EXPRESSION OF INTEREST FOR
STATE OF WEST VIRGINIA
DIVISION OF NATURAL RESOURCES

# A/E SERVICES- PIPESTEM RESORT SP WASTEWATER IMPROVEMENTS

**Solicitation No: CEOI 0310 DNR1900000003**




Responsive People | Creative Solutions

**FEBRUARY 22, 2019**

159 Plara Drive | Keyser, WV 26726 | P 304.788.3370 | F 304.788.3577 | www.rkk.com

February 22, 2019

Mr. Guy Nisbet, Supervisor
Department of Administration, Purchasing Division
2019 Washington Street East
Charleston, West Virginia 25305-0130

RE: **Expression of Interest**
**Solicitation No.: CEOI 0310 DNR1900000003**
**A/E Services – Pipestem Resort State Park Wastewater Improvements**

Dear Mr. Nisbet:

At **Rummel, Klepper & Kahl, LLP (RK&K)**, we realize there is more to offer our clients than traditional design services. If selected for the Pipestem Resort State Park Wastewater Improvement project, we will be an active partner with the West Virginia Division of Natural Resources (DNR) identifying needs, analyzing alternatives and designing a project that incorporates cost-effective strategies while meeting DNR's specific needs. This formula for success is based on our team's broad experience providing engineering design services related to wastewater treatment facilities for municipal clients, large and small. The key to our success is our continued focus on creative, cost-effective solutions and responsiveness.

As you review our enclosed qualifications, please note we offer strengths we believe set our team apart from other interested firms:

- **We understand your expectations.** In our previous meetings and discussions with DNR, we have come to understand what you are looking for from your design consultant—a quality design that is well thought-out and ready for bidding and construction without hassles along the way. We will look at your project through the lens of a contractor throughout the design process with our experienced design and construction professionals. Our promise is to make sure we are responsive to any comments or concerns you have during the process.

- **Experienced Project Managers.** RK&K's project managers are well acquainted in management of this type of project, with decades of relevant wastewater utilities design experience along with successfully designing similar wastewater projects. RK&K's management team places great emphasis on identifying cost effective solutions based on accurate cost estimates.

- **A Local Multidisciplinary Team.** RK&K has a multidisciplinary local team of 25+ staff members located in our Keyser, West Virginia office to serve DNR on this project. Our in-house team specializes in the design and evaluation of water and wastewater systems, facility design, water distribution, and sewage collection system improvements; water quality, and construction administration, management and inspection services.

- **Specialized Subconsultant.** RK&K anticipates providing all work associated with this project; however, Montum Architecture, LLC will serve as a subconsultant to RK&K if the need is determined. Tom Pritts, AIA, owner brings more than 17 years of experience in this field, including several current and successfully delivered projects for DNR.

- **Ability to begin Immediately.** The RK&K Team can begin work on the Pipestem Resort State park Wastewater Improvement project immediately. This project is a perfect fit for RK&K, and we have the available resources to meet the DNR's schedule.
- **Commitment to DNR.** RK&K will work alongside DNR representatives and utilize a proven, efficient and effective approach to meet the project objectives. RK&K is committed to working with DNR to meet the needs of this project.

We are enthusiastic about the opportunity to serve DNR on this important project and welcome an opportunity to meet with the selection committee to discuss the project in more detail. If you have any questions regarding this proposal, please contact me at 304.788.3370 or e-mail jcole@rkk.com. Thank you for the opportunity to submit our qualifications.

Very truly yours,

**Rummel, Klepper & Kahl, LLP**

John W. Cole, PE
Manager, Municipal Engineering

Purchasing Divison
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

**State of West Virginia**
**Centralized Expression of Interest**
**02 — Architect/Engr**

**Proc Folder:** 544956

**Doc Description:** A/E Services for Pipestem Resort SP Wastewater Improvements

**Proc Type:** Central Contract - Fixed Amt

| te Issued | Solicitation Closes | Solicitation No | Version |
|---|---|---|---|
| 19-02-01 | 2019-02-22 13:30:00 | CEOI 0310 DNR1900000003 | 1 |

**RECEIVING LOCATION**

) CLERK
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19 WASHINGTON ST E
ARLESTON WV 25305

**DOR**

**dor Name, Address and Telephone Number:**

Rummel, Klepper & Kahl, LLP
159 Plaza Drive
Keyser, WV 26726
Phone: 304.788.3370

**NFORMATION CONTACT THE BUYER**

lisbet
558-2596
nisbet@wv.gov

iael W. Myers, PE

ure X

FEIN # 52-0599112

DATE 2/8/19

**rs subject to all terms and conditions contained in this solicitation**

**DDITIONAL INFORMATION:**

xpression of Interest Request

he West Virginia Purchasing Division is soliciting Expression(s) of Interest for the Agency, The Division of Natural Resources from qualified firms provide necessary engineering, and other related professional services to design and specify for construction as well as provide construction ntract administration, for repairs and renovations to certain wastewater treatment and collection systems at Pipestem Resort State Park. The anned improvements may also include any other work necessary for, or related to, the aforementioned facilities, as well as any other necessary icillary work; all located in Pipestem Resort State Park in Summers County, West Virginia. per the bid requirements, specifications and terms id conditions as attached hereto.

Online submissions of Expressions of Interest are Prohibited

| VOICE TO | SHIP TO |
|---|---|
| VISION OF NATURAL RESOURCES<br>RKS & RECREATION-PEM SECTION<br>4 4TH AVE<br>UTH CHARLESTON WV25305 | SUPERINTENDENT<br>DIVISION OF NATURAL RESOURCES<br>PIPESTEM STATE PARK<br>3405 PIPESTEM DR<br>PIPESTEM WV 25979-0150<br>US |

| n | Comm Ln Desc | Qty | Unit Issue |
|---|---|---|---|
| | Civil engineering | | |

| m Code | Manufacturer | Specification | Model # |
|---|---|---|---|
| 01500 | | | |

**ded Description :**

itectural/engineering services and contract administration for wastewater treatment and collection systems at Pipestem Resort State Park.

## ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions

**DESIGNATED CONTACT:** Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

(Name, Title)
John W. Cole, PE, Manager, Municipal Engineering
(Printed Name and Title)
159 Plaza Drive, Keyser, WV 26726
(Address)
304.788.3370 / 304.788.3577
(Phone Number) / (Fax Number)
jcole@rkk.com
(email address)

**CERTIFICATION AND SIGNATURE:** By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Rummel, Klepper & Kahl, LLP
(Company)

(Authorized Signature) (Representative Name, Title)

Michael W. Myers, PE, Partner
(Printed Name and Title of Authorized Representative)

2/8/19
(Date)

410.728.2900 / 410.728.2834
(Phone Number) (Fax Number)

# ADDENDUM ACKNOWLEDGEMENT FORM
## SOLICITATION NO.:

**Instructions:** Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

**Acknowledgment:** I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

**Addendum Numbers Received:**
*(Check the box next to each addendum received)*

- ☐ Addendum No. 1
- ☐ Addendum No. 2
- ☐ Addendum No. 3
- ☐ Addendum No. 4
- ☐ Addendum No. 5
- ☐ Addendum No. 6
- ☐ Addendum No. 7
- ☐ Addendum No. 8
- ☐ Addendum No. 9
- ☐ Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Rummel, Klepper & Kahl, LLP
Company

Authorized Signature

2/8/19
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

West Virginia Ethics Commission

# Disclosure of Interested Parties to Contracts

Pursuant to *W. Va. Code* § 6D-1-2, a state agency may not enter into a contract, or a series of related contracts, that has/have an actual or estimated value of $1 million or more until the business entity submits to the contracting state agency a Disclosure of Interested Parties to the applicable contract. In addition, the business entity awarded a contract is obligated to submit a supplemental Disclosure of Interested Parties reflecting any new or differing interested parties to the contract within 30 days following the completion or termination of the applicable contract.

For purposes of complying with these requirements, the following definitions apply:

*"Business entity"* means any entity recognized by law through which business is conducted, including a sole proprietorship, partnership or corporation, but does not include publicly traded companies listed on a national or international stock exchange.

*"Interested party"* or *"Interested parties"* means:

(1) A business entity performing work or service pursuant to, or in furtherance of, the applicable contract, including specifically sub-contractors;
(2) the person(s) who have an ownership interest equal to or greater than 25% in the business entity performing work or service pursuant to, or in furtherance of, the applicable contract. (This subdivision does not apply to a publicly traded company); and
(3) the person or business entity, if any, that served as a compensated broker or intermediary to actively facilitate the applicable contract or negotiated the terms of the applicable contract with the state agency. (This subdivision does not apply to persons or business entities performing legal services related to the negotiation or drafting of the applicable contract.)

*"State agency"* means a board, commission, office, department or other agency in the executive, judicial or legislative branch of state government, including publicly funded institutions of higher education: Provided, that for purposes of W. Va. Code § 6D-1-2, the West Virginia Investment Management Board shall not be deemed a state agency nor subject to the requirements of that provision.

The contracting business entity must complete this form and submit it to the contracting state agency prior to contract award and to complete another form within 30 days of contract completion or termination.

*This form was created by the State of West Virginia Ethics Commission, 210 Brooks Street, Suite 300, Charleston, WV 25301-1804. Telephone: (304)558-0664; fax: (304)558-2169; e-mail: ethics@wv.gov; website: www.ethics.wv.gov.*

# West Virginia Ethics Commission
# Disclosure of Interested Parties to Contracts

(Required by *W. Va. Code* § 6D-1-2)

**Name of Contracting Business Entity:** Rummel, Klepper & Kahl, LLP **Address:** 159 Plaza Drive, Keyser, WV 26726

**Name of Authorized Agent:** Michael W. Myers, PE **Address:** Same

**Contract Number:** _____ **Contract Description:** Pipestem Resort State Park Wastewater Treatment & Collection System Renovations

**Governmental agency awarding contract:** WV Division of Natural Resources

☐ **Check here if this is a Supplemental Disclosure**

**List the Names of Interested Parties to the contract which are known or reasonably anticipated by the contracting business entity for each category below *(attach additional pages if necessary)*:**

1. **Subcontractors or other entities performing work or service under the Contract**
   ☐ Check here if none, otherwise list entity/individual names below.

2. **Any person or entity who owns 25% or more of contracting entity (not applicable to publicly traded entities)**
   ☐ Check here if none, otherwise list entity/individual names below.

3. **Any person or entity that facilitated, or negotiated the terms of, the applicable contract (excluding legal services related to the negotiation or drafting of the applicable contract)**
   ☐ Check here if none, otherwise list entity/individual names below.

Signature: _____ Date Signed: 2/8/19

**Notary Verification**

State of Maryland, County of Anne Arundel:

Michael W. Myers, the authorized agent of the contracting business entity listed above, being duly sworn, acknowledge that the Disclosure herein is being made under oath and under the penalty of perjury.

Taken, sworn to and subscribed before me this 8th day of February, 2019

VIRGINIA A. HAGE NOTARY PUBLIC ANNE ARUNDEL CO. MD

Virginia A Hage
Notary Public's Signature exp. 4/7/20

**To be completed by State Agency:**

Date Received by State Agency: _____

Date submitted to Ethics Commission: _____

Governmental agency submitting Disclosure: _____

*Revised June 8, 2018*

STATE OF WEST VIRGINIA
Purchasing Division

# PURCHASING AFFIDAVIT

**CONSTRUCTION CONTRACTS:** Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

**ALL CONTRACTS:** Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

**EXCEPTION:** The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

**DEFINITIONS:**

**"Debt"** means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

**"Employer default"** means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

**"Related party"** means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

**AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (*W. Va. Code* §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.**

**WITNESS THE FOLLOWING SIGNATURE:**

Vendor's Name: Rummel, Klepper & Kahl, LLP

Authorized Signature: _____ Date: 2/8/19

State of Maryland

County of Anne Arundel, to-wit:

Taken, subscribed, and sworn to before me this 8th day of February, 2019.

My Commission expires 4/7, 2020

AFFIX SEAL HERE

VIRGINIA A. HAGE NOTARY PUBLIC ANNE ARUNDEL COUNTY, MD

NOTARY PUBLIC _____

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# EXECUTIVE SUMMARY

## Introduction

The Executive Summary provides a synopsis of the various components of RK&K's Expression of Interest (EOI) as well as our ability to fulfill the contract requirements to successfully deliver design services and construction contract administration services to the West Virginia Division of Natural Resources (DNR) for the wastewater infrastructure and treatment system at Pipestem Resort State Park that is located on the border of Mercer/Summer Counties, West Virginia. Our proposed team for this project is committed to deliver engineering solutions that are technically-sound, cost-effective and environmentally compliant.

## Statement of Qualifications

**Section 2, Statement of Qualifications,** describes RK&K's more than 96 years of expertise in providing professional services for the study, design, construction and project delivery for all aspects of water and wastewater utility systems. This industry expertise makes RK&K a reliable partner to fulfill DNR's needs. Our firm has been involved in numerous studies to evaluate the adequacy and condition of existing facilities, develop and evaluate alternatives for new facilities that best meet current and future needs of client's water and sewer utilities; and identify and recommend the best program for managing the water and sewer systems development and growth in a particular planning area for a specified planning horizon. RK&K also routinely provides preliminary engineering and designs, final design, development of contract documents for new construction, rehabilitation, replacement and construction inspection/administration services for wastewater improvement projects.

Section 2 also describes the **Capacity of the Firm**. RK&K has projects in varying stages of completion and our team's current workload will have no impact on our ability to provide services to DNR for the successful delivery of this project. Our firm maintains a healthy and manageable workload and are vigilant about responding promptly to the satisfaction of our clients. Based on the current and projected workloads of our team, RK&K can fully commit all necessary resources to facilitate the successful, timely delivery of professional engineering and related services to DNR. This project will be led from our Keyser, West Virginia office which includes 25+ dedicated staff available to begin this project upon notice to proceed. Additionally, RK&K has more than 1,350 engineers, designers, and support staff available to support Keyser's staff to meet schedules as required.

This Section also describes **RK&K's Related and Past Experience** delivering projects with similar requirements and schedules. Because of our depth of staff, and our familiarity and proven approach delivering similar projects, we are confident in our ability to deliver a successful project that meets DNR's goals and objectives. Our experience with the **Requirements of State and Federal Agencies** is also described as well as our Team's **Technical Expertise** related to wastewater systems.

RK&K's West Virginia Certificates of Authorization are included at the end of this section.

## Methods of Approach

**Section 3, Methods of Approach,** describes RK&K's understanding and the various phases of our approach to deliver this project. It is our understanding DNR is seeking a professional engineering firm to provide necessary engineering and related professional services to design and specify for construction as well as provide construction contract administration, for the wastewater infrastructure and treatment system at Pipestem Resort State Park. We understand the planned improvements may also include any other work necessary for, or related to, the park facilities, as well as any other necessary ancillary work; all located in Pipestem Resort State Park.

## Management and Staffing

**Section 4, Management and Staffing,** describes our project team proposed for this work. We offer DNR a team of professionals who are well versed in the wastewater industry for this project. Our team consists of professional engineers licensed in the State of West Virginia with a sound knowledge of standards and design requirements. The team will be led by **John Cole, PE,** Project Manager offering 17 years of diverse experience in the wastewater industry, including wastewater treatment plants, pumping stations, and

collection systems, as well as construction management. Mr. Cole will lead a group of highly qualified individuals with vast knowledge and experience who have worked together on prior wastewater projects.

Mr. Cole will be the point of contact for the DNR for all communications related to the project, ensuring that all project team members receive design directives.

**Section 4 also includes RK&K's Management Approach and Quality Assurance process.** We have included a detailed organizational chart identifying each key team member and their proposed project assignment. In addition, resumes of key team members are provided and a copy of their professional licenses are included under the Appendix.

RK&K will also utilize the services of **Montum Architecture, LLC** as subconsultant for architectural services on this project. Mr. Tom Pritts, owner of Montum, will serve as our team's architect offering his more than 17 years of experience in architectural design, construction, and sustainable design practices, as well as current and past work with DNR.

## Experience with Similar Projects

**Section 5, Prior Experience,** contains RK&K's qualifications, experience and references. Our proven track record is evidenced by high ratings and repeat business from a variety of clients. This reputation has allowed RK&K to provide repeat services to many West Virginia clients and agencies. The experience and expertise our staff are gained from projects with these clients and is directly applicable to the services DNR envisions for the Pipestem Resort State Park Wastewater Improvements project. As demonstrated on our project profiles included in this section, RK&K has garnered a vast amount of experience working on similar projects spanning decades. We are confident in our team's ability to deliver the Pipestem Resort State Park Wastewater Improvements project on schedule and in the most efficient and cost-effective means possible.

## )VERVIEW OF THE FIRM

Founded in 1923, **Rummel, Klepper & Kahl** (RK&K) is a leader in providing the full spectrum of planning, engineering and construction services to water and wastewater agencies and unicipalities throughout the mid-Atlantic and Southeastern Regions. Our rvices include all aspects of water quality and quantity management ranging om water and wastewater treatment plants, wastewater collection and ter distribution systems, and pumping stations. Adept at a diverse x of wastewater system projects, our engineering team possesses pertise in hydraulics, hydrology, infrastructure planning, project nagement, and construction administration.


**Ranked #73 on the 2018 Engineering News Record's listing of Top 500 Design Firms**, RK&K serves an array of municipal, state and federal nts from 25 offices, including two in West Virginia – Keyser and Charleston. The firm employs a ll-diversified staff of engineers, planners, environmental specialists, surveyors, designers, draftsmen/CAD hnicians, GIS specialists, construction managers, inspectors and support staff.

## ROFESSIONAL SERVICES

&K's services include preliminary engineering dies/reports, environmental and qualifying reviews, veys, preparation of funding applications, final design, paration of bidding and contract documents, participation the evaluation of construction bids and construction nagement and inspection services.

| In-House Services | |
|---|---|
| **Water/Wastewater** | **GIS, Survey & Mapping** |
| Water Resources | Geotechnical Engineering |
| Civil/Site Development | Natural & Cultural Resources |
| Transportation Planning & Engineering | Natural Gas, Petroleum & Pipeline Engineering |
| Traffic Engineering | Value Engineering |
| Structural Engineering | Landscape Architecture |
| Environmental Services & Permitting | Construction Management & Inspection |

## PACITY OF THE FIRM

ices for the Pipestem Resort State Park Wastewater rovements project will be offered from RK&K's Keyser e, which includes 25+ dedicated staff. When additional ialty resources are needed, manpower of 1,300+ neers, designers, technicians and support staff will be ed to support the work.

## ATED PRIOR EXPERIENCE

K is knowledgeable of Mercer/Summers Counties local conditions, and is well versed on West Virginia codes, ordinances, and lations for water system design projects. **Section 5** of this submission provides profile sheets depicting RK&K's relevant experience.

K has an abundance of experience in providing engineering services for wastewater system improvement projects for small county ocal governments, including municipalities who might not have the benefit of an engineering staff. RK&K's vast experience in all ts of wastewater system design has included completion of studies for new systems; evaluation of existing facilities; mmendation of improvements; preparation of preliminary engineering reports and funding applications; assistance to the client in ing funding for a project; design and preparation of plans and specifications; and assistance to the client in bidding and award of a act. Further, RK&K has provided construction engineering and inspection services during construction, including assistance to clients ject closeout.

## ECHNICAL EXPERTISE

**RK&K has an abundance of experience in providing engineering services for wastewater system projects.**

&K's environmental/sanitary engineering experience covers anning, design and construction management for all aspects of astewater systems. The firm has achieved great success in ater/sanitary and environmental engineering, placing numerous stewater projects into successful operation. RK&K has been involved in numerous studies to evaluate the adequacy of existing cilities and to develop and evaluate alternatives for new facilities that best meet the current and future needs of clients.

## /astewater Systems

&K can attest to over 96-years of achievement in the field of civil/sanitary gineering, focusing on planning, study and design services for numerous stewater conveyance systems that have included over 200 interceptor vers, conventional gravity and low-pressure sewers, parallel relief sewers, d force mains. These projects have involved pipelines ranging from 8- to 8-inches in diameter constructed of ductile iron pipe (DIP), pre-stressed ncrete cylinder pipe (PCCP), reinforced concrete pipe (RCP), polyvinyl oride (PVC), high density polyethylene (HDPE), centrifugally-cast rglass mortar, clay, steel and cast-in-place conduits to 22-feet in meter. Pipeline installation conditions have varied from conventional nches with pile bent, cradle, or indigenous material foundations to aqueous crossings including horizontal directional drills, to bridge pensions and tunnels. Boring and jacking of the roadway and railroad at e crossings is frequently an aspect of work.

**Town of Oakland – Sewer System Replacement**

K has provided design services for corrosion control, including adjustable impressed current and passive sacrificial anode cathodic tection systems as well as polyethylene wrap protection for ferrous pipelines and PCCP systems as required. Our team has also vided design for reinforced concrete conduits, both plastic liner and special construction materials with sacrificial barrel design re a corrosive hydrogen sulfide environment was anticipated. For relief of parallel sewers, RK&K's team has assisted in the design ydraulic interconnection and balancing structures between the existing and relief sewers.

her, RK&K has been involved in many projects requiring special investigations and rehabilitative design where existing interceptors force mains either have structural damage that compromises the integrity of the sewer system or have conditions that limit the ssary flow through the pipe. Investigative efforts have involved SSES tasks such as televising the interior of pipelines, obtaining and ecting core samples of pipe walls, smoke and dye testing to identify in-flow sources, inspecting for pipe wall failure or deformations, movement, joint separation, corrosion, erosion, scouring and tuberculation. This type of work has also included analyses of bilitative alternatives and preparation of rehabilitative plans and specifications. These analyses usually include a comparative uation of in-situ repair methods versus a more traditional approach of excavation and pipe acement often have higher costs and may present construction and safety challenges as compared with in-situ methods. In-situ iods such as sliplining with HDPE pipe, inflating a resin-impregnated felt and polyethylene tube within the sewer to create a anent liner, and chemical grouting are effective methods to improve the structural condition and carrying capacity of a pipeline.

t of this work has involved design to maintain services while the pipeline was being repaired. RK&K has also been involved in gency design for projects where changed field conditions or erroneous record documents have required modifications to contract ments.

## Wastewater Pumping Stations

RK&K's specialized experience in wastewater pumping station studies and design has involved both new and upgraded existing facilities. Among the numerous wastewater pumping stations planned and designed by RK&K are examples of high-, medium-, and low-head facilities employing horizontal and both close-coupled and extended-shaft vertical pump configurations, as well as submersible and dry-pit submersible pumping units. Auxiliaries have included comminution, mechanical screening, grit collection and washing; oil accumulators and hydropneumatics systems; compressed air, chlorine, hydrogen peroxide, and ferrous sulfate feed for hydrogen sulfide control; activated carbon and ozone wet well air quality control; soil odor filters; packed tower chemical scrubbers; heating, ventilation, and dehumidification systems; emergency standby generators; and dual power supply systems.

**Virginia Beach Public Utilities**

Many assignments have involved the examination, testing and evaluation existing pumping stations, and development of remedial designs for improvement, upgrade, relief or replacement. RK&K reviews each project and scope in detail to determine any potential issues that may become present during the design and construction. As such, some of these issues which have been successfully addressed, include, but are not limited to:

- Modifications of pump motor speed, horsepower, and impeller size to achieve increased capacity and head.
- Interception of wet weather flows and associated abrasive grit.
- Sequences of construction and operation to maintain existing wastewater pumping capacity during construction, testing, and station piping change-over.
- Modifications of pump materials, motors, instrumentation, and other appurtenances.

**Frankfort PSD – Regional Sewer System**

## Wastewater Treatment Facilities

RK&K has completed more than 100 wastewater treatment assignments, including the design of new treatment and pre-treatment systems, rehabilitations, expansions, upgrading, and process-modification systems. System and process capacities have ranged from 1 to 180 mgd and have been designed for a broad spectrum of sanitary and combined sanitary and industrial waste loads. Additionally, RK&K has successfully completed more than 30 significant industrial wastewater treatment assignments in the mid-Atlantic and Southeastern Regions.

## Force Main/Interceptor Rehabilitation or Replacement

RK&K has provided services for projects requiring special investigations and rehabilitative design where existing interceptors and force mains either have structural damage that compromises the integrity of the sewer system or have conditions that limit the necessary flow through the pipe. Investigative efforts have involved SSES tasks such as televising the interior of pipelines, obtaining and inspecting core samples of pipe walls, smoke and dye testing to identify in-flow sources, inspecting for pipe wall failure or deformations, pipe displacement, joint separation, corrosion, erosion, scouring and tuberculation.

is type of work has also included analyses of rehabilitative alternatives and preparation of rehabilitative plans and specifications. ese analyses usually involve a comparative evaluation of in-situ repair methods versus a more traditional approach of excavation and pe replacement. Excavation and pipe replacement often have higher costs and may present construction and safety challenges as mpared with in-situ methods. In-situ methods such as sliplining with HDPE pipe, inflating a resin-impregnated felt and polyethylene be within the sewer to create a permanent liner, and chemical grouting are effective methods to improve the structural condition d carrying capacity of a pipeline. Most of this work has involved design to maintain services while the pipeline was being repaired.

## ydraulic Modeling

aluating an existing system, identifying problem areas, assessing the merits of ommended improvements or planning a proposed system, sewage force main tems and sanitary and combined sewer systems with computers is a proven, ective, and reliable technology for simulating and analyzing system behavior der a wide range of hydraulic conditions. RK&K uses various modeling software, pending upon the needs of the utility. RK&K has provided modeling support for ny counties and municipalities in West Virginia and in neighboring states, as well rivate utilities and institutions, including Greater Marion PSD, Central Hampshire ) and the City of Romney. The bulk of RK&K's experience involves WaterCAD by estad Methods for water distribution and force main systems and XP-SWMM2000 XP Software for combined and sanitary collection systems.

## rizontal Directional Drilling

K has performed Horizontal Directional Drilling (HDD) services for numerous clients across the country. Over the last ten years, the has completed more than two hundred HDD projects ranging from road crossings to over 7,000-feet water crossings. RK&K's staff xperienced in all phases of HDD assessment, design, permitting, construction management, inspection and training. Our staff vides a practical approach to the feasibility, design, and construction of HDD installations. The engineering services include technical economic feasibility assessments, production of detailed reports, geotechnical assessments, designs, specifications and drawings, ineering support for contractors, and construction management/inspection for HDD Projects.

K occupies a key position in the application of HDD to cross obstacles such as waterways and roads. Our representatives understand downhole survey system being utilized by the project's contractor. We interpret readings and perform independent calculations rmining the position and curvature of the pilot hole. Drilling fluid returns at the entry and exit point are calculated to correlate with specific design challenge. We also provide recommendations to the client and contractor related to the drilling fluid program.

# UPPORT SERVICES FOR WASTEWATER SYSTEM FACILITIES

## tructural Engineering

&K offers experienced structural engineers capable of providing the services quired for this project. Our structural engineering staff is well qualified in rforming all phases of work, commencing with concept and feasibility studies rough final design and construction phase services. With an extensive ckground in municipal facility projects, examples of structural services include ll houses, treatment plants, pumping stations, storage tanks, utility tunnels d vaults, retaining walls, drainage structures, operations facilities, fuel handling ilities, and chemical storage facilities.

**Charles Town Water Treatment Plant**

## echanical Engineering

&K's mechanical design experience includes HVAC, dehumidification, piping, w monitoring and valving systems for water and wastewater treatment plants d pumping stations; compressed air and odor control systems for treatment nts and pumping stations; and plumbing systems for various facilities. omatic temperature and ventilation controls are designed in accordance with epted code requirements for air change frequency and to maintain the comfort of operations and maintenance personnel. All chanical equipment requirements are carefully accounted for when interfacing with the main facility control systems.

## ctrical Engineering

K has the in-house capabilities to design all types of electrical power distribution and control systems for municipal, industrial and sportation type construction contracts. The firm has provided complete design and construction phase services for various types acilities throughout the mid-Atlantic region. These facilities include water and wastewater treatment plants, pumping stations, well ses, and natural gas regulating stations.

gns have included low and medium voltage switchgear, complete power ribution systems, motor control centers, pump controls, HVAC controls, dby emergency power generator systems, SCADA systems and lighting ems of all types.

**Frankfort Public Service District**

## otechnical Services

RK&K geotechnical engineering department has been involved in the field stigations, analyses, and geotechnical report preparation for various icipal engineering facilities in excess of 30 years. During this period, erous treatment plants, pumping stations, solid waste disposal facilities, and rock fill dams, levees, floodwalls, lagoons, water supply wells and r supply reservoir projects have been investigated and final designs ared. In addition, remedial measures and upgrades of existing facilities been analyzed and geotechnical input provided for final design. For these cts, test borings and observation wells have established soil, rock, and ndwater conditions at the site which, when used in conjunction with atory test results where required, has resulted in the most practical dation system or rehabilitation measures for the project.

## ıstrumentation/Control and SCADA Systems

&K has extensive experience in the evaluation and design of strumentation and control systems of all types. RK&K has designed merous water pumping facilities based on level control and pressure ntrol for single and multi- pump applications ranging from a few rsepower to several hundred horsepower. Control systems utilized have luded pre-engineered relay-based systems, custom designed relay-based stems, pre-engineered digital control systems, and custom designed stems using programmable logic controllers (PLCs). In each case, control stems have been integrated with the necessary alarm, telemetry and ADA functions required for the application.

ıny of the systems designed have included the use of variable frequency ves to control pump speed, including customized multi step speed trols to limit piping fluid velocities under specific operating conditions. In most cases, RK&K's designs have included some level of k up control, ranging from redundant level/pressure sensing equipment, to full back up secondary controls providing automatic erating in the event of primary control failure. Other functions implemented in the design of pump control systems have been omatic valve timing/sequencing, seal water systems, automatic pump alternation, pump lockout circuitry, motor thermal monitoring vibration monitoring. RK&K's involvement in the design of pumping control systems is often extended into the construction phase project, where troubleshooting and start up services have been provided to aid in the implementation of the design.

## )eration and Maintenance and Start-up Services

K's experience with operation and maintenance associated with water, wastewater and stormwater facilities includes a wide range apabilities and services. These consist of training of client staff and operators; preparation of detailed O&M manuals and standard rating procedures; plant evaluation, performance testing, and troubleshooting; and facility startup. RK&K is an innovator in the ign and delivery of customized training programs for O&M personnel, many of which are often developed to address client specific cerns for facilities already in operation. RK&K has developed comprehensive SOPs, standard maintenance procedures, operator ket guides, emergency response plans, operating placards, and other information for plant personnel. In addition, our team provides mmendations to improve plant performance, energy and chemical system optimization, structural integrity and design life and pment operation and reliability.

rding inventory management and control for municipal water, wastewater and stormwater facilities, RK&K often institutes as part e O&M manual or standard operating procedures, a facility specific protocol for managing spare parts inventories, lubricants and pment specific tools. These protocols are usually developed in conjunction with the client's operation and maintenance staff and range from a three-ring binder containing the inventory listing, parts, identification numbers, and vendor codes to a complete puter database installed on a networked hardware system with terminals accessible rious system facilities.

## GINEERING SUPPORT SERVICES

## mitting

has extensive experience and close working relationships with numerous federal tate environmental agencies to obtain required permits. Through recent experience ojects for municipalities, RK&K's Team has developed a close working relationship the WV Bureau of Health, WV Department of Environmental Protection; WV rtment of Natural Resources Office of Land and Streams; WV State Historic rvation Office; as well as US Fish and Wildlife and Army Corps of Engineers.

## nvironmental Assessments

e RK&K Team includes individuals experienced in identifying jurisdictional aters of the U.S., including the vegetation, soils and hydrology for wetland lineations. Several key and support staff members are U.S. Army Corps of gineers' (COE) certified wetland delineators and/or professional wetland lentists. RK&K can assess functions and values of affected wetlands using chniques such as the Hollands Magee method, Soil Conservation Service ethod, Hydrogeomorphic Classification method (HGM) Rapid Assessment ocedure (Magee Hollands Method) or other accepted methods.

&K has conducted several hundred wetland delineations and numerous ictional assessments. Wetland delineations are performed in accordance th the 1987 COE Manual and have been approved by, and jurisdictional terminations have been obtained from various COE districts, including ltimore and Norfolk.

&K includes professionals skilled in delineating and documenting stream conditions (physical and biological), submerged aquatic getation habitat and water quality conditions. RK&K has experience using a variety of methodologies for characterizing stream ditions including Rosgen Stream Classification, U.S.D.A.'s Stream Visual Assessment Protocol and EPA's Rapid Bioassessment tocols.

team also has extensive experience in preparing ecological technical reports which include biological assessments prepared in npliance with the Endangered Species Act.

## onstruction Management/Inspection Services

K's Construction Management and Inspections Department has been viding construction phase services for over 50 years involving hundreds of lic works' projects with aggregate construction costs in the billions of ars. Projects include water and sewer infrastructure, water and tewater treatment plants, pumping stations, stormwater management, ways, bridges, transit tunnels, subways, hydroelectric plants, marine ities, and flood control facilities plus a variety of building projects. Many ects involve a full range of construction management/administration and ection services from design, preconstruction, construction and post-truction phase, including materials testing, tests and start-up, claims lution, CPM scheduling and contract close-out. RK&K's construction neering and inspection services involve public works, capital ovements, transportation and/or development projects.

K employs hundreds of construction engineering/inspection personnel of varying levels of expertise. RK&K's employees are vledgeable about traditional as well as state-of-the art construction inspection practices and procedures and materials testing niques. Many of RK&K's staff are NICET-certified, Troxler nuclear gauge trained, hold state erosion and sediment control lications, are certified or approved by client's materials laboratories, and have solid backgrounds and expertise in field surveying onstruction layout.

## t Estimations

K's cost control plan focuses on both internal cost and assignment schedule as well as the construction cost of the facilities being ned. RK&K maintains a monthly routine of monitoring and updating project costs. RK&K's in-house accounting system provides y reports so that project/task managers know where they are from a budget standpoint on a real-time basis. As a quality

anagement technique, RK&K prepares construction cost estimates by hand in addition to using an automated cost estimating system. ie owner is notified immediately when a condition/circumstance exists that affects the budget of the project. This approach has oven very effective with construction bids consistently within 5% of the cost estimate for contracts for $1,000,000 or less and within % for contracts greater than $5,000,000. Construction change orders have been consistently within 2% of construction cost.

## /EST VIRGINIA CERTIFICATES OF AUTHORIZATION

### ate Board of Registration for Professional Engineers

opy of RK&K's Certificate of Authorization from the State Board of Registration for Professional Engineers is included on the following ge.

### est Virginia Board of Professional Surveyors

opy of RK&K's Certificate of Authorization from the West Virginia Board of Professional Surveyors is included on page 9.

# CERTIFICATE OF *Authorization*

STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS

*The West Virginia State Board of Registration for Professional Engineers having verified the person in responsible charge is registered in West Virginia as a professional engineer for the noted firm, hereby certifies*

**RK&K ENGINEERS, LLP**
**C01505-00**

***Engineer in Responsible Charge: MICHAEL W MYERS - WV PE 018055***
*has complied with section §30-13-17 of the West Virginia Code governing the issuance of a Certificate of Authorization. The Board hereby notifies you of its certification with issuance of this Certification of Authorization for the period of:*

**January 1, 2018 - December 31, 2019**

*providing for the practice of engineering services in the State of West Virginia.*

IF YOU ARE REQUIRED TO REGISTER WITH THE SECRETARY OF STATE'S OFFICE.
PLEASE SUBMIT THIS CERTIFICATE WITH YOUR APPLICATION.

IN TESTIMONY WHEREOF, THE WEST VIRGINIA STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS HAS ISSUED THIS COA UNDER ITS SEAL, AND SIGNED BY THE PRESIDENT OF SAID BOARD.

BOARD PRESIDENT

WEST VIRGINIA BOARD OF PROFESSIONAL SURVEYORS

# *Certificate of Authorization*

## Rummel, Klepper & Kahl, LLP

*Keyser, West Virginia*

## CERTIFICATE OF AUTHORIZATION # 19-5554

This certificate is issued by the West Virginia Board of Professional Surveyors in accordance with *W.Va. Code §30-13A-20*
The person or organization identified on this certificate is licensed to conduct professional surveying and mapping services in the State of West Virginia for the period

**January 1, 2019 through December 31, 2019**

***This certificate is not transferrable and must be displayed at the office location for which issued.***

In witness whereof, I have put my hand, this 31st day of December 2018

2019

R. Michael Shepp, P.S., Chairman
James T. Rayburn, P.S., Member

Sefton R. Stewart, P.S., Secretary
Gary D. Facemyer, P.E, P.S., Member

Douglas C. McElwee, *Esq.*, Public Member

## PROJECT UNDERSTANDING

RK&K would like to express appreciation to **Nathan Hanshaw,** Assistant Superintendent of Pipestem State Park, for taking the time to discuss the Park's specific needs with respect to waste water system improvements. From this discussion, RK&K is aware that the project consists of the replacement of an existing wastewater treatment facility serving the Park Lodge, Amphitheater and Canyon Rim Visitor's center, along with various elements of the Visitor's Center collection system which is experiencing I&I issues.

We understand that the existing facility is a 1970s era 10,000 GPD extended aeration plant, and that the condition of the plant is such that replacement is the recommended course of action.

RK&K understands that the proposed engineering services will consist of inspecting and evaluating the existing wastewater infrastructure and treatment system, providing preliminary design with alternatives, providing a final design based on the decision of the WVDNR, preparation of a complete set of construction documents, and construction administration or monitoring during the construction of the system.

We are aware that Pipestem State Park initiated a replacement project for a similar wastewater treatment plant that served the cabin area in 2016. RK&K will take this into consideration in the design of any new facility to ascertain technology compatibility and uniformity of Park-wide maintenance procedures.

## COMMUNICATION PROCEDURES

At RK&K, we believe proactive communication with your staff is as important as interdepartmental coordination within our firm. For this reason, our team will collaboratively work with representatives from DNR deliver a cost-effective, detailed design that fits the specific needs of Pipestem State Park. We offer DNR an integrated project approach that begins with working closely with your representatives to comprehend a full understanding and the project goals. This interactive and collaborative process will be led by our Project Manager, **John Cole, PE.** From project initiation to project closeout, he will serve as the main contact, make sure that consensus is reached at each phase and that the design solutions developed are responsive to DNR's goals and project needs.

Mr. Cole will maintain communication with DNR's representatives at the onset of the project continuing through construction and post-construction services. He will be responsible of the management of the Project Team and make sure all team members involved have a clear understanding of your project scope, the intent of your overall project goals and the appropriate design criteria and environmental concerns to make certain our services exceed the DNR's expectations. Furthermore, he will clearly communicate the scope, schedule and budget to make sure that we deliver the projects in a cost-effective and timely manner. Mr. Cole, along with members of our team, will communicate regularly with DNR during construction to ascertain that existing systems are kept in operation while the new infrastructure is being constructed. Our on-site team members will communicate with RK&K's engineers and with the RK&K's operators responding rapidly to DNR's requests and project needs.

## MAINTAINING PROJECT BUDGET

RK&K maintains an excellent record of managing design budgets, accurately estimating project construction costs, and managing project construction resulting in a minimal number of change orders and cumulative change order values below industry averages. Primarily two of the best methods we have used to control scope are open communication and keeping current on the project budget. We realize that effective and reliable communication keeps the project's scope understood by all stakeholders as the project progresses. The other step in controlling scope is our cost control plan that focuses on both our internal cost and assignment schedule and the construction cost of the project being designed. In this atmosphere of budgetary constraints, nobody likes surprises. Therefore, we maintain a monthly routine of monitoring and updating project costs. Our management information system provides timely reports, so project managers know where they are from a budget standpoint on real-time basis. Our Project Manager, John Cole, will carefully monitor budgets on a weekly basis using RK&K's management information system (Deltek Vision). Deltek Vision allows staff to monitor progress vs. budget and to identify problem areas early—allowing early action to be taken, if necessary, to make sure the project stays on schedule and budget. The contract budget will include a set percentage for contingency to address unexpected costs such as delays due to weather, material delivery, or contractor performance.

Quality control is a crucial component to maintaining a project budget. Mr. Cole will make sure that project tasks are progressing on schedule and budget. He will also be responsible for ensuring our team is performing the appropriate quality control checks and will assign key staff leaders to review deliverables to identify issues early and verify proper adjustments are made. He will also keep close attention to contractor shop drawings during the construction, and closely monitor costs of proposed materials.

## MAINTAINING PROJECT SCHEDULE

The project schedule, with concurrence of DNR, will be set during the planning stage. Attention will be given to defining critical issues and any project constraints, developing a completion schedule, and including key milestones. The schedule will be in the form of a Gantt chart showing work components planned by task, through the duration of the project. The schedule will be compressed where possible to meet key milestones and schedule constraints. We will account for schedule delays, including inclement weather, delivery of equipment, and manpower in the project plan. Contract plans, and specifications will be produced to account for these delays to assist in ensuring timely completion of construction. RK&K has a past record of developing project plans and specifications promptly. While RK&K is capable of a fast-paced turn around, the team will make certain that quality and accuracy is considered when establishing the schedule.

The construction will be monitored by onsite resident project representative who will work alongside the contractor's personnel throughout the project. The resident project representative will be in constant contact with RK&K's project engineer to alert to any potential delays so that actions may be taken to offset any delay before the project schedule is affected. Regular meetings and communication will be held with the Contractor and Owner to make sure that all parties adhere to the project schedule.

Based on the current and projected workloads of our team, we can fully commit all necessary resources to facilitate the successful, timely delivery of design and construction services for this project. RK&K's resources, including staff and equipment at other offices, are at the disposal of our project team. Because of our depth of staff, and our familiarity and proven approach to delivering professional services for similar projects, we are confident in our ability to deliver this project on time and within schedule.

## PERFORMANCE DATA

One of the primary reasons we staff a project the way we do is to populate the project team with readily available and qualified personnel. This team is no exception – each person was chosen based on their experience and performance providing services on similar wastewater improvement projects. Our team is comprised of engineers, CAD designers, surveyors, and resident project representatives ready to begin work immediately and capable of performing the tasks required to meet DNR's goals and objectives. We have organized our team to ensure that we have the staff and resources to facilitate the successful, timely delivery of engineering services for a successful project. RK&K's resources, including staff and equipment are at the disposal of our project team as schedules

and assignment workloads require. Our success is achieved by implementing a proven staff and work plan which focuses on: effective project management to achieve DNR's objectives and rapid responses—including proactive management of costs; providing a skillful team with the requisite expertise to provide the services requested; clearly understanding the work to be performed and the expected outcomes; establishing and implementing robust QC/QA protocols; and optimizing the allocation of resources to meet schedules.

## PROJECT GOALS AND OBJECTIVES

We have assembled a team from our Keyser office to be responsive to each item within the scope of work involved with this project. As such, our team is equipped to work concurrently to deliver high-quality projects, on-time, and within budget. Each team member is ready to begin immediately and will work objectively to create a desirable end result for the wastewater improvements at Pipestem Resort State Park that truly incorporates DNR's vision and goals. Our proposed team is known for its technical know-how and over the top personal service.

### Goal/Objective 1: Review of Existing Plans and Conditions

The RK&K Team will begin by gathering all available information on DNR's sewer system. RK&K acknowledges that effective communication is the key to success. Meetings will be conducted at the park facility for discussion and with DNR representatives to determine a plan that can be applied with minimal disruption to the park, staff, guests and operation of the facility, while meeting the intention of the project.

### Goal/Objective 2: Design Services

RK&K will provide all necessary services for the design of the project. Construction plans and specifications will be developed in accordance with current federal and state laws, and codes, and will be combined with the bidding and contract documents necessary to advertise the project for bid. During the design process, the RK&K Team will continue to meet frequently with DNR's representatives to review progress and receive input.

**Budget and Schedule Control:** RK&K has an exceptional record of completing projects on time and within budget. RK&K's in-house cost accounting system is capable of segregating and identifying accumulated costs for this project. We will utilize this system to make sure that the project is designed and executed within budget.

**Quality Assurance/Quality Control:** RK&K's in-house quality assurance/quality control program will also be utilized to make sure that all documents are complete, accurate, and concise.

### Goal/Objective 3: Construction Contract Administration Services

RK&K will provide the necessary contract administration services to make sure that the project is constructed in compliance with plans and specifications. Project Manager, Mr. Cole, will serve as the communication link between DNR and the contractor. He will conduct monthly progress meetings with the contractor and DNR to review progress and to resolve any problems that may arise. At the completion of the project, he will conduct a walk-through inspection with DNR's representatives and the contractor, prepare a punch list of items needed to be completed and conduct a final inspection after work is complete. He, along with our team members, will provide technical assistance during the one-year warranty period to resolve any problems that may occur.

With concurrence from the DNR, RK&K will provide full-time inspection on the project. RK&K employees are knowledgeable about construction as well as state-of-the-art-construction inspection practices/procedures and materials testing techniques. DNR will be provided the opportunity to approve the inspector recommended by RK&K for the work. The inspector will provide assurances that the project is completed in accordance with the plans and specifications.

# ANTICIPATED CONCEPTS AND METHODS

## Typical Approach

RK&K's project approach has been utilized successfully on many wastewater improvement projects with requirements similar to those needed for the Pipestem Resort Wastewater Improvement project. This project will be led by an experienced team who have sufficient experience related to the services required for the successful delivery of this project. All work will be done in accordance with applicable federal, state and local regulations, including funding agencies involved. RK&K's typical methods of approach is outlined below and will customized as needed to meet DNR's specific requirements.

## System Study

The RK&K Team will begin by gathering all available information on the Wastewater Plant and Collection systems at Pipestem Resort State Park, such as reviewing relevant existing plans. RK&K will follow the reviews by meeting with DNR's operators, managers and others to obtain information.

After the initial discussion and reviews are completed, the team will meet with DNR to present findings and preliminary recommendations for the project. In addition to presenting the results of the study, RK&K will solicit input from DNR at this or subsequent meetings. These meetings are essential to everyone's understanding of the system's needs and the resultant proposed project. These meetings also serve to reduce or eliminate future misunderstanding of the work to be completed.

## Engineering Report

RK&K will proceed with development of a Facility Plan. This report is the first requirement in developing a sewer project to delineate project details. The report will include project description, and project cost estimate necessary to present the project to the DNR. Upon completion of the facility plan, RK&K will submit to DNR for review and approval.

## Construction Plans and Specifications

Once the project is fully defined, the RK&K Team will proceed with the development of construction plans and specifications. The plans and specifications will be prepared to support the various phases of the project. Upon completion, the plans will be combined with the bidding and contract documents necessary to advertise the project for bid. The plans will provide a detailed description of the work to be completed by the contractor. The plans will be supplemented by detailed specifications defining the method of completing the work and the material specifications. RK&K's detailed specifications have been refined over years of working within the State, incorporating the lessons learned from similar wastewater improvement projects.

During the development of the contract plans and specifications, the RK&K Team will meet frequently with DNR to review progress and receive input. Normally, plans for owner and regulatory agency review and comment are submitted at 60%, 90% and 100% completion status.

## Preparation of Bidding and Contract Documents

With completion of the plans and specifications, we prepare contract and bidding documents in anticipation of advertising the project for bids. This complete package will be used to define the project requirements from a contractual perspective for uniformity of requirements among all contractors.

Assembly of the contract and bidding documents completes the project package. While many of these documents are determined by funding agency requirements, RK&K will use the Engineers Joint Contract Document package as the basis of the contract documents.

The Engineers Joint Contract Documents Committee (EJCDC) is an undertaking of the American Consulting Engineers Council (ACEC), American Society of Civil Engineers (ASCE) and the National Society of Professional Engineers (NSPE). EJCDC has developed and periodically updates a set of documents representing the latest and best thinking of practicing engineers and legal counsel on contractual relations between the parties involved in construction-related projects. These documents have been endorsed and recommended by the various funding agencies in West Virginia.

he EJCDC documents are standard contract documents utilizing carefully drawn language to define the respective responsibilities of he parties with respect to construction related projects based upon "test of time" experience. These documents are the industry odel for professional engineering services and construction processes. The documents spell out accepted division of duties and esponsibilities of the Engineer, Owner and Contractor and represent the culmination of legal precedent and expert review.

ollowing preparation of the complete construction document package, updated permits will be obtained from the Department of ealth, Department of Environmental Protection and other applicable entities before going to bid. All necessary rights-of-way or asements must be acquired. RK&K will prepare the permit applications for DNR's submittal. RK&K will provide any technical assistance equired during the review process. RK&K is licensed to survey and prepared to assist the DNR in securing easement(s) and right-of-ay(s). Although these approvals are straightforward, they will take time. All of this is dependent on the source of funding for the oject.

pon obtaining the construction permits from the applicable entities and permission from funding agencies and Public Service ommission, the project will be ready for advertisement.

## idding Phase Assistance

ith approval of DNR, the project can proceed to bid advertisement. A contract of this scope of work is normally advertised for three four weeks to allow sufficient time for contractors to assemble prices and prepare a competitive bid. During that time, RK&K will nduct a pre-bid meeting with the contractors to review the project and answer any questions. An addendum will be issued as cessary to clarify any element of the project.

e project will be advertised for bids in accordance with state law and agency requirements. Projects are normally advertised in the al and regional newspapers. Advertisement in the Charleston or adjacent newspapers is also recommended to reach a wide dience of contractors. In addition to the newspapers, plans will be placed with Dodge Reports, West Virginia Contractors Association d other plan rooms in the West Virginia area. The objective is to alert as many contractors as possible and increase competition wards securing a low bid for the project.

a specified date and time, bids will be collected at a designated location. RK&K will then assist DNR in opening and reviewing bids. e apparent low bidder will be announced at the end of the meeting.

## rticipation in the Evaluation of Bids Received

er the bids are opened, RK&K will review each submittal package in detail. This review includes verifying that the math is correct; ifying that all documentation required is satisfactory. Some of these requirements are initially checked at the bid opening; and luating the contractors' ability to accept and satisfactorily complete the project. This could include evaluation of financial assets, rent workload, previous projects and discussion with previous clients and engineers who have worked with the contractor.

er the comprehensive review is completed, RK&K will make a recommendation to award the contract to the selected contractor. At stage of the project, RK&K will prepare the NOTICE OF AWARD and CONTRACT AGREEMENT to send to the contractor. After the tractor signs the contract agreement and returns it along with the payment and performance bonds and any other required uments, RK&K will issue, with DNR approval, a NOTICE TO PROCEED. A contractor normally has ten days to begin construction after eipt of this notice.

## onitoring and Inspection of Construction Activities

K will serve as the communication link between DNR and contractor. Shop drawings and submittals furnished by the contractor be reviewed by RK&K for compliance with plans and specifications. The Project Manager will monitor construction, visiting the site ften as necessary as the project proceeds.

K's Project Manager will conduct monthly progress meetings with DNR and the contractor to review the project's progress. The ect Manager will also review the contractor's pay requests to verify quantities and recommend payment for work completed. At completion of the project, RK&K will conduct a walk-through inspection with DNR and contractor, prepare a punch list of items ded to be completed and conduct a final inspection after work is complete. RK&K will also provide technical assistance during the

ne-year warranty period to resolve any problems that may occur. Near the end of the warranty period, RK&K will conduct a final ispection of the facility with the DNR. Any problems or defects noted will be sent to the contractor for correction.

K&K will provide full-time inspection on the project, if desired by DNR. RK&K employees are knowledgeable about traditional as well s state-of-the-art-construction inspection practices/procedures and materials testing techniques. DNR will be provided the pportunity to approve the inspector recommended by RK&K for the work. The inspector will work to confirm that the project is ompleted in accordance with the plans and specifications. The project inspector will be provided with all necessary assistance from K&K's project manager to make sure the project is completed in accordance with the plans and specifications.

## ROJECT MANAGEMENT

fective project management begins with creating the best team possible to accomplish the required work. We have assembled a mprehensive team experience in wastewater system design, operations and maintenance. As previously mentioned, John Cole will the main point of contact and Project Manager leading our team. His proactive approach to establishing and maintaining open mmunication and cooperation among the team allows our team to quickly adjust to project changes and resolve issues without nfusion or delay. As Project Manager, he will make sure that project tasks are progressing on schedule and on budget. He will also be sponsible for ensuring that our team is performing the appropriate quality control checks.

ir exceptional project management process, team coordination, and early and continuous coordination with DNR's staff and regulatory encies will lend to a successful project delivery. RK&K's project management tools include RK&K's in-house Project Management idelines that are a collection of best management practices proven to produce successful projects. Mr. Cole will utilize the guidelines d software tools to manage this project including Microsoft Project for planning and scheduling tasks, resources, and deliverables. &K's project cost reporting software will be used to track project labor and other direct costs. Project charges will be updated on a ekly basis providing Mr. Cole with the latest cost information for each of the projects they are managing.

## ANAGEMENT APPROACH

&K's management approach is based on providing the following commitments to clients:

- Meeting established schedules and exceeding expectations by responding rapidly to client requests;
- Manage multiple assignments simultaneously, if required;
- Uphold quality of service through implementation of our in-house Quality Assurance and Quality Control (QA/QC) Program; and
- Dedicate the appropriate resources and experienced staff to meet accelerated schedules.

rk on this project will begin with a project initiation meeting to establish a clear project understanding and to determine the lines of mmunication between Mr. Cole, RK&K's Project Manager, and DNR's representatives. All project goals and requirements will be ntified via an Internal Project Memorandum. After developing a clear understanding of the project requirements, Mr. Cole will draft technical approach, anticipated schedule and staffing requirements, and fee estimate. These documents will be reviewed in draft nat with the DNR's project manager. Once the draft scope of work and schedule, are approved, he will submit final documents for roval by DNR. Once DNR issues a Notice to Proceed, he will develop a Work Plan that documents the scope, budget, and schedule; ntifies the standards that will be followed; identifies critical project elements; and establishes coordination requirements.

## ALITY ASSURANCE


Quality is paramount at RK&K. RK&K's Quality Assurance / Quality Control (QA/QC) Program will be a crucial component to maintaining the established schedule and budget for this project. RK&K's employs a continuous, multi-faceted QA/QC approach. RK&K places great emphasis on developing the highest quality engineering and environmental products. It is RK&K's belief that future assignments are obtained in large measure on how well current assignments are performed. RK&K utilizes standardized policies for maintaining quality in the work produced.

**Quality Assurance and Quality Control is a top priority in the development of any RK&K project.**

Through the rigorous application of appropriate criteria and sound engineering practice, QC for each assignment will be performed by every employee working on the project. Team members will utilize

&K's established QA/QC Program, which includes three major principles: **project management control, quality of work and cost ntrol.**

## uality of Work

ordinating with team members assures proper direction and flow of information. The successful implementation of such a course of tion requires daily contact between the Project Manager and key staff members. RK&K will implement an established in-house Staff erating Plan (SOP) which has proven successful in the past. QA/QC at RK&K is an active and iterative process beginning at project eption, concluding only after the project goals and objectives have been met.

comply with this approach, QA/QC will be addressed at various levels, as described in the previous section, with QC at the discipline d level and QA at the discipline Project Manager/peer review level. No deliverable will be submitted to DNR without fully complying h our QA/QC process.

ecution of tasks assigned under this contract is an extension of RK&K's QA/QC procedures and requires an effort by all involved sonnel in producing quality documents (studies, reports, plans, specifications, etc.) that: are complete, accurate and concise; provide ficient detail and description; are consistent with established codes, design criteria and West Virginia and federal standards; provide ompleted product that is constructible, operable and maintainable; and completely satisfies the needs of the DNR.

## st Control

&K maintains a cost accounting system (DELTEK system) that is capable of segregating identifying accumulating costs for each job performed under Cost-Type projects. The ject Manager will carefully monitor budgets on a weekly basis. RK&K's DELTEK system ws managerial staff to monitor progress versus budget, which aids in the identification potential problem areas and allows the implementation of appropriate remedial ons early enough in the project to make sure that tasks are completed within budget. &K's system provides the project management team with a report that includes a breakdown of man-hours and payroll by individual s for "budget", "actual payroll used", "available to complete" and the budgeted and actual hourly payroll rates which enables the ject manager to monitor the project status quickly and efficiently.

**RK&K's cost accounting system is a valuable asset for monitoring project progress versus budget.**

## OJECT TEAM

K provides planning, design and construction phase services daily for wastewater system projects throughout the mid-Atlantic and theastern regions. Team members chosen for this project have extensive histories working on successful wastewater improvement ects. The following paragraphs provide information on key staff members chosen for this project.

**As Project Manager, John W. Cole, PE** will oversee the administrative and technical aspects of the project and make sure consensus is reached at each phase and that the design solutions we develop are responsive to DNR's goals and needs. He offers his 17 years of diverse experience in the field of wastewater system design to this project where he has been the lead engineer and managed numerous wastewater improvement projects. He will remain in contact with DNR for the project's duration ensuring the progress of the work and verifying DNR's needs are met.

**Michael W. Myers, PE,** Partner, has more than 33 years of municipal engineering experience and will serve as Partner-in-Charge. Mr. Myers is responsible for RK&K's water/wastewater practice firm-wide and will ensure adequate resources are made available to the project team to successfully deliver all required services. He is experienced in all aspects of sanitary/environmental engineering including planning, design, permitting, construction, operation and maintenance and troubleshooting for water and wastewater pipelines, pumping stations and treatment facilities throughout West Virginia the mid-Atlantic and Southeastern Regions.

Myers will ensure that RK&K's standards of quality and performance are maintained and that DNR is satisfied with the level of service re providing. He will also assist with the management of contract negotiations. He places the full weight and integrity of the RK&K ership behind our Project Manager, John Cole, PE, and has dedicated the individuals shown on the organizational chart to make sure

r contract commitment is met. The RK&K Team is organized to offer Mr. Cole as a continuous, single point of responsibility to DNR for e duration of this project.

**&K's Team Members** --bring a unique mix of skills, experience and portfolio of working together on dozens of wastewater infrastructure ojects. This collective depth and breadth of our personnel's experience makes our team perfectly suited to promptly deliver all aspects work required for these improvements. They will assist the key leaders listed above on this project. Each have been chosen for their lity and experience on past relevant projects, as well as availability to perform the work. This team has provided a multitude of planning, sign and construction phase services for wastewater improvement projects throughout West Virginia.

&K's team is comprised of highly-qualified individuals with vast knowledge and experience in their respective fields. They will assist the . Cole in the successful delivery of this project. Each were selected due to their ability and experience on past relevant projects, as well availability to perform the work. This team has provided a multitude of planning, design and construction phase services for wastewater tem projects throughout state.

Montum Architecture

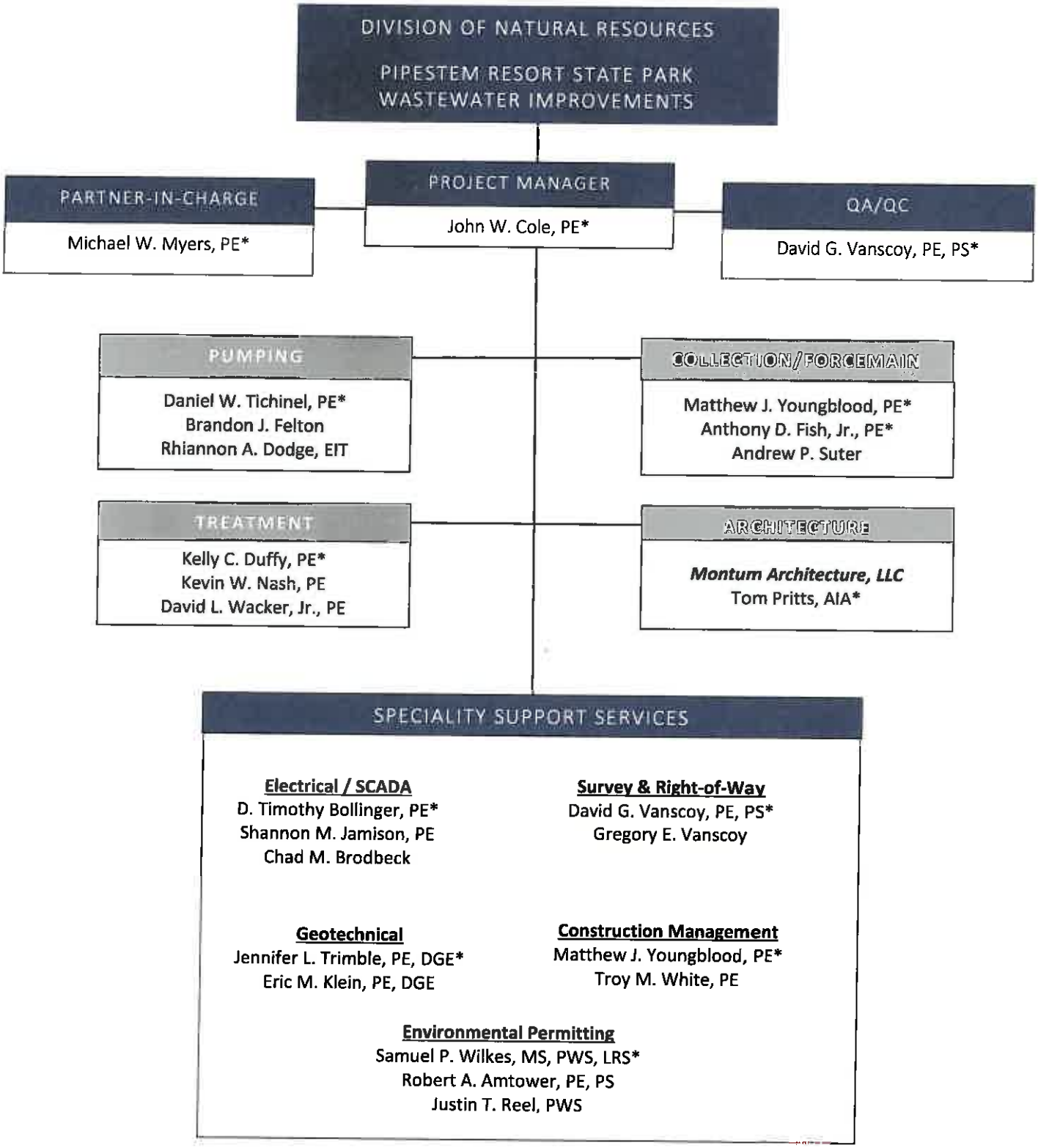
**Subconsultant** – RK&K will utilize the services of Montum Architecture, LLC to assist in Architecture services, if required. **Thomas F. Pritts, AIA** will lead Montum team offering his more than 17 years of experience in design, specifications, and project management gained on a wide range of projects, including several current and past projects for the DNR. Mr. Pritts is a member of the West Virginia Chapter of American Institute of Architects and was involved in the establishment of the US Green Building Council's West Virginia Chapter. RK&K will oversee all work provided by Montum.

## am Organization

llustrated in our organization chart on the following page, we have assembled our team to be responsive to each item within the scope vork involved with this project. As such, our team is equipped to work concurrently to deliver high-quality projects, on-time, and within get. Each team member has more than sufficient staff capacity to devote to their areas of discipline.

umes of each key team member are also provided.

# EAM ORGANIZATION CHART




*Resume included

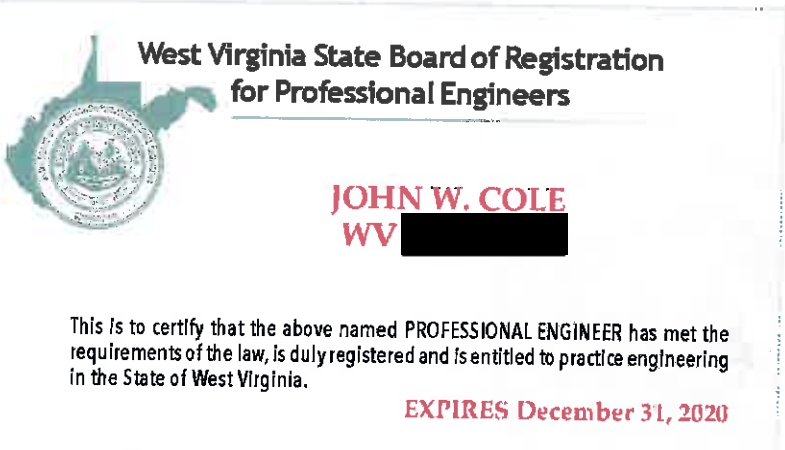
# OHN W. COLE, PE
## ROJECT MANAGER

**Education:** BS, Civil Engineering Technology, Fairmont State College, 2001

**Professional Registration**: Professional Engineer, WV, 2008 [redacted] also registered in MD, VA & OH

**Experience:** 17 years

. Cole has been actively involved in the planning, design, d construction of West Virginia's infrastructure projects for ore than 17 years, providing industry leadership through dressing the region's infrastructure needs. He has diverse erience in design of water and wastewater treatment nts, pumping stations, distribution and collection systems, division development, and construction management. His ponsibilities include full project delivery including feasibility dies, design, construction plans and specifications, cost mating, construction administration inspection and gineering.


West Virginia State Board of Registration for Professional Engineers

JOHN W. COLE
WV [redacted]

This is to certify that the above named PROFESSIONAL ENGINEER has met the requirements of the law, is duly registered and is entitled to practice engineering in the State of West Virginia.

EXPIRES December 31, 2020

**wn of Oakland Sewer Improvements, Oakland, MD:** Project nager. Responsible for the design of various sewer line replacements, I&I flow monitoring and smoke testing, and the installation of a screen at the Town's main pump station, upstream of the wastewater treatment plant. Project also included the preparation of both eliminary Engineering Report (PER) and Environmental Report (ER) for submission to USDA Rural Utility Service (RUS) for funding.

**w Creek Public Service District, Mineral County, WV:** Project Manager. Oversaw flow monitoring and smoke testing efforts for locating rces of inflow and infiltration entering the collection system.

**olina and Idamay Sewer System Replacement Project, Greater Marion Public Service District, WV:** Project Engineer responsible for ow and infiltration study; preparation of conceptual design to replace a failing vacuum collection system; overseeing design of roximately 25,200 LF of gravity sewer, 9,500 LF of pressure sewer, 7,400 LF of force main, and two sewage pump stations.

**thern Mineral County Regional Sewer System Wastewater System, Mineral County Commission, WV:** Project Engineer responsible for ting in the development of the facilities plan recommending a regional sewer project consisting of a new 1.2 mgd WWTP, 40 miles ewer collection, 2.5 miles of sewer rehabilitation, three miles of sewer force mains, and 10 sewage pump stations; coordinated efforts lved in the funding and permitting process. Phase 1- Design: responsible for coordinating and overseeing the design of the WWTP uding the following major components, influent pump station, mechanical fine screen, vortex grit unit, Aqua SBR's, post-equalization, matic backwashing filters, aerobic digesters, and a belt filter press.

**les Town Utility Board On-Call Water & Sewer Projects, Charles Town, WV:** Project Manager. Oversaw design and construction phase ices for various water and sewer on-call projects. Projects included design and construction of new sewage lift stations; modifications isting sewage lift stations; over 10 miles of water mains and sewage force mains; improvements to two of the Utility's three WWTP's; ovements to the single WTP including a 1 MG water storage tank; construction of three emergency back-up generators; painting of ral elevated water storage tanks.

**awilla WWTP, Charles Town, WV:** Project Manager responsible for coordinating RK&K's evaluations for optimizing the start-up of a Four Stage Bardenpho membrane bioreactor facility designed for BNR treatment. Oversaw the design and construction of the ent pump station and 5,600 LF of 8" force main including the telemetry system for operating the pumps.

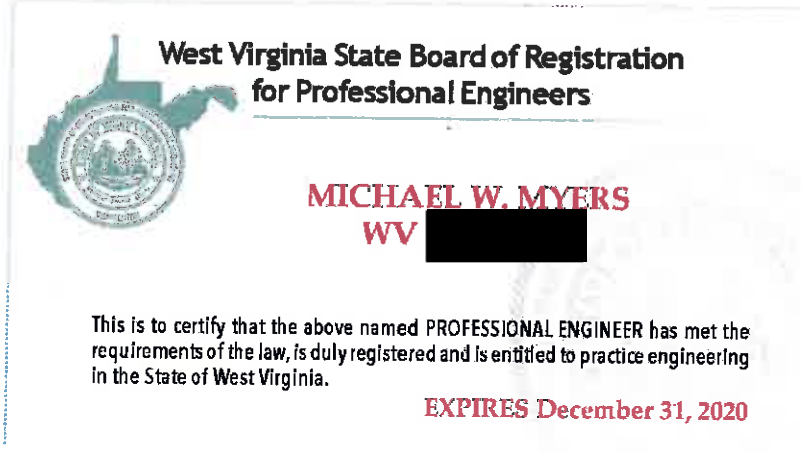
# MICHAEL W. MYERS, PE
## PARTNER-IN-CHARGE

**Education:** BS, Civil Engineering, Pennsylvania State University, 1985
MA, Management, Webster University, 1989

**Professional Registration:** Professional Engineer, WV, 2009 [redacted] also registered in MD, PA, VA, FL, NC, TX, DE, & DC

**Experience:** 33 years

Myers is responsible for RK&K's municipal ter/wastewater engineering and utility design practice nwide, and will ensure adequate resources are made ilable. He has extensive experience with water, wastewater l stormwater infrastructure improvement projects, and has ved as a project manager and designer on many technically erse planning, study and design projects throughout the -Atlantic region and Southeastern Regions.




**rthern Mineral County Regional Sewer System Mineral nty, WV:** Partner-in-Charge. Responsible for this $39 lion regional sewer system project which includes over 40 es of sewer collection; 10 pump stations and a new 1.20 D wastewater treatment plant including biological nutrient oval.

**v Creek Public Service District, I&I Evaluation, Mineral County, WV:** Partner-in-Charge of project for flow monitoring and smoke testing cate sources of inflow and infiltration entering the collection system.

**rles Town Utility Board On-Call Water & Sewer Projects, Charles Town, WV:** Partner-in-Charge. Overseeing design and construction of ous water and sewer on-call projects. Projects ranged from the design of new sewage lift stations, modifications to an existing sewage tation, design of over 20,000 LF of sewage force mains, to overseeing painting of two elevated water storage tanks and water treatment t.

**Water & Sewer Deficiencies Correction, Martinsburg, WV:** Partner-in-Charge. As a consultant RK&K assisted on major improvements to water and sewer system at the VA Medical Center in Martinsburg, WV. Scope of work involved new and replacement water and sewer , removal and reclamation of existing abandoned water and sewer infrastructure and rehabilitation and replacement of existing sewer ction system.

**kfort Public Service District Water System, Wiley Ford, WV:** Partner-in-Charge of Water system evaluation, upgrades/improvements, extension projects for the FPSD's water system to include preparation of a preliminary engineering study and report which will be used unding applications; system evaluation; preliminary and final design services; preparation of all necessary permit applications; aration of construction plans, specifications, and bidding documents; assistance during bidding; and construction administration and ction services.

**all Water System Improvements, Berkeley County, WV:** Partner-in-Charge of a water audit project with the primary goal of identifying auses of excessively high-water losses in the County's Northern Service Area. Tasks performed under this audit included leak surveys, g and calibration of larger master meters, district metered area (DMA) testing, large billing meter profiling and sizing and umption analysis.

# )AVID G. VANSCOY, PE, PS

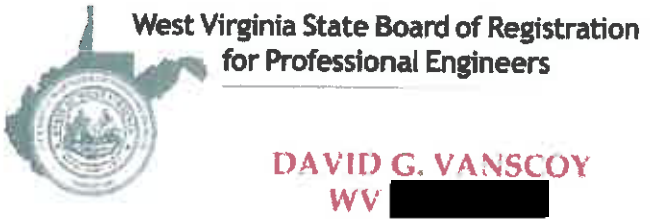
## UALITY ASSURANCE AND QUALITY CONTROL/SURVEY & RIGHT-OF-WAY

**Education:** MS, Structural Engineering, West Virginia University, 1972
BS, Civil Engineering, West Virginia Institute of Technology, 1970

**Professional Registration:** Professional Engineer, WV, 1974 [redacted] also registered in MD
Professional Surveyor, WV, 1995 (#1228)

**Experience:** 46 years

Vanscoy has more than 46 years of experience in design d management of diverse civil engineering projects luding streets/roadways, water distribution and treatment ilities, wastewater collection and treatment facilities, and development. Mr. Vanscoy is very skilled in working with ltidisciplinary teams on large, complex projects to ensure mless interfaces between disciplines, as well as interfacing h local interests involved in smaller projects in ensuring t their needs are met.


West Virginia State Board of Registration for Professional Engineers

DAVID G. VANSCOY
WV [redacted]

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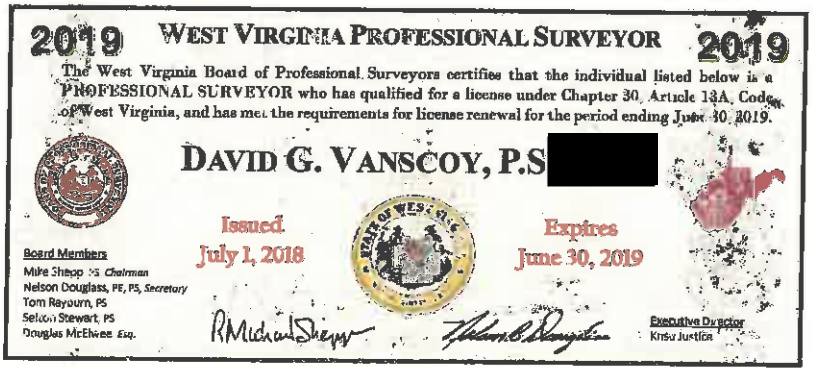
EXPIRES December 31, 2020


2019 WEST VIRGINIA PROFESSIONAL SURVEYOR 2019

The West Virginia Board of Professional Surveyors certifies that the individual listed below is a PROFESSIONAL SURVEYOR who has qualified for a license under Chapter 30, Article 13A, Code of West Virginia, and has met the requirements for license renewal for the period ending June 30, 2019.

DAVID G. VANSCOY, P.S [redacted]

Issued July 1, 2018

Expires June 30, 2019

Board Members
Mike Sheop PS Chairman
Nelson Douglass, PE, PS, Secretary
Tom Rayburn, PS
Selden Stewart, PS
Douglas McElwee Esq.

Executive Director
Kristy Justice

olina and Idamay Sewer System Replacement **Project, rion County, WV:** Director in Charge. Performed a study luation of a relatively new vacuum collection system for mmunities of Idamay and Carolina which suffered from ility to function properly. The study resulted in design construction engineering services for the elimination of ng vacuum collection system and construction of 6,300 LF pressure sewer. Also performed Inflow and Infiltration y as part of this project.

**thern Mineral County Regional Sewer System Phase 1 tewater Treatment Plant (Design and CM/CI), Mineral nty, WV:** Director in Charge. Responsible for a $39 million onal sewer system project which included over 40 miles ewer collection; 10 pump stations and a new 1.20 MGD wastewater treatment plant including biological nutrient removal.

**kfort Public Service District - Wiley Ford Sewer Project, Wiley Ford, WV:** Director in Charge. Responsible for design, contract plans and ifications, construction engineering and inspection services, and obtaining funding for the new Wiley Ford Sewer System. The project ides wastewater collection services for over 450 resident and commercial customers. The collection system consists of over 55,000 of collection lines, 6,600 feet of force main, and nearly 12,000 feet of service laterals. The system contains 273 manholes and 48 nouts. Construction bids were 1.1 million below the engineer's estimate. Also included in the system were three duplex pumping ons and an 8" force main under the Potomac River to discharge into the City of Cumberland system.

**eley Sewer System Evaluation, Mineral County, WV:** Director in Charge. Evaluated the existing Ridgeley Sewer System and developed s to correct the considerable problems with backups and clogged and failed lines. Following the study, prepared a facility plan which ribed the proposed $1.96-million project. This facility plan was then used to prepare a funding application to the West Virginia structure and Jobs Development Council.

# MATTHEW J. YOUNGBLOOD, PE

## OLLECTION/FORCEMAIN & CONSTRUCTION MANAGEMENT

**Education:** BS, Civil Engineering, West Virginia University, 2006

**Professional Registration:** Professional Engineer, WV, 2016 [redacted]

**Experience:** 12 years

Youngblood has 12 years of experience with a background municipal wastewater/water treatment design and lection system infrastructure. His skills include facilities nning, preliminary study and design of water and stewater facilities, water distribution network and sewer work, and construction management services.

West Virginia State Board of Registration for Professional Engineers

MATTHEW JOSEPH YOUNGBLOOD
WV [redacted]

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EXPIRES December 31, 2020

**olina and Idamay Sewer System Replacement Project, ater Marion Public Service District, Marion County, WV:** ject Engineer. Assisted with Inflow and Infiltration study h sewer camera inspections. Designer on vacuum sewer relocation to improve the efficiency of the sewer ection system in the Town of Idamay. Also assisted with gn to replace the vacuum system with gravity and force main sewer system. Construction Engineer on replacement of the vacuum em.

**land Water Distribution System Study, Town of Oakland, MD:** Project Engineer. Responsible for the design of waterline replacements on nerous streets in Oakland, which included the design of booster stations to provide adequate pressure to water customers within the em.

**er Line Extension, Town of Lonaconing, Allegany County, MD:** Designer. Assisted on four water improvement projects including new s and line replacement and construction management in the Towns of Midland, Barton and Lonaconing.

**er System Improvements, Town of Lonaconing, Allegany County, MD:** Construction Engineer. Assisted in the replacement of Koontz Run . Existing earth dam was replaced with three-million-gallon pre-fabricated concrete tank.

**thern Mineral County Regional Sewer System Phase 1 Collection System, WWTP (CM/CI), Mineral County, WV:** Construction Engineer. d with this new regional sewer collection system which includes over 20 miles of sewer collection lines. Provided engineering oversight 6 mgd Wastewater Treatment Plant to serve Northern Mineral County.

**thern Mineral County Regional Sewer System Phase 2 Collection System, Mineral County, WV:** Construction Engineer. New gravity ction and force main sewage system to replace individual septic systems and old collection system which was in non-compliance with regulations. The project included a river crossing and installation of three duplex pump stations with auto-dial alarm systems. Both able and permanent generators were provided as part of the project.

**ney Collection System Replacement, Phase 1, Hampshire County, WV:** Assisted in the construction management of the sewer collection m replacement project.

**an Ridge Subdivision Site Development, Atlantic Land Corporation, Davis, WV:** Assisted with design of roadway layout, which included g culverts for drainage in the subdivision. Also assisted with the design and layout of the water and sewer utilities.

**Creek Lake State Park, Garrett County MD:** Project Designer on the replacement of water line and two chlorination feed stations. gned an RV dump station to expand the traffic volume for the camp ground.

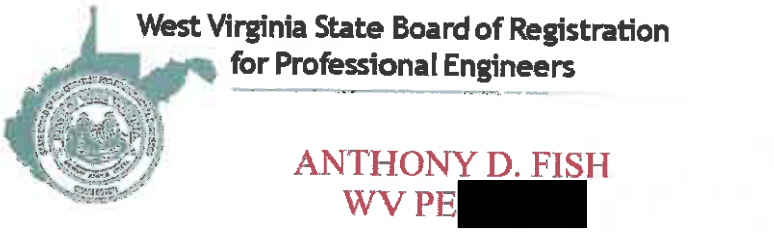
# NTHONY D. FISH, JR., PE
## OLLECTION/FORCEMAIN

**Education:** BS, Civil Engineering, West Virginia Institute of Technology, 1992
AS, Drafting & Design Engineering Technology, WV Institute of Technology, 1987

**Professional Registration:** Professional Engineer, WV, 2004 [redacted] also registered in MD

**Experience:** 25 years

Fish recently joined RK&K as Senior Project Engineer in &K's newly opened Charleston, WV office. Mr. Fish brings years of experience as a civil engineer, including experience projects in West Virginia, with strong design and project nagement skills. Qualified in all phases of project elopment, his experience includes problem identification, ceptual solutions, cost estimating, preliminary and final ign, plan production, contract development, work ction, contract administration, construction inspection field engineering. Before joining RK&K, Mr. Fish was the stant City Engineer for the City of Charleston, West Virginia 03-2016) where he managed small, medium and large ign and construction projects.


West Virginia State Board of Registration for Professional Engineers

ANTHONY D. FISH
WV PE [redacted]

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EXPIRES December 31, 2020

**rt Street Pump Station Rehabilitation, Charleston, WV:** Project Manager and Design Engineer. Over the last major, $495K rehabilitation retrofit of the Court Street Pump Station. Oversaw the design and construction of a major pump station rehabilitation and upgrade. n successful separation of the storm and sanitary flows in the Court Street area, the 1970's era technology facility was replaced with dern lifting pumps, an updated control and automation system, and a separated redundant external pump which starts and operates atural gas in the event of a main system shutdown or power failure.

**rison Avenue / Magazine Branch Storm Sewer Rehabilitation, Charleston, WV:** Lead Designer. Oversaw construction of a major bilitation to the Garrison Avenue storm sewer. The main line, consisting of twin structures 96" to 60" in diameter and 10,600 LF was bilitated fully at several joints and a new pipe invert was placed using shotcrete and pumped epoxy. Several laterals were replaced, access / manholes were rehabilitated and replaced at seven locations.

**nia Street Pump Station Rehabilitation, Charleston, WV:** Project Manager. Responsible for the replacement of a failing lift station p located at the Railroad underpass on Virginia Street West. A lift station serving a narrow urban railroad underpass failed during a icularly wet West Virginia Spring causing localized flooding and resulting in full roadway closure. Designed and implemented an rgency pump replacement and control and power system rehabilitation to quickly return the lift station and the roadway to service.

**ght Drive Storm Sewer Rehabilitation, Charleston, WV:** Assistant City Engineer. Planned and reconstructed a large, failed concrete channel transporting water from the Twilight Drive incinerator, under Barlow Drive and to the Elk River. The project involved nstruction of large collapsed segments of the conduit, rehabilitation of joints and the placement of approximately 725 feet of new t.

**tant City Engineer, City of Charleston, WV:** Assistant City Engineer. Worked in a variety of disciplines including structural, architectural, portation and geotechnical engineering design and mapping and GIS development. Management of small, medium and large design onstruction projects.

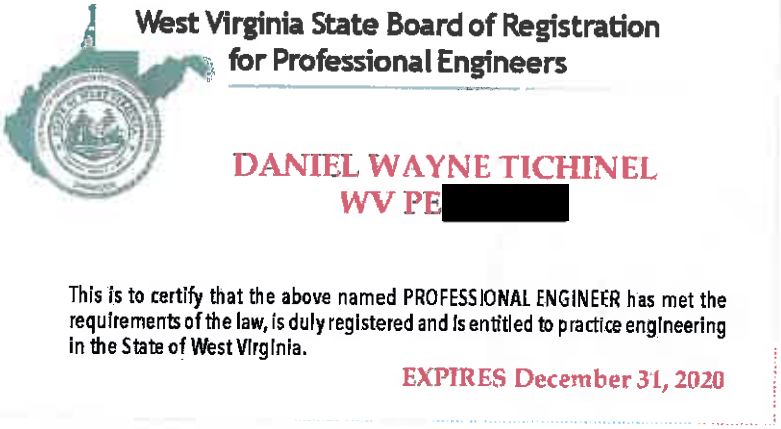
# )ANIEL W. TICHINEL, PE
## UMPING

**Education:** BS, Civil Engineering, Bucknell University, 2010

**Professional Registration**: Professional Engineer, WV, 2015[redacted]; also registered in MD

**Experience:** 8 years

. Tichinel has eight years of civil engineering experience h an emphasis on water and wastewater infrastructure. His erience includes preparation of preliminary engineering orts (PER) and environmental reports (ER), the design of ter distribution systems and sanitary sewer systems, luding pump stations and collection and conveyance tem evaluation, pump station rehabilitation design, new np station design, pressure reducing stations, water atment plant design, storage tank design, and pipeline lacement/realignment projects.




**rett County Department of Public Works – Deep Creek VTP Preliminary Engineering Report / Environmental orts:** Project Engineer. Responsible for preparation of a PER & ER for the 2.2 MGD Deep Creek Lake WWTP Enhanced Nutrient Removal rade.

**rett County Department of Public Works – Trout Run WWTP Preliminary Engineering Report / Environmental Reports:** Project Engineer. ponsible for preparation of a PER & ER for the 0.9 MGD Trout Run WWTP Enhanced Nutrient Removal upgrade.

**keley County Public Service Water District – Phase B Distribution System Improvements, Berkeley County, WV:** Project Engineer. ponsible for design of 1,830 LF of 12" CL 51 DIP water line and 2,390 LF of 16" CL 51 DIP water line within residential areas of the County nprove the overall hydraulics of the water system.

**zley Run Water Treatment Plant, Grantsville, MD:** Project Engineer. Responsible for design of a 100,000 gpd water treatment plant. The gn included the treatment facilities, site layout and associated mechanical equipment. The project achieved the client's desired tment capacity while minimizing the site's disturbance area.

**n of Luke – Preliminary Engineering Report, Luke, MD:** Project Engineer. for preparing a PER to examine the feasibility and probable s for various water distribution and water supply alternatives to improve the Town's water supply and service. Preparation of the report lved evaluating three different water distribution alternatives and six different water source options for the Town.

**kfort Public Service District, Water System Upgrade, Contract 3 – Water Treatment Plant Improvements, Fort Ashby, WV:** Project neer. Responsible for design of numerous improvements including water filter and valve upgrades; sediment basin upgrades and ntenance; raw water and grinder pump upgrades maintenance; dewatering pump station upgrades; 1500 sf storage facility, intake ntenance, plant painting.

**kfort Public Service District, Water System Improvements, Contract 4- Waterline Construction & Pump Station:** Project Engineer. onsible for the design of a new 150-gpm pump station along Painter Hollow Road. The project alleviated low pressure problems within unrise Heights and Deerfield Estates subdivisions and eliminated the need for two booster stations and two deteriorated water storage s.

# ELLY C. DUFFY, PE
## REATMENT

**Education:** MS, Environmental Engineering, University of Massachusetts, 1998
BS, Agricultural and Biological Engineering, Cornell University, 1996

**Professional Registration:** Professional Engineer, MD, 2002 [redacted]

**Experience:** 21 years

s. Duffy is a Senior Manager for RK&K's Wastewater Sector d has 21 years of wastewater collection and treatment gineering experience. Her experience encompasses project ase from planning, design, and construction administration vices. She has been involved with wastewater treatment nt and collection system projects through various project ses. She has completed several wastewater treatment nt designs, most of which were designed for nutrient noval. Many of the projects she has completed were small medium sized facilities with a focus on providing a cost ctive, reliable facility with maintenance requirements sistent with staffing. She has worked on all project phases uding Preliminary Engineering Reports, final design and struction phase services.

DLLR
Department of Labor, Licensing and Regulation
LICENSE - REGISTRATION - CERTIFICATION - PERMIT
STATE OF MARYLAND
DEPARTMENT OF LABOR, LICENSING AND REGULATION
Lawrence J. Hogan, Jr., Governor
Boyd K. Rutherford, Lt. Governor
Kelly M. Schulz, Secretary

STATE BOARD FOR PROFESSIONAL ENGINEERS
CERTIFIES THAT:
KELLY CHEEK DUFFY

IS AN AUTHORIZED: 05 - PROFESSIONAL ENGINEER

| LIC/REG/CERT | EXPIRATION | EFFECTIVE | CONTROL NO |
|---|---|---|---|
| [redacted] | 07-18-2020 | N/A | [redacted] |

Signature of Bearer
Kelly M. Schulz
Secretary DLLR

**thern Mineral County Regional Sewer System Phase 1 WWTP, New Mineral County, WV:** Project Engineer. Responsible for preliminary ign and equipment selection for a new 0.6-MGD WWTP designed for BNR treatment. The preliminary design included an evaluation of tment technologies, including SBR, oxidation ditch and wave oxidation systems. The SBR treatment system was selected, and a sequent evaluation of SBR vendor systems was performed. Denitrification filters were provided. All plant processes were designed uding headworks, chemical feed, disinfection, aerobic digestion and sludge dewatering using a belt filter press and liquid polymer feed em.

**of Charles Town On-Call Water & Sewer General Services, Jefferson County, WV:** Project Engineer for on-call engineering services tract for water and sewer related projects. Responsible for an evaluation of operational improvements at the Tuscawilla WWTP, uding modifications to the MBR facility. Also, responsible for an evaluation of upgrades to the Charles Town WWTP.

**kfort Public Service District - Wiley Ford Sewer Project, Wiley Ford, WV:** Project Engineer. Assisted in a Facility Plan evaluation of 0.5 1.0 MGD BNR treatment facilities for a new WWTP. The Facility Plan included an evaluation of using three technologies for BNR tment: oxidation ditches, Biolac - type wave oxidation treatment, and SBR treatment. The WWTP evaluation also included unit esses for screening, grit removal, clarification, chlorination, dechlorination, sludge thickening, and sludge dewatering with a belt filter s.

**tewater Treatment Plant – Central Hampshire Public Service District, Hampshire County, WV:** Project Engineer responsible for upgrade eatment plant using the wave oxidation treatment system. The upgrade included replacing and adding treatment basin aeration pment, providing aeration of a sludge storage basin to prevent freezing, providing new blowers, and the addition of a new forty-foot eter clarifier. Upgrades improve treatment and allows incoming flows to increase to the original plant design capacity of 0.2 MGD.

# ). TIMOTHY BOLLINGER, PE

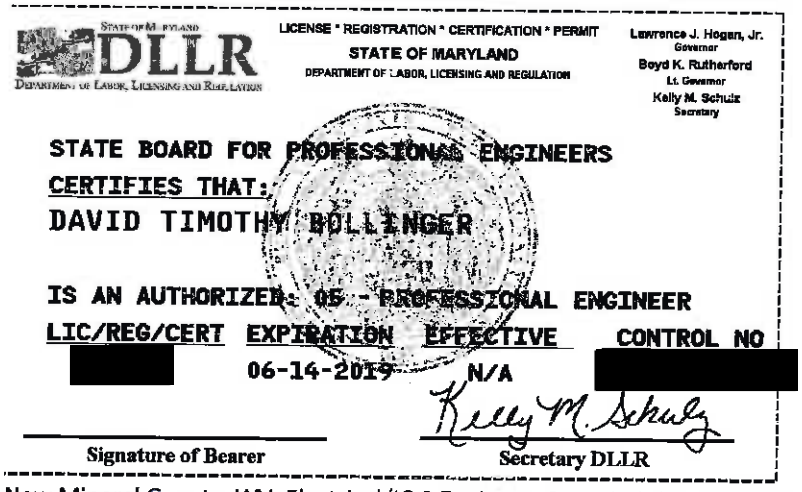
## LECTRICAL/SCADA

**Education:** BS, Civil Engineering, Bucknell University, 1977

**Professional Registration**: Professional Engineer: PA, 1984 [redacted] also registered in MD, NC, & VA

**Experience:** 41 years

. Bollinger's 41-year career involves the study and design of ctrical and instrumentation/control systems for a variety of ter and wastewater treatment and pumping facilities. He rformed instrumentation and process control design for tems including programmable controllers, remote nitoring and control systems and personal computer eration. He provides electrical engineering support for &K's utility, energy and environmental projects, including ctrical design inclusive of instrumentation and control and ADA interfacing services. As part of the design process, he pares detailed P&ID drawings and a description of eration.


STATE OF MARYLAND DLLR
DEPARTMENT OF LABOR, LICENSING AND REGULATION
LICENSE * REGISTRATION * CERTIFICATION * PERMIT
STATE OF MARYLAND
DEPARTMENT OF LABOR, LICENSING AND REGULATION
Lawrence J. Hogan, Jr. Governor
Boyd K. Rutherford Lt. Governor
Kelly M. Schulz Secretary

STATE BOARD FOR PROFESSIONAL ENGINEERS
CERTIFIES THAT:
DAVID TIMOTHY BOLLINGER

IS AN AUTHORIZED OF PROFESSIONAL ENGINEER

| LIC/REG/CERT | EXPIRATION | EFFECTIVE | CONTROL NO |
|---|---|---|---|
| [redacted] | 06-14-2019 | N/A | [redacted] |

Signature of Bearer
Secretary DLLR

**thern Mineral County Regional Sewer System Phase 1 WWTP, New Mineral County, WV:** Electrical/I&C Engineer. Provided the electrical ign for the WWTP, which included a main distribution switchboard with automatic transfer switch, diesel emergency generator, power ribution, underground duct banks, lighting design and an electrical grounding system. Designed a Process Control System for the WWTP sisting of motor control centers, variable frequency drives, control panels, instrumentation, a PLC System, and HMI software. The PLC tem consisted of three Allen-Bradley CompactLogix PLCs, and three operator interface touch screens. The HMI software utilized for the ject was Rockwell Software View SE. The project included a new horizontal open-channel UV system.

**Neck State Park Wastewater Treatment Plant Phase I Upgrade, Cecil County, MD:** Electrical/I&C Engineer. Assisted on the design-build ject for an interim upgrade to an existing extended aeration activated sludge plant. The interim upgrade includes new influent pumping, equalization, aeration, and ultraviolet radiation disinfection.

**Call Water & Sewer General Services, City of Charles Town, Jefferson County, WV:** Electrical/I&C Engineer. On-call engineering services water and sewer related projects for the Charles Town Utility Board (CTUB).

**ipsco Wastewater Treatment Plant ENR Facilities, Baltimore, MD:** Electrical/I&C Engineer. Final Design services for the 90-mgd ENR ities at Patapsco WWTP. ENR facilities designed to treat the effluent from the existing secondary treatment system.

**seum Drive Pressure Reducing Station and Offline Storage Facility, Hampton Roads Sanitation District, City of Hampton, VA:** Electrical/I&C neer. Proposed in-line pressure reducing sewage pumping station to relieve discharge pressures for multiple sewage pumping stations e City of Hampton. Facility will feature in-line quad-plex pumping, duplex tank drain pumps, automated controls, variable frequency s, automated control and isolation valves and standby power generator. Services included facility siting, wetlands delineation, nitting and mitigation, geotechnical investigations, design bid and construction phase services.

**Hill Wastewater Treatment Plant Upgrade, Town of Warrenton, VA:** Electrical/I&C Engineer Upgrade and expansion of an existing trickling treatment plant. Plant improvements include new screen and grit removal, SBRs filtration, ultraviolet radiation disinfection, and sludge stion and dewatering. The design capacity of the upgrade facility is 0.6 MGD. Recently completed Phase 2 PER for expanding the ty to 0.9 mgd.

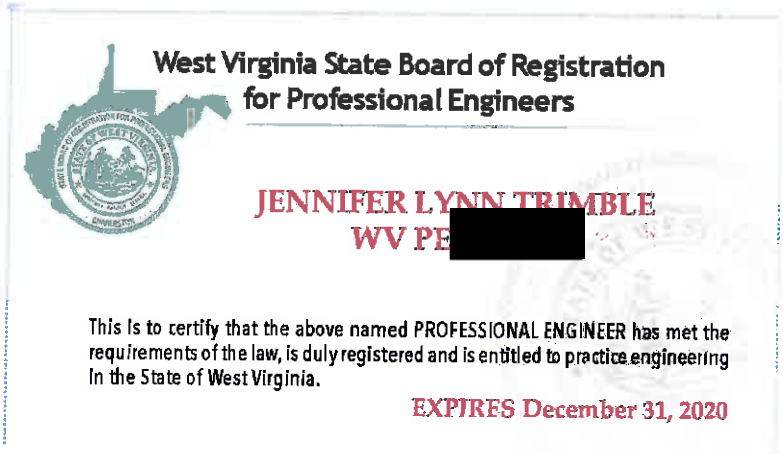
# ENNIFER L. TRIMBLE, PE, DGE
## EOTECHNICAL

**Education:** MS, Civil Engineering, West Virginia University, 1999
BS, Civil Engineering, West Virginia University, 1998

**Professional Registration:**
Professional Engineer, WV, 2015 [redacted]; also registered in MD, DE, VA, PA, & DC
Diplomate of Geotechnical Engineering, 2016, National Designation [redacted]

**Experience:** 19 years

s. Trimble is responsible for planning and directing otechnical explorations, preparation of geotechnical gineering reports, geotechnical analyses, conducting hnical reviews, developing plans/specifications, and viding QA/QC in support of highways, rail transit lines, ldings, water and wastewater facilities and other civil gineering projects. Technical experience includes evaluation subsurface conditions, in-situ testing, conducting seismic raction studies, verifying groundwater levels, evaluating risks potential sinkhole areas, and providing recommendations h respect to geotechnical engineering considerations.



West Virginia State Board of Registration for Professional Engineers

JENNIFER LYNN TRIMBLE
WV PE [redacted]

This is to certify that the above named PROFESSIONAL ENGINEER has met the requirements of the law, is duly registered and is entitled to practice engineering in the State of West Virginia.

EXPIRES December 31, 2020

**rthern Mineral County Regional Sewer System Phase 1 stewater Treatment Plant (Design), Mineral County, WV:** Geotechnical Engineer. Assisted in the design of a new 0.6-MGD WWTP. Design luded reinforced concrete SBR's, filtration facilities, influent pumping station, UV disinfection, chemical feed systems, sludge digestion l sludge dewatering. Design included reinforced concrete retaining walls and foundations for precast concrete facilities buildings.

**n Point Wastewater Pumping and Water Reclamation Facilities, Charles County, MD:** Geotechnical Engineer. Project included the struction of a new wastewater treatment facility, 0.3-million gallons per day, pumping stations, oxidation ditch, clarifier, UV radiation cture, filter structure, and influent and effluent force mains, provided Geotechnical Engineering Services. Foundations for the new eight ctures consisted of approximately 900 tapered driven timber piles with an allowable capacity of 30-kips. Conducted one static pile load and three Pile Dynamic Tests (PDA) on production piles.

**k River Wastewater Treatment Plant Digester Renovations (SC 8526), Baltimore, MD:** Geotechnical Engineer. Project included the study, gn and construction phase services to upgrade from the conventional high rate (CHR) digester process to the two-phase (acid-gas) erobic digestion process (two-phase process) with additional thickening facilities Phosphorus removal was achieved primarily through ti-point chemical addition at the primary and secondary clarifiers.

**Call Sanitary Engineering Services, Baltimore, MD:** Geotechnical Engineer. Provided geotechnical engineering recommendations and vided construction phase services for 72 MGD pump station that extended 50 feet below grade. Interceptor consisted of 15,600 feet of nch force main, including 1,900-foot pile supported force main across the Back River, 430 feet of 90-inch diameter tunnel under RAK and MD 150, support of excavation, and deformation monitoring of nearby structures. Provided and reviewed pile driving criteria other construction phase services such as review of contractor submittals for monitoring adjacent structures during construction.

**y Run Wastewater Diversion Pumping Station and Force Main, Baltimore City, MD:** Geotechnical Engineer. Prepared Geotechnical neering Report and prepared Contract Documents for construction of a 26-mgd pump station and two stage construction MSE walls. ided geotechnical recommendations for approximately 75-ft deep rock excavation adjacent to a historic bridge supported by shallow dations and piles and 100-year old arched culvert.

# AMUEL P. WILKES, MS, PWS, LRS
## NVIRONMENTAL PERMITTING

**Education:** MS, Environmental Science & Policy, Johns Hopkins University, 2003
BS, Earth & Environmental Science, Wilkes University, 1996

**Professional Registration:** Professional Wetlands Scientist, 2003[redacted]

**Experience:** 22 years

. Wilkes has more than 22 years of consulting experience as a project nager and senior environmental scientist providing technical support watershed management, restoration, natural resource conservation, d hazardous materials programs. Experienced at providing oversight d managing field teams and contractors collecting wetland, stream ality, environmental media data, and general site condition data for characterization.

West Virginia
Department of
Environmental Protection

*WILKES, SAMUEL PETER*
Licensed Remediation Specialist
Registration Number [redacted]

Director, Division of Land Restoration

Date Issued - Date Expires

**awha Valley Regional Transportation Authority Charleston, WV:** ject Engineer. Investigated and closed out the WVDEP case files for a king underground storage tank through the UECA program. Provided ff oversight and quality control to employees and subcontractors ducting the field investigation, data validation and risk assessment.

**oming County Economic Development Authority, WV:** Project ineer. Former Lusk Lumber Treatment Plant Brownfield Site VRP#16005), under the supervision of a Licensed Remediation Specialists, provided review and summary of previous investigations, posed sampling and analysis plan to address data gaps in previous investigations, coordinated with WVDEP Brownfields Staff. icipating sampling and developing remediation plan.

**Associates, Logan County, WV:** Project Engineer. Performed a Phase I ESA on a property to be purchased and developed for senior sing. Discovered potential USTs in 1950s Sandborn Maps, which triggered a Phase II ESA with ground penetrating radar (GPR) survey. GPR survey revealed anomalies, which led to geoprobe subsurface sampling. Numerous soil samples indicted presence of petroleum rocarbons. Advised client against purchasing property and to turn over documents to the County and WVDEP as an abandoned UST e. Client redesigned the building footprint from single story to three-story. Advised client to conduct additional environmental sampling g property line to ensure that no contamination plume was moving toward the remainder of the property.

**veground Storage Tank (WV Senate Bills 373 and 423 Implementation), WV:** Project Manager. Supported numerous clients by conducting critical visual inspections of approximately 2,000 ASTs throughout the state. Six inspectors were in the field for two months while an e support staff was processing daily reports from the inspectors into inspection logs, photo logs, reviews and recommendations for AST. The inspection documentation resulted in a "Fit for Service", "Not Fit for Service", or "Fit with Required Repairs" determination ach tank. In addition, completed Spill Prevention, Response Plans for submittal to the WVDEP.

**t Virginia Source Water Protection Plans, WV:** Project Manager. Assisted in the development of over 20 source water protection plans ommunity drinking water systems throughout the state of WV for WVDHHR Conducted meetings with public water systems, assessed ntial threats to the source water, suggested preventative and mitigation strategies and developed source water protection plans.

**Voluntary Cleanup Program Support, Park City, UT:** Project Engineer. Worked collaboratively with UTDEQ Voluntary Clean-up Program and EPA to ensure consistency between Superfund and VCP sites. Provided recommendations on other consultants Field Sampling , Quality Assurance Project Plans, Site Characterization Reports, and Remedial Action Plans.

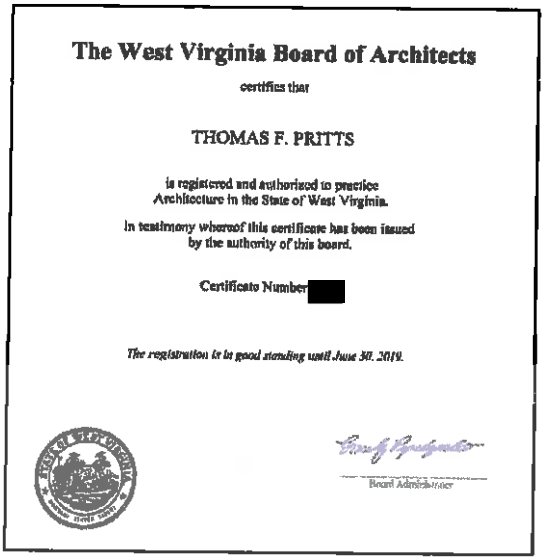
# HOMAS PRITTS, AIA, LEED-AP, CSI-CCS
## RCHITECTURE

Montum Architecture

**Education:** BA, Bachelor of Architecture, Virginia Tech, 2004

**Professional Registration:** Licensed Architect, WV, MD

**Experience:** 15 years



The West Virginia Board of Architects

certifies that

THOMAS F. PRITTS

is registered and authorized to practice Architecture in the State of West Virginia.

In testimony whereof this certificate has been issued by the authority of this board.

Certificate Number [redacted]

*The registration is in good standing until June 30, 2019.*

Board Administrator

r. Pritts will serve as our team's architect offering his more than 17 years of perience in architectural design, construction, and sustainable design actices. He is actively involved in all aspects of the project process, from the tial meeting to post-occupancy evaluation. Professional collaboration, ıovative project delivery and an attention to detail are the qualities that fine Mr. Pritts'. He is engaged at the professional, community and civic level d is a member of the West Virginia Chapter of American Institute of chitects and was involved in the establishment of the US Green Building uncil's West Virginia chapter.

/DNR | Berkeley Springs State Park Pool Bathhouse Roofing Replacement: Architect DNR project for specifications and administering roofing replacement of the pool hhouse. The existing roofing was a combination of EPDM and built-up roofing. ling wood framing was replaced and ACM abatement was incorporated in the nolition.

/U Potomac State College Nursing Renovation: Architect for this project to renovate the former National Guard Armory to house the r-year WVU School of Nursing BSN program. The project converted former meeting spaces into demonstration nursing laboratories lecture spaces. Office spaces were renovated. Electrical and HVAC systems were updated to meet the new needs.

apon State Park – Old Inn Renovation: Performed work as a sub-consultant to the MEP designer who designed heating and air ditioning systems to convert the building for four-seasons use. Designed interior renovations and selected furnishings reconfiguring space from it former use as individual lodging rooms into "whole-house" rentals for large gatherings like family reunions and corporate nts. Updated the kitchen space with pro-style appliances and "large meal"-friendly layouts.

stewater Treatment Plant Upgrade, City of Martinsburg, WV: Performed work as a sub-consultant to the Process Engineer. The design tered around a moving bed biological reactor. Architectural work included rehabilitation of existing building for new functions, new cess buildings, and a new operations office building. Integration with process piping and equipment design was critical and typically se needs defined the building configurations

ditional Project Highlights:

oming East High School HVAC Renovation – Wyoming County
untainview and MTEC HVAC Renovation – Monongalia County Schools, WV
keley Springs State Park – Old Roman Bath Renovation
ckwater Falls State Park – Boiler Room Renovation
r Lady of the Mountains Parish – Bathroom Renovation

# PREPARATION OF PER & ER FOR DEEP CREEK LAKE/TROUT RUN WASTEWATER TREATMENT PLANTS

## GARRETT COUNTY, MD

**Owner:** Board of County Commissioners of Garrett County, Maryland

**Contact:** Patrick Hudnall | 2008 Maryland Highway, Suite 2, Oakland, MD 21550 | 301.334.7465 | phudnall@garrettcounty.org

**Dates:** 2016 – 2017

**Key Team Members:** John Cole, Daniel Tichinel, Kelly Duffy, Kevin Nash

2016, the Garrett County Department of Public Works – Utilities Division retained RK&K's services to prepare Preliminary Engineering ports (PER) & Environmental Reports (ER) to examine the feasibility and probable costs an Enhanced Nutrient Removal (ENR) Upgrade to the Trout Run Waste Water atment Plant (WWTP) and Deep Creek Lake WWTP.


USDA RURAL DEVELOPMENT
PRELIMINARY ENGINEERING REPORT (PER)

TROUT RUN
WASTEWATER TREATMENT PLANT
ENR Upgrade

April 30, 2017

Garrett County, MD
Public Works Utilities Division

RK&K ENGINEERS

**ep Creek Lake WWTP:** Preparation of the reports involved evaluating three process hnologies for the ENR upgrade. The challenge presented to RK&K was to identify an R process that would perform to permit limits in the cool climate of Garrett County d would be acceptable to MDE. RK&K met the challenge by completing a thorough alysis of influent data and recommending a reconfiguration of the existing Orbal idation Ditch. The report also included recommendations that would allow the WWTP meet the current discharge permit. RK&K is currently assisting the Utilities Division h attaining funding from Maryland Department of Environment through the Bay toration Fund.

**ut Run WWTP:** The scope of the reports included evaluating two alternatives for the posed ENR upgrade. Each alternative included analyzing three biological process hnologies to achieve the ENR goal. Alternative 1 involved evaluating upgrades to the ting Trout Run WWTP for ENR. Alternative 2 involved upgrading the existing Oakland VTP for ENR to serve as a Regional WWTP for the Town of Oakland and Trout Run vice areas. Alternative 2 also included an evaluation of five options to convey waste water from the existing Trout Run WWTP to the posed Oakland Regional WWTP. Considering Trout Run WWTP and Oakland WWTP sit adjacent to the Little Youghiogheny River, ntifying an economical and sustainable conveyance option that would meet current Maryland Department of Environment (MDE) land and waterways construction regulations was challenging. RK&K recommended a viable sewer force main conveyance option that the lowest Life Cycle Costs and environmental impacts.

# NFLOW & INFILTRATION STUDY
## IEW CREEK, WV

**Client:** New Creek Public Service District

**Contact:** Denny Flemming | PO Box 32, New Creek, WV 26743 | 304.788.5470 | ncpsd@frontier.com

**Dates:** Ongoing

**Key Team Members:** John Cole, Andrew Suter; Rhiannon Dodge

ith the approval from the WV Public Service Commission (WV PSC) to ange the billing conditions between the New Creek Public Service strict (PSD) and City of Keyser from water consumption to metered wer flow, the New Creek PSD experienced a significant increase in atment cost due to actual flows. Therefore, the New Creek Public rvice District retained RK&K as engineering consultant to perform a dy of Inflow and Infiltration (I&I) entering the sewer collection tem.

w Creek's sewer system, consisting of approximately 694 manholes d 24 miles of sewer line, dates to 1977. Over the years, the system s seen limited maintenance resulting in excess stormwater entering system through various locations such as broken main lines, nected downspouts, improper pipe seals, and loose manhole covers. thout repairs and remediation, NCPSD's bill from the City of Keyser will continue to increase, with eventual increase in sewer rates. inflow and infiltration study will determine the causes of the excess water through three different aspects of investigation: gineering document scanning and digitizing, flow monitoring, and smoke testing.

**gineering Document Scanning and Digitizing:** To effectively analyze the collection system, all known sewer plans pertaining to the lection system were collected, scanned, and digitized to allow the preparation of a single sewer system overview map. RK&K prepared rge-scale overview map for displaying on an interior wall of the PSD office. In addition, digital files were provided to the PSD for future erence.

**w Monitoring:** Portable flow monitors purchased from Greyline Instruments Inc. were used to monitor and record significant rain nts at different manhole locations. The meters recorded level and velocity, and produced a flow chart in gal/min. Flows were pared to rain and time to narrow down possible I&I sources on specific sewer line branches.

**oke Testing:** Smoke testing was conducted during dry periods to ensure that smoke could be detected above ground if it escaped the er lines. Testing was performed with a smoke blower, sewer pipe plugs, marker flags, and a video camera to document any illegal nections, broken sewer lines, etc. Locations to place the blower, determined from smoke testing, were chosen ahead of time to test ific sections of sewer line efficiently. During the test, illegal downspout connections, broken/missing cleanout caps, foundation ns, unsealed manholes, and broken main and lateral lines were discovered. With video evidence, the PSD can now notify each perty owner regarding issues and required remediation, as well as address any problems that are the PSD's responsibility.

# TOWN OF OAKLAND I&I STUDY
## OAKLAND, MD

**Client:** Town of Oakland

**Contact:** Gwen Evans | 15 South Third Street, Oakland, MD 21550 | 301.334.2691 | townofoak@gmail.com

**Dates:** Ongoing

**Key Team Members:** Dave Vanscoy, John Cole, Andrew Suter, Rhiannon Dodge

e Town of Oakland retained RK&K as engineering consultant to rform a study of Inflow and Infiltration (I&I) entering into their sewer llection system. The Town has had high levels of water entering the wer system during rain events, leading to overflowing manholes and erloading the treatment plant.

kland's sewer system dates to 1909, and some of the original pipe and nholes are still in operation today. Excess stormwater can enter the wer system through old and vulnerable terra cotta pipes and brick-med manholes. In addition, water can enter the system through gally connected downspouts, improper pipe seals, and loose manhole vers. The Town has not been able to keep current with upgrades and nediation, and therefore, the cost to pump the excess stormwater has d will continue to increase. Consequently, treatment cost will rise, causing an increase in sewer rates. The I&I Study will determine the ses of the excess water through three different aspects of investigation: manhole inspections, flow monitoring and smoke testing.

**nhole Inspections:** This portion of the I&I study consisted of surface inspections at 436 manholes. Covers were removed, and photos re taken of the surface/environment around the cover for reference and of each pipe connection entering the manhole. Photos were taken at any damaged or leaking locations. Multiple measurements. ranging from depth of manhole, diameter of all pipes entering exiting the manhole and drop connection heights. were recorded. Inlet locations were refenced with respect to their position to the let pipe. and flow levels were noted at time of inspections. Weather and time of day were also noted. After all necessary items were orded, each manhole was given a rating from 1 to 5, classifying each manhole's condition. 1 being good and 5 being poor.

**w Monitoring:** Portable flow meters were used to monitor and record flows during significant rain events at various manhole locations. meters recorded level, velocity and temperature, but could produce a flow chart in gal/min for practicality. Flows were compared to and time to narrow down possible I&I sources on specific sewer lines. Later in the study, when televising the sewer lines would be ducted, a more specific area could be chosen based on flow monitoring results rather than televising the entire collection system, ch reduced costs.

**oke Testing:** This portion of the study was conducted during dry periods, typically in the summer months to ensure that smoke could etected above ground if it escaped the sewer lines. Testing was performed with a smoke blower, sewer pipe plugs, marker flags and eo camera to document any illegal connections, broken pipes, etc. Predetermined locations to place the blower were chosen ahead me to test specific sections of sewer line efficiently. During the test, illegal downspout connections, broken/missing cleanout caps e the most common issue. The most frequent problem was illegally connected foundation drains and/or driveway drains. With video ence, the Town was able to notify each property owner about the issues and required remediation, as well as address any problems were the Town's responsibility.

# GREATER MARION PUBLIC SERVICE DISTRICT I&I STUDY
## MARION COUNTY, WV

**Client:** Greater Marion Public Service District

**Contact:** Carol Brooks | 44 Aberdeen Drive, Worthington, WV 26591 | 304.287.2244 | mommaredsquirrel@msn.com

**Dates:** 2014

**Key Team Members:** Dave Vanscoy, John Cole, Matt Youngblood, Andrew Suter

December 2013, the Greater Marion Public Service District (GMPSD) retained &K as its engineering consultant to perform an Inflow & Infiltration (I&I) Study its sewer collection system, with a focus on the collection systems within the mmunities of Carolina and Idamay, and to propose corrections to eliminate I&I ere possible.

e communities of Carolina and Idamay originally had separate sewer systems. ch system consisted of a gravity design with terracotta pipe and brick manholes at conveyed sewage to the towns' individual WWTPs. Between 1998 and 2000 GMPSD was formed and a new vacuum collection system was constructed in rolina, Idamay, and adjacent Kellytown, and connected to Worthington's sting vacuum system. From the beginning, the new vacuum system had blems, with most of these being attributed to excessive I&I flows. The failing vacuum system was replaced in 2014 with a gravity tem that conveys sewage to Worthington WWTP via force mains from two pump stations in each outlying community. The Community Kellytown is still connected to the Worthington Vacuum Station via vacuum sewer.

Five study components were required to properly investigate the I&I problems found in both communities. The components are as follow: main line sewer video inspection, used to identify conditions of the main lines and any possible sources of I&I; smoke testing, conducted to locate illegal connections or possible breaks in the sewer lines; cleanout installation/lateral inspection, utilized at locations that warranted further investigation through video inspection of the properties lateral lines; individual house inspections, including in-house plumbing inspection, used when a lateral line showed evidence of I&I flow; flow monitoring, employed throughout study to monitor flow and progress toward I&I reduction.

This project featured two unique aspects: (1), study of a vacuum system that was converted back into a gravity system, with various aspects of the vacuum system still existing and allowing I&I flow; and (2), concurrent analyses of two communities' independent sewer systems with different types of I&I issues in each. One required over 70 cleanout installations with mainline issues in streams/springs while the other required less than 30 cleanout installations but had broken/damaged vacuum system equipment left connected to system.

# CHARLES TOWN UTILITY BOARD ON-CALL WATER & SEWER
# TASK 19B – 2016 SEWER PROJECT
## EFFERSON COUNTY, WV

**Client:** Charles Town Utility Board

**Contact:** Joe Burris | 832 S. George Street, Charles Town, WV 25414 | 304.676.6890

**Dates:** 2017

**Key Team Members:** John Cole, Brandon Felton

e 2016 Sewer Project consists of the construction of three (3) new sewer lift tions and associated gravity collection and force mains for conveying raw wage collected from both the Sanitary Associates Sewer Service Area and llow Springs Sewer Service Area to the existing Charles Town WWTP for atment. The project also included the demolition of three (3) existing sewage stations, two (2) of which were failing, modifications to an existing sewage lift tion, and the demolition of the existing Willow Spring WWTP for complying th a consent order from the WV Department of Environmental Protection.

or to the project, sewage from the Sanitary Associates Service Area gravity fed o to the adjacent Jefferson County Public Service District (District) sewer utility eventual transportation to the Charles Town WWTP for eventual treatment. o sewage lift stations within the service area were failing and required nplete replacement. In addition, one of the District's sewer lift stations was exceeding design capacity resulting in sewage backups. assist the District, CTUB redirected the sewage collected from the two failing lift stations to the Willow Spring Service Area whereby noving approximately 40,000 gpd of sewage from the District's lift station.

Sewage within the former Willow Spring Service Area was treated at the Willow Springs WWTP which was a 100,000gpd package aeration treatment facility. With the additional sewage flows from the Sanitary Associates Service Area and operational issues with the WWTP the CTUB decided to decommission the plant and redirect all sewage flows to the Charles Town WWTP for treatment.

The project involved the design and construction of three new sewage lift stations, each with emergency back-up generators and bypass connection capabilities; construction of approximately 4,700-LF of 12" dia. gravity sewer collection; construction of approximately 9,400-LF of 6" dia. sewer force main; installation of a sewer SCADA system; construction of 580-LF of 24" dia. steel casing under two separate 4-lane divided highways; and modifications to an existing sewer lift station.

# CAROLINA & IDAMAY SEWER SYSTEM REPLACEMENT
## MARION COUNTY, WV

**Client:** Greater Marion Public Service District

**Contact:** Carol Brooks | 44 Aberdeen Drive, Worthington, WV 26591 | 304.287.2244 | mommaredsquirrel@msn.com

**Dates:** 2014

**Key Team Members:** Dave Vanscoy, John Cole, Matt Youngblood, Brandon Felton, Andrew Suter

ıe Greater Marion Public Service District (GMPSD) retained RK&K as eir engineering consultant to perform a study of their sewer collection stem; focusing on the collection systems within the Communities of rolina and Idamay. The study consisted of evaluating the vacuum llection system that was constructed in 2000, which replaced an older avity collection system and eliminated two individual treatment ilities.

e Community's sewer system – constructed in 2000 and consisting marily of vacuum collection – was failing, causing very unreliable rvice to the customers of the GMPSD. Significant inflow and infiltration ws from the customers contributed to the problems. The GMPSD nsulted RK&K and it was determined that the best solution was to lace the existing vacuum collection system with a conventional gravity llection system.

ddition to converting the existing vacuum collection system to gravity, ewage pumping station was required to convey the sewage to the mmunity of Carolina for further transfer and treatment. The Idamay mping station was designed to handle a peak flow of 130 gallons-per-ute at 370' TDH. Due to the high operating head situation, a Smith & eless wet well mounted pump station utilizing Duplex Twin – 50 HP uum prime pumps mounted in series was used. The pump station veys the sewage through dual 4" C900 PVC/Class 305 force mains tected by surge relief valves that relieve high surge pressures by erting sewage back to the wet well when force main pressures exceed pre-set surge pressure set point of the relief valve.

s project featured two unique aspects: (1) elimination of a relatively failing vacuum collection system and (2) construction of 6,300 LF of pressure sewer. Due to the topography of the region and in an rt to minimize the size of the pumps within the Carolina PS, the pumps were designed to convey sewage 50-ft in elevation above the mp station. From the high point, the sewage will flow by gravity/pressure sewer through a vertical drop of nearly 350-ft. The pressure er portion is the result of the alignment crossing under the West Fork River just prior to the Worthington WWTP.

# NORTHERN MINERAL COUNTY REGIONAL SEWER SYSTEM
## MINERAL COUNTY, WV

**Client:** Frankfort Public Service District

**Contact:** Rae Corwell | PO Box 80, Wiley Ford, WV 26753 | 304.738.9552 | rcorwellfpsd@atlanticbb.net

**Dates:** Ongoing

**Key Team Members:** Dave Vanscoy, John Cole, Matt Youngblood

2001, the Mineral County Commission in West Virginia requested that e Frankfort Public Service District (FPSD) investigate the feasibility of veloping a sewage collection and treatment system in northern Mineral unty. RK&K was hired to conduct the sewer feasibility study.

e objective of the study was to define sewage treatment needs from the rspective of public health and safety while ensuring the environmental alth of local waterways. The study area covered approximately 35 uare miles and fourteen sewage treatment plants with affiliated rastructure. Eleven of these sewer systems had serious systemic ficiencies, which resulted in raw sewage spills, lethal toxicity to aquatic , sewage backups into structures, improper treatment, and violations of facilities' respective National Pollutant Discharge Elimination System PDES) permits.

e project area contained 2,576 customers representing 3,058 equivalent dwelling units, both residential and commercial. Sewage vice for those residents and businesses was provided at that time by the Fort Ashby wastewater treatment plant, 13 other individual atment plants, and individual septic systems.

&K evaluated the collection system and treatment plant specifications necessary for comprehensive sewage collection and disposal in project area. Development of a facility plan for the proposal ensued.

ring the design of the regional project, the FPSD submitted a plan for the entire regional sewer system that envisioned the elimination he fourteen existing wastewater treatment facilities, which would be superseded by the construction of a 1.2 million-gallon-per-day GD) wastewater treatment plant, 63 miles of sewer lines (of diameters ranging 6" through 21"), and fourteen sewage lift stations ded among nine sewer sheds covering 35 square miles.

problem of obtaining adequate funding while maintaining affordable user rates within any single fiscal year became apparent early he design process. A recommendation was therefore made to divide the entire project into multiple phases to increase the likelihood ncrementally securing the project funding necessary for construction.

laboration between the FPSD and RK&K has been ongoing to the present time. RK&K continues to serve in the capacities of planning, gn, preparation, construction management, and associated duties. To date, two of three planned phases of the Northern Mineral nty Regional Sewer System (NMCRSS) project have been completed.

**se I:** Phase I of the NMCRSS project allowed for the construction of approximately 13 miles of interceptor sewer lines (8" through diameter), one remote sewage pump station, and the construction of a 0.6 MGD regional wastewater treatment plant. The total

opulation served by this phase of the project is nearly 7,500 people, representing approximately twenty-five percent of the Mineral ounty population.

ignificant challenges in permitting, funding, design and construction ere overcome to provide a cost-effective treatment method of meeting ate nutrient loading limitations while minimizing the impact to the rrounding area and the financial burden on the District's customers. The quencing Batch Reactor (SBR) biological process was utilized as the imary means of treatment, incorporating both chemical addition to hance the nitrification process, and filtration to enhance phosphorus moval. This design resulted in the FPSD plant becoming the first eatment facility to be specifically designed, constructed, and placed into ccessful operation within the State of West Virginia in accordance with e State's limitations on nutrient loadings (5 mg/L of total nitrogen and 5 mg/L of total phosphorus) entering the Chesapeake Bay. The eatment plant process comprises an influent pumping station, a rotating echanical fine screen, vortex grit removal, SBRs, continuous backwash -flow sand filters, UV disinfection, cascade aeration, aerobic digestion, and belt-filter-press. Concurrent with construction of the plant's ocessing components, an operations building complete with testing laboratory was erected, as were chemical storage facilities and a intenance garage. In recognition of this design, the FPSD project received a 2011 Silver Award for Engineering Excellence from the nerican Council of Engineering Companies of West Virginia.

spite challenging site conditions, the wastewater treatment plant (WWTP) was operational in June of 2011 (15 months after Notice to ceed).

**ase II:** The second phase included the addition of 800 new customers, elimination of the five remaining antecedent wastewater atment facilities, and construction of six remote sewage pump stations and an additional 30 miles of sewer collection lines. ditionally, the treatment capacity of the new WWTP was expanded from 0.6 MGD to 1.2 MGD. The WWTP expansion involved the struction of two additional SBR tanks, one digester, four more sand filters, and additional UV disinfection capacity. Phase II of the ional project was completed in April of 2016 (13 months after Notice to Proceed).

**nding:** Due to the high anticipated cost (in excess of $52 million), the regional project was divided into multiple phases in an effort to ure the necessary funding. Phase I of the project cost approximately $18.22 million, while Phase II cost $26.95 million. The planned d phase of the project has an estimated construction cost of $16 million.

**ociated Work:** Phases I and II of this project necessitated the acquisition of several private sewer systems, a wastewater treatment nt site, and 7 pump station sites. RK&K completed land surveys, prepared plats and legal descriptions, and supported attorney and ner during the procurement process. In addition to these acquisitions, 111 right-of-way easements were required for Phase I, and se II required over 800 easement agreements. RK&K coordinated the acquisition process among attorney, right-of-way agents, and ner. In a limited number of instances where land was acquired through the mechanism of eminent domain, RK&K provided court imony.

# CHARLES TOWN UTILITY BOARD ON-CALL WATER & SEWER TASK 17 TUSCAWILLA WWTP TROUBLESHOOTING & PROCESS UPGRADES CHARLES TOWN, WV

**Owner:** Charles Town Utility Board

**Contact:** Joe Burris | 832 S. George Street, Charles Town, WV 25414 | 304.676.6890

**Dates:** 2014 - 2015

**Key Team Members:** John Cole, Kelly Duffy, David Wacker, Dave Vanscoy

ıe Tuscawilla Wastewater Treatment Plant is located in Charles Town was ıgraded (by others) in 2013 from an aerated lagoon to a membrane bioreactor th an average daily design capacity of 0.5 MGD. Since start-up of the MBR stem, Tuscawilla WWTP has experienced non-steady performance and failed to nsistently meet their BNR effluent limits for total nitrogen. Additionally, emical consumption far exceeded the design figures and dramatically increased e Owner's operation costs. In an effort to meet total nitrogen limits and reduce emical costs, as part of an on-call contract, the Charles Town Utility Board TUB) retained RK&K to troubleshoot the membrane bioreactor operation and sign necessary upgrades.

**gineering Services:** The RK&K Team evaluated the process design to ensure that biological reactor was adequately designed. Both spreadsheet type culations and BioWin process modeling were used to evaluate the design. The aluation determined that the reactor tankage design was sufficient to meet R effluent limits.

ɔrder to troubleshoot the process, RK&K performed onsite testing for several ıcess control variables and advised the operators to make minor process ıtrol adjustments. During this time RK&K worked closely with the membrane nufacturer in order to properly advise the operators. Through this laboration, it was determined that all three membrane units were not uired to operate at once. With all three membrane units in service, an excess dissolved oxygen was being recycled to BNR tank inhibiting denitrification. &K recommended that only two membrane units be in service at once and to uce to the dissolved oxygen set points. Since the operational modifications e made, effluent total nitrogen has consistently remained under 5 mg/L.

K worked with the CTUB to troubleshoot low flow conditions and its effect on meate pumping rates as well as freezing issues during low flow conditions.

owing the operational troubleshooting, the CTUB asked for recommendations for capital upgrades. RK&K recommended the allation of nitrate probes and submersible mixers in order to increase denitrification rates and reduce supplementary carbon addition. K completed the design of the probe and mixer installation, as well as the necessary electrical improvements. Tuscawilla WWTP has increased process control and requires less supplemental carbon for denitrification.

# GREENSBORO REGIONAL WASTEWATER SYSTEM
## CAROLINE COUNTY, MD

**Owner:** Town of Greensboro, Maryland

**Contact:** David Kibler | 111 South Main Street, Greensboro, MD 21639 | 410.482.6935 | dkibler@greensboromd.com

**Dates:** 2012 - 2016

**Key Team Members:** Michael Myers, Kelly Duffy, Justin Reel

ne Town of Greensboro Regional Wastewater System (RWS) is a newly constructed oject located in Caroline County, on the Eastern Shore of Maryland, in the Chesapeake y drainage area. The project consisted of a new WWTP, pumping station and nveyance system from the former WWTP and new collection/conveyance system to rve an adjacent town currently served by failing septic systems.

e new WWTP is designed for an average daily flow of 0.332 MGD and provides limit of chnology levels of nutrient removal to meet effluent requirements of 3.0 mg/l TN and 3 mg/l TP. The former WWTP did not provide nutrient removal, experienced flooding ring Hurricane Irene, and was on a land-limited confined site.

e new WWTP construction value was approximately $7.5 million. The WWTP was nstructed on a large, isolated parcel purchased by the Town which is located above the 0 yr. flood plain. Treatment systems include vortex grit removal, SBR system, nitrification filters, cascade post aeration, UV disinfection, and chemical storage and d systems including methanol, alum, phosphoric acid and sodium hypochlorite. Reed ds are used for sludge treatment/storage.

e SBR utilizes jet technology provided by Evoqua. Two SBR basins were provided. The tanks were constructed integral with the post equalization basin and sludge holding k in a single, compartmentalized circular structure for cost savings. The Blower Building s constructed adjacent to the SBR tankage and houses the jet motive pumps, blowers, ctrical room, and chemical feed equipment.

ur continuous backwash flow filter cells are utilized for denitrification. On-line nitrate phosphate analyzers are utilized to control methanol and alum feed. Phosphoric acid vailable, but is not typically utilized. Filter effluent is discharged through a cascade tem for post aeration. Utility water pumps and a drain pumping station were also vided.

new WWTP was started-up in December 2016 and is meeting enhanced nutrient ioval limits.

project was funded by grants and loans from the United States Department of lculture, MDE and Community Development Block Grant. The Town obtained the funding through multiple years of planning. RK&K ed as the Town's engineer throughout the project and provided inspection services during construction.

# POWHATAN WASTEWATER TREATMENT PLANT UPGRADES
## STATE FARM, VA

**Owner:** Virginia Department of Corrections

**Contact:** Jim Schrecengost | PO Box 26963, Richmond, VA 23261 | 804.674.3102 | james.schrecengost@vadoc.virginia.gov

**Dates:** 2009 - 2014

**Key Team Members:** Michael Myers, Kelly Duffy

RK&K completed the design of an upgrade for the Powhatan WWTP that is wned and operated by the Department of Corrections. The WWTP serves ie Powhatan Correctional Center. The project included upgrades ecessary to comply with the Chesapeake Bay effluent nutrient limits which e 6 mg/l total nitrogen (TN) and 0.5 mg/l total phosphorus (TP). The oject also included a new operations building with laboratory and site provements to provide an improved access road and drainage.

ie Powhatan WWTP was an extended air, suspended growth facility signed for an average daily flow of 0.465 MGD and operating at a flow of proximately 0.3 MGD. Treatment included influent screening, flow ualization, biological treatment using intermittent aeration, clarification ing three 25 foot diameter clarifiers, post clarification and ultraviolet diation (UV) disinfection. Dry powder alum was fed for phosphorus moval. Sludge was aerobically digested, dewatered and stored offsite. e facility was not originally designed for intermittent aeration, but plant erations staff manually adjusted the air control system to cost effectively ovide a high degree of nitrogen removal.

e RK&K Team evaluated the existing facility to determine if the existing ermittent aeration and chemical feed systems were sufficient to meet the w effluent requirements. The team analyzed influent data, characterized luent loads, and evaluated existing operating data and effluent data. The m created mass balances and used spreadsheet analyses of itrification and nitrification capacities. It was determined that new tinuous backwash filters would be provided and used for solids removal urrent flows. As flows increase to the design flow and the denitrification capacity of the reactors decreases, the filters will be used enitrification filters with the addition of supplemental carbon.

ew liquid alum storage and feed facility was provided to eliminate problems associated with the powdered system. Aeration system trols and monitoring were upgraded and automated.

ew operations laboratory building and dewatered cake storage facilities were also provided.

struction was completed in 2014 and the facility has been meeting the goals of the project.

# WINEBRENNER WASTEWATER TREATMENT PLANT
## WASHINGTON COUNTY, MD

**Client:** Buchart Horn, inc. / Basco Association **Owner:** Washington County, Maryland

**Contact:** Mark Bradshaw | 3700 Koppers Street, Suite 305, Baltimore, MD 21227 | 240.313.2600 | mbradshaw@washco-md.net

**Dates:** Completed 2016

**Key Team Members:** Michael Myers, Kelly Duffy, Kevin Nash

ıe Winebrenner WWTP is located along Pen Mar Road near Fort Ritchie in Cascade, ID and has a design capacity of 0.60 mgd. The plant formerly utilized rotating biological ɔntactors (RBCs) prior to upgrading for nutrient removal. Nearly all flow is from ɔmmunities served by septic tank effluent pumping (STEP) systems. Only a small ɔrtion of the flow from the military base, Fort Ritchie, consists of raw sewage. The plant storically nitrified year-round, but operated at flow rates well below design capacity. ıe plant has significant I&I (Influent and Infiltration), particularly during winter snow elts.

ew development at Fort Ritchie is planned for upcoming years and will include imarily residential users served by a new collection system. As a result, the plant grade was planned for normal strength residential wastewater. The plant was graded for enhanced nutrient removal for an effluent concentration of 3 mg/l total rogen and 0.3 mg/l total phosphorus (annual average).

e former liquid treatment consisted of manual bar screening, aerated grit removal, w metering using a Parshall flume, off-line flow equalization for high flow events, mary clarification, aerated RBCs, secondary clarification, chlorination, dechlorination, d cascade post aeration with discharge to Falls Creek. Sludge was wasted to two robic digesters and disposed of by hauling to the Conococheague WWTP. There were ered sludge drying beds which are used only for back-up purposes.

significance, the plant is bisected by an embankment for railroad tracks, originally ned by Western Maryland Railroad, with the headworks, flow equalization tank, primary clarifiers and sludge system located on one e and the RBCs, secondary clarifiers and disinfection system located on the other side. There was limited room for new improvements d the site of the drying beds was re-purposed.

e initial ENR process evaluation included evaluation of three types of systems to replace the RBCs: 1) sequencing batch reactors owed by denitrification filters, 2) oxidation ditch using the Eimco Carrousel configuration, and 3) biological aerated filters for ification followed by un-aerated biological filters for denitrification. The evaluation concluded the SBRs followed by denitrification rs to be the least cost alternative but the overall costs were high. As a result, a long-term, full scale pilot of a ballasted activated dge system was completed using the BioMag process. The full scale pilot was the first test of applying the BioMag technology in a rient removal facility with anoxic zones.

sequent to the successful ten-month pilot test, a second evaluation was performed and the BioMag was selected as the lowest cost rnative. Utilizing the BioMag technology allowed the existing clarifiers to be reused, reduced the footprint of the new reactor, and inated the need for filters. The BioMag system was configured for use in a Four-Stage Bardenpho reactor system. The system was gned for the varying influent flows experienced.

# REFERENCES

n addition to the references noted on the project profile sheets above, RK&K is pleased to provide the following professional references o demonstrate successful experience on other projects. We encourage you to call each client to further articulate the value RK&K rovides. Please ask about not only the technical credentials of our staff, but also our commitment to schedule compliance, cost erformance and communication.

| CLIENT | CONTACT/ADDRESS | PHONE/E-MAIL |
|---|---|---|
| **New Creek Public Service District** | **Jeremy Shingler, General Manager**<br>4242 New Creek Highway<br>Keyser, WV 26726 | Phone: 304.790.9333<br>ncpsdwv@gmail.com |
| **Town of Oakland** | **Gwen Evans, Executive Coordinator**<br>15 South Third Street<br>Oakland, MD 21550 | Phone: 301.334.2691<br>townofoak@gmail.com |
| **Greater Marion Public Service District** | **Carol Brooks, Manager**<br>44 Aberdean Drive<br>Worthington, WV 26591 | Phone: 304.287.2244<br>mommaredsquirrel@msn.com |
| **Frankfort Public Service District** | **Jerry Frantz, Treasurer**<br>5 County Route 28/10<br>Ridgeley, WV 26753 | **Phone: 304.738.9552**<br>jerryfrantz@frontier.com |