidewalks, culverts, utilities, inlets, catch basins, and other stormwater facilities. Services include interpreting surveys and preparing and reviewing site plans, subdivision plans, and stormwater drainage calculations and reports related to stormwater detention facilities, non-structural stormwater run-off best management practices, and green infrastructure techniques, as well as flood mitigation and low-impact development strategies. Prepare, review, and analyze utility, building, and structure layouts and easements. Provide expert testimony at Planning and Zoning Board meetings, and attend Council meeting. Involved with budgeting, capital improvement projects, grant applications, and construction administration.

Municipal Engineering Services, Hopatcong Borough, Sussex County, NJ: As "Engineer on Record," perform all aspects of municipal engineering services, including preparation, review, and analysis of construction design and details for public improvements, including street pavements, curbs, sidewalks, culverts, utilities, inlets, catch basins and other stormwater

facilities. Tasks include the review and analysis of sidewalks, bump-outs, buffer strips, shade trees, landscaping, lighting and other information related to complete streets. Provide expert testimony at municipal Board meetings. Involved with budgeting, capital improvement projects, grant applications, and construction administration.

Municipal Engineering Services, Hamburg Borough, Sussex County, NJ: Planning, Zoning Board, and Municipal Engineer. Perform all municipal engineering functions including representation at the Board of Public Works, Council meetings, and Planning and Zoning Boards. Responsible for the preparation, review, and analysis of construction design and details for public improvements, including street pavements, curbs, sidewalks, culverts, utilities, inlets, and catch basins. Services include interpreting surveys and preparing and reviewing site plans and subdivision plans for the Planning and Zoning Boards. Involved with budgeting, capital improvement projects, grant applications, and construction administration.

Municipal Engineering Services, Andover Township, Sussex County, NJ: Former Planning Board Engineer responsible for the review of development applications, Planning Board meeting attendance, capital improvement projects, and construction administration.

Municipal Engineering Services, Franklin Borough, Sussex County, NJ: Assistant to the Municipal Engineer for all aspects of municipal engineering services including capital improvement projects.

Hopatchung Road Streetscape – Phase I: Homerlea Avenue to Chincopee Avenue, Hopatcong Borough, Sussex County, NJ: Developed site plans for the beautification of Hopatchung Road, including new sidewalks, curbing, ADA-compliant crossings, and light fixtures, as well as drainage improvements. Planning was coordinated and approved by the County, as well as the Sussex County Soil Conservation District. The project was constructed in phases with funding through the Federal Highway Administration Transportation Enhancement Grant.

Hopatchung Road Streetscape – Phase II: Chincopee Avenue to Lakeside Boulevard, Hopatcong Borough, Sussex County, NJ: Developed site plans for the beautification of Hopatchung Road, including new curbing, ADA-compliant crossings, and light fixtures, as well as drainage improvements. Planning was coordinated and approved by the County, as well as the Sussex County Soil Conservation District. The project was constructed in phases with funding through the Federal Highway Administration Transportation Enhancement Grant.

Broadway Streetscape – Phase I: Diamond Spring Road to First Avenue, Denville Township, Morris County, NJ: Developed site plans for the beautification of Broadway in Downtown Denville, which included new curbing, a paver utility strip, ADA-compliant crossings, and light fixtures, as well as drainage improvements. The project was constructed in phases with funding through the Federal Highway Administration Transportation Enhancement Grant.

Broadway Streetscape – Phase II: First Avenue to Bloomfield Avenue, Denville Township, Morris County, NJ: Developed site plans for the beautification of Broadway in Downtown Denville, which included new curbing, a paver utility strip, ADA-compliant crossings, and light fixtures, as well as drainage improvements. The project was constructed in phases with funding through the Federal Highway Administration Transportation Alternatives Grant Program.

Shunpike Road Sidewalk Improvements – Phase I: Southern Boulevard to Shunpike Field, Chatham Township, Morris County, NJ: Oversaw the development of site plans and sidewalk alignment for half of a mile of new sidewalks in a residential neighborhood. Work included preparing plans and specifications for Morris County Engineering Department and Morris County Soil Erosion and Sediment Control to review, addressing ADA compliance, and working with property owners to minimize property disturbance. Construction responsibilities included general project oversight, field engineering modifications, and pay applications.

Shunpike Road Sidewalk Improvements – Phase II: Noe Avenue to Cougar Field, Chatham Township, Morris County, NJ: Oversaw the development of site plans and sidewalk alignment for half of a mile of new sidewalks in a residential neighborhood. Work included preparing plans and specifications for Morris County Engineering Department and Morris County Soil Erosion and Sediment Control to review, addressing ADA compliance, and working with property owners to minimize property disturbance. Construction responsibilities included general project oversight, field engineering modifications, and pay applications.

Downtown Parking Analysis, Denville Township, Morris County, NJ: Performed a parking analysis to estimate the existing municipal parking available that services the economically-

critically Downtown Denville area. Current and future parking demands for weekdays, Saturdays, and Sundays were investigated.

Ann Street Improvements, Morris County, Morristown, NJ: Design of erosion control measures and stormwater management elements, including drainage inlets, grading improvements, and the use of river stone to curtail erosion. Landscaping features were designed to enhance the aesthetics and provide a "downtown" atmosphere.

Slayton Drive Pump Station Improvements, Millburn Township, Essex County, NJ: Prepared detailed design drawings and construction specifications for sewer pump station upgrades, including, but not limited to, new bypass piping system, intake channel modifications, odor control system, and site improvements. (2020)

Heritage Lakes Pump Station, Hamburg Borough, Sussex County, NJ: Project manager responsible for the design and construction period services for various improvements at a municipal sanitary pump station. Improvements included new pumps and electrical equipment.

Chatham Glen Pump Station, Chatham Township, Morris County, NJ: Responsible for the design of a sewage pumping station at the Chatham Glen Wastewater Treatment Plant (to be abandoned) and design of the force main to carry wastewater from Chatham Glen to the Township's main treatment plant. Related design tasks included survey management, preparation of permit applications for Treatment Works Approval (TWA), and land use permitting associated with wetlands/wetlands transition area disturbance, as well as preparation of a Level II Planning Document.

Forest Trail Sewage Pump Station, Denville Township, Morris County, NJ: Project Manager responsible for the design and construction phase services for various improvements at a municipal sanitary pump station. Improvements included new pumps and electrical equipment.

Southside Sewage Pump Station, Chatham Township, Morris County, NJ: Project Manager responsible for the design and construction phase services for various improvements at a municipal sanitary pump station. Improvements included new pumps and electrical equipment.

Chatham Street Sewage Pump Station, Chatham Township, Morris County, NJ: Project Manager responsible for the design and construction phase services for various improvements at a municipal sanitary pump station. Improvements included new pumps and electrical equipment.

Chatham Heights Sewage Pump Station, Chatham Township, Morris County, NJ: Project Manager responsible for the design and construction phase services for various improvements at a municipal sanitary pump station. Improvements included new pumps and electrical equipment.

Gingerbread Castle Road Pump Station, Hamburg Borough, Sussex County, NJ: Project Engineer for the rehabilitation of a 30-year old wastewater pumping station. Project included the installation of a new wet well, valve chamber, electrical controls, and emergency generator. Provided construction management services which involved detailed coordination of maintaining existing wastewater flows while the new pump station was being constructed.

Lime Kiln Pumping Station Upgrade, Hamburg Borough, Sussex County, NJ: Project Manager for the upgrade of a 30-year old sewage pumping station consisting of twin self-priming centrifugal pumps with a standby propane-fueled engine. Project involved the design and contract document preparation for the replacement of both pumps while maintaining service, replacement of the propane standby engine with a natural gas-fired standby generator, piping replacements, and miscellaneous repairs to the pumping station structure.

Warehouse Expansion Parking Lot Improvements, Peerless Beverage Company, Union Township, NJ: Prepared site plans for beverage company warehouse expansion, including site layout, grading, and stormwater management designs. Prepared supplemental stormwater design calculations. Provided project management services with building architect. (2019 – 2020)

Haran Circle Flood Wall, Millburn Township, Essex County, NJ: Supervised the development of conceptual plans to design and construct 500 lf of concrete flood walls along the East Branch of the Rahway River. The proposed flood walls will provide flood protection to the low lying residential areas in the vicinity of Haran Circle.

Stormwater Infrastructure Improvements, Millburn Township, Essex County, NJ: Supervised the design project to provide a 50-year level of flood protection to residential areas within the Township. The first phase included the design of a 300-foot long earth dike and pump station to prevent floodwaters from the East Branch of the Rahway River from inundating the local residents. The second phase included the design of approximately 800 lf of low flood walls along the East Branch of the Rahway River. Project activities included detailed hydrologic and hydraulic analyses using HEC-1 and HEC-2 models, flood routings, and obtaining a major Stream Encroachment and Freshwater Wetlands Permits from the NJDEP.

Webster Avenue Drainage Improvements, Westchester County, New Rochelle, NY: Designing and preparing construction bid documents for drainage improvements in the vicinity of Webster Avenue. The scope of work includes new catch basins, television inspection and cleaning, extension of storm sewers, "bubblers," drainage pipe, and curb rehabilitation. Preparing construction plans and specifications and providing construction phase services.

Hutchinson River Flood Mitigation, Westchester County, Eastchester, Scarsdale and New Rochelle, NY: Performed detailed hydrologic and hydraulic analysis of the Hutchinson River upstream of Reservoir No. 1. Scope of work includes evaluating possible flood mitigation measures, including channelization, replacing existing culverts, dam decommissioning, and maintenance activities. Responsible for preparation of grant applications and FEMA compliance.

Seepage Repairs, New Jersey Water Supply Authority, West Amwell, NJ: Plan and conduct a site investigation and inspection of seepage along the D&R Canal at Station 411+37. Oversight of soil borings and test samples to determine soil properties for engineering design. Responsible for preparation of a geotechnical memo detailing design criteria, possible alternatives, construction schedules, construction impacts and concerns, and recommendations for accomplishing the requirements of the project, as well as preparation of construction plans and technical specifications for bidding long with final cost estimate and bid review. Provided construction management and part time construction inspection through completion of the project.

Seepage Analysis, New Jersey Water Supply Authority, Franklin Township, NJ: Plan and conduct a site investigation and inspection of seepage along the D&R Canal at Station 2334+67. Provide oversight of soil borings and test samples to determine soil properties for engineering design. Responsible for the preparation of a geotechnical memo detailing design criteria, possible alternatives, construction schedules, construction impacts and concerns, and recommendations for accomplishing the requirements of the project, as well as preparation of construction plans and technical specifications for bidding along with final cost estimate and bid review. Provide construction management and part time construction inspection through completion of the project.

Rehabilitation of the Landing Lane Spillway at Station 2999+50 of the Delaware and Raritan Canal, New Jersey Water Supply Authority (NJWSA), New Brunswick, NJ: Preparation of design drawings and detailed construction specifications for the enhanced spillway design. Designed specifications in accordance with NJWSA requirements for historic preservation. (2019)

Spruce Run Reservoir Outlet Works System, New Jersey Water Supply Authority (NJWSA), Hunterdon County, NJ: Preparation of Schematic Design Report. Prepared alternatives analyses for the upgrade/rehabilitation of several components of the outlet works system. (2019)

Flood Mitigation – Morris County Pier Removal, Denville Township, Morris County, NJ: Prepared the New Jersey State Historical Preservation Office (SHPO) application for the removal of the historic piers from the Rockaway River due to the hydraulic impairments they caused. After receiving authorization, designed and prepared demolition plans and NJDEP Land Use Applications for the removal of the piers.

Flood Mitigation – Stormwater Outfall Improvements, Denville Township, Morris County, NJ: Development of site plans and NJDEP Land Use permits for the replacement of stormwater outfall structures as a flood mitigation measure design to allow only the one-way flow of stormwater.

Flood Mitigation Plan, Denville Township, Morris County, NJ: Performed a study to determine the feasibility, cost effectiveness, and constraints associated with proposed

downtown flood control measures. Flood control measures included flood walls, pump stations, road improvements, curbing, flood gates, and backflow valves on outfall structures.

Pelham Parkway and Farragut Avenue Roadway Rehabilitation, Westchester County, NY: Responsible for design plans and layout for the resurfacing of two County roads, including design for milling, paving, drainage upgrades, guiderail and sign repairs, and roadway restriping. Prepared quantity take-off and cost estimate for each road. (2020 – present)

Washington Street and Washington Avenue Rehabilitation, Westchester County, NY: Provided detailed land survey and base mapping, traffic engineering, and schematic design. Design the modification and/or replacement of existing features not meeting current design standards and incorporate energy conservation standards when practical. Produce estimate and plans and specifications for bidding. Provide design support during construction.

Improvement of Curtis Avenue and Garfield Avenue, West Orange Township, Essex County, NJ: Oversight of field survey and base mapping for project area along with easement mapping and easement descriptions. Project includes the design of new concrete sidewalks and driveway aprons, granite block curb, retaining walls, manhole castings and manhole repairs, new catch basins, rebuild inlets, new or extended storm sewer construction, and roadway milling and paving. Responsible for preparation of construction stakeout and cut sheets.

Road Maintenance Program, Denville Township, Morris County, NJ: Perform inspections, and evaluate and produce recommendations for road maintenance for municipally-maintained roadways. Consideration is given to the results of the evaluation and numerical rating, in conjunction with reasonable financial considerations, and roadway vehicular traffic volumes in order to recommend roadway maintenance. Maintain records of roadway improvements. (2013 – present)

Road Improvements, Chatham Township, Morris County, NJ: Supervised the design, bidding, and construction phases of the improvements to various municipal roads. Improvements included water and stormwater system upgrades as well as reconstruction of the roads, installation of new granite block curbing, signage, striping, and site restoration.

Road Improvements, Hopatcong Borough, Sussex County, NJ: Supervised the design, bidding, and construction phases of the improvements to various municipal roads. Improvements included water and stormwater system upgrades as well as reconstruction of the roads, installation of new granite block curbing, signage, striping, and site restoration.

Road Improvements, Hamburg Borough, Sussex County, NJ: Supervised the design, bidding, and construction phases of the improvements to various municipal roads. Improvements included water and stormwater system upgrades as well as reconstruction of the roads, installation of new granite block curbing, signage, striping, and site restoration.

Municipal Road Evaluation, Hopatcong Borough, Sussex County, NJ: Project Manager for the Municipal Road Evaluation and Report, which was undertaken to evaluate existing roadway conditions and develop an affordable and manageable approach to improving and upgrading these conditions. The project consisted of an inventory of the Borough's existing roadway system. A Road Evaluation Report was prepared, which focused on the condition of the existing roadway wearing surface, curbs, and sidewalks, as well as sanitary sewer and storm sewer castings and trench repairs in relationship to the pavement surface. Developed a five-year roadway improvement program and outlined the parameters for periodic updates to the program. Prepared a preliminary pedestrian route map, which identified priority locations for future pedestrian access improvements based on the data accumulated during the inventory.

Muriel Hepner Park Pedestrian Bridge Replacement, Denville Township, Morris County, NJ: Assisted with preparation of plans and specifications for the replacement of an existing pedestrian footbridge across a section of Muriel Hepner Pond with a 50-ft-long, 7-ft-wide arch-truss style bridge. Responsibilities include the preparation of an NJDEP Division of Land Use Flood Hazard Area Individual Permit for the replacement of an existing footbridge. The project is being constructed with funding through the County. (2017 – present)

Reservoir No. 1 Dam Compliance, Westchester County, New Rochelle, NY: Completed a dam inspection of the high hazard New Rochelle Reservoir No. 1 Dam located along the Hutchinson River. Scope of work also included updating the Dam's Inspection and Maintenance (I&M) Manual and the Emergency Action Plan (EAP). Preparation of the EAP included updating H&H breach analysis.

Water Storage Tank Painting, Sussex Borough, Sussex County, NJ: Preparation of contract documents and construction period services for painting a 500,000 gallon and a 300,000 gallon municipal water storage tank. Services included the design of bypass pumping and temporary storage facilities.

Ingram Tank Painting, Hopatcong Borough, Sussex County, NJ: Prepared plans and specifications and provided construction management services for the repair and repainting of a 0.5 MG standpipe storage tank. Appropriate lead abatement procedures were required as part of the repainting of the tank. New cathodic protection was also installed.

Brooklyn Mountain Road Tank, Hopatcong Borough, Sussex County, NJ: Prepared plans and specifications for a new water storage tank. The project involved the demolition of six existing small diameter tanks and replacement with a 240,000 gallon glass-lined steel-bolted storage tank. Planning of the new storage tank involved public hearings and meeting with concerned residents in order to finalize the improvements and to satisfy the surrounding neighborhood.

Water Storage Tank Improvements, Hamburg Borough, Sussex County, NJ: Project Manager in charge of the design and construction management of the renovation and repainting of two ground-level water storage tanks that provide gradient control and storage for the water system. The project involved using lances to apply pressure grout from the tank perimeter to fill voids that had developed below the tank shell bottom plates since the original construction and caused a failure of one of the welds.

Water Storage Tanks, Franklin Borough, Sussex County, NJ: Project Manager for the design and construction of a 0.5 MG ground-level water storage tank and a 0.5 MG 100-foot tall water storage standpipe designed to replace an existing standpipe, provide improved pressure balancing within the water system, and decrease well pump on/off cycling.

Green Infrastructure (GI) Planning Documents Review, Westchester County, New Rochelle, NY: Prepared a city-wide Green Infrastructure Program in accordance with the National Fish and Wildlife Foundation, Long Island Sound Futures Fund grant requirements and the goals of the City's GreeNR sustainability plan. Scope of work included Implementation Plan, including research analysis and summary, model construction standards for recommended infrastructure (bioswales, tree pits, etc.), contractor specifications and annual maintenance plan, potential locations and five-year work plan, and ongoing funding recommendations. Responsible for public outreach with residents, Council, and the business community. Performed a research review of comparable municipalities with robust GI programsand Cost Benefit Analysis of Implementing Green Infrastructure, broken out by practices and measures, Provided recommendations for city code changes, Prepared public outreach education package. Set standards with construction ready design documents.

Green Infrastructure (GI) Improvements, Westchester County, New Rochelle, NY: Responsible for implementation of the green infrastructure planning project, which included stormwater districts recommendations, parameters of program determined with city staff for the short, medium, and long term, identifying responsible staff and/or external contractors for management of the program, construction designs/standards, ongoing funding sources, and strategy for developing local employment opportunities.

Sanitary Sewer Flow Monitoring Systems and Controls, Orange County, NY: Evaluate the District's potential flow monitoring locations using geographic information system (GIS) data, maps, plans, site visits, internal manhole and pipe inspection data, site features to develop a planning report for FMFC. Identify additional locations where redundant flow meters could be installed. Evaluate the options of utilizing new stand-alone manholes or vaults, existing manholes or vaults, and pump stations or other structures to secure the installation of FMSC equipment that are cost effective and technically feasible. Performed a cursory structural analysis of existing structures and their impact on installing FMSC equipment. Evaluate and identity various meter types and data management methods. Evaluate and identify various avenues through which the flow monitoring equipment can be acquired.

Sewer Feasibility Study, Denville Township, Morris County, NJ: Completed a feasibility study, including a needs analysis, to determine the feasibility, cost effectiveness, and environmental constraints associated with the proposed extension of the Township's sanitary sewers within the future sewer service area of the Township. The project resulted in preliminary engineering studies being conducted and, ultimately, new sanitary sewers being cost-effectively installed.

Stormwater Consultant, Village of Scarsdale, Westchester County, NY: Provided technical assistance to the Village Planning Board in its review of a nine-lot subdivision with eight new houses on Garden Road. Scope of work included review of the Stormwater Pollution Prevention Plan (SWPPP) and the hydraulic report as well as site development plans, calculations, related application materials, and historic information from prior subdivision applications. Attended Planning Board meetings and staff meetings to present review comments, hear presentations, neighbor and Planning Board member concerns, and/or respond to inquiries. Review and respond to comments from the public.

Horizontal Directional Drilling (HDD) Geotechnical Boring and Drilling Plan Review, New Jersey Water Supply Authority, Princeton, Mercer County NJ: Provide a cursory review of a Drill Fluid Management and Contingency Release Plans for the HDD bores under the D&R Canal and Carnegie Lake. Provide onsite inspections during critical periods when work is scheduled in proximity of the Canal. Provide general consultation during construction activities.

Horizontal Directional Drilling (HDD) Drilling Plan and Design Review, New Jersey Water Supply Authority, Somerset and Middlesex County, NJ: Provide a cursory review of a Drill Fluid Management and Contingency Release Plans and design materials for the 16-inch diameter HDD crossing under the D&R Canal for PSE&G gas line replacement. Provide engineering advise and opinion on the design as it relates to the Authority's interest in the canal and review any impacts to the Canal. Provide onsite inspections during critical periods when work is scheduled in proximity of the Canal. Provide general consultation during construction activities.

Rehabilitation of D&R Canal Embankment Downstream of the Island Farm Weir, NJ Water Supply Authority, Franklin Township, NJ: Supervised the design and construction documents for rehabilitation and erosion protection of approximately 600 feet of the embankment of the Delaware & Raritan Canal just downstream of the Island Farm Weir across the Raritan River. Erosion protection included gabion mattress, riprap, and erosion control blankets. As part of the design, prepared the applications and obtained the necessary environmental permits from the NJDEP. Assisted with construction phase services, including inspection services, shop drawing reviews, and all other tasks necessary to complete the construction of the project.

Rehabilitation of Kenilworth Boulevard Dam, Union County, Cranford and Kenilworth, NJ: Supervised the analysis, design and permitting for the rehabilitation of the Kenilworth Boulevard Dam located in. Performed a regular inspection of the dam and prepared a Regular Inspection Report in accordance with the requirements of the NJ Dam Safety Section. Developed design plans and specifications to rehabilitate the dam and bring the dam into compliance with the NJ Dam Safety Standards. The rehabilitation includes removal of over five acres of trees from the structure, revetment repairs along the auxiliary spillway, pavement overlay of the bicycle path on the crest, and post and rail fencing. In addition to the rehabilitation work, performed a detailed hydrologic and hydraulic analysis using HEC-RAS and HEC-HMS to identify potential future modifications to the structure to improve its capacity to provide flood mitigation to the downstream communities.

Desilting of the Rahway River and Replacement of Dam Gates, Cranford Township, Union County, NJ: Supervised the analysis, design, permitting, and construction phase services for the desilting of the Rahway River and replacement of dam gates at Droescher's Dam and Hansel Dam. Obtained environmental and dam safety permits from the NJDEP to replace the dam gates and remove approximately 1,200 cubic yards of sediments from the Rahway River just upstream of each dam. Developed construction plans and specifications for bidding the project. Provided construction phase services including inspection services, shop drawing reviews, payment application approvals, daily construction reports with photographs, and all other tasks necessary to complete the construction of the project.

Lake Montowac Dam, Montville Township, Morris County, NJ: Supervised the design, permitting, and construction phase services for dam repairs to restore the dam. Improvements include installation of a new low-level outlet gate valve and operator, patch repairs to the concrete dam, and other miscellaneous repairs. Perform regular inspections of the dam and prepared a Regular Inspection Report in accordance with the requirements of the NJ Dam Safety Section. Provided emergency inspections to identify and recommend repairs to address seepage issues at the dam.

Rehabilitation of Lake Solitude Dam, High Bridge Borough, Hunterdon County, NJ: Supervised the construction phase services for the rehabilitation of Lake Solitude Dam. The

rehabilitation included stabilization of the primary spillway with the installation of toe blocks anchored into rock, construction of a 150-foot long roller compacted concrete (RCC) auxiliary spillway, and elevating the earthen dam approximately 8 feet. In addition, a 78-inch diameter steel penstock, previously utilized for hydropower generation in the early 1900s, was rehabilitated with a 48-inch diameter insert to serve as a low level outlet and provide for possible addition of hydropower generation in the future. Provided general civil engineering activities, including site inspections, review of contractor submittals, and coordination with regulatory agencies. In 2013, the Association of State Dam Safety Officials (ASDSO) presented the Borough with the Northeast Regional Award of Merit for the Borough's exemplary contribution to dam safety. The project also received the 2013 Project of the Year award in the category of municipal construction management from the NJ Society of Municipal Engineers.

Lake Openaka Dam, Denville Township, Morris County, NJ: Coordinated with the NJDEP, the County, the Township, and local contractors to implement immediate actions to address an emergency situation with the structural elements of the dam and to ensure that the dam is in a safe condition. The dam was unable to maintain the normal pool elevation due to a partial collapse of the concrete spillway and significant seepage through the dam. Obtained permits from the Bureau of Freshwater Fisheries to lower the lake and perform a fish salvage. Developed temporary repair measures to stabilize the dam in a lowered state until permanent repairs could be implemented. (2009 – 2010)

Cooks Pond Dam, Denville Township, Morris County, NJ: Supervised hydrologic and hydraulic analyses of the dam using HEC-1 and HEC-RAS software programs to establish the existing conditions of the structure. The analyses included a breach analyses using multiple storm events for the purpose of evaluating the classification of the dam and determining the Spillway Design Flood magnitude. The results of the analyses recommended a reduction of the spillway design flood. Performed a regular inspection of the dam and provided recommendations and preliminary design for improvements to the dam, including a new spillway structure and overtopping protection. Obtained the necessary permits and developed construction plans and specifications for the design improvements. (2009)

Lake Lenape Dam Improvements, Andover Township, Sussex County, NJ: Performed detailed hydrologic and hydraulic analyses to establish the existing conditions and proposed improvements for the dam. Developed design plans and specifications for the rehabilitation of the dam and spillway, including dam overtopping protection. Obtained all necessary permits, including a Dam Safety Section Permit and Freshwater Wetlands Permit from the NJDEP. (2004 – 2007)

Franklin Pond Dam, Franklin Borough, Sussex County, NJ: Responsible for the design and preparation of contract specifications and a permit application to improve the dam. Project involved the reconstruction of an existing masonry dam, installation of a low flow channel and a pedestrian walkway, and stabilization of the downstream channel.

Sediment Removal Program (Contract WC-2), Cranford Township, Union County, NJ: Supervised the development of drawings and specifications for the removal of approximately 800 cubic yards of sediment from the Rahway River. Prepared and obtained all permits. Provided construction phase services.

Sediment Removal Program (Contract WC-1), Cranford Township, Union County, NJ: Supervised the development of drawings and specifications for the removal of approximately 200 cubic yards of sediment from the Rahway River. Prepared and obtained all permits. Provided construction phase services.

Rockaway River Desilting, Denville Township, Morris County, NJ: Responsible for preparing site plans for the removal of silt and sediment from the Rockaway River in two key locations. Prepared and received NJDEP Land Use permits, required for disturbance in a Flood Hazard Area. Construction responsibilities included general project oversight and construction phase services.

Franklin Pond Watercourse Cleaning, Franklin Borough, Sussex County, NJ: Project Manager for the preparation of contract documents and construction management for the removal and disposal of accumulated silt in an existing 40-acre pond. Project involved sampling of the sediments to be removed and assessment of economically-viable alternatives for disposal of the excavated spoils in conformance with regulatory restrictions. Identified an abandoned zinc mine within one mile of the Pond which had similar background concentrations of arsenic in the soil remaining in the bottom of the pit as were present in the Pond silt. Obtained NJDEP approval for use as an ultimate disposal site. The dredged material was

covered with available mine tailings at the conclusion of the project in order to preserve the historic authenticity of the zinc mine.

Wildwood Shores Water Main Replacement, Hopatcong Borough, Sussex County, NJ: Designed plans and profiles for the replacement of water mains in public roadways. Related design tasks included preparation of NJDEP water supply/extension applications. Construction responsibilities included general project oversight and construction phase services.

Water Main Reinforcement, Hamburg Borough, Sussex County, NJ: Project Engineer for a water main installation project which was implemented to improve water quality and fire flow within the existing water distribution system. The project involved pipe jacking beneath an active railroad in order to effectively lube the existing water distribution system. Provided construction management services during the installation of the proposed improvements.

Water System Improvements, Hamburg Borough, Sussex County, NJ: Project Manager responsible for the design and construction administration of multiple water transmission and distribution main replacement and expansion projects.

Water Distribution and Transmission Main Improvements, Ringwood Borough, Passaic County, NJ: Project Manager responsible for construction administration of 15,000 lf of distribution mains, associated service connections, and related water system appurtenances around Erskine Lake.

General Wastewater Consulting Services, Chatham Township, Morris County, NJ: Project Manager and client contact for general consulting services including attendance at meetings, construction management engineering services, flow analyses and flow calculations, response to customer complaints, and general assistance to the licensed operator.

Wastewater Collection and Treatment System Evaluation, Vernon Township, Sussex County, NJ: Assisted in a detailed study to evaluate proposals developed by both the Sussex County Municipal Utilities Authority and a private water and wastewater operations firm to build, own, and operate a wastewater treatment plant designed to jointly serve the needs of the proposed Mountain Creek recreational development (proposed by the Intrawest Corporation) and the Town Center area of the Township. Developed a wastewater treatment process concept and associated project cost for the Township to build, own, and operate the treatment plant rather than relying on outsourcing. The evaluation included review of administrative, technical, and financial aspects of all proposals, preliminary evaluation of the suitability of a Township-owned lot to serve as the site for the wastewater treatment plant, and development of a collection system layout and associated preliminary project cost for serving the Town Center area.

Wastewater Management Plan, Morris Township, Morris County, NJ: Assisted in the preparation of a wastewater management plan for the Township. Responsibilities included evaluating existing and future service areas, calculating and projecting wastewater flows, and coordinating report preparation and related drafting.

Effluent Pump Station, Water Pollution Control Plant No. 1, Chatham Township, Morris County, NJ: Project Manager responsible for the coordination of the permitting and design of a 4.0 MGD effluent pump station. Provided construction period services and NJDEP loan administration.

Primary Clarifier Improvements, Water Pollution Control Plant No. 1, Chatham Township, Morris County, NJ: Coordination of mechanical and structural improvements to primary clarifier at municipal wastewater treatment plant. Provided design and construction period services.

Electrical Improvements, Water Pollution Control Plant No. 1, Chatham Township, Morris County, NJ: Project manager responsible for the coordination of numerous electrical improvements at a municipal wastewater treatment plant.

Bank Street Pump Station and Stormwater Improvements, Hamburg Borough, Sussex County, NJ: Responsible for the design and preparation of contract specifications to upgrade an existing potable water booster system. In addition, designed modifications for the improvement of stormwater flow on-site.

Mariner Well Improvements, Hopatcong Borough, Sussex County, NJ: Design of the site and interior piping design of the municipal well house. Designed the layout of chlorine contact time piping. Related design tasks included preparation of NJDEP water supply applications.

Construction responsibilities included general project oversight and construction phase services.

Well House Chlorine Contact Piping, Hopatcong Borough, Sussex County, NJ: Designed layout of chlorine contact time piping at several Borough well locations. Related design tasks included preparation of NJDEP water supply applications. Construction responsibilities included general project oversight and construction phase services.

Bayview Well Improvements, Hopatcong Borough, Sussex County, NJ: Design and construction management for the installation of municipal well improvements. Project included design and specification of a submersible well pump, metering and disinfection facilities, and integration of the well pump controls and alarms with the existing Supervisory Control and Data Acquisition (SCADA) system.

Well No. 2 Filter Improvements, Hopatcong Borough, Sussex County, NJ: Design and permitting of a cartridge filter for a 100 gpm municipal well under the direct influence of surface water.

Madison Well Filter Improvements, Hopatcong Borough, Sussex County, NJ: Design and permitting of a cartridge filter for a 100 gpm municipal well under the direct influence of surface water.

Well No. 1A, Hamburg Borough, Sussex County, NJ: Design and construction management for the installation of a new 300 gpm well. Project included design and specification of a 300 gpm submersible well pump, metering and disinfection facilities, rapid sand filters for iron removal, and integration of the well pump controls and alarms with the existing Supervisory Control and Data Acquisition (SCADA) system.

Well Drilling Program, Hopatcong Borough, Sussex County, NJ: Construction supervision of an exploratory water well drilling program. Project included exploratory probe hole with appurtenant geophysical logging, observation wells, test wells, and test pumping.

Well Pump Testing Program, Hamburg Borough, Sussex County, NJ: Planning, specification writing, construction supervision, and analysis of field data for a water well pump testing program for proposed Well 1A.

Well Treatment Facilities Expansion, Hopatcong Borough, Sussex County, NJ: Design and construction management of the expansion of nine individual treatment facilities including electrical improvements and replacement of chlorination equipment and piping.

Spill Containment, NJ Transit Corporation, Kearny, NJ: Prepared detailed engineering drawings and technical specifications for the removal of underground storage tanks (USTs) and numerous environmental improvements. Environmental improvements included the installation of an aboveground storage tank system and miscellaneous concrete containment structures.

Underground Storage Tank (UST) Removals, Morris County Vocational-Technical School, Denville, NJ: Responsibilities included the preparation of permits, coordination with contractors, implementation of field assessments, and final report services related to the removal of two RCRA-regulated underground storage tanks (USTs). Responsibilities included the preparation of permits, coordination with contractors, implementation of field assessments, and final report preparation.

Underground Storage Tank (UST) Specifications, NJ Transit Corporation, Jersey City, NJ: Prepared detailed technical specification for the removal of underground storage tanks (USTs) as part of a bus garage rehabilitation project. The specifications also addressed the management of potentially-contaminated groundwater that would be generated as part of dewatering operations.

Underground Storage Tank (UST) Removals, Bellemead Development Corporation, Various Sites, NJ: Provided services related to the removal of underground storage tanks (USTs) at numerous facilities. Project responsibilities included the preparation of permits, coordination with contractors, implementation of field assessments, and final report preparation.

Underground Storage Tank (UST) Management Services, NJ Transit Corporation, Fairview, NJ: Provided services related to the removal and installation of numerous underground storage tanks (USTs). Project responsibilities included the design and preparation of a bid specification and construction drawings for the removal and installation of numerous UST systems. Supervised and oversaw all remedial activities and provided construction engineering services.

Underground Storage Tank (UST) Removals, Block Drug Company, Various Sites, NJ: Provided services related to the removal of underground storage tanks (USTs) at numerous facilities. Project responsibilities included the preparation of permits, coordination with contractors, implementation of field assessments, and final report preparation.

Underground Storage Tank (UST) Removal, Montville Township, Morris County, NJ: Provided services related to the removal of an underground storage tank (UST) at the Municipal Building. Responsibilities included the preparation of permits, coordination with contractors, implementation of field assessments, final report preparation, and the preparation of a detailed specification for public bidding.

Hazardous Waste Study, NJ Transit Corporation, Various Sites, NJ: Performed a study on existing storage vessels and handling practices of hazardous material at numerous facilities. Tasks included site inspections of applicable facilities, evaluation of existing storage vessels and handling practices, and development of a Best Management Practice (BMP) Plan.

Northeast Quadrant Stormwater Management Project, Phases 3 and 4, Cranford Township, Union County, NJ: Developed preliminary design concepts for improvements to an existing dike system in the vicinity of the Rahway River. The analysis included a detailed hydrologic and hydraulic study of the existing and proposed conditions using HEC-RAS and HEC-1 computer software programs. Met with representatives from the Township, County, USACOE, and NJDEP to review the results of the analysis and discuss the potential impacts to the Rahway River due to improvements to the existing dike system. (2004 – present)

Northeast Quadrant Stormwater Management Project, Phase 2, Cranford Township, Union County, NJ: Performed a detailed hydrologic and hydraulic study for the development and evaluation of flood management improvements using HEC-1, HEC-2, and StormCAD computer software. Developed the Phase 2 design component of the overall study, which included a 180 cfs stormwater pumping station and gravity storm sewer interconnections. Obtained all necessary permits, including Stream Encroachment and Freshwater Wetland Permits from the NJDEP. (2005 – 2008)

Northeast Quadrant Stormwater Management Project, Phase 1, Cranford Township, Union County, NJ: Performed a detailed hydrologic and hydraulic study for the development and evaluation of flood management improvements in the vicinity of the Rahway River using HEC-1, HEC-2, and StormCAD computer software. Developed the Phase 1 design component of the overall study, which included improvements to local storm sewer systems and the design of a new express sewer system. Designed an 800-foot+ bio-retention swale as part of the express sewer system to provide stormwater quality prior to discharging to the Rahway River. Obtained all necessary permits, including Stream Encroachment and Freshwater Wetland Permits from the NJDEP. Assisted in the construction management of the project. (2003 – 2006)

Residential Development Sanitary Sewer Systems, Hamburg Borough, Sussex County, NJ: Review of design documents and construction inspection for numerous sanitary sewer residential development projects throughout the Borough. Responsibilities included inspection, coordination with contractor, assignment of inspectors to various projects, general project coordination, and client contact.

Kitchell Road Sewer Extension, Denville Township, Morris County, NJ: Project Engineer for the design of a wastewater collection system consisting of gravity sewers, force mains, low pressure sewers, and a new regional pumping station to service approximately 300 house connections. Responsibilities included the preparation of plans and specifications and hydraulic calculations. Prepared permit applications and coordination under NJDEP Environmental Infrastructure Financing Program.

River Road Sewer Extension, Chatham Township, Morris County, NJ: Project Engineer for the design of a wastewater collection system consisting of gravity sewers, force mains, and low pressure sewers to service approximately 70 house connections. Responsibilities include the preparation of plans and specifications and hydraulic calculations. Prepared permit applications and coordination under NJDEP Environmental Infrastructure Financing Program.

Falcon Ridge Sanitary Sewer Extension, Hamburg Borough, Sussex County, NJ: Designed a sanitary sewer extension which eliminated an existing wastewater pumping station. The project involved pipe jacking beneath an active railroad corridor. Assisted in obtaining the appropriate easements for the proposed construction. The overall project will

result in a substantial cost savings to the Borough due to the elimination of the existing pump station which is in need of rehabilitation.

Wastewater Collection System, Hopatcong Borough, Sussex County, NJ: Assisted in the design of the collection system consisting of 20,000 lf of gravity sewer, 4,000 lf of force main, grinder pumps, and 54,000 lf of low-pressure sewer to service approximately 2,800 house connections. Responsibilities included the preparation of plans and specifications, hydraulic calculations, and design of low-pressure force mains and grinder pump systems. Prepared permit applications and submittals for NJDEP Environmental Infrastructure Financing program.

Infiltration/Inflow (I/I) Investigations and Corrective Measures, Chatham Township, Morris County, NJ: Project Manager overseeing the sanitary sewer I/I investigation to identify sources of I/I (especially Rainfall Derived I/I (RDI/I)) to recommend appropriate rehabilitation and maintenance to reduce I/I entering the municipal sewer system. Rehabilitation methods included manhole repairs by grouting, excavation and installation of pipe repair clamps, and excavation and repair of leaking service connections at mainline sewers.

Infiltration/Inflow (I/I) Investigations and Corrective Measures, Hamburg Borough, Sussex County, NJ: Project Manager overseeing the sanitary sewer I/I investigation to identify sources of I/I (especially Rainfall Derived I/I (RDI/I)) to recommend appropriate rehabilitation and maintenance to reduce I/I entering the municipal sewer system. Rehabilitation methods included manhole repairs by grouting, excavation and installation of pipe repair clamps, and excavation and repair of leaking service connections at mainline sewers.

Infiltration/Inflow (I/I) Investigations, Sussex Borough, Sussex County, NJ: Oversaw the sanitary sewer I/I Investigation to identify sources of I/I (especially Rainfall Derived I/I (RDI/I)) to recommend appropriate rehabilitation and maintenance to reduce I/I entering the municipal sewer system. Rehabilitation methods included manhole repairs by grouting, excavation and installation of pipe repair clamps, and excavation and repair of leaking service connections at mainline sewers.

Well No. 2 Standby Generator, Hamburg Borough, Sussex County, NJ: Project Manager responsible for the design and construction phase services for the installation of a 75-kW standby emergency generator at a municipal water supply well house.

Well House Back-up Generators, Hopatcong Borough, Sussex County, NJ: Project Manager for electrical improvements at nine municipal well houses for emergency backup power supply. Coordinated design and construction phase services.

Municipal Building Standby Generator, Hopatcong Borough, Sussex County, NJ: Prepared site plans for the installation of a manual transfer switch to attach the Borough Office of Emergency Management (OEM) building to the existing generator at the adjacent Municipal Building. The manual transfer switch allows the OEM building to be utilized during a community-wide power outage. The project was funded through the NJOEM Hazard Mitigation Grant Program.

Firehouse No. 3 Standby Generator, Hopatcong Borough, Sussex County, NJ: Project Manager responsible for the design and construction phase services for the installation of a 75-kW standby emergency generator at a municipal firehouse.

Firehouse No. 4 Standby Generator, Hopatcong Borough, Sussex County, NJ: Project Manager responsible for the design and construction phase services for the installation of a 60-kW standby emergency generator at a municipal firehouse.

Department of Public Works (DPW) Facility Standby Emergency Power, Hopatcong Borough, Sussex County, NJ: Prepared site plans for the installation of a 400-kW emergency backup diesel-fueled generator at the DPW facility. The generator allows the DPW yard to be utilized during a community-wide power outage.

Hertel Landfill Superfund Site Remedial Services, Confidential Client, Plattekill, NY: Designed a Landfill Closure Plan for this 20-acre Hertel Landfill Superfund Site. Tasks included designs of final cover, stormwater management, landfill gas and leachate control devices and a post-closure maintenance plan.

Global Landfill Superfund Site, NJ First, Inc., Old Bridge, NJ: Assisted in the preparation of preliminary design and cost estimates for landfill cap alternatives, leachate collection underdrain system, and stormwater management. Assisted in the evaluation of remedial alternatives with respect to implementability, cost, and effectiveness in protecting the environment.

Right-to-Know Compliance, Port Authority of NY/NJ, Various Sites, NY and NJ: Conducted SARA III/Community Right-to-Know Surveys for compliance with State requirements.

RCRA Investigation, William Prym, Inc., Dayville, CT: Developed and implemented a sampling plan for a RCRA sludge lagoon. Project responsibilities included development of sampling plan, evaluation of lagoon configuration for proper characterization of waste material, and supervision of sampling efforts.

ISRA/ECRA Compliance, Boris Kroll Jacquard Loomis, Paterson, NJ: Conducted review of site operations, assisted in the preparation of Remedial Action Workplans (RAWs) for impacted soil and groundwater, supervised remedial actions, and provided client/regulatory interface.

ISRA/ECRA Compliance, Wimpey Materials, Inc., Lake Hopatcong, NJ: Performed a Preliminary Assessment (PA) and subsequently coordinated and supervised remedial efforts to address contaminated soils at a diversified 800-acre facility. Operations at the facility included quarry operations utilizing a complex network of hydraulic crushers, production of asphalt pavement, and production of concrete. Over 40 Areas of Concern (AOCs) were identified and evaluated at the facility.

ISRA/ECRA Compliance, Eitner Enterprises, Inc., Linden, NJ: ISRA/ECRA compliance effort for a metal fabricator. Project responsibilities included the preparation of a Preliminary Assessment (PA) and Site Investigation Report (SIR) and a Remedial Action Workplan (RAW) to remediate soils contaminated with PCBs and polycyclic aromatic hydrocarbons. Supervised and oversaw all remedial activities and provided construction engineering services.

ISRA/ECRA Compliance, Tube Manufacturing, Inc., Bridgewater, NJ: Engineer for an ISRA/ECRA compliance project for a manufacturer of stainless steel tubing. Project responsibilities included the design and implementation of a recovery system for groundwater contaminated with chlorinated solvents. Supervised and oversaw all remedial activities and provided construction engineering services. Groundwater investigation included an evaluation and classification of the underlying aquifer.

Colloids Facility ISRA/ECRA Compliance, Rhone-Poulenc, Newark, NJ: Project responsibilities included the implementation of an approved ISRA/ECRA clean-up plan including the preparation of a detailed specification, construction drawings, and field support services. Restorations included the design of a new exterior tank farm and truck loading pad. Supervised and oversaw all remedial activities and provided construction engineering services.

ISRA/ECRA Compliance, Jersey Central Power & Light (JCP&L), Union Beach, NJ: Responsibilities included the preparation and implementation of ISRA/ECRA sampling and cleanup plans. Remedial actions included underground storage tank (UST) removals, delineation of soil contamination, and groundwater monitoring. Supervised and oversaw all remedial activities and provided construction engineering services.

ISRA/ECRA Compliance, American Galvanizing, Folsom, NJ: ISRA/ECRA compliance project for a metal galvanizing company. Responsibilities included permit submittals, preparation of a specification to implement an approved ISRA/ECRA clean-up plan for the encapsulation of soils contaminated with heavy metals, and the design of drainage structures and asphalt pavement over five acres of disturbance.

ISRA/ECRA Compliance, DuBois Chemicals, Inc., East Rutherford, NJ: Engineer for an ISRA/ECRA compliance project for a facility which manufactures and distributes institutional and industrial cleaning and maintenance products. This 7.9-acre facility stored numerous hazardous materials in exterior aboveground bulk storage tanks and an interior warehousing facility. Responsibilities included the development of a soil and groundwater sampling program and site evaluation submission.

Subsurface Investigations, NJ Department of Transportation, Various Sites, NJ: Performed Preliminary, Site, and Remedial Investigations at numerous sites. Investigations included an inspection of the subject sites, review of available plans, evaluation of historical site usage, geophysical investigations, and the development and implementation of subsurface investigations. Developed conceptual remedial actions to address impacts to soil and groundwater.

Remedial Investigation, NJ Transit Corp., Bloomfield and Belleville, NJ: Performed a complex Remedial Investigation (RI) of soil and groundwater on properties being considered for the construction of a new maintenance facility for light rail vehicles. Evaluated and prepared remedial actions for elevated levels of several metals, PCBs, polyaromatic hydrocarbons, and

chlorinated solvents detected in soils and groundwater. Evaluated engineering controls to encapsulate impacted soils.

Groundwater Investigation, NJ Transit Corp., Howell, NJ: Performed NJPDES groundwater monitoring and initiated a Remedial Investigation (RI) to investigate discharges from several underground storage tanks (USTs). The RI involved the delineation of free-phased floating petroleum product and a dissolved groundwater plume underlying the site.

Groundwater Investigation, NJ Transit Corp., Paterson, NJ: Performed a Remedial Investigation (RI) and prepared a conceptual Remedial Action Workplan (RAW) to investigate discharges from several underground storage tanks (USTs). The RI involved the delineation of free-phased floating petroleum product and a dissolved groundwater plume underlying the site.

Underground Storage Tank (UST) Management Services, Versailles Realty Co., Rumson, NJ: Project Engineer for the investigation and remediation of eight underground fuel oil storage tanks (USTs). Tasks involved the design and implementation of soil and groundwater sampling programs, supervision of the removal of USTs and remediation of impacted soils, and the performance of an assessment of proposed groundwater remediation alternatives.

SPCC/DPCC Upgrade, Confidential Client, Rahway, NJ: Evaluated an existing earthen berm surrounding a 500,000 gallon #6 heating oil tank for compliance with SPCC/DPCC secondary containment requirements. Prepared engineering drawings and provided construction supervision to upgrade berm for SPCC/DPCC compliance.

Bay Head Rail Yard, NJ Transit Corporation, Bay Head, NJ: Updated an SPCC Plan for this facility, which required an assessment of numerous underground and above ground tank systems, oil/water separator systems, and a surface improvement.

Confidential Client, Fords, NJ: Provided engineering design and field support for numerous site improvements for an industrial chemical manufacturer. Engineering tasks included the design of drainage structures, tank farm containment structures, tank truck loading areas, and asphalt paving. Developed engineering designs, estimated construction costs, and provided construction supervision for numerous upgrades to comply with current NJDEP DPCC requirements.

Automated People Mover Environmental Impact Statement (EIS) Utility Assessment, SWEC/BRW, A Joint Venture, Newark, NJ" Performed a detailed utility assessment for inclusion in the Environmental Impact Statement (EIS) for the automated people mover railway connection to Newark International Airport. Tasks included a detailed review of historical and readily available engineering drawings of the study area, inventory of all utilities within the study area, evaluation of impacts, development of potential relocation costs and preparation of a Preliminary Assessment Report.

Site Investigation, NJ Transit Corp., Madison, NJ: Identified an unknown migratory path of a discharge of heating oil from an underground storage tank (UST) to public storm sewers. Tasks included reviewing historical "as-built" drawings, supervising a ground penetrating radar survey, overseeing sewer inspections and cleaning, and preparing a Remedial Action Workplan (RAW) to address impacts to soil and groundwater from the discharge.

NJPDES Investigation, Port Authority of NY/NJ, New York, NY: NJPDES investigation to identify the potential sources of elevated zinc, lead, and total organic carbon found within the drainage structures of the Port Authority Trans-Hudson Corporation (PATH) Railroad System. Project responsibilities included the development and implementation of a sampling plan, evaluation of existing drainage structures, pumps, and system components, and preparation of a Summary Report.

Site Investigation, Port Authority of NY/NJ, Newark Liberty International Airport, Newark, NJ: Investigation to identify and characterize industrial and other potential pollutant dischargers which are tributary to the peripheral ditch at the airport. Responsibilities included identification of the drainage basin which contributes surface water flow to the ditch, a review of government and private files, evaluation of combined sewer overflows within the drainage basin, and preparation of a Summary Report.

Environmental Site Assessment, Gibson Tube, Inc., Branchburg, NJ: Provided ASTM site assessment services for a potential real estate acquisition, including historical and regulatory review, site inspection, review of facility documents, and review of previous assessment efforts.

Environmental Site Assessment, Scaturo Supermarkets, Bayhead, NJ: Provided ASTM site assessment services for financial requirements including historical and regulatory review, site inspection, review of facility documents, and review of previous assessment efforts.

Environmental Risk Evaluations, Consulting Services, Inc., Various Sites, US: Assisted in the preparation of environmental risk evaluations at numerous sites. Assessments included review of operational procedures, regulatory compliance history, contingency plans, potential impacts to sensitive receptors within the surrounding area, and recommendations to remove environmental risks.

Environmental Site Assessments, Lasky Company, Millburn, NJ: Performed numerous Phase I environmental site assessments for this diversified high speed printing company. Assessments included a review of facility operations, construction plans, regulatory compliance history, potential impacts to sensitive receptors, review of aerial photographs, and regional subsurface evaluations.

Environmental Site Assessment, Griefen, Bensalem, PA: Performed a Phase I environmental site assessment on a multi-tenant commercial building. Assessment included a review of facility operations, regulatory compliance history, potential impacts to sensitive receptors, review of aerial photographs, and regional subsurface evaluations.

Environmental Site Assessment, Mack Management Co., Paramus, NJ: Performed a Phase I environmental site assessment on a five-story office complex. Assessment included a review of facility operations, construction plans, regulatory compliance hazards, potential impacts to sensitive receptors, review of aerial photographs, and regional subsurface evaluations.

Environmental Site Assessment, Morris County, Morristown, NJ: Performed a multi-phased environmental site assessment on two vacant parcels. Assessment included an inspection of the subject sites, review of available plans, regulatory compliance history, potential impact to sensitive receptors, review of aerial photographs, and the development and implementation of a subsurface investigation.

Environmental Site Assessment, Bellemead Development Corporation, Parsippany/Troy Hills, NJ: Responsible for performing an environmental site assessment at a commercial facility prior to a real estate transaction. Specific issues addressed included the inspection of the site for environmental concerns, historical investigation of site usage, aerial photograph interpretation, documentation of utility service, and contact with local, state, and federal regulatory officials.

Phase I Environmental Site Assessment, Aetna Realty Investors, Inc., Hartford, CT: Responsible for performing Phase I environmental site assessments at numerous hotels and commercial office buildings prior to a real estate transaction. Specific issues addressed included the inspection of each site for environmental concerns, historical investigation of site usage, aerial photograph interpretation, documentation of utility service, and contact with local, state, and federal regulatory officials.

Preliminary Assessments, Wimpey Minerals, Inc., Various Sites, US: Performed a Preliminary Assessment (PA) and subsequently coordinated and supervised remedial efforts to address contaminated soils at several facilities utilized for the production of asphalt pavement. Tasks included evaluation of current and historical operation and manufacturing activities, preparation of PA, identification of potential areas of concern (AOCs), coordination and supervision of remedial activities, and preparation of Remedial Action Reports (RARs).

Major Modification of Water Allocation Permit, Hopatcong Borough, Sussex County, NJ: Prepared and obtained NJDEP Water Allocation Permit for an increase in maximum monthly and annual average diversion. Modifications also included the addition of new public community supply wells.

First Avenue Streetscape, Denville Township, Morris County, NJ: Responsible for the development of site plans for the beautification of First Avenue, including new curbing, a paver utility strip, and new decorative light fixtures, as well as sidewalk and municipal parking lot improvements. The project is being constructed with funding through a Federal Highway Administration Transportation Alternatives Program (TAP) Grant. (2017 – present)

Muriel Helpner Park Improvements, Denville Township, Morris County, NJ: Supervised the planning, design, permitting, and construction of park improvements, consisting of the construction of a paved asphalt perimeter walking/biking trail and parking lot improvements.

Tennis Court Improvements, Chatham Township, Morris County, NJ: Oversaw the preparation and final design of six championship-size tennis courts, including wind/visual screens on two sides, new coated chain link fencing, a practice wall, shade structures, picnic benches, and improved surface and subsurface drainage.

Nash Field Athletic Field Improvements, Chatham Township, Morris County, NJ: Designed and oversaw the construction of an underdrain system in conjunction with a natural topsoil Little League baseball field to mitigate the effects of stormwater and poor drainage in the area.

Veteran's Field Ball Field Improvements, Hopatcong Borough, Sussex County, NJ: Designed and layout of sports field lighting, site grading, and fencing. Construction responsibilities included general project oversight and construction period services.

Veteran's Memorial Field Athletic Field Improvements, Denville Township, Morris County, NJ: Design and layout of new synthetic turf field system, parking lot expansion, and lighting improvements. Performed hydrologic runoff calculations and hydraulic design of storm sewers related to the site design for athletic fields, including grading design and design of underdrain systems. One of the design components included the construction of an infiltration/detention basin.

Skateboard Park, Chatham Township, Morris County, NJ: Project Manager for the design, coordination, equipment selection, community outreach, and construction services for the construction of the Township's first skate park, complete with skate equipment. The project included base and surface preparation. Site improvements included the installation of fencing and appurtenances.

Shunpike Athletic Field Improvements, Chatham Township, Morris County, NJ: Designed and developed the stormwater management features for the site. The design included hydrologic and hydraulic calculations to develop stormwater management structures to maintain compliance with the requirements of stormwater management rules. One of the design components included the construction of an extended wetlands detention basin. (2008 – 2009)

Skate Park, Hopatcong Borough, Sussex County, NJ: Project Manager for the design, coordination, equipment selection, community outreach, and construction services for a new "state-of-the-art" skate park. The project included base and surface preparation and the installation of fencing and appurtenances.

Ball Field Site Lighting, Hopatcong Borough, Sussex County, NJ: Design, permitting, Board approval, and construction engineering for the installation of a lighting system meeting the Little League and soccer lighting standards for the Borough's municipal recreation fields.

Lagoon Lining, Ocean County Planning Board, Ocean County, NJ: Evaluation of impermeable lining alternatives for a lagoon on a County golf course. Prepared plans and specifications. Served as Resident Observer for the installation of a synthetic liner.

Department of Public Works (DPW) Building Expansion, Hopatcong Borough, Sussex County, NJ: Design and layout of a pre-engineered building expansion, including a washbay, oil/water separator, and additional site improvements. The project required NJDEP Land Use Freshwater Wetland permitting as well as Sussex County Soil Conservation District approval.

River Road Firehouse, Denville Township, Morris County, NJ: Design and construction oversight of a 1,550-sf addition to the existing firehouse, which is located partially in the Floodway and entirely in the Flood Hazard Area and Riparian Zone of the Rockaway River. Design involved elevating the structure and the use of flood vents to meet FEMA and NFIP criteria for buildings in a Floodway. Related design tasks included preparation of plans and applications for NJDEP Land Use permits.

Proposed Sanitary Landfill, City of Linden, Union County, NJ: Design and permitting for a 22-acre sanitary landfill. The estimated life of the landfill is 20 years serving the City and Exxon Corporation's Linden facility. Responsibilities included the preparation of preliminary and final design of site grading, layouts, leachate collection systems, leachate pump station, final cover, and drainage systems. Preparation of NJDEP permit applications.

Landfill Closure Plan, Olbrys Sanitary Landfill, Middlesex County, NJ: Designed final contours, final cover, and stormwater management features for a 10-acre sanitary landfill. Preparation of post-closure maintenance and financial plan.

Landfill Closure Plan, Metuchen Holdings Corp. (former Oakite Products facility), Metuchen, NJ: Assisted in the design and cost estimates for final cover alternatives and groundwater recovery alternatives. Supervised contractor in placement of interim soil cover over exposed asbestos area.

Sanitary Landfill, Schuller International, Inc. (formerly Manville Sales Corp.), Somerset County, NJ: Preliminary design and cost evaluation for groundwater recovery options. Responsible for design of final contours, final cover, and stormwater management features. Preparation of post-closure maintenance and financial plan.

Sanitary Landfill Closure Plan, Bernards Township, Somerset County, NJ: Responsible for the evaluation of final cover alternatives and impacts on leachate generation. Preparation of final grading plan, cap design, stormwater management design, post-closure maintenance schedule, and cost estimates.

Interim Solid Waste Transfer Station, Automated Modular Systems, Inc., Linden, NJ: Design and permitting of 1,000 tpd interim solid waste transfer station. Assisted in the preparation of preliminary design layouts, construction engineering services, and permitting.

MOTT MACDONALD

William A. DiBartolo, Jr., PLS

Personal summary

Education:

BS, Surveying Engineering Technology, New Jersey Institute of Technology, 2007

Registrations:

Professional Land Surveyor

NJ #24GS04331200, 2011
NY #050993-1, 2016

Years with Mott MacDonald:

9

Years with other firms:

8

Professional memberships:

National Society of Professional Land Surveyors

New Jersey Society of Professional Land Surveyors, Board of Directors

New York State Association of Professional Land Surveyors

Mr. DiBartolo is responsible for administering Mott MacDonald's land surveying operations in New Jersey as Survey Manager. His experience includes a wide variety of land surveying, 3D laser scanning (LIDAR), geographic information system (GIS), and municipal survey projects, giving him a multidisciplinary perspective towards project management and execution. His land surveying experience includes a full range of survey services in support of engineering design and publically-funded land acquisition projects. These include boundary, topographic, and environmental surveys, as well as the preparation of as-built building information modeling (BIM) models.

Mr. DiBartolo's project duties also include setting property corners, metes and bounds descriptions, parcel mapping for easement and right-of-way acquisitions, tax map preparation and revisions, ALTA/ACSM surveys, construction stakeout and grade sheet preparation, preparation and review of major and minor subdivision plats and descriptions, and report preparation for legal proceedings. His tax map experience includes maps drawn in ink on mylar and AutoCAD, as well as converting existing sheets into AutoCAD format. He is responsible for yearly tax map maintenance, updates, and drafting revision, and has performed NJDEP Green Acres and NJSADC Farmland Preservation Surveys for numerous properties throughout New Jersey. He has also performed monitoring well surveys for numerous Garden State Parkway/NJ Turnpike rest areas/service stations, as well as more than 200 retail gasoline service stations throughout New Jersey.

Mr. DiBartolo has experience with Global Positioning System (GPS), robotic total station, and both mobile and terrestrial LIDAR instrumentation to most effectively complete projects. Additionally, he has coordinated the location of stormwater outfalls and inlets with mapping grade GPS for inclusion in Tier A municipalities' Geographic Information Systems (GIS) mapping.

Employment history

2015 – Present	Mott MacDonald
2011 – 2015	County of Morris
2007 – 2011	Borbas Surveying and Mapping
2004 – 2007	Hatch Mott MacDonald (now Mott MacDonald)

Selected projects

Gibson Farmland Preservation, Freehold Township, Monmouth County, NJ: Managed the survey of a 52-acre privately owned farm and prepared a 46.5 Acre Farmland Preservation Easement for the township, funded thought the State of New Jersey Farmland Preservation Program. Additional easement documents were prepared to accommodate a future roadway widening of State Route 33 and for the maintenance of a county owned culvert. (2020)

Green Acres Open Space Survey, Chatham Township, Morris County, NJ: Managed the survey of a 7.5-acre parcel acquired by the township for open space though the NJDEP Green Acres funding program. (2018)

Digital Tax Assessment Map, Chatham Borough and Wharton Borough, Morris County, NJ: Project Manager for the creation of a digital tax assessment map and development of a land record database for use by the Borough Tax Assessor and Engineer. Individual parcels from the tax map were joined with the land records database using geographic information system (GIS) software to create new zoning, Open Space, and Historic District maps. (2012 – 2014)

Offshore Windfarm Development, Equinor/Empire Wind, NY: Survey Manager responsible for managing aerial survey and utility investigations for the initial phase of the offshore windfarm development project. (2020)

Netherwood Pumping Station Clearwell Condition Assessment, New Jersey American Water, Plainfield, NJ: Survey Manager for the preparation of a 3D laser scan of a 100-year old, 1.5 MG underground clearwell. Point cloud data collected from the laser scan was used to generate cross sections of the clearwell to assist in the structural assessment. High resolution 360-degree panoramic photos were also recorded inside of the structure to enable portions of the condition assessment to be completed remotely in an effort to minimize the length of time the clearwell was off-line. (2019)

Raritan-Millsotone Water Treatment Plant Upgrades, New Jersey American Water, Bridgewater, NJ: Survey Manager in support of upgrades to the gravity filter building piping. Completed a 3D laser scan of the 36,000 square foot facility, including a 500-ft long pipe gallery, operating floor, and roof. A building information modeling (BIM) model was created from the laser scan to assist in the design of upgrades to the filter piping, HVAC, and electrical systems. (2018)

CR 512 Water Main Crossing under the Passaic River and NJ Transit Right-of-Way, Long Hill Township, Morris County, NJ: Survey Manager for the preparation of a topographic, bathymetric, and right-of-way base mapping for the design of approximately 1,090 lf of 18-inch-diameter steel casing pipe installed utilizing horizontal directional drilling (HDD) crossing the Passaic River and NJ Transit right-of-way. (2016)

Utility Tunnel Improvements, Passaic Valley Sewerage Commission, Newark, NJ: Survey Manager for the preparation of a 3D laser scan and development of a building information modeling (BIM) model of the plant's 3,300-ft long utility tunnel. (2020)

Odor Control Upgrades – Ocean City, Seven Mile, and Wildwood Wastewater Treatment Facilities, Cape May County Municipal Utilities Authority, Cape May, NJ: Survey Manager for the preparation of 3D laser scans and development of building information modeling (BIM) models of various facilities at the Authority's wastewater treatment facilities. Over 45,000 square feet of treatment buildings were scanned and modeled in support of upgrades to the facility odor control systems. (2020)

Wastewater Treatment Plant Floodwall Protection, Passaic Valley Sewerage Commission, Newark, NJ: Survey Manager for the preparation of an updated existing conditions and utility mapping for the design of a 12,600 lf floodwall. The mapping served as a Basis of Design for the relocation of existing utilities to accommodate the design of the floodwall, which will protect the treatment plant from flooding and storm surges. (2017)

Sewer Asset Inventory Survey, Lakewood Township, Ocean County, NJ: Survey Field Crew Coordinator for field data collection regarding the Township's sanitary sewer assets. Asset locations were captured using a combination of survey grade Global Positioning System (GPS) equipment and conventional survey techniques. (2017)

Easement Mapping, Penn East Pipeline, Luzerne County, PA to Mercer County, NJ: Senior Surveyor for oversight of field survey and drafting teams in the production of easement plats for a 120-mile underground pipleline. (2017)

Combined Sewer Asset Inventory Survey, City of Elizabeth, Union County, NJ: Survey Field Crew Coordinator for field data collection regarding the City's combined sewer assets. Asset locations were captured using a combination of survey grade Global Positioning System (GPS) equipment and conventional survey techniques. (2016)

Combined Sewer Asset Inventory Survey, Village of Ridgefield Park, Bergen County, NJ: Field Crew Coordinator for data collection regarding the Village's sanitary and storm sewer assets. Asset locations were captured using a combination of survey grade Global Positioning System (GPS) equipment and conventional survey techniques. (2015)

Water and Sewer System Upgrades, Lakewood Township, Ocean County, NJ: Survey Manager for an aerial survey of a 300-acre section of the Township and ground survey of 25,000 lf of roadway to obtain utility mark-out and record accurate rim and invert elevations on sanitary and drainage sewer structures. (2015)

Roadway Reconstruction Projects, City of Summit, Union County, NJ: Survey Manager for the preparation of topographic surveys for roadways for various milling and paving, road and sidewalk reconstruction, and drainage improvement projects. (2014 – 2020)

Braydon Street, Lincoln Street, and Johnson Avenue, City of Englewood, Bergen Count, NJ: Survey Manager for the survey of approximately 5,000 lf of roadway to assist with the development of design drawings in connection with road reconstruction projects. (2012)

Passaic Avenue Bridge over the Passaic River, Town of Kearny, Hudson County, NJ: Survey Field Crew Chief for an existing conditions survey of a concrete beam bridge. The survey included topography of the bridge deck, abutments, and land below the structure, and a detailed survey of the locations and elevations of individual piers and beams. (2009)

NJ Transit Bridge over the Passaic River, City of Newark, Essex County, NJ: Survey Field Crew Chief for a survey for a proposed Riparian Grant related to upgrades to an existing railroad crossing over the Passaic River. The existing structure, piers, and bulkheads were

surveyed and mapped with adjoining Riparian Grants in the project area to show the extent and metes and bounds of the proposed grant. (2007)

County Administration Building Storm Drainage Improvements, Morris County, Morristown, NJ: Survey Manager for a detailed existing conditions and topographic survey of the Ann Street side of the building for the design of stormwater drainage improvements. (2015)

Brookside Park Pond, Scotch Plains Township, Union County, NJ: Survey Manager for the topographic and hydrographic survey of the Brookside Park Pond and surrounding wetlands. Detailed subsurface topography was required to calculate the volume of sediment to be dredged. (2015)

Monitoring Well Surveys, Garden State Parkway and NJ Turnpike, NJ Turnpike Authority, Various Locations, NJ: Managed the surveying of over 100 groundwater monitoring wells at eight different service stations in support of Licensed Site Remediation Professional (LSRP) site remediation efforts. Groundwater Monitoring Well "Form B" certifications were prepared for all wells and submitted to the NJDEP.

Warren County Landfill, Oxford Township, Warren County, NJ: Survey Field Crew Chief for an as-built survey of approximately 4,400 lf of PVC pipe for a landfill gas collection and extraction pipeline. (2011)

Fuel Storage Tank Settlement Monitoring, Buckeye Partners/City of Linden, Union County, NJ: Survey Field Crew Chief for a settlement monitoring survey of four new fuel storage tanks during the load testing of each tank. Measurements were recorded around the perimeter of the tanks simultaneously to monitor settlement and movement to the required accuracy of 1/16-inch (0.005 feet). (2009)

Environmental Site Remediation Surveying Support, International-Matex Tank Terminals, Bayonne, Hudson County, NJ: Survey Field Crew Coordinator for surveying support for the site cleanup and remediation of a 600-acre petroleum bulk storage and processing facility on the Upper New York Harbor. Provided as-built records and volume calculations of excavations, prepared deed notice area descriptions for remediated areas, and surveyed 400+ groundwater monitoring wells. (2007 – 2011)