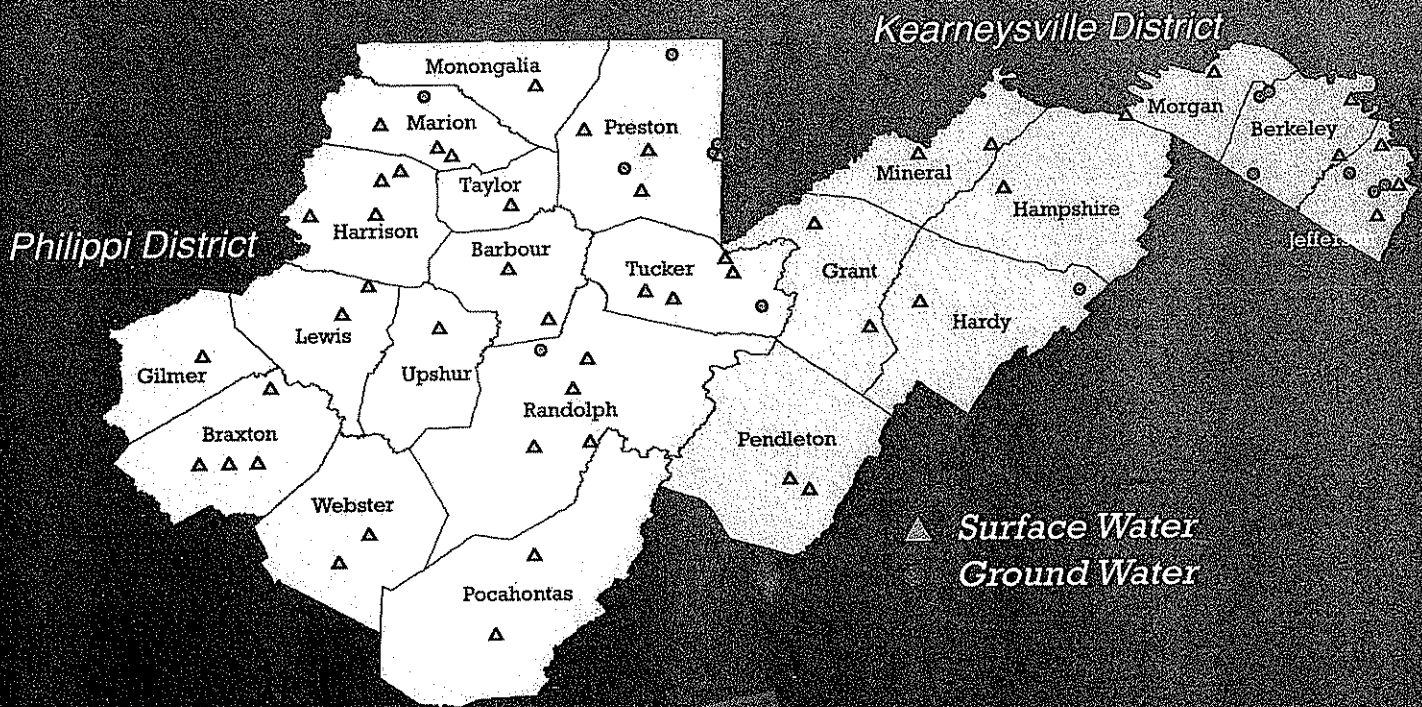


*Expression of Interest for*

# Source Water Protection Technical Help Program

**EHS90111**

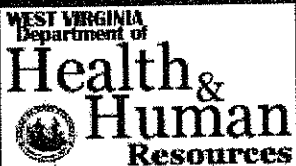


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PROCUREMENT DIVISION  
STATE OF WV

*March 19, 2009*



State of West Virginia  
Department of Administration  
Purchasing Division  
2019 Washington Street, East  
Charleston, WV 25035

RUMMEL, KLEPPER & KAHL, LLP  
Consulting Engineers  
Keyser, WV





**Rummel,  
Klepper  
& Kahl, LLP**

*William K. Hellmann  
Emeritus*

*David W. Wallace  
Robert J. Halbert  
Stephen G. Zentz  
J. Michael Potter  
Thomas E. Mohler  
James A. Zito*

*Michael W. Myers*

*Charles M. Easter, Jr.  
Joseph A. Romanowski, Jr.  
Michael L. Krupsaw  
Lars E. Hill  
J. Tommy Peacock, Jr.  
Martin C. Rodgers  
Kenneth A. Goon  
Richard J. Adams, Jr.  
John A. d'Epagnier  
Barbara J. Hoage  
Christopher F. Wright  
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Nancy R. Bergeron  
Stuart A. Montgomery  
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Henry J. Bankard, Jr.  
James F. Ridenour, Jr.  
Robert J. Andryszak  
Raymond M. Harbeson, Jr.  
B. Keith Skinner  
Karen B. Kahl  
Seyed A. Saadat  
John C. Moore  
Eric M. Klein  
Todd E. Rousenberger  
Donald P. Lauzon  
Thomas M. Heil  
Robert D. Ostermiller  
Barry L. Brandt  
Malachi M. Mills  
James A. Burnett  
Brian L. Hepting*

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Ph: 304-788-3370  
Fax: 304-788-3577  
www.rkk.com**

March 17, 2009

Ms. Roberta Wagner  
State of West Virginia  
Department of Administration  
Purchasing Division  
2019 Washington Street, East  
PO Box 50130  
Charleston, WV 25305-0130

Re: Request for Quotation  
RFQ #EHS90111

Dear Ms. Wagner,

In accordance with the Request for Quotation for the West Virginia Bureau of Public Health, Rummel, Klepper & Kahl, LLP (RK&K) is pleased to submit one (1) original and six (6) copies of our engineering proposal to provide engineering services for the Source Water Protection Technical Help Program (SWPTHP). RK&K has extensive experience in all aspects of water system management in West Virginia and the Mid-Atlantic region.

David G. Vanscoy, P.E., associate and regional manager of RK&K's West Virginia operations will be assigned as program manager for the project. Dave has over 37 years of experience in all aspects of public works engineering requirements including water, sewer, drainage, roads and streets. John W. Cole, P.E. will be assigned as the SWAP project manager for the project. John has over 7 years of experience with an emphasis on rural public works projects. Dave, John and RK&K's staff of experienced engineers and technicians are capable of immediately addressing the engineering needs for the WV BPH project.

RK&K is a 630-person multidisciplinary consulting engineering firm headquartered in Baltimore, Maryland. The firm has been providing services throughout the Mid-Atlantic and Southeastern states since 1923. RK&K's expertise encompasses water, environmental, sanitary, civil, transportation, structural, geotechnical, mechanical/electrical, natural gas/petroleum operations, and construction engineering inspection. Ranked #128 on the 2008 *Engineering News Record's* listing of Top 500 Design Firms and Ranked #75 on their list of Pure Design Firms in 2008, RK&K serves an array of Federal, State, and local clients from our headquarters and 14 branch offices.

RK&K has offices in West Virginia, Virginia, North Carolina, Pennsylvania, Delaware, Florida, and Washington, D.C. The firm employs a well-diversified staff of engineers, planners, environmental specialists, surveyors, designers, draftsmen/CADD technicians, construction managers, inspectors, and support staff. RK&K's services involve feasibility studies, project planning, preliminary engineering, final design, and construction inspection/management.



## Rummel, Klepper & Kahl, LLP

### WHY SELECT RK&K?

RK&K has developed an experienced engineering team to partner with the West Virginia Bureau of Public Health for the source water protection technical help program. The following items summarize the direct benefits resulting from assignment of this project to RK&K:

- David G. Vanscoy, PE, PS, a proven project manager, will manage all work.
- Project Team's experience allows effective communication with local agencies.
- Multitude of project experience allows for quick problem solving.
- RK&K is a full-service engineering firm capable of providing all required services.
- RK&K's Keyser office location is conducive to quick response/close coordination with WV BPH.

As partner-in-charge, I will personally ensure that all appropriate resources are made available to the project team for the timely completion while maintaining quality control as our top priority. RK&K appreciates your consideration of our qualifications and looks forward to developing a solid working relationship with the West Virginia Bureau of Public Health.

Very truly yours,

RUMMEL, KLEPPER & KAHL, LLP

A handwritten signature in black ink, appearing to read 'Robert J. Halbert', with a long horizontal flourish extending to the right.

Robert J. Halbert, P.E.  
Partner

RJH: DGV:jwc

Enc.



## FIRM HISTORY

### Origin

In 1923, two German-trained engineers named Richard Charles Sandlass and George Arnold Wieman, formed the consulting engineering firm of Sandlass, Wieman & Associates in Baltimore, Maryland. The firm prospered from steady growth and diversification of services. With the addition of Edward Rummel, Howard Klepper and William Kahl, the firm changed its name in 1951 to Rummel, Klepper & Kahl. Since its inception, RK&K has remained a partnership.

### Ownership

RK&K became a limited liability partnership in 1998; current partners include:

- Robert J. Halbert, P.E.
- David W. Wallace, P.E.
- Stephen G. Zentz, C.P.A.
- J. Michael Potter, P.E.
- Thomas E. Mohler, P.E.
- James A. Zito, P.E.
- Michael W. Myers, P.E.
- William K. Hellmann, P.E. (Partner Emeritus)

The firm's associates, key individuals who manage and coordinate projects and staff, work closely with the Partners and serve as liaisons with clients and subconsultants, and enhance projects with their vital technical expertise. RK&K currently has 32 associates located in seven states and the District of Columbia. The **Keyser, WV Office** is managed by RK&K Associate, David G. Vanscoy, P.E., P.L.S.

### Professional Registrations

RK&K supports the professional growth of its employees. The firm offers paid leave as well as exam expenses for engineers seeking professional engineering license. Presently, RK&K has 127 professional engineers registered in 15 states.

### Reputation and Philosophy

RK&K is one of the most respected engineering firms in the mid-Atlantic and Southeastern regions. RK&K is a partnership that promotes teamwork, while stressing quality and service, resulting in product-driven responsiveness to clients' needs. RK&K is technically strong, diverse and aggressive, yet respectful. RK&K is large enough to compete with national firms, yet small enough to know employees faces and names. RK&K knows that its dedicated people are our greatest asset.

## OVERVIEW OF THE FIRM

Rummel, Klepper & Kahl, LLP is a 630-person multi disciplinary consulting engineering firm headquartered in Baltimore, Maryland. The firm has been providing services throughout the mid-Atlantic and Southeastern regions since 1923. RK&K's expertise is in sanitary, environmental, civil, transportation, structural, geotechnical, mechanical/electrical, natural gas/petroleum operations and construction engineering and inspection. Ranked #128 on the 2008 *Engineering News Record's* listing of Top 500 Design Firms and Ranked #75 on their list of Pure Design Firms, RK&K services an array of Federal, State, and local clients from our headquarters and 14 branch offices in **Keyser, West Virginia**; Alexandria, Fairfax, Virginia Beach, Newport News, Richmond and Staunton, Virginia; Raleigh and Concord, North Carolina; York, and Norristown, Pennsylvania; Dover, Delaware; Lakeland Florida, and Washington, D.C. The firm employs a well-diversified staff of engineers, planners, environmental specialists, surveyors, designers, draftsmen/CADD technicians, construction managers, inspectors, and support staff.



RK&K's services involve feasibility studies, project planning, preliminary engineering, final design, and construction inspection/management. RK&K has provided the full range of engineering and inspection services on similar projects including:

- Water Resources Engineering:** hydrology/hydraulic analysis, stream restoration, TMDL reduction strategies, flood control, floodplain studies, storm drainage structures, stormwater management, sediment/erosion control and soil bio-engineering
- Sanitary Engineering:** water and wastewater pipeline, pumping and treatment facilities; industrial and solid waste disposal; wet-weather compliance; system modeling and operations
- Site Development:** educational, medical, commercial, industrial, recreational/sports and waterfront facilities; military installations
- Natural Gas, Petroleum and Pipeline Engineering and Consulting:** natural gas pipelines, transmission and distribution systems and facilities; petroleum pipelines, storage, distribution, training and related facilities; system modeling and analysis; and natural gas utility consulting services
- Environmental Engineering:** facility and site assessments; hazardous and toxic waste site characterization and remediation; spill plan development, spill containment system design; underground/aboveground storage tank system testing, design, installation and closure; and hazardous material handling
- Utility Alignment, Rehabilitation, and Relocation:** all public and private utilities
- Natural Environment:** wetland delineations/mitigations; stream classifications/stabilization; forest stand delineations; natural resource inventories; rare, threatened and endangered species surveys and biological assessments; and completing supporting environmental technical reports, documentation and regulatory agency coordination
- Transportation Engineering:** highways, interstates, roadways and streets, interchanges, collector-distributor roads, roundabouts, railroads and mass transit, toll facilities, airport landslide facilities
- Construction Management and Inspection:** bridges, highways, buildings, water and sewer, utilities and other public works facilities
- Structural Engineering:** bridges and related transportation structures, tunnels, site-specific utility structures, culverts, retaining walls, noise barriers, foundations, piers, bulkheads, relieving platforms and jetties
- Traffic Engineering:** traffic forecasting and analysis; highway signing, pavement marking and lighting; traffic signal design; traffic control; maintenance of traffic during construction; traffic impact studies; high accident location studies; travel time/delay studies; warrant, capacity, intersection/interchange, arterial, queuing and roundabout analyses; and trip generation/distribution
- Geographic Information Systems (GIS):** GIS needs analysis, master plans, design/development and implementation management, conversion services, training and support, relational database administration, field collection and data verification (conventional and GPS), custom GIS programming and integration services, document scanning and image archive development
- Geotechnical Engineering/Geology:** retaining walls, foundations, dams and impoundments, groundwater supply/management/quality investigations, slope stability and dredged material management
- Permit Application and Acquisition:** Section 401/404, CERCLA, RCRA, NPDES, wetlands, natural resources, floodplains, stormwater management and sediment/erosion control



## DETAILED STATEMENT OF FIRM'S CAPACITY, AS IT RELATES TO THE PROJECT

### A. Introduction

RK&K has achieved great success in sanitary/environmental engineering since entering the field in 1946. During this time, RK&K has placed numerous water and wastewater projects into successful operation. The firm's environmental/sanitary engineering experience covers the full spectrum of services including evaluation, planning, design and construction management for water supply, treatment, pumping, transmission and distribution systems as well as wastewater collection, treatment, and disposal. These projects have included new construction, rehabilitation, upgrading and expansion of water/wastewater treatment plants, water/wastewater pumping stations, transmission/distribution mains, sanitary sewers, interceptors, force mains, gravity sewers and storage facilities including raw water storage reservoirs and finished water storage tanks. RK&K has also been involved in numerous studies to evaluate the adequacy of existing facilities and to develop and evaluate alternatives for new facilities that best meet the current and future needs of our clients.

### B. Source Water Protection and Watershed Inventory Capabilities

RK&K maintains a team of diverse professionals that are especially qualified and experienced in performing all types of environmental inventories and natural resource surveys. RK&K has performed literally hundreds of various types of geographical inventories including watershed contaminant source inventories, wetland delineations, stream classifications, biological assessments as well as completing all the necessary technical reports and documentation for regulatory agency review and approval. RK&K has completed a watershed Contaminant Source Inventory (CSI) and Susceptibility Analyses for the three watersheds supplying the Liberty, Loch Raven and Liberty Reservoirs which supply drinking water to approximately 1.8 million customers of the Baltimore Metropolitan area. A more detailed description of this project is presented in the included project profiles.

### C. Geotechnical Engineering and Geophysical Capabilities

The RK&K Geotechnical Engineering/Geology Department has been involved in field investigations, laboratory testing, analyses, and geotechnical report preparation for various municipal engineering facilities for in excess of 36 years. During this period, numerous treatment plants, pumping stations, solid waste disposal facilities, earth and rockfill dams, levees, floodwalls, lagoons, and water supply reservoir projects have been investigated and final designs prepared. In addition, remedial measures and upgrades of existing facilities have been analyzed and geotechnical input provided for final design. For essentially all of these projects, test borings and observation wells have established soil, rock, and groundwater conditions at the site which, when used in conjunction with laboratory test results where required, has resulted in the most practical foundation system or rehabilitation measures for the project. As directly related to this project, RK&K has extensive engineering experience in wellhead protection, karst evaluations, sinkhole mitigation, geophysical surveys and in-situ tests in carbonate rock areas.

### D. Geographical Information System (GIS) Capabilities

The RK&K GIS Department has provided a wide variety of GIS services to our clients for over 18 years. Services include the design, development and implementation of GIS data and systems related to: asset management; utility management and maintenance; transportation and traffic analysis; environmental inventories, studies and analysis; and other engineering and planning related subjects.

RK&K utilizes software from leading GIS industry leaders, including **ESRI**, **Bentley Systems** and **AutoDesk**, with focused expertise in the ESRI GIS environment. RK&K analysts and technicians use the **ArcGIS version 9.2** suite (ArcInfo, ArcView, ArcMap, ArcCatalog, ArcEditor, ArcPad, and ArcToolbox) and special add-on packages (Spatial Analyst and 3D-Analyst) to design, build, edit, manage and analyze spatial data. We maintain powerful spatial data servers (**ArcSDE 9.1 and 9.2/Oracle 9i**) on which we perform multi-user access and editing of large GIS datasets and geodatabases, and which quickly and



efficiently serve spatial vector and raster data throughout the firm. Our GIS personnel have extensive experience working with all the ESRI GIS formats, including: SDE databases, Personnel geodatabase (Microsoft Access), shapefiles and coverages, as well as raster formats.

RK&K programmers utilize ESRI's **ArcObjects** and **Microsoft's .NET** programming environments to create applications and tools that run within the ESRI ArcGIS environment to assist in the creation, management, quality reviews, analysis of GIS data, or integration with relational databases and other systems. RK&K uses the **ArcIMS**, **Java** and **ASP.NET** to build **Internet and Intranet web sites** that access GIS spatial content allowing users with only a browser to access, view and query a wide range of GIS datasets within an interface specifically designed to facilitate the user's interaction with the data.

GPS equipment readily available includes Trimble TSC1 mapping grade units to the more accurate Topcon Hyper XT and GR3 survey grade units.

## 1. GIS Services:

Services RK&K's GIS department has provided for our clients during the last the six years include:

- Performing needs analysis and cost justification/benefit
- Acquiring and installing hardware and software (including networks)
- Designing GIS layers for the GeoDatabase, Shapefile and Coverage formats
- Develop/maintain geodatabase metadata
- Implementing and administering ArcSDE databases
- Implementing ArcIMS websites
- Coordinating and management of photogrammetric services:
  - Establishment of horizontal and vertical survey control
  - Management & acquisition aerial photography and development of digital orthophotography
  - Development of new and updated planimetrics
- Design and development of environmental-related data layers through GPS field data collection
- Developing of utility (sanitary sewer, water, stormwater, natural gas) GIS data layers, by:
  - Performing detailed field surveys to obtain feature locations, existing conditions and attributes, by using mapping and survey-grade GPS technologies, and traditional surveying techniques
  - Scanning and vectorizing utility records
- Developing Project-wide/Citywide/Countywide/Statewide GIS data layers
- GIS-based analysis and reporting
- Custom map layout and development
- Developing customized application software to make the use of GIS-base technology more efficient
- Integration of utility GIS datasets with hydraulic modeling software
- Development and presentation of both standard and customized training

## 2. Database Expertise

Personnel in the RK&K GIS department have extensive experience working with relational database technologies from Microsoft, ORACLE, INFORMIX, Dbase and others. This experience enhances our ability to create solid relational databases for our clients both inside and outside the ESRI GIS environment. The current RK&K programming staff has designed, developed, implemented and provided support for numerous database applications for our engineering clients. Listed below are several of these database applications that have been developed within the Microsoft Access environment. Several of the applications listed below make use of the Access database within other application environment, such as: GIS (ArcView/ArcGIS/ArcInfo),



CADD (MicroStation and AutoCAD), and Office applications (Word and Excel).

Several recent projects utilizing RK&K's database expertise include:

**I-270 Wetland Mitigation** - A Microsoft Access application/database was created to evaluate wetland mitigation sites. The application combined GIS data (land use, property information, GPS) along with environmentally based information. The application ranked, aggregated and related other information such as property owner, habitat, soil type, slope, hydrology and constraint issues.

**NCDOT Stream Assessment** - RK&K performed stream assessments for NCDOT. An Access database design and user-interface was created to input stream attributes such as channel condition, alterations, riparian data and water quality/appearance. This data was tied to the GIS to perform preliminary site analyses while querying pertinent spatial data.

**Automated Letter System** - RK&K developed an automated letter system for the Office of Bridge Development that greatly simplifies the task of producing many of the hundreds of letters required for each project. The system utilizes Microsoft Access to manage all projects, project managers, consultants and the letter base; Microsoft Word for word processing; and OLE (Object Linking and Embedding) to perform inter-application management tasks.

**Project Review Tracking System** - RK&K developed a structural review tracking system utilizing Microsoft Access for the Office of Bridge Development. The application enables a review manager to prioritize and schedule structural reviews through each stage of the review process. Reports may be generated that show information on the reviews by priority, length in the queue, and review stage. The system can also generate a statistical analysis of historical reviews to assist in identifying possible review process bottlenecks.

**Schedule of Prices Generator** - RK&K developed an application that reads schedule of prices information output by the Engineer's Estimate application, reformats and imports the information into a word processing document for use in a project's Invitation for Bids. Supported word processing applications: Microsoft's Word for Windows, WordPerfect (V5.1, DOS V6.0, Windows V6.0, Windows V6.1).

**Maryland Construction Management System** - RK&K developed the replacement to the DBase Clipper-based Maryland Construction Management System (MCMS) in use at all construction sites around the state. The new system was designed and developed using the SQL database and object-oriented technology found within Microsoft Access. The application manages all contract items and associated costs and usage, all information found on the Inspector's Daily Reports (IDR), extra work orders, stored materials, invoice estimate generation, trainee management, calculation of earthwork quantities based on the end area method, and simple to complex area and volume calculations.

#### E. Environmental Site Assessment Capabilities

- Environmental Site/Facility Assessment Experience:** RK&K has been a leader in implementing cost-saving and innovative approaches to the assessment, investigation, characterization, design, and remediation of petroleum and hazardous waste; underground storage tank (UST) and aboveground storage tank systems management, testing, design and installation; as well as closure of leaking UST's throughout the mid-Atlantic and southeastern regions. RK&K is extremely familiar with the special requirements for preparation of Phase I Reports, Phase II Reports and Corrective Action Plans. Site assessments, compliance audits and "due diligence" assessments for real estate acquisition are performed in accordance with ASTM guidelines as applicable. As required by OSHA and the EPA, RK&K ensures that members of the project team fulfill the training requirements of the 40-hour OSHA 29 CFR 1910.120, Hazardous





Waste Operations and Emergency Response (HAZWOPER) and OSHA 29CFR 1910.146 Confined Space Regulations. RK&K staff are trained to recognize and assess site safety and health hazards, implement work practices to minimize site hazards, recognize properties and toxic effects of hazardous materials and identify exposure guidelines, select and use self-contained breathing apparatus and air purifying respirators, select and use specialized chemical protective clothing, decontaminate personnel and equipment, select and use atmospheric monitoring equipment, identify components of a medical surveillance program, perform first-aid and cardiopulmonary resuscitation, and plan for safe site investigations.

- **Specialized Field Investigations:** RK&K's experience with groundwater ranges from the installation/development of monitoring wells for hydrogeological investigations to modeling of groundwater pollutant fate and transport to design and start-up of bioremediation systems to treat contaminated aquifers. RK&K's hydrogeologists, geologists, scientists, engineers, and environmental specialists are experienced in geophysical surveys, monitoring well installation, computer modeling, contaminant transport, groundwater flow mapping, and geologic interpretation. RK&K maintains an extensive supply of field sampling and monitoring equipment including a state-of-the-art photoionization detector for atmospheric screening of volatile organic compounds in ambient air and personnel monitoring and field-portable gas chromatograph capable of analyzing multimedia samples for a broad range of contaminants including volatile, semi-volatile and chlorinated hydrocarbons; polychlorinated biphenyls (PCBs); pesticides and polynuclear aromatic hydrocarbons (PAHs). Additionally, RK&K is capable of performing a wide range of geophysical studies including electrical resistivity, seismic refraction, magnetometer and electro-magnetic surveys and ground penetrating radar as well as hydrological studies including groundwater elevation monitoring and aquifer performance testing.
- **Corrective Action/Remediation Design:** RK&K, as part of numerous environmental remediation projects, has evaluated and/or designed soil and groundwater remediation incorporating pump and treat, bioremediation and in-situ technologies. These technologies have included air stripping, granular activated carbon (GAC) adsorption, oil-water separation, filtration, air sparging, soil vapor extraction, reverse osmosis, chemical precipitation, chemical oxidation, as well as bio-stimulation.

#### F. Work Force Availability

Rummel, Klepper & Kahl has a combined professional staff of over 630 people located in the mid-atlantic region, including 30 design and inspection staff working out of our Keyser, West Virginia office. The RK&K Team includes 19 environmental scientists/specialists, 18 hydraulic/water resources engineers, 9 GIS specialists and numerous support staff committed to this contract. The RK&K Team includes 9 personnel who were actively involved in RK&K's previous source water evaluation experience. As a result, the RK&K Team has the experience to immediately start on this project when given notice. This is a sizeable staff for the West Virginia Bureau of Public Health Environmental Health Services to draw from to complete the source water protection technical help program needs.



## PROJECT UNDERSTANDING

RK&K has reviewed the WVBPH's EOI, particularly Section 3.2 identifying the various requirements and objectives of the project. RK&K's experience water system studies and evaluations are directly applicable to this project.

## PROJECT APPROACH

Based on the Team's experience and the objectives outlined in the EOI, RK&K has developed the basic project approach listed below in the following subsections.

### *Record Review and Data Collection*

When notification of award has been given, the Team will gather and review files of previous SWAP work relevant to the systems listed in the EOI to familiarize themselves with the various systems. Contact with the District Health Offices will be made and visits scheduled to the District Offices to gather valuable information such as Sanitary Surveys, previous SWAP reports and monitoring data all of which will provide valuable information in understanding the various systems, additional visits to the Central Office may be required to gather additional information. In addition, once the BPH's database of known PCS's as well as the state and federally regulated databases are received, the Team will begin reviewing and preparing material to review with the various CPWS Systems. A letter of introduction from RK&K will be sent to each system explaining RK&K's involvement and the scope of the project as well as request contact information for scheduling visits to the system.

### *CPWS Systems Field Review*

In an effort to efficiently proceed with this project, the RK&K Team anticipates scheduling multiple system visitations per week in order to conduct the field review and various meetings. As described in Section 3.2.3 of the EOI, the Team anticipates scheduling a minimum of three (3) meetings with each system to inform them of the project, review existing data, solicit input, present findings and provide management and contingency plans.

Of significant importance, as mentioned in the EOI, is the location and verification of abandoned water wells and underground storage tanks within wellhead protection areas.

### *PCS Survey*

Following the initial meeting with the CPWS systems and as described in Section 3.2.4 of the EOI, the RK&K Team will survey the PCS previously identified, identify and locate any new PCS within the delineations and ZCC areas. Updates to the PCS database will be made accordingly.

### *Management & Contingency Plans*

Once the initial meeting with the system and corresponding field work has been conducted, the SWAP Project Manager and SWAP Specialists will coordinate and review the information gathered for the system in order to develop management and contingency plans as discussed in Section 3.2.5 and Section 3.2.6 of the EOI. At a minimum, the items listed under these two (2) sections (Section 3.2.5 and Section 3.2.6) in the EOI will be discussed and addressed for each of the plans.

### *Reporting*

Following the first two meetings indicated in the EOI, the RK&K Team will meet with each of the system operators to discuss the results. In addition, as indicated in Section 3.2.2 of the EOI, RK&K will provide the BPH PM weekly updates, general discussions, projected invoices, and CPWS meeting minutes with attendees.



**OVERVIEW OF FIRM'S STAFF CAPACITY**

The most important element to the success of an engineering project is the staff available to complete the assignment. The project team assembled for this project has a wealth of experience and knowledge in their respective fields. Equally important, RK&K's professional staff recognizes that providing consulting engineering services extends beyond number crunching and preparation of construction plans and specifications. The success of this project also hinges on our ability to respond to the needs of the WV Bureau of Public Health officials in a timely and professional manner. Whether working on a specific task or responding to requests made over the telephone, the staff at RK&K is anxious to work with the WV Bureau of Public Health to address their engineering consulting needs. Simply put, we are a people-oriented firm.

An organization chart depicting the team proposed for this project is found on the following page. The design team proposed on the organization chart will be assigned for the project's duration. Information pertaining to RK&K staff that may be assigned to this project and a description of individual responsibilities can be found on page 3-2. Full page resumes for our proposed key staff begins on page 3-3.

RK&K's project team will be supported from our multi-disciplined staff of 630 individuals in the noted disciplines. The disciplines highlighted in **blue** are most likely to be involved in this project.

<b>Civil Engineers</b>	<b>18</b>	<b>Environmental Scientist</b>	<b>19</b>
<b>Environmental Designers / Technicians</b>	<b>12</b>	Electrical Engineers	6
<b>Geologist</b>	<b>3</b>	<b>Water Resource Engineers</b>	<b>18</b>
Landscape Architect	2	Mechanical Engineers	3
Environmental Engineers	28	Geotechnical Engineers	5
Structural Engineers	31	Traffic Engineers	18
Transportation Engineers / Designers	89	Utility Engineers	12
Archaeologist / Historians	2	Urban / Regional Planners	9
Construction Managers	29	Construction Inspectors	164
CADD Technicians	53	<b>GIS Specialists</b>	<b>9</b>
<b>Surveyors</b>	<b>20</b>	<b>Information Technology Specialists</b>	<b>8</b>
<b>Graphic Specialists</b>	<b>7</b>	<b>Administrative Staff</b>	<b>65</b>

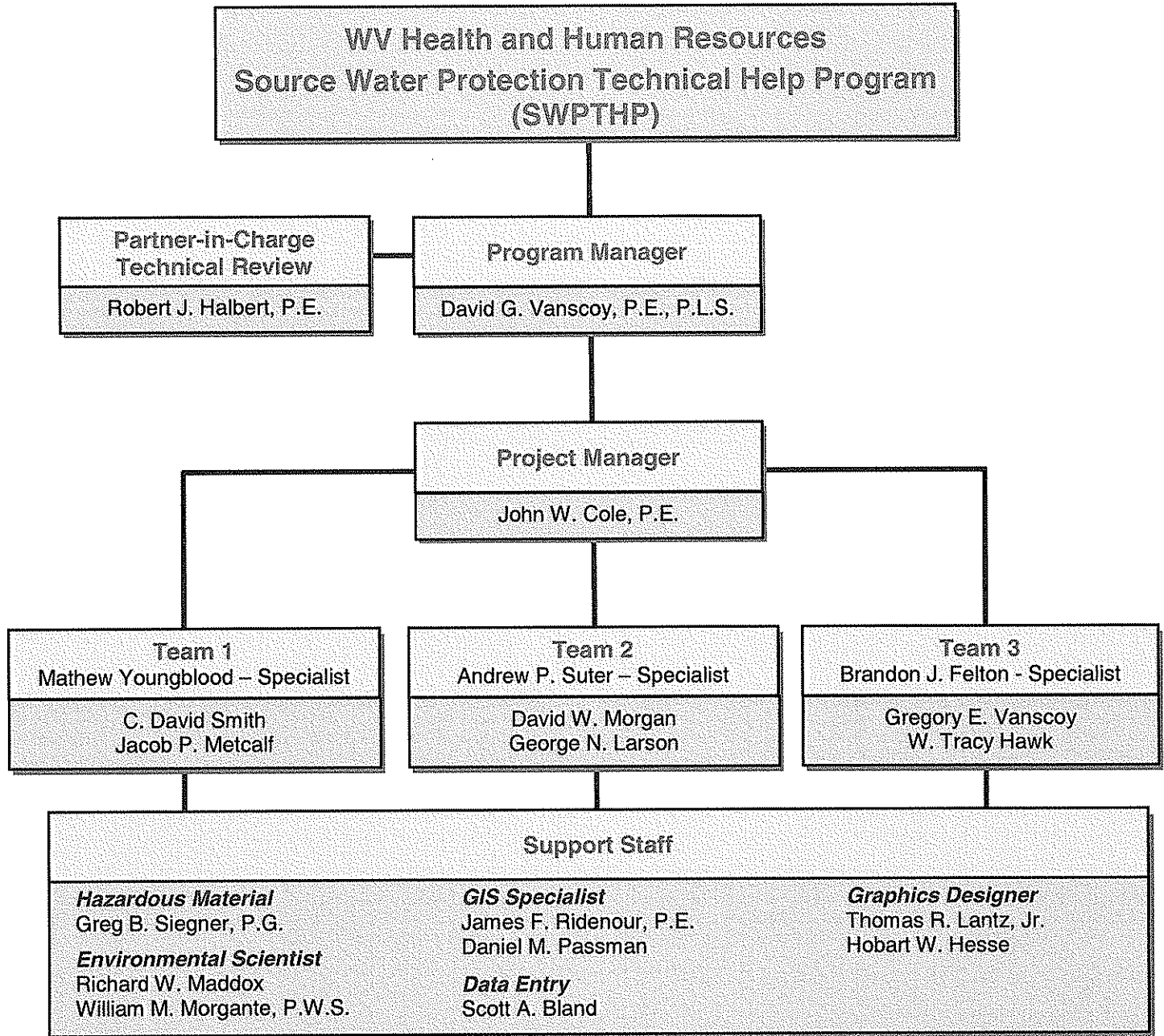
Total Personnel 630

The project will be managed out of RK&K's Keyser, West Virginia office with **David G. Vanscoy, P.E.** as program manager. Dave provides technical leadership and management of projects in RK&K's **Keyser Office**, and has over 37 years of experience in civil and structural engineering, with an emphasis on rural public works projects. Dave earned his bachelor's degree from the West Virginia Institute of Technology and his master's degree from West Virginia University in Morgantown. He is a registered professional engineer in West Virginia and Maryland, a registered land surveyor in West Virginia and an active member of the American Society of Civil Engineers, West Virginia Rural Water Association, Water Environment Federation, and American Water Works Association.

Assisting Dave and acting as the SWAP Project Manager will be John W. Cole, P.E. John has over 7 years of experience in civil engineering with an emphasis on rural public works projects. John earned his bachelor's degree from Fairmont State College in Fairmont, WV. He is a registered professional engineer in West Virginia and an active member of the American Society of Civil Engineers, Water Environment Federation, and American Water Works Association.



Both Dave and John will be assisted by a team of experienced professionals knowledgeable in their respective fields and who were selected on the basis of (1) past experience with similar projects detailed in **Section 4** of this technical proposal, (2) familiarity with the project area, (3) skill and experience with the required equipment/software and (4) availability to devote sufficient time to work on this project. In addition, a team organization chart depicting the team members and the management flow is provided below.





**DAVID G. VANSCOY, P.E., P.L.S.**  
 Associate



**Project Assignment:**  
 Program Manager

**Education:**  
 M.S., Structural Engineering, 1972  
 B.S., Civil Engineering, 1970

**Registration:**  
 P.E. West Virginia and Maryland  
 P.L.S. West Virginia

**Years' Experience:**  
 RK&K: 9  
 Other Firms: 27

**Associations:**  
 American Water Works  
 Association  
 American Society of Civil  
 Engineers  
 West Virginia Rural Water  
 Association  
 West Virginia Society of  
 Professional Surveyors  
 American Society of Highway  
 Engineers

Mr. Vanscoy has over 36 years of experience in public works projects. His career started as a summer interim for the West Virginia Department of Highways in 1966, being first employed there for 7 years after obtaining a masters degree in structural engineering from West Virginia University at Morgantown. In 1987, Mr. Vanscoy started his own firm in Keyser, West Virginia, and served as City Engineer on a consultant basis. Mr. Vanscoy has diverse experience in design of water and wastewater treatment plants and facilities as well as construction management. In June 1999, Mr. Vanscoy joined RK&K as the regional manager in charge of the Keyser, West Virginia office and was later promoted to an associate. Mr. Vanscoy was born and educated in the State of West Virginia and has a very strong bond and sense of responsibility to West Virginia. Relevant experience includes:

**Source Water Assessment Projects (SWAP), West Virginia Bureau of Public Health:** project manager for ground water assessment and protection studies for over 90 systems throughout West Virginia.

**Town of Lonaconing, Maryland, New Water Distribution System:** project manager for the design and construction of four completed water line projects involving over 40,000' of new water line and three additional water line projects which will be advertised this year. Two of these projects were AML funded.

**LaVale Sanitary Commission, LaVale, MD:** project manager for design and construction of various projects including a 450 gpm pumping station, transmission mains, replacement of distribution lines and services.

**Grant County Public Service District:** project manager for design and construction of a water main replacement project including the replacement of an existing 100,000 gallon concrete stave water tank with a 300,000 gallon glass coated steel tank.

**Corporation of Harpers Ferry:** project manager for design and construction of a the replacement of an existing 190,000 gallon riveted steel water storage tank with a 340,000 gallon water storage tank. The design also required insallation of telemetry system to control the high service pumps.

**Keyser Raw Water Intake Modifications, Keyser, WV:** project manager / regulatory /funding agency liaison (RK&K) for City's comprehensive water and sewer improvement program. A part of the water project included major modifications of the raw water intake. This project was funded in part by a Small Cities Block Grant.

**Fort Ashby Public Service District Water System Improvements, Fort Ashby, WV:** project manager/regulatory/funding agency liaison for design and construction of 1-mgd water treatment plant, raw water intake, and various other improvements to their water and sewer systems.

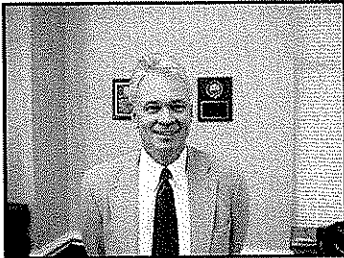
**New Creek Water Association, New Creek, WV:** project manager for evaluation of existing system and design and construction of 140,000 gallon storage tank; 350,000 gallon storage tank; 30,000 gallon storage tank; new booster station; upgrade booster pumping stations; addition of fire hydrants to system; drilling of well.

**Frankfort Public Service District Wiley Ford Sewer Project, Mineral County, WV:** project manager responsible for design, contract plans and specifications, and construction engineering and inspection servicoes for the new Wiley Ford Sewer System. The project provides wastewater collection services for over 450 resident and commercial customers within the community of Wiley Ford. The collection system consists of over 55,000 feet of collection lines, 6,600 feet of force main, and nearly 12,000 feet of service laterals. The system contains 273 manholes and 48 cleanouts. Construction bids were 1.1 million below the engineer's estimate. Also included in the system were three duplex pumping stations and an 8" force main under the Potomac River to discharge into the City of Cumberland system.

**Frankfort Public Service District Northern Mineral County Regional Sewer System, Mineral County, WV:** project manager for the proposed regional sewer system. At this time the Facility Plan has been prepared for this 39 million dollar sewer project which includes over 64 miles of sewer collection, 15 pump stations and a new 1.15 MGD wastewater treatment plant including biological nutrient removal.



**ROBERT J. HALBERT, P.E.**  
 Partner



**Project Assignment:**  
 Technical Review

**Education:**  
 B.S., Civil Engineering, 1974

**Registration:**  
 Maryland, Pennsylvania, South  
 Carolina, Virginia, Delaware, Maine,  
 West Virginia and Florida

**Years' Experience:**  
 RK&K: 17  
 Other Firms: 14

**Associations:**  
 American Society of Civil Engineers  
 American Water Works Association  
 Water Environment Association  
 Society of America Military  
 Engineers  
 Wastewater Operators Association  
 Water Environment Federation

Mr. Halbert is a partner of the firm with responsibilities for civil, water resources, sanitary and environmental projects and assignments undertaken by RK&K. He will be responsible for technical review and input throughout the course of this project. He has extensive experience in planning; design and construction management of large civil works projects throughout the mid-Atlantic region. Examples of projects undertaken during his 31-year career are:

**Source Water Assessment Projects (SWAP), West Virginia Bureau of Public Health:** partner-in-charge of ground water assessment and protection studies for over 90 systems throughout West Virginia.

**Town of Lonaconing, Maryland, New Water Distribution System:** partner-in-charge for the design and construction of over 20,000 LF of water line replacement on existing system. Two of these projects were AML funded.

**Susquehanna River Intake and Pumping Station, York, PA:** partner-in-charge for a 12-mgd raw water pumping station, submerged river intake and 36-inch water transmission main to provide additional raw water during drought conditions for the York Water Company. Water will be pumped through 15 miles of pipeline to the Lake Redman Impoundment.

**Lake Linganore Intake Structure and Pumping Station, Frederick County, MD:** partner-in-charge for civil, sanitary, environmental, geotechnical, structural, mechanical and electrical design and construction phase services for permanent intake structure, multi-level screens, raw water pumps, raw water main, and a future zebra mussel prevention/mitigation system. Raw water intake configuration was evaluated as part of a feasibility study and decision matrix.

**Front Royal Raw Water System Improvements, Front Royal, VA:** partner-in-charge during study and design for replacement of an existing raw water pumping station and a 14-inch steel raw water transmission main with a new raw water river intake structure in the Shenandoah River, 8-mgd pumping station, and approximately 2 miles of 16- to 24-inch ductile iron pipe transmission main to the treatment plant's raw water reservoir.

**Havre de Grace Raw Water Intake, Harford County, MD:** partner-in-charge of design of a 10-mgd raw water intake structure for the Harford County WTP at Havre de Grace in the Susquehanna River. Design included investigation of riverbed, depth of intake, configuration of bar screen. Also provided construction phase/startup and operation services.

**Rockville Raw Water Intake Rehabilitation Construction/Program Management, Montgomery County, MD:** provided constructability/technical reviews of structural and operational modifications to an existing Potomac River intake pumping station to increase protection against flooding, increase the pumping capacity and improve the monitoring and control of the pumping station components. Provided engineering evaluation and guidance regarding several challenging construction issues including blasting and removal of bedrock in the vicinity of the submerged intake in the Potomac River.

**Montebello Water Filtration Plant Improvements, Phase VI, Baltimore, MD:** partner-in-charge for the design of a 318-mgd dual media filtration plant including chemical feed systems, filter backwash facilities, rapid mix systems and other miscellaneous appurtenances. Filtration facility will be designed to treat water from two major reservoirs and the Susquehanna River.

**Montebello Water Filtration Plant Improvements, Phase V, Baltimore, MD:** partner-in-charge for this \$25-million project to provide major improvements and alterations to the Montebello Plant, which supplies two-thirds of the Baltimore Metropolitan water supply. Project includes extensive improvements to existing Plant 1 facilities including washwater pumps, 4 new 260-foot diameter sedimentation basins, sludge vaults and new 6 grounds maintenance complex buildings. Currently providing construction phase management services during the three-year construction schedule.



**JOHN W. COLE, P.E.**  
 Project Engineer



**Project Assignment:**  
 Project Manager

**Education:**

B.S., Civil Engineering Technology,  
 2001

**Registration:**

P.E. West Virginia

**Years' Experience:**

RK&K: 7  
 Other Firms: 0

**Associations:**

American Society of Civil  
 Engineers  
 Water Environment Federation  
 American Water Works Association

Mr. Cole is an engineer in the Keyser Office with over 7 years of design experience in public and private works projects. His career started as a summer interim for the West Virginia Department of Highways in 2000. Since joining RK&K in 2001, Mr. Cole has developed a diverse experience in design of water and wastewater treatment plants, distribution and collection systems, residential subdivision development as well as construction management. Relevant experience includes:

**Source Water Assessment Project (SWAP), West Virginia Bureau of Public Health:** project analyst for 92 ground water systems throughout the State of West Virginia.

**Greater Marion Public Service District, Marion County, WV:** project engineer with Inflow and Infiltration study. Preparation of Conceptual Design to replace the vacuum system with gravity and force main sewer system.

**Wiley Ford, Mineral County WV:** developed the hydraulic model on the replacement of the water lines to improve the service and quality of water. The project will also include a new water tank and booster station to provide improved water pressure and supply.

**Northern Mineral County Regional Sewer System – Phase 1, Mineral County, WV:** project engineer, responsible for assisting in the development of the facilities plan, coordinated efforts involved in the funding and permitting process, coordinated and oversaw the design efforts of the various disciplines (i.e. mechanical, structural, environmental, etc.) involved with designing the 1.20 MGD SBR WWTP.

**Tuscan Ridge Subdivision, Tucker County, WV:** project engineer for the 486± acres, 370 lot subdivision. Oversaw design efforts which included 8 miles of roads; 10 miles of sewer lines; 9 miles of water lines; 8 miles of gas, underground electric, cable and telephone lines; 3 sewage pump stations, 1 water booster station, a 150,000 gallon water storage tank, and a 0.1 MGD wastewater treatment plant.

**New Creek Water Association – Construction Contract 3, New Creek, WV:** project supervisor responsible for overseeing contractor during the cleaning, rehabilitation, and painting of a 100,000 gallon and 50,000 gallon water storage tanks.

**Romney Collection System Replacement – Phase 1, Hampshire County, WV:** assisted in the facility plan preparation, funding acquisition, design and construction efforts of the 29,000 LF of sewer collection system replacement project.

**Northern Mineral County Regional Sewer System Facility Plan, Mineral County, WV:** assisted in the preparation of the facilities plan identifying the 35 square mile service area, 62 miles of new collection system and a regional WWTP.

**New Creek Water Association – Construction Contract 1 & 2, New Creek, WV:** assisted in the design and construction of approximately 5-miles of water line extension and the addition of fire hydrants to existing system.

**Town of Lonaconing, Maryland, New Water Distribution System:** assisted in the design and construction of over 20,000 LF of water line replacement on existing system. Mill Run Project is being funded by AML.

**Capon Bridge Technology and Industrial Park, Hampshire County, WV:** assisted in the design, contract plans and construction of Technology Park including site development, roadway, water, sewer and other utilities including a 30,000-sf multi-tenant building.



**Matthew J. Youngblood**  
Project Designer



**Project Assignment:**  
SWAP Specialist – Team 1 Leader

**Education:**  
B.S., Civil Engineering, 2006

**Registration:**  
None

**Years' Experience:**  
RK&K: 2  
Other Firms: 1

**Associations:**  
American Society of Civil Engineers,  
American Society of Highway  
Engineers

Mr. Youngblood is a civil engineering graduate with over 2 years of experience in public and private works projects. His career started as a summer intern for the West Virginia Department of Highways in 2001. Since joining RK&K in 2006, Mr. Youngblood has developed experience in the design of water and sewer infrastructure. Relevant experience includes:

**Tuscan Ridge – Town of Davis Subdivision, Tucker County, WV:** assisted with design of roadway layout, which included sizing culverts for drainage in the subdivision. Also assisted with the design and layout of the water and sewer utilities.

**Romney Collection System Replacement – Phase 1, Hampshire County, WV:** assisted in the construction management of the sewer collection system replacement project.

**Greater Marion Public Service District, Marion County, WV:** assisted with Inflow and Infiltration study with sewer camera inspections. Designer on vacuum sewer line relocation to improve the efficiency of the sewer collection system in the Town of Idamay. Assisting with design to replace the vacuum system with gravity and force main sewer system.

**Town of Lonaconing, Allegany County, MD:** designer on three water improvement projects including new lines and line replacement in the Towns of Midland and Barton. Assisted with construction management of all three projects.

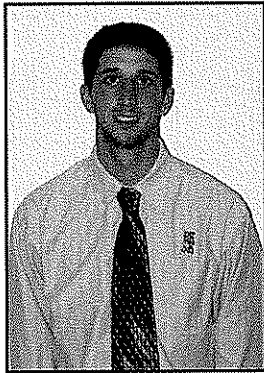
**Deep Creek Lake State Park, Garrett County MD:** designer on the replacement of water line and two chlorination feed stations. Designed an rv dump station to expand the traffic volume for the camp ground.

**Wiley Ford, Mineral County WV:** designer on the replacement of the water lines to improve the service and quality of water. The project also includes a new water tank to provide improved water pressure and supply.





**Andrew P. Suter**  
Project Designer



**Project Assignment:**  
SWAP Specialist – Team 2 Leader

**Education:**  
B.S., Civil Engineering,  
2007

**Registration:**  
None

**Years' Experience:**  
RK&K: 1  
Other Firms: 0

**Associations:**  
American Society of Civil Engineers  
American Society of Highway  
Engineers

Mr. Suter is an engineering graduate and has over a year of experience in public and private works projects. His career started as a summer intern for the West Virginia Department of Highways in 2004. Mr. Suter joined RK&K as an intern during the summer of 2006, and in the summer of 2007, he began working full time. Relevant experience includes:

**Northern Mineral County Regional Sewer System Mineral County, WV:** one of the project designers, responsible for assisting in the development of the facilities layout. Assisted in Design of Several of the WWTP buildings.

**Tuscan Ridge, Town of Davis Subdivision, Phase 3-4, WV:** one of the project designers responsible for roadway layout and design, as well as lots and right-of-way design. Assisted in E & S Design of Phase 3, as well as water tank site design on phase 4.

**Dan's Mountain Access Road and Storage Facility, MD:** Assisted in design of access road, and erosion and settlement control plan. Also assisted in design of storage facility, as well as site layout and development.

**Potomac Plaza, Greyhound Properties, L.L.C., Mineral County, WV:** assisted in the design of foundations for building 601 and 701 shopping centers.

**Keyser/McCoole Bridge, Mineral County, WV:** assisted in right-of-way acquisitions. Responsible for Field Verification of Properties, and Plan assisting others in plan development. Coordinated design efforts on the water and sewer relocation which included a pump station, major river crossing, collection and distribution relocation.

**Brandon J. Felton**

| Mr. Felton is a mechanical engineering graduate with over 2 years of



Project Designer



**Project Assignment:**  
SWAP Specialist – Team 3 Leader

**Education:**  
B.S., Mechanical Engineering, 2006

**Registration:**  
None

**Years' Experience:**  
RK&K: 2  
Other Firms: 0

**Associations:**  
American Society of Heating,  
Refrigeration & Air Conditioning  
Engineers

experience in public and private works projects. His career started in the water and waste water industry as a maintenance worker for the Frankfort Public Service District in 2003. Since joining RK&K in 2006, Mr. Felton has developed experience in design of equipment pertaining to water and wastewater treatment systems. Relevant experience includes:

**Grant County Public Service District – Point Pump Station Upgrade, Grant County, WV:** assisted in the design of increasing the pumping capacity of the pump station in order to reduce pump run time and supply the recently increased demand flow due to increased population growth. Also assisted with the design of a new 5400' transmission main between the upgraded Point pump station and the existing storage tank.

**Northern Mineral County Regional Sewer System– Phase 1, Mineral County, WV:** assisted in the design of mechanical equipment, buildings, treatment plant site layout, and pump stations pertaining to the 1.20 MGD SBR WWTP and collection system. Also assisted in right-of-way acquisition for the collection system, which consisted of over 9 miles of line work.

**Alliant Technical Systems Raw Water Intake – Conceptual Design, Rocket Center, WV:** assisted in the conceptual design of a new raw water intake and pump station along the Potomac River to supply the Allegany Ballistics Laboratory Water Treatment Plant with treatable water.

**Tuscan Ridge Subdivision – Phase 3, Davis, WV:** assisted in the design of a sewage pumping station and related valve vault along with the pump station site layout.

**LaVale Sanitary Commission – Water Distribution System Improvements, LaVale, MD:** assisted in the design of a suspended stream crossing where the waterline was placed in a casing and the casing secured to a bridge in order to eliminate an underground stream crossing.

**Greater Marion Public Service District – Sewer System Upgrade, Marion County, WV:** assisted in the design of several sewage pumping stations that utilized two non-clog series pump sets. Also assisted with an I&I study to temporarily reduce excess flow surges in the system during rain events.

**Grant County Public Service District – Maysville Water Storage Tank, Grant County, WV:** assisted in the design of a new 297,000 gallon glass coated steel water storage tank, site layout and telemetry alignment.

**Harpers Ferry Water Works – Water Storage Tank, Harpers Ferry, WV:** assisted in the design of a new 241,000 gallon glass coated steel water storage tank that involved the demolition of an existing 190,000 gallon water storage tank.



Scott Bland



**Project Assignment:**  
 Data Entry

**Education:**

**Registration:**

**Years' Experience:**  
 RK&K: 5  
 Other Firms: 0

**Associations:**

Mr. Bland started working for RK&K in 2002 as an Intern and was hired full-time in 2003. Since joining RK&K he has been involved in numerous projects for both computer and survey related work. Relevant experience includes:

**Source Water Assessment Project (SWAP), West Virginia Bureau of Public Health:** data entry and field crew for 92 ground water systems throughout the State of West Virginia.

**Northern Mineral County Regional Sewer system, Mineral County, WV:** data research/ data entry and crew member for survey and GPS control/processing for the 35 square mile service area, 62 miles of new collection system and a regional WWTP.

**Alliant Techsystems, Allegany Ballistics Laboratory, Rocket Center, WV:** survey crew member for location of 49 test pits at Allegany Ballistics Laboratory and tie into existing monuments for horizontal and vertical control for Risk Reduction Resources at facility operated for US Navy in Mineral County, WV.

**Keyser-McCoole Bridge, WV & MD:** crew member doing deed research/ data entry and survey work for the planning and design of a replacement bridge to replace the existing 2,200-foot bridge.

**Lakewood Subdivision, Short Gap, WV:** crew member doing data entry, QA/QC and survey work for the development of 940± acres of Northern Mineral County, WV; circa 1987 to present. Project to date includes 400+ platted lots in Sections 1 thru 6 as well as engineering support for a 50-acre manmade lake and water distribution & sewer collection systems.

**Tuscan Ridge Subdivision, Tucker County, WV:** crew member for boundary survey, control survey for aerial mapping, subdivision design, lot stakeout, and sewer stakeout for 486± acres lying adjacent to the Monongahela National Forest in Davis, WV

**LaVale Sanitary Commission, LaVale, MD:** collected data from site and digitized information for the design and construction of replacement of distribution mainline and services.

**New Creek Water Association – Construction Contract 1 & 2, New Creek, WV:** crew member for deed research, data entry, QA/QC and surveying in the design and construction of approximately 5-miles of water line extension and the addition of fire hydrants to existing system.

**New Creek Highlands Subdivision:** crew member doing deed research/ data entry and survey work for boundary survey, control survey for subdivision design, lot stakeout, and for 826± acres on New Creek Mountain and Abrahams Ridge in Mineral County, WV

**Dan's Mountain Access Road and Storage Facility, MD:** crew member for survey and GPS control/processing for design of access road, and storage facility, as well as site layout and development.



**James F. Ridenour, P.E.**  
Associate



**Project Assignment:**  
GIS Specialist

**Education:**  
B.S. Civil Engineering  
1983

**Registration:**  
P.E. 1990/Civil Engineering  
Maryland Registered #18139

**Years' Experience:**  
RK&K: 25  
Other Firms: 1

Mr. Ridenour heads the RK&K GIS department and is the firm's chief systems analyst with over 26 years of experience in the Engineering and Information Technology fields. During his 26-year career, Mr. Ridenour has focused on the design, development and implementation of systems containing GIS, relational database and CADD technologies for projects relating to infrastructure management, utilities, transportation, civil, planning and geotechnical engineering. Mr. Ridenour has expert knowledge of ESRI's GIS applications and technologies, and experience working with a variety of asset management and work order systems. He has extensive experience performing needs assessment, analyses and implementation of enterprise-wide systems deployed via a network (LAN/WAN) or the web. Mr. Ridenour's relevant project experience includes:

**University of North Carolina, Chapel Hill, NC:** task manager responsible for: redesign of stormwater utility ArcSDE GIS; Design documentation; PLTS QA/QC suite development; development of field collection and inspection procedures and manuals; Quality assurance of existing stormwater GIS data; Engineering document conversion; GIS editing tools development.

**Utility GIS Data Automation - Water, Baltimore, Maryland:** project manager responsible for the development of a comprehensive ESRI ArcStorm data layer of the entire water distribution network within the City. Resulting dataset contained over 750,000 features and annotations with all water meter features linked by the account number to the City's utility billing database.

**Jones Falls Sewershed Study - Project 994, Baltimore, Maryland:** task manager responsible for data management for this large EPA consent decree project. Responsibilities include the management of a large SDE-based geodatabase running in Oracle, geodatabase synchronization with the client, oversight of all GIS data edits and QC, 8,000 manhole inspections, GPS and traditional survey data, 1.4 million feet of CCTV inspection data and associated DVS video files. Additionally supervised and assisted in the design and development of numerous data management tools and application running in the Windows and ESRI GIS environments.

**Baltimore City Emergency Water On-Call, Baltimore, Maryland:** conducted a study of the feasibility in integrating the City's Customer Service Request and Work Order database systems with the current water GIS data layer, allowing engineers to perform spatial analysis of system problems to enable better informed maintenance decisions.

**Collection System GIS, Wilmington, Delaware:** project manager responsible for the design and development of a detailed ESRI geodatabase GIS of the City of Wilmington's collection system. Designed and implemented comprehensive topology analysis and testing routines, using Oracle, to locate errors and elevation inconsistencies within the network.

**GIS On-Call Services, Wilmington, Delaware:** project manager responsible for providing numerous GIS-related services, including: collection system maintenance; assistance with photogrammetric services; GIS consulting and training to City and City consultants; digital archive maintenance; and the collection system PDF CD.

**Design and implementation of a GIS for the City of Charlottesville, Virginia:** assisted with needs analysis, and design of the utility GIS data layers (water, sewer and gas) for the City and surrounding County. Developed custom user ArcView GIS and AutoCAD CADD tools to speed access and data consistency.

**Enhanced Street Centerline GIS, Wilmington, Delaware:** project manager responsible for the design and development of an enhanced street centerline file for the City of Wilmington's Department of Public Works. Developed several GIS utilities to enable technicians to quickly and accurately reposition the original DelDOT centerline source file. Also developed tools to assist in the population and checking of centerline segment attributes.



**William M. Morgante, P.W.S.  
Environmental Scientist**



**Project Assignment:  
Environmental Scientist**

**Education:**

M.S. Plant and Soil Science, 2000  
B.L.A. 1981

**Certifications:**

Qualified Professional (Forest  
Conservation Planning) MD/2003  
P.W.S. 2007/Professional Wetland  
Scientist #1712/National

**Years' Experience:**

RK&K: 4  
Other Firms: 19

Mr. Morgante has 8 years of experience as an environmental scientist and 12 years of experience as a landscape architect working for both public and private sector clients. His experience includes varied projects along the East Coast from Massachusetts to Florida and inland to Ohio. Mr. Morgante's projects have focused on wetland delineation and mitigation, ecological restoration and assessment, forest stand delineation, stream restoration, as well as environmental construction monitoring. Representative projects are described below:

**Northern Damascus Park and Ride, Montgomery County, Maryland:** Responsible for the Natural Resource Inventory of an eight acre parcel including a Forest Stand Delineation and a wetland delineation. Forest Stand Delineation followed Montgomery County requirements.

**Maidens Choice Creek Wetland Enhancement Design, Baltimore City, Maryland:** Managed and coordinated design components for complex wetland design involving the enlargement of a one-half acre floodplain area for a degraded urban stream. Design components included water budget analysis, site layout, grading, planting and specifications.

**The Landings, Berlin, Maryland:** Project Manager responsible for designing and the Microstation drafting for a Wetland Mitigation Plan, Widgeon Grass Transplanting Methodology, shoreline canal stabilization, and native landscape plan associated with a 200 unit residential development along a sensitive coastal estuary.

**Lower Mill Creek Basin Greenway Master Plan, Cleveland, Ohio:** Assisted with natural resource inventory and analysis along three miles of an urban stream. Presented initial ecological findings at public meeting. Supported with coordination of design charrette identifying natural resource preservation and enhancement strategies as well as potential greenway trails.

**Loyola College of Maryland Master Plan, Baltimore, Maryland:** Project manager responsible for assembling ecological components for an urban college master plan including resource inventory, analysis, synthesis and design recommendations. Provided ecological principles, goals, and objectives for the master plan. Project issues included incorporation of unnoticed campus stream into campus design, the reduction of impervious surfaces, and removal of exotic invasive plants. Graphics provided in PowerPoint format.

**Towson University Master Plan, Towson, Maryland:** Assisted with field reconnaissance, natural resource inventory, analysis and synthesis for urban college campus master plan. Important issues addressed included impervious surface reduction, exotic invasive plant removal and campus sustainability. Natural resource initiatives and issues provided in PowerPoint format.

**Woodrow Wilson Bridge Reconstruction, Potomac Rive, Maryland and Virginia:** Served as Environmental Compliance Monitor overseeing the enforcement of federal (ACE and EPA) and state (Maryland and Virginia) environmental permits for numerous environmental permits relating to a high profile bridge reconstruction project. Responsibilities included on-site monitoring of dredging operations at the Woodrow Wilson Bridge and monitoring placement of dredged materials in Charles County, Virginia.



**Richard W. Maddox**  
**Natural Resources Group Manager**



**Project Assignment:**  
**Natural Resources Group Manager**

**Education:**  
B.A. Biology/Environmental  
Science, 1982

**Registration:**  
None

**Years' Experience:**  
RK&K: 3  
Other Firms: 20

**Associations:**  
Society for Ecological Restoration  
International Erosion Control  
Association

Mr. Maddox is the manager of the Natural Resources Group at RK&K and an experienced project manager specializing in managing diverse environmental projects. Projects have included over 20 distinct environmental disciplines and roles including: ecological assessments, natural resource permitting, regulatory compliance, mitigation monitoring, stormwater management studies, NPDES permitting, resource agency negotiation, contract specification development, revegetation design, right-of-way negotiations, value engineering review, public involvement, client advocacy, NEPA documentation, and constructability review. His experience includes the following:

**South Wilmington Wetland Park Functional Assessment, Delaware Department of natural Resources and Environmental Control (DNREC), Wilmington, Delaware:** supervising wetlands delineation, wetland functional assessment, well installation and monitoring, coordination with environmental regulatory agencies, and preparation of permit package revisions. Leading the QAQC review of the project

**Middle, East and Lower Stony Run Interceptor Improvements and Stream Restoration Project, City of Baltimore, Maryland:** leading the environmental permitting effort for this \$46M project that includes 8,100 LF of stream restoration, 10,800 LF of interceptor rehabilitation, 4,600 LF of parallel relief sewer, a 20-mgd diversion pumping station and 2,000 LF of force main. Role includes close communication with the US Army Corps of Engineers, and Maryland Department of the Environment, and the coordination of six design firms.

**Stemmers Run Relief Wastewater Pumping Station and Force main, Baltimore County, Maryland:** Supervised coordination with environmental regulatory agencies, and preparation of permit package revisions, including mitigation plans for the 72-mgd relief pumping station, flow diversion structure, 16,200 linear feet of 54-inch force main, and 54-72 inch relief interceptor. Reviewed and revised contract documents and wetland mitigation plans.

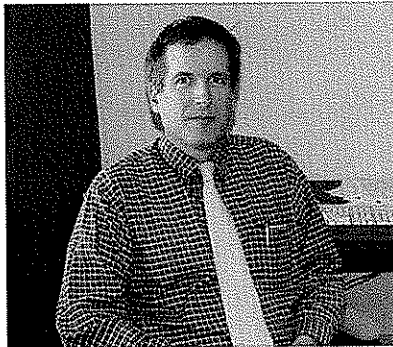
**Stormwater Management Program, Safeway Corporation, Oakland, CA:** Assisted in responding to State storm water regulations for six of Safeway's industrial facilities in Oakland, CA. Conducted site inspections, recommended pollution prevention practices, and developed the Storm Water Pollution Prevention Plans (SWPPPs) and Monitoring Programs.

**I-95 Woodrow Wilson Bridge Replacement Project, Potomac River, VA-MD-DC:** Managed Section 404 permit modifications for wetlands and waters of the U.S. mitigation projects associated with the bridge replacement project. Oversight of the submerged aquatic vegetation (SAV) mitigation commitment including related construction inspection for installation and mitigation monitoring of SAV.

**Edgehill South Drainage Study and Design, York County, VA:** environmental project manager responsible for stream and wetland delineation for a neighborhood drainage study. Work included coordination with the U.S. Army Corps of Engineers and the Department of Environmental Quality for permitting.



**Gregory B. Siegner, P.G.  
 Professional Geologist**



**Project Assignment:  
 Geologist**

**Education:**

B.S. Geology, 1978

**Registration:**

P.G. 1992/ Professional Geologist  
 Hazardous Waste Operations and  
 Emergency Response – General  
 Site Worker Refresher Course,  
 Aerosol Monitoring & Analysis, Inc.  
 (AMA), 2004  
 Hazardous Waste Operations and  
 Emergency Response – General  
 Site Supervisor’s Course, America  
 North/EMCON, Inc., 1992

**Years’ Experience:**

RK&K: 23  
 Other Firms: 7

Mr. Siegner has been involved in planning and performing subsurface investigations, test boring inspection, laboratory analysis, analysis of geotechnical data, and preparation of reports and recommendations for design and construction. He currently serves as the technical lead for contamination, remediation and waste management issues. Mr. Siegner also served for seven years as an environmental project manager during which time he was involved with assessment and corrective action at contaminated sites. He has successfully completed the 40-hour OSHA course. He supervised the site assessments and clean up work at over 100 impacted sites along the Trans Alaska Pipeline from Prudhoe Bay to Valdez. Mr. Siegner served as project manager or project geologist for UST-related site assessments and corrective actions at over 30 service stations in southern California. The following project examples typify Mr. Siegner’s geological/environmental experience.

**Emergency Response During the Accidental Sewage Spill into the Town’s Groundwater Supply, Town of Walkersville, Maryland:** project geologist. In coordination with Dr. Tom Aley of Ozark Underground Laboratory, fluorescein dye was injected into the karst aquifer to track the contaminant plume migration. The dye concentration was monitored from water wells, springs, and streams throughout the town. The persistent dye provided a reliable marker that served as the primary water quality indicator after the index bacteria life span had expired. The plume was tracked as it passed the town water supply wells and moved downgradient sufficiently for public groundwater consumption to resume. Project completed.

**Crabbs Branch Stormwater Management Facility Stability Analysis, Montgomery County, Maryland:** project geologist for geotechnical investigation of 1,200-foot long earth dam with a busy county roadway along the dam crest. Performed rapid-turnaround field investigation of unconfined groundwater migration through the dam embankment and laboratory analysis of unusual erosion features. Determined that dam integrity was not at risk and prepared recommendations for corrective action of erosion problems.

**Stemmers Run Relief Wastewater Force Main, Baltimore County, Maryland:** RK&K’s design efforts included a construction dredging investigation for the 54-inch force main crossing of Back River. RK&K was responsible for regulatory liaison with the United States Army Corps of Engineers (USACE), as well as state and county environmental regulators; planning and completion of environmental characterization of the clay sediments along the 2,000-foot long crossing for disposal. The investigation included Vibracore sampling to depths of 20 feet and laboratory analysis of sediment and surface water. The report of findings will be used by the regulatory agencies to evaluate upland and tidal disposal proposals.

**Belair Road Transmission Main, Baltimore County, Maryland:** Project geologist for Environmental Site Assessment (ESA) as part of the design for 9,500 foot or 24-inch water main for Baltimore County DPW. The assessment included review of MDE files for contaminated sites adjoining the alignment. Prepared recommendations for management and disposal of petroleum-contaminated soils excavated during construction.

**South Capitol Street Transportation Study, D.C.:** Project geologist for assessment of contaminated site issues for the ongoing Environmental Impact Statement preparation for DDOT. Mr. Siegner is responsible for preparation of the Preliminary Environmental Screening Assessment technical report that summarizes contaminated site issues and potential impacts to the transportation design alternatives.

# Baltimore Raw Water Management Study

## Baltimore, Maryland

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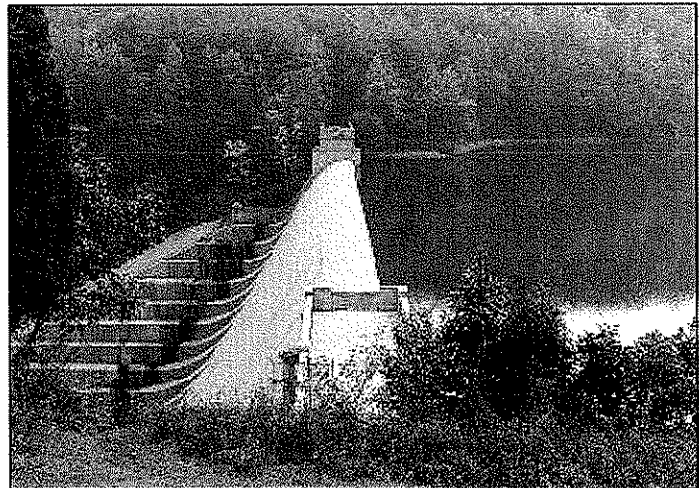
### *Introduction*

The Baltimore Metropolitan Water System receives raw water supply from three river sources: the North Branch of the Patapsco River, Gunpowder River and the Susquehanna River. The North Branch of the Patapsco River is impounded by the Liberty Dam and has a capacity of 43 billion gallons (bg). The Gunpowder River has two impoundments, Loch Raven Dam and Prettyboy Dam, having a combined capacity of 43 bg. The Susquehanna River is currently a standby source, only used when the elevation of the reservoirs drop. In the future with the construction of the new Fullerton Water Treatment Plant, this source will be used on a full-time basis. Recent agreements between the City of Baltimore and the Susquehanna River Basin Commission (SRBC) limit the amount of water the City can use, especially during drought conditions.

### *Engineering Services*

This study was conducted under the Comprehensive Plan for Water Facilities project. The purpose of the study was to develop and analyze alternative management strategies of the City's raw water sources and minimize the impacts of the recently imposed SRBC restrictions.

In order to fully evaluate the operations and hydraulics of Liberty, Loch Raven and Prettyboy Reservoirs in conjunction with the Susquehanna supply source, extensive computer programming was required to develop a project specific computer model for analyzing alternative reservoir management strategies. The computer program, designated as "RESMODEL", incorporated 63 years of historic streamflow data, system demands, electric power rate schedules, alternative reservoir withdrawal parameters as well as all pertinent pumping, transmission and treatment facility data. The program was operated under various alternative operating scenarios to simulate the coordinated operation of all raw water supply sources in conjunction with the hydraulics of the respective treatment, pumping and transmission facilities. The program identified anticipated reservoir fluctuations, pumping costs and treat-



ment capacity requirements over a 63-year duration under current year and projected year 2025 system demands. An added feature of the program was the ability to plot the results showing water levels in the reservoirs over the study period of record.

As a result of utilizing the "RESMODEL" computer model, RK&K was able to specifically identify the operational and financial impacts of the SRBC withdrawal restrictions to Baltimore City and devise an alternative operational strategy that minimized added pumping costs and ensured sufficient raw water reserves during the most severe record drought conditions.

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Client: City of Baltimore Department of Public Works  
Cost: \$735,000 (Fee)  
Date: 2001





# Comprehensive Plan for Water Facilities, Phase 1

## Baltimore, Maryland

### Introduction

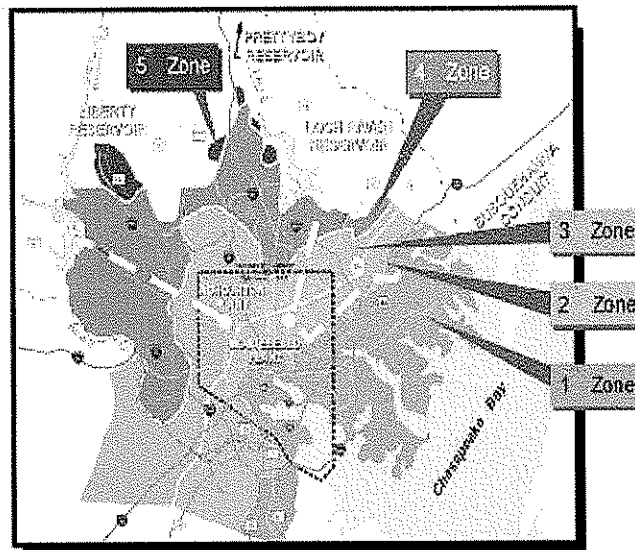
The project scope of the Comprehensive Plan for Water Facilities encompassed virtually all facets related to the supply of drinking water from "source to tap" with the primary focus being on those aspects related to water quality. Specifically, this project involved performing facility evaluations and developing recommended improvements for Baltimore's source watersheds, dams, raw water transmission mains, treatment facilities, finished water storage, distribution, pumping and rechlorination facilities. The project also involved development and implementation of operator training and certification programs and Capital Improvement Program (CIP) review and recommendations.

### Engineering Services

A list of recommendations was presented in the plan that have been formulated into capital improvement projects and initiatives. These projects and initiatives are needed to replace aging facilities, maximize water quality throughout the system, maintain compliance with the requirements of the Safe Drinking Water Act, and improve plant operation, maintenance and training activities. This list of projects was distilled from the multitude of findings and recommendations contained in the nine volumes of the plan:

- Volume 1 Modernization Report
- Volume 2 Regulatory Compliance Report
- Volume 3 Water Treatment Facilities Baseline Evaluation Report
- Volume 4 Computerization Report
- Volume 5 Water Treatment Facilities Operations Assessment Report
- Volume 6 Plant Scale Testing Report
- Volume 7 Pilot Testing Report
- Volume 8 Watersheds and Raw Water Reservoir Assessment Report
- Volume 9 Finished Water Facilities Assessment Report

The area of particular importance, and greatest impact, was the evaluation of Baltimore's three water treatment facilities: Montebello Filtration Plants 1 and 2 and the Ashburton Filtration Plant. These facilities have a combined treatment capacity of about 465 mgd. Detailed performance evaluations were completed for each treatment unit process to identify those "performance limiting factors" that



directly impact plant operations and water quality. The facilities were also evaluated to determine their ability to comply with all current and future water quality regulations including Stage I and II of the Disinfection/Disinfectant By-Product Rule (D/DBPR).

The overall approach to the facility evaluations involved identifying immediate, short- and long-term improvements required to ensure regulatory compliance, as well as optimize plant performance. An important factor influencing the selection of improvement alternatives was the ability of the existing facilities and administration to accommodate such changes. The goal of the recommended improvements was not to simply comply with the water quality regulations, but to achieve the best quality water economically and practically possible.

On-site bench and pilot scale testing was utilized to evaluate the performance of existing plant operations as well as alternative treatment technologies. Recommended immediate improvements included installation of individual filter turbidimeters, various filter control modifications and enhancements to existing backwash and filter media schemes. The primary challenge under short-term evaluations was reducing the formation of chlorinated disinfection by-product levels to below acceptable limits of the proposed Stage I D/DBPR without performing major capital improvements. Long-term improvement evaluations considered conventional filtration with ozone, direct filtration with ozone and microfiltration (Membranes). Biologically Active Filtration (BAF) was evaluated under a variety of alternative filter schemes using anthracite, sand and Granular Activated Carbon (GAC).

Client: City of Baltimore Department of Public Works  
Cost: \$3.5 Million (Engineering Fee)  
Date: 1998



# City of Charlottesville GIS

## Charlottesville, Virginia

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### *Introduction*

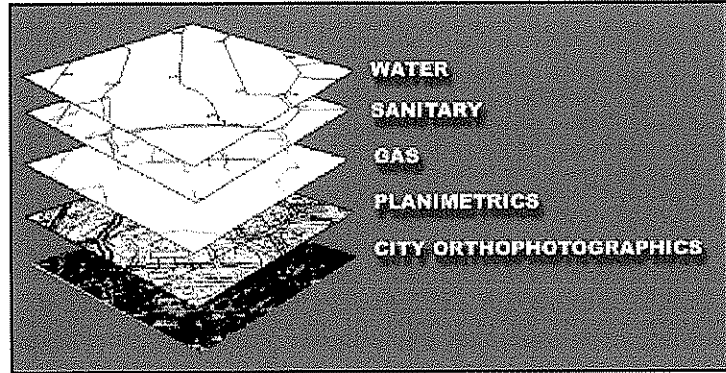
Following a qualifications-based professional services procurement process, the City of Charlottesville Department of Public Works (DPW), having responsibility for water, sewer and gas utilities along with road and building maintenance, awarded RK&K a contract to provide complete implementation services for a GIS for use by DPW, city engineer, city planner and the surrounding county's water and sewer authority.

### *GIS Services*

Services included conducting a needs analysis, basemap creation, utility GIS layer development (water, sanitary sewer, storm sewer and gas), cadastral mapping, database georeferencing and the development of a gas distribution network model.

The needs analysis was conducted with interviews of representatives from all city departments, Albemarle County, University of Virginia (whose campus is in Charlottesville), Albemarle County Service Authority, regional planning agencies and utility companies including electric, telephone and cable. The resulting report identified sources of data, required applications, suggested hardware/software solutions, departmental responsibilities for maintenance of data and possible additional users of the system.

RK&K's joint venture partner, Air Survey Corporation, supported the effort by developing landbase information. This included the establishment of new high accuracy horizontal and vertical control; acquisition of aerial photography for approximately 72 square miles; analytical triangulation; development of 1"=100' planimetric base maps; digital elevation model; and one-foot resolution digital orthophotographic image files.



To complete the implementation of GIS, RK&K scanned the City's original 24" x 36" gas, water, sewer, storm drain and cadastral maps. These maps were converted to vector based AutoCAD files and the attribute data was attached to files utilizing ESRI's ArcCAD GIS software. The digitized AutoCAD files were adjusted to match photogrammetry and features field verified using Global Positioning System (GPS) equipment. The resulting ArcView GIS dataset represents the local public facilities/utilities in the City of Charlottesville and a portion of Albemarle County.

Using the newly generated ArcView gas data, RK&K developed a B<sup>3</sup> GasWorks model of the City's gas distribution network. The input data for the model was extracted directly from the ArcView gas dataset, and RK&K provided utilities and documentation to enable gas model results to be imported back into the ArcView gas dataset for display and additional analysis.

RK&K also provided operation user and administration manuals, custom programming and applications development, training and hardware integration and installation associated with the GIS implementation.

The entire project was completed within 18 months of contract initiation at a cost that was 40% below that projected by an independent consultant. The system is currently fully operational and is maintained by existing City personnel.

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Client: City of Charlottesville Department of Public Works  
Fee: \$601,000  
Date: 1996



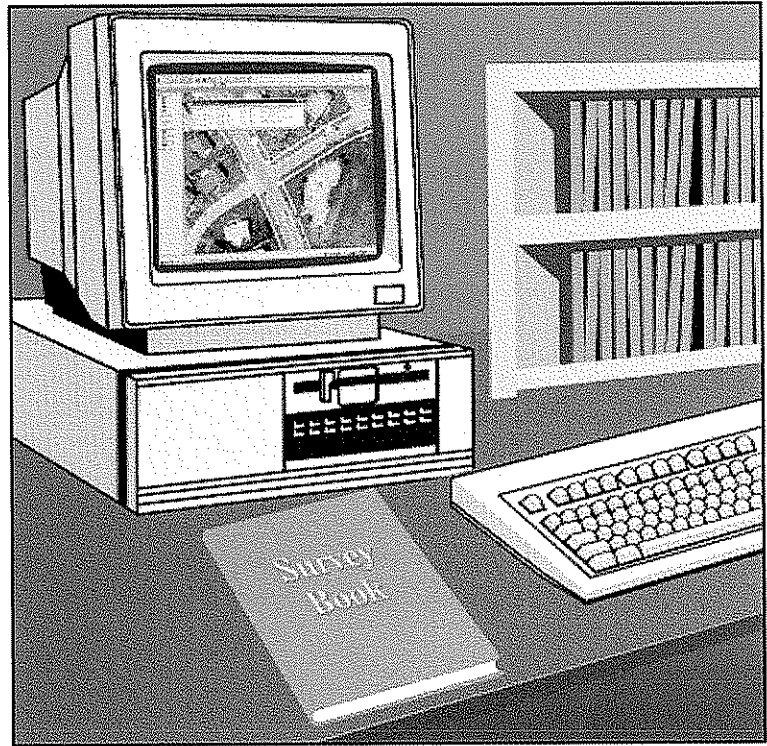
# GIS-Based Survey Management System

## Statewide – Maryland

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### *GIS Services*

Under an open-end contract for metes and bounds plats preparation with the Plats and Survey Division of the Maryland State Highway Administration, RK&K performed a needs analysis and cost justification for the establishment of a GIS-based system to maintain and index the office's collection of 35,000 survey field books dating into the late 1800's. RK&K conceptualized and developed a pilot project to demonstrate the use of GIS technology using ESRI's ArcView software. The pilot application provided the functionality to locate, both visually and by keywords, surveys that were performed by the State for over 100 years. This application significantly reduces the time and complexity of the research/retrieval process necessary to identify the survey field book numbers and pages associated with surveys in the user-specified area. Incorporated in the resulting ArcInfo-based system was data from the National Geodetic Survey to identify survey control monumentation throughout the state. RK&K provided custom programming to incorporate the new system with current drafting/management practices.



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Client: Maryland State Highway Administration  
Fee: \$400,000  
Date: 1998



# Maryland Office of Planning GIS

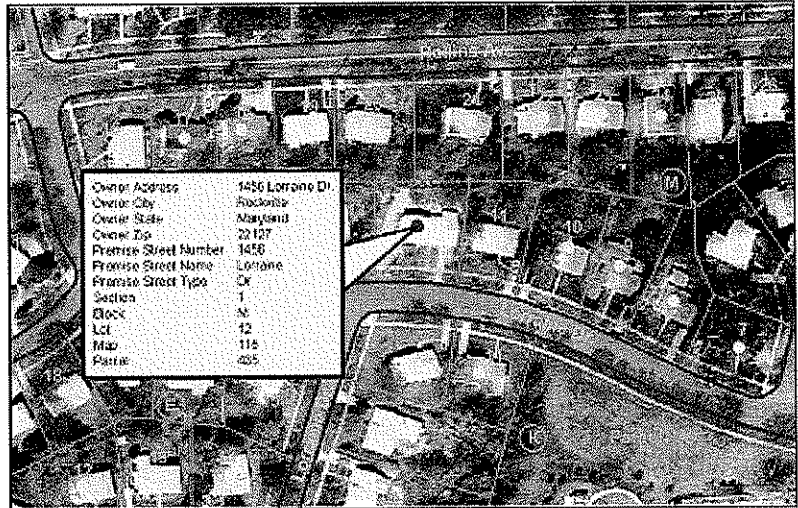
## Statewide -- Maryland

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### GIS Services

The State of Maryland's project for the Maryland Office of Planning and Department of Assessments and Taxation (DAT) was completed in July of 1996 and involved a four-year effort. Following budget reductions in 1991, the DAT was forced to absorb a 2/3 cut in its cartographic staff, reducing the workforce of 51 cartographers to 17. The staff was responsible for the development and maintenance of nearly 2,800 parcel maps statewide which depicted the location of property boundaries for the nearly 2 million parcels in the state. The Maryland Office of Planning (MOP) was interested in continuing to maintain this state resource in a format that was compatible with the new GIS effort, with the intent of linking the DAT attribute database containing hundreds of fields of data related to each parcel with the proper location of the parcel in the state. RK&K's GIS division was commissioned to conduct a multi-agency study to determine the potential and cost associated with development of a system to modernize these maps through computerization. The resulting report suggested a PC-based networked AutoCAD/ESRI-based system that involved scanning the property maps and maintaining the resulting map image in a hybrid raster/vector format linked to the DAT database. The cost of implementing this system was projected by RK&K at approximately 40% below the cost estimated by the State.

Through a competitive bid process, RK&K was subsequently awarded a contract to implement the recommended solution. The cost of implementation was slightly below the original projection of RK&K due to the decreased cost of technology. The PC-based system is now completely implemented throughout the State, and the resulting computerized parcel maps tied to DAT data are currently marketed by MOP to other state agencies, counties, municipalities and other interested parties. The resulting revenue from these ventures is used to support the continued maintenance of the digital product. This project was named "Technological Achievement of the Year" in Maryland in 1994 by the governor.



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Client: Maryland Office of Planning and Department  
of Assessments and Taxation  
Fee: \$600,000  
Date: 1996



# Water Utility GIS Data Automation

## Baltimore, Maryland

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### *Introduction*

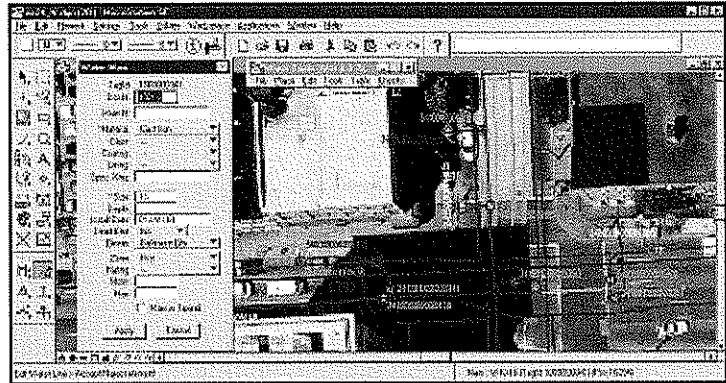
RK&K was awarded the contract for the automation of the Baltimore City Department of Public Works' water utility maps and records. The Utility GIS Automation project allowed water network management and maintenance to become easier and more efficient. The primary objective of this project was to replace the existing and inaccurate 100-scale water plat paper maps with an ArcInfo coverage and ArcStorm database layer of the water system for the entire 92 square miles of the City. A secondary objective of the project was to preserve the City's aging paper water records and documents. To this end, RK&K used high-speed scanning equipment to collect and then catalog the 26,000 existing utility paper maps and engineering documents.

### *Engineering Services*

RK&K worked with the City, and other automation consultants, to establish a database design; automation and annotation specifications encompassing the water distribution network; sanitary and storm sewers; and conduit utilities. These design specifications, while very detailed and specific, were developed with a common thread between the utilities to allow them to work together.

RK&K GIS technicians and engineers, using the digital library of City water documents and field surveys, vectorized all water utility infrastructure features such as mains, valves, hydrants, meters, service lines, tanks, pumps, reservoirs and cathodic protection features into MicroStation CADD design files.

An RK&K custom designed and developed MicroStation MDL application provided a link between the water feature graphic elements within the design file and the Oracle database containing the water feature attributes, enabling users to place and attribute features efficiently. This application also incorporated a series of 150 custom QA/QC routines to



analyze both the topologic network and associated attribute data to ensure consistency and accuracy throughout the dataset.

Final deliverables included the water network as an ArcInfo coverage ready for use with ArcStorm, Oracle export files containing the water feature attribute tables and 2,200 40-scale paper check plots and mylar plots of the network.

RK&K is currently developing a hydraulic model of the entire Baltimore water system, containing all mains 8 inches and larger. A GIS dataset of the water network outside of the City was incorporated with the 750,000 water features within the City limits. This combined GIS dataset is being integrated with the Cybernet water model from Haestad Methods. RK&K analysts and programmers have developed the functionality to calculate and apply the nodal water demands to the model from information directly from the water meter readings from the City's own utility billing database.

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Client: City of Baltimore Department of Public Works  
Fee: \$2.7 Million  
Date: 1999



# Susquehanna River Withdrawal Study

## New York, Pennsylvania and Maryland

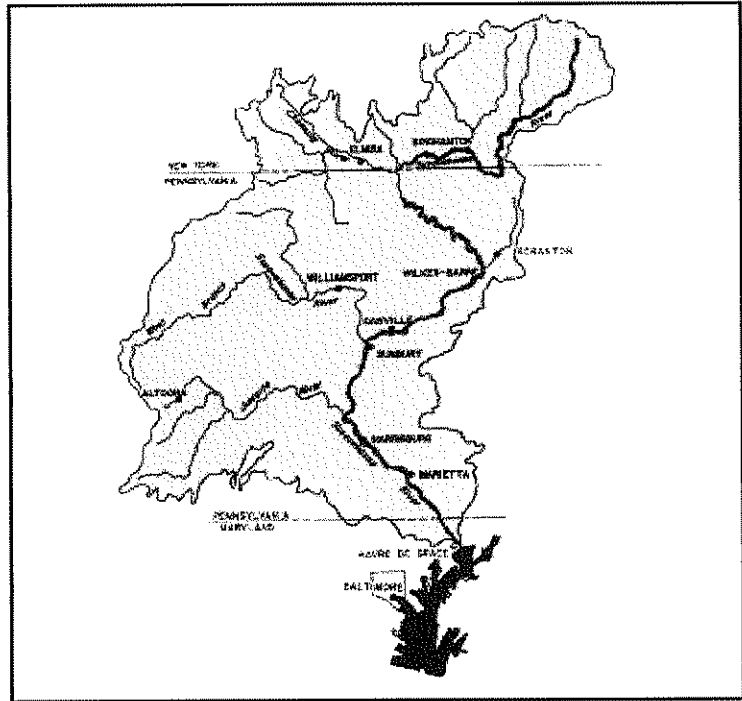
### Introduction

The Baltimore Metropolitan Water System receives raw water supply from three river sources: the North Branch of the Patapsco River, Gunpowder River and the Susquehanna River. The North Branch of the Patapsco River is impounded by the Liberty Dam and has a capacity of 43 billion gallons (bg). The Gunpowder River has two impoundments, Loch Raven Dam and Prettyboy Dam, having a combined capacity of 43 bg. Earlier studies performed by RK&K determined the safe yields of the Liberty, Loch Raven and Prettyboy Reservoirs to be 93, 101 and 46 mgd, respectively. During periods of low stream flows in the North Branch Patapsco and Gunpowder Rivers, raw water supply to Baltimore is supplemented by pumping Susquehanna waters from an intake just upstream of the Conowingo Dam. Agreements between the City of Baltimore and the Susquehanna River Basin Commission (SRBC) historically allowed for withdrawal rates of up to 250 mgd; however, restrictions and rate charges imposed by the SRBC made the Susquehanna source less reliable and more costly.

### Engineering Services

The overall purpose, therefore, of the Susquehanna River Withdrawal Study was to develop and analyze alternative management strategies of the Patapsco, Gunpowder and Susquehanna raw water sources to minimize the impacts of the added restrictions and costs imposed by the SRBC.

In order to fully evaluate the operations of Liberty, Loch Raven and Prettyboy Reservoirs in conjunction with the Susquehanna supply source, extensive computer programming was required to develop a project specific computer model for analyzing alternative reservoir management strategies. The computer program, designated as "RESMODEL", incorporated 63 years of historic streamflow data, system demands, electric power rate schedules, alternative reservoir withdrawal parameters as well as all pertinent pumping, transmission and treatment facility data. The program was operated under various alternative operating



scenarios to simulate on a weekly basis the coordinated operation of all raw water supply sources in conjunction with all respective treatment, pumping and transmission facilities. The program identified anticipated reservoir fluctuations, pumping costs and treatment capacity requirements over a 63-year duration under current year and projected year 2025 system demands. An added feature of the program was the ability to plot the results showing water levels in the reservoirs over the study period of record.

As a result of utilizing the "RESMODEL" computer model, RK&K was able to specifically identify the operational and financial impacts of the SRBC withdrawal restrictions to Baltimore City and devise an alternative operational strategy that minimized added pumping costs and ensured sufficient raw water reserves during the most severe record drought conditions.

Client: City of Baltimore Department of Public Works  
Cost: \$90,000  
Date: 1995



# WSSC's High and Dependent Zones Water Facility Plan

## Prince George's County, Maryland

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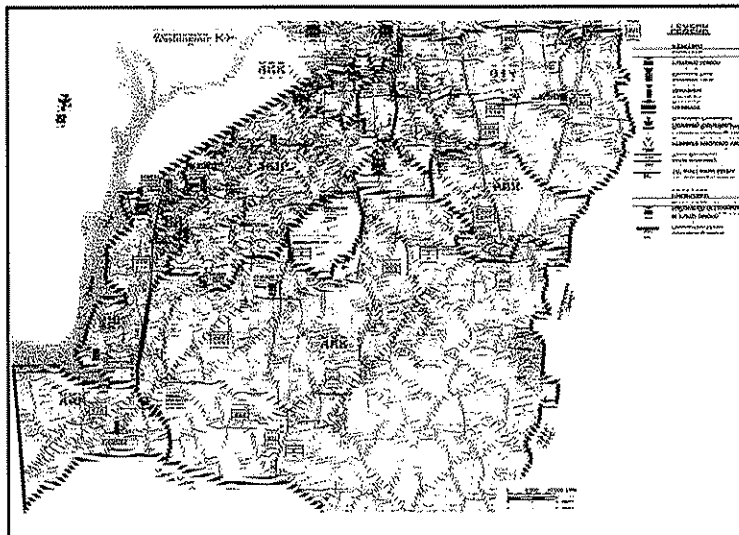
### *Introduction*

The project included preparing a facility plan for evaluating Prince George's County's water supply, transmission and storage facilities requirements for the southern two-thirds of Prince George's County to accommodate future 30-year water system demands.

### *Engineering Services*

The project included projection of future water demands; determination of existing system capacity to satisfy present and future demands by analytical methods and computer modeling; identification of system deficiencies in water supply, transmission and storage; development of improvement alternatives to eliminate hydraulic deficiencies; alternative evaluation based on cost, environmental and phased-construction concerns; preliminary engineering and cost estimate of a detailed plan for implementation of the selected alternative; and preparation of a study report. The hydraulic analysis was performed using RK&K's version of the KYPIPE computer program. The transmission system in the study area was also analyzed for surge conditions using the University of Kentucky "SURGE" computer program. As a part of the hydraulic system analysis required for this project, an investigation was performed to determine supply capability of Project 80 mains feeding the project study area from Montgomery Main Service Zone. Proposed alternatives to eliminate transmission deficiencies in the project study area system included new mains ranging from 16- to 36-inches in diameter.

The study also involved a selection of sites for proposed water storage facilities (storage deficiencies identified total 30 mg, elevated tank sites investigated number 24, tank sizes range from 1.5- to 4.0-mg each). An evaluation of the impacts of the facilities as well as proposed transmission mains on the natural and human environment at the facility site and along transmission main alignments was also required. A carefully developed public participation plan was initiated to encourage input from the project citizenry in developing preferred alternative systems and to mitigate adverse public opinion.



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Client: Washington Suburban Sanitary Commission  
Cost: \$728,000 (Engineering Fee)  
Date: 1996



# Comprehensive Plan for Water Facilities, Phases 1 and 2

## Baltimore, Maryland

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### Introduction

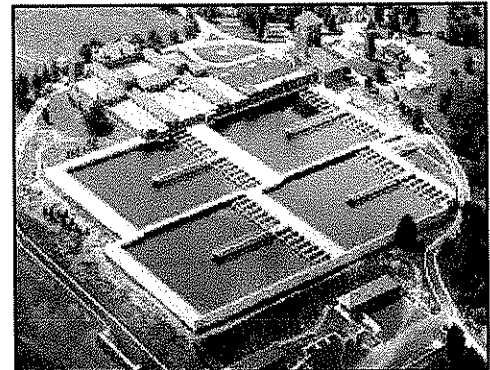
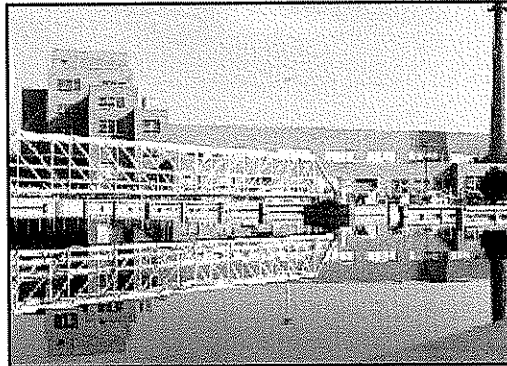
The project scope of the comprehensive plan for water facilities encompassed virtually all facets relating to the supply of drinking water from "source to tap." The project had two phases with the first one consisting of facility evaluations for Baltimore's source watersheds, dams, raw water transmission mains, treatment facilities, finished water storage, distribution, pumping and rechlorination facilities. The second phase involved updating the city's master water plan and developing a hydraulic model.

The Baltimore water system encompasses an area of approximately 300 square miles and serves roughly 1.8 million people across four political jurisdictions. The City's system includes three raw water reservoirs, three water filtration plants, 23 finished water pumping stations, 25 finished water storage tanks, seven open finished water reservoirs, ten remote chlorinator stations, and approximately 4,500 miles of distribution mains ranging in size from 4 to 108 inches in diameter.

### Engineering Services

A list of recommendations was presented in the plan that have been formulated into capital improvement projects and initiatives. These projects and initiatives are needed to replace aging facilities, maximize water quality throughout the system, maintain compliance with the requirements of the Safe Drinking Water Act, and improve plant operation, maintenance and training activities. This list of projects was distilled from the multitude of findings and recommendations contained in the nine volumes of the plan:

- Volume 1 Modernization Report
- Volume 2 Regulatory Compliance Report
- Volume 3 Water Treatment Facilities  
Baseline Evaluation Report
- Volume 4 Computerization Report
- Volume 5 Water Treatment Facilities  
Operations Assessment Report
- Volume 6 Plant Scale Testing Report
- Volume 7 Pilot Testing Report
- Volume 8 Watersheds and Raw Water  
Reservoir Assessment Report
- Volume 9 Finished Water Facilities Assess-  
ment Report



The facility evaluation of the City's three water treatment facilities was of particular importance and had the greatest impact under the Phase 1 study. Immediate, short- and long-term improvements required to ensure regulatory compliance, as well as optimize plant performance, were identified. Improvements were recommended not simply to comply with the water quality regulations, but to achieve the best water economically and practically possible. On-site bench and pilot scale testing was utilized to evaluate the performance of existing plant operations as well as alternative treatment technologies.

Under Phase 2, a master plan for the entire metropolitan area water distribution system was developed. In order to complete this, a hydraulic model was developed using the WaterCAD modeling software package by Haested Methods. As part of this phase, RK&K updated population and system demand projections; completed a storage needs analysis; performed a raw water management evaluation; conducted field testing; constructed, calibrated and evaluated the hydraulic model; performed vulnerability assessment; assisted with lead and copper rule compliance; and prepared the City's inaugural Consumer Confidence Report. The ultimate goal of this phase was to provide the framework for all necessary hydraulic and operational improvements through the year 2025.

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Client: City of Baltimore Department of Public Works  
Cost: \$4.2 Million (Fee)  
Date: 2002





# North East Water System Study

## Cecil County, Maryland

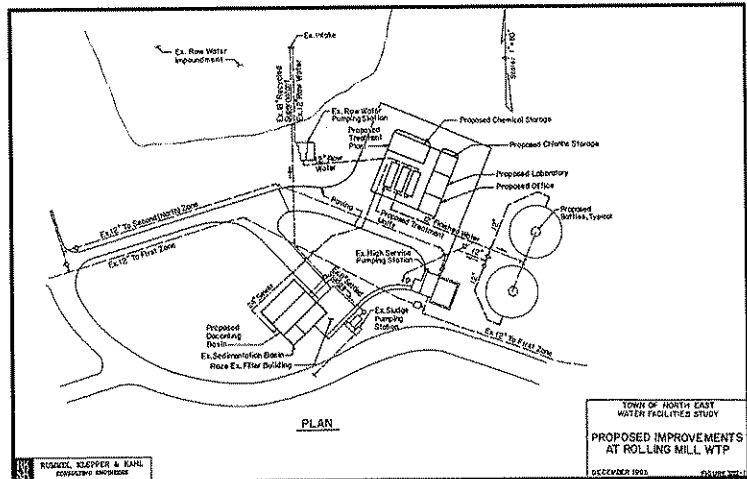
### Introduction

The Town of North East, located in Cecil County, Maryland, owns a water supply system that serves nearly 4,200 customers located both within and outside the Town limits. The water system consists of two water treatment plants, three elevated storage tanks, a ground storage reservoir and water transmission/distribution system. Of the three elevated tanks, one tank is primarily used to serve the John F. Kennedy service area located on I-95. The two treatment plants, Rolling Mill and Leslie, experienced operational difficulties leading to water quality concerns for the Town as well as the Maryland Department of the Environment (MDE). Most important, the Rolling Mill WTP consistently failed to comply with various provisions of the 1986 Amendments to the Safe Drinking Water Act (SDWA). The structural condition of one of the elevated storage tanks, the Mauldin Avenue Tank, had severely deteriorated and a completed inspection report for this tank indicated extreme need to replace this tank as soon as possible.

The Town's water distribution system consists of four water service zones. The First and Second Service Zones are primarily served by the Rolling Mill WTP. The Leslie WTP serves the Third and Fourth Service Zones. The Leslie WTP has served all four service zones on occasion. However, the Rolling Mill WTP does not have capability to serve the Third and Fourth Service Zones if the Leslie WTP is out of service.

### Engineering Services

The purpose of this study was to evaluate the existing water system and prepare a preliminary design report to present a rational and orderly approach for expansion of the water system over the next 20 years keeping pace with regulatory requirements and anticipated increases in demand. The scope of work included population and water demand projections for the service area;



hydraulic analyses of the existing water system to identify flow and pressure problems; identification of improvements required for the water system to meet future demands; evaluation of the water treatment plants regarding regulatory compliance, raw water source capacity, operation and maintenance as well as staffing requirements; and preparation of the report.

Client: Town of North East  
Cost: \$27,250  
Date: 1996



# Lonaconing Water System Study and Design

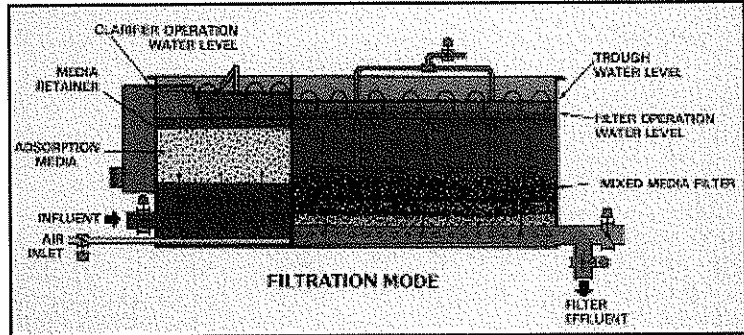
## Allegany County, Maryland

### Introduction

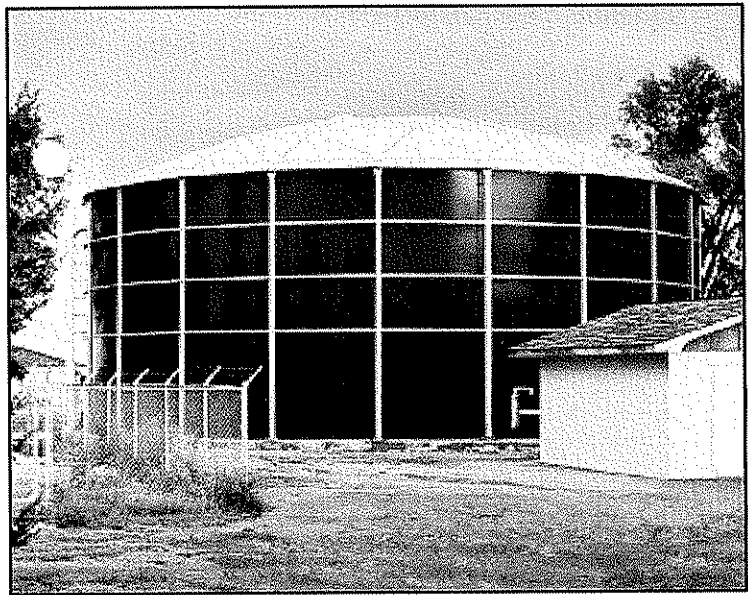
RK&K was responsible for the planning, design and construction management for three package water treatment plants to serve three small communities in Allegany County.

### Engineering Services

The project included identification of suitable locations for the proposed water treatment plants in the vicinity of each existing raw water reservoir, determination of the capacity of each of the proposed ground water storage tanks for installation on the site of each water treatment facility and evaluation of system hydraulics. Each of the four 100-gpm package water treatment plants included a finished groundwater storage tank and backwash waste holding tank. The Midland-Gilmore plant has a 500,000-gallon tank, Koontz Run has a 300,000-gallon tank and Charlestown has a 200,000-gallon tank. Storage tanks supply potable water to the Lonaconing water distribution system which provides water for filter backwash and for the plant water system. The backwash waste holding tanks are used to remove and concentrate the waste solids using sedimentation. In conjunction with the water treatment plant project, 10,000 linear feet of ten-inch raw water main was rehabilitated and/or replaced and 14,000 linear feet of eight-inch finished water main was installed.



Trident<sup>®</sup> Water Treatment Unit



Water Storage Tank

Client: Allegany County Department of Public Works  
Cost: \$3,200,000  
Date: 1993



# Water System Facility Study

## Rockville, Maryland

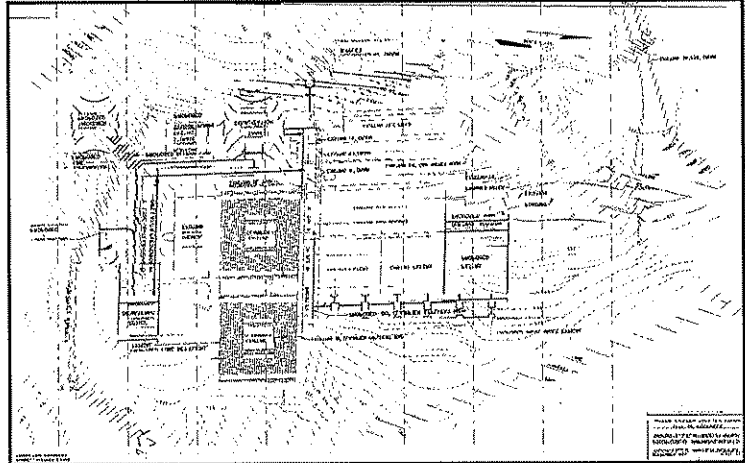
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### *Introduction*

The purpose of the investigation was to verify the adequacy of the water supply, treatment, transmission and storage system elements to accommodate future 20-year system demands; make recommendations to eliminate the identified deficiencies; and assess impacts of the 1986 Safe Drinking Water Act Amendments on the existing process train.

### *Engineering Services*

The investigation included development and evaluation of water treatment plant unit processes to satisfy system water demands and water quality requirements. Site development plans were prepared for proposed new unit processes. The study also included an investigation of various alternatives for disposal of the treatment plant residuals and wash-water. The alternatives considered for dewatering and disposal of alum sludge included: (1) seasonal shutdown of the Rockville plant during Potomac River low flow periods with purchase of finished water from WSSC and interim discharge of untreated plant sludge and backwash water to the Potomac River when river flows exceed the minimum flow rate set by the State of Maryland; (2) continuity of the Rockville plant operation, multicellular lagoon storage of residuals during Potomac River low flow periods and wastewater supernatant blended with raw water supply for recycle through Plant; (3) plant residuals and backwash water to equalization tank and thence at a controlled flow rates to Blue Plains Wastewater Treatment Plant; and (4) plant residuals to equalization tank, a thickener and thence to a residual dewatering station at controlled flow rate. Residual dewatering devices considered included sand drying beds, centrifuge, plate filter press, belt filter press and vacuum filter. For the disposal of residuals, landfilling and alum regeneration and re-use were investigated. A cost analysis was performed for all alternatives. The final recommendation was to dewater alum residuals using plate filter press, recycle the filtrate and landfill the sludge cake.



During the study, the required capacity of the water system in the year 2010 was determined at 14 mgd by projecting population, daily and maximum day demand from the historical data. A staged construction plan was developed to incorporate the proposed improvements based on hydraulic and fiscal considerations.

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Client: City of Rockville Department of Public Works  
Cost: \$213,000 (Engineering Fee)  
Date: 1990



# Comprehensive Plan for Water Facilities

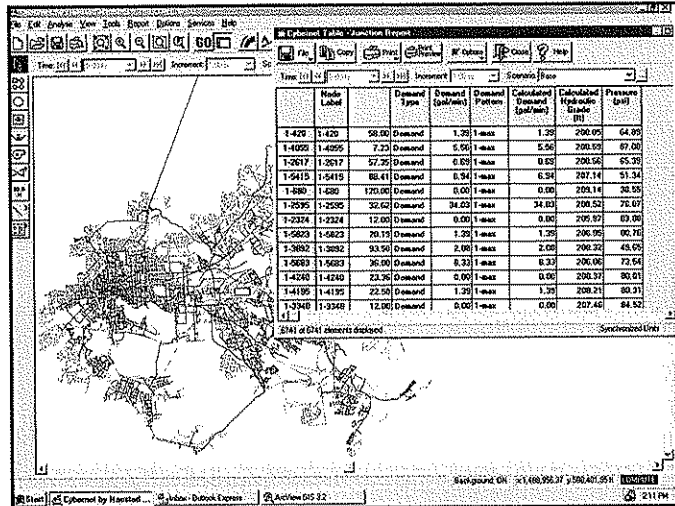
## Baltimore, Maryland

### Introduction

The project scope of the Comprehensive Plan for Water Facilities encompassed virtually all facets related to the supply of drinking water from "source to tap" with the primary focus being on those aspects related to water quality. Specifically, this project involved performing facility evaluations and developing recommended improvements for Baltimore's source watersheds, dams, raw water transmission mains, treatment facilities, finished water storage, distribution, pumping and rechlorination facilities.

As part of the Comprehensive Plan, RK&K performed a watershed Contaminant Source Inventory (CSI) and susceptibility analyses for the Loch Raven, Prettyboy and Liberty Reservoirs. Together, these three reservoirs have a drainage area of over 460 square miles and are the primary source of drinking water for approximately 1.8 million customers of the Baltimore metropolitan area. One of the primary objectives of the investigations was to summarize existing and potential point sources of contamination within the Loch Raven, Prettyboy and Liberty Watersheds as well as to assess the potential risk to the quality of the raw water from the contamination sources.

RK&K performed the CSI by compiling and supplementing as necessary all available existing information from a variety of Federal, State and local agencies into a Geographic Information System (GIS) format. Some of the contaminant sources included in the inventory were owners and locations of Aboveground Storage Tanks (AST) and automotive businesses, community right-to-know facilities that store, use or produce threshold amounts of hazardous materials under Superfund Authorization and Amendment Act (SARA), Registered Underground Storage Tank (UST) owners and locations, CERCLA sites, NPDES sites, landfill sites, sewage sludge disposal sites, spills, sinkholes and hazardous waste generators among others.



A final report was generated detailing the location of all potential contaminant sources as well as recommendations for improvements to the existing regional source water protection program.



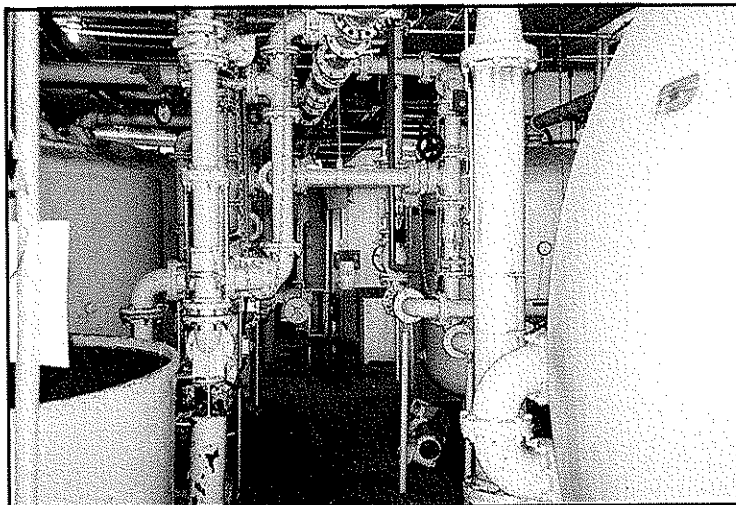
# Water Emergency Response and Treatment Plant Upgrade

## Frederick County, Maryland

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### *Introduction*

The Town of Walkersville in Frederick County, Maryland retained RK&K to provide monthly operational assistance to their water plant operators. The Town operates a groundwater treatment facility under the influence of surface water. The water system includes three wells, ferric chloride coagulation, pressure filtration, ion exchange softening and nitrate removal, fluoridation, chlorine disinfection and three high service pumps. While these services were provided, the Town experienced the ultimate water utility nightmare; their water supply source was contaminated with approximately one million gallons of raw sewage from a sewer main break.



### *Engineering Services*

RK&K assisted the Town in responding to this event in numerous ways. RK&K immediately recommended a groundwater monitoring program including dye trace studies and sampling for groundwater contaminants, sewage indicators and surrogates. A groundwater extraction program was implemented in order to expedite the removal of the contamination. RK&K also evaluated the feasibility of emergency treatment and water supply alternatives, as the Town's plant was removed from service due to the contamination from the sewage spill. Alternatives evaluated included portable nanofiltration, cartridge filtration and a temporary connection to the City of Frederick Water System. While the Town was connected to the City's supply, RK&K performed a detailed investigation of the Town's water plant and recommended modifications to the existing plant including an upgrade of the existing pressure filters, chemical feed system, data management and remote alarm systems. RK&K also designed an absolute, one-micron cartridge filtration system used as a backup in the event of future contamination events. During this time, RK&K attended numerous public meetings and press conferences to inform the public of the events that transpired and to provide technical information on the planned treatment plant upgrades.



Finally, RK&K prepared Standard Operating Procedure (SOP) Manuals for the Town's plant and conducted training sessions with the Town's operators. Training was provided for each unit process as well as for the Town's data management and alarm system.

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Client: Town of Walkersville  
Cost: \$125,000  
Date: 1999



# Rock Ridge Estates Water Appropriation Permitting and Contamination Investigation

## Cecil County, Maryland

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### *Introduction*

CEM performed a complete contamination investigation and provided water supply development services for this proposed residential development on individual well and septic fields in Cecil County.

### *Project Scope*

The site was characterized by a poor aquifer, and there was extensive and organized local opposition to the project. Several high-yield wells were sited using innovative geophysical techniques, and were successfully brought into full production. A thorough resource impact analysis was conducted, and the results of the entire investigation were presented at a public hearing held by the Water Management Administration of the Maryland Department of the Environment. Based on the analysis and testimony, a water appropriation permit was granted by the State for the full amount requested by the client.



CEM also prepared an environmental site assessment for the property, for which the results of the investigation were used to fulfill the *Due Diligence* requirements necessary for the "Innocent Landowner Defense" provisions of the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund.

These services include reviewing existing county, state, and federal government records and databases for the project study area. The results of the database searches were summarized, tabulated and presented in a report.

CEM documented the environmental setting of the project area by describing the geology, topography, and general groundwater flow. CEM also documented land use activities within the project area, and acquired database map files from EDR services to review past and present aerial photographs, property maps, deeds, zoning maps, and landowner interviews.

CEM used the latest Trimble ProXL Global Positioning System (GPS) to quickly and accurately capture the attributes and GPS position of the locations, geographic points, lines and areas for the project. The use of GPS eliminated the need for cumbersome field logging, as well as duplication of effort resulting from traditional surveying after the assessment

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### **Chesapeake Environmental Management, Inc.**

Client: First Land Management, Inc.  
Cost: \$22,000  
Date: 2001

# Capon Bridge Technology and Industrial Park

## Capon Bridge, West Virginia

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### **Introduction**

The Capon Bridge Technology and Industrial Park project is being developed by the Hampshire County Development Authority as a high technology business park for Hampshire County. The \$2 million dollars project is being funded by Appalachian Regional Commission, West Virginia Industrial Park Fund (legislative digest) and the Local Development Authority. The HCDA is anticipating additional development work at the park being funded by the Economic Development Administration and the Division of Highways. RK&K has been involved in the project from the beginning, including project definition, site selection, grant application, conceptual designs and contract documents. The project is were completed in the fall of 2003.

RK&K civil/site design activities encompassed all aspects of site design including, master planning of site, lot/parcel layout, access roads, wastewater treatment plant, water treatment plant, water storage tank, site grading, stormwater control, water distribution main from water treatment plant to water storage tank, utility (water, sewer, electric, communication) infrastructure within the park. Coordination with the West Virginia Division of Highways for the Reconstruction and Realignment of Smokey Hollow Road and the Allegheny Power Company for providing 3 phase electrical services to the site.

### **Site Development**

The site chosen was a 90 acre tract of land located on Smokey Hollow Road (CO Rt. 6) approximately 0.5 miles from the intersection of U.S. Route 50, CO Rt. 6 and 1 mile east of Capon Bridge, West Virginia, and 1.5 miles west of Virginia state line. The site has good highway access and the availability of utilities - water, sewer, electric and telephone located at the site.

The site development will include the Reconstruction of Smokey Hollow Road by the West Virginia Depart-

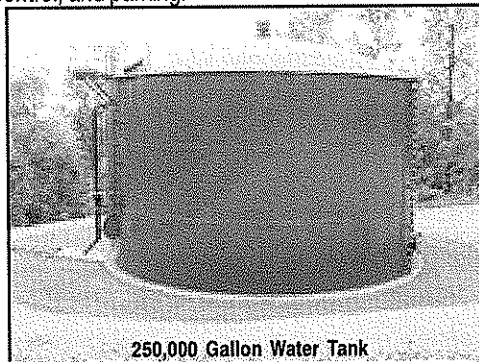
ment of Highways, construction of a 25,000 GPD wastewater treatment plant, water treatment plant, 250,000 gallon water storage tank, 2,700' of access roads, water distribution system and sewage collection systems, conduit pipes for electrical and telecommunications, and access roads for the water treatment plant and storage tank.

### **Approvals and Permitting**

One of the duties on this project was to obtain all approvals and permits for this project. Approvals were obtained from the West Virginia Division of Highways, and the West Virginia Infrastructure and Jobs Development Council. Permits were required for sediment and erosion control, water and sewer construction, sewage treatment plant, and the highway entrances.

### **Multi-Tenant Building**

Along with the Industrial Park, the Hampshire County Development Authority constructed a 30,000 SF Multi-Tenant Building. The project is currently complete and being occupied by Mill Branch Industries providing an increased job base for West Virginia. RK&K's duties include: site design, entrance road, site utilities, sediment and erosion control, and parking.



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Client: Hampshire County Development Authority  
Cost: \$2 Million  
Date: 2001



# Town of Carpendale - Water Systems Improvements

## Carpendale, West Virginia

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### *Introduction*

The Town of Carpendale was incorporated in 1991 from three separate subdivisions. At that time, each subdivision operated its own water system including wells, storage and distribution systems. All of the systems were in disrepair and needed to be replaced.

### *Engineering Services*

The Town of Carpendale hired Vanscoy Engineering and Surveying (now RK&K) for their water project. A preliminary engineering report was prepared for the project which called for development of a new well, construction of a water treatment facility (chlorination), construction of a 200,000 gallon storage tank and construction of over 30,000 LF of distribution mains to provide water and fire protection for the 400 residents of the new Town.

Potential well sites were evaluated within the project area. Consideration in the site selection was given to the location and protection of the source water from external contamination.

The 8-inch well was drilled over 800 feet into the limestone and sandstone bedrock. The well produces over 80 gpm using a 25 HP submersible pump. The water is pumped through the treatment facility where chlorine is injected for disinfection into the storage tank ready for distribution to the Town's residents.

The \$1.5-million project was funded with a \$750,000 Small Cities Block Grant and a \$750,000 loan from the Water Development Authority. We were involved in all phases of this project from its inception to preliminary plans, assisting with the funding applications, permitting, contract plans and specifications, bidding and contract award and finally, providing construction engineering and inspection of the contractors during construction.



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Client: Town of Carpendale  
Cost: \$1.5 Million  
Date: 1994





# City of Keyser - Raw Water Intake and Transmission Mains

## Keyser, West Virginia

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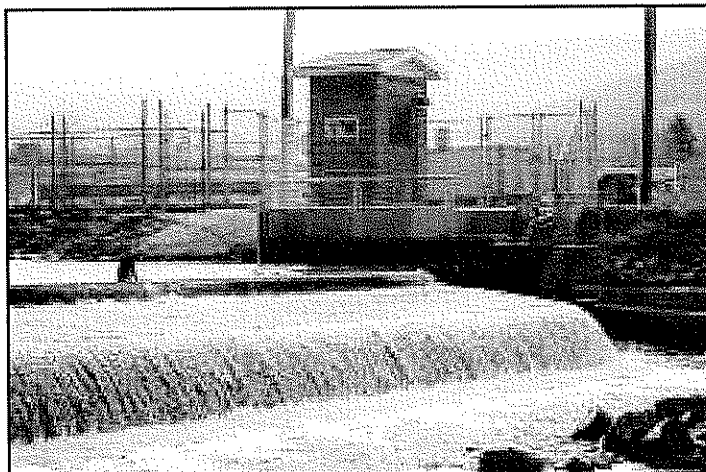
### *Introduction*

The City of Keyser has a 3-mgd water treatment plant located on New Creek. This plant currently operates at a 2-mgd rate and produces over one million gallon of water each day providing water to Keyser, New Creek Valley and McCoole, Maryland.

The City of Keyser withdraws water from New Creek to supply it's water treatment plant. The intake originally consisted of a single screened opening constructed on the bank of New Creek. The water entered the screen and flowed by gravity to the well from which it was pumped to the sedimentation tank. The intake was originally constructed in the mid-1920's. A concrete weir was constructed to form a pool of water to better enable it to enter the intake.

### *Engineering Services*

In 1998-99, the City of Keyser undertook a system-wide water improvement project designed to upgrade the entire system. The project was designed by RK&K and consisted of a new raw water intake, the replacement of 40,000 feet of water main, nearly 800 water services, cleaning and painting of a water tank and general improvements to the water treatment plant. RK&K team members were involved with this project from its inception including defining the scope of the project; preparing preliminary engineering reports; funding applications including a Small Cities Block Grant, permit approvals, final contract plans and specifications; and construction engineering and inspection. One component was to rebuild the weir and intake screens to quadruple the available intake area. This was done to minimize debris clogging the screens and creating problems. The weir had deteriorated to the point that there was concern for its stability. The concrete apron had eroded away and exposed the weir's foundation to erosion. The weir was encased in concrete and the foundation of the apron extended to bedrock. The entire screened intake structure was rebuilt and new removable screen panels added to



Rebuilt Water Intake Structure

increase the capture area. Additional water plant improvements including the addition of one raw water pump, refurbishment of the other two pumps, improvements to the 70 year old building replacement windows and doors, and a new roof. The chlorine handling system was also upgraded to allow safe handling of 1 ton cylinders.

**Over 40,000 feet of new 12-, 10-, 8-, 6- and 2-inch waterline was replaced throughout the town.** Much of the replaced line was nearly 100 years old. New touch read water meters were installed for all customers along the new lines - a total of 800 meters were replaced. The City has reported that the new lines have resulted in a water savings of over 200,000 gallon per day.

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Client: City of Keyser  
Cost: \$4.5 Million  
Date: 1999



# Patterson Creek Water Treatment Plant and Raw Water Intake

## Fort Ashby, West Virginia

### Introduction

The Patterson Creek Water Treatment Plant (WTP) was constructed in 1994 to supplement the Fort Ashby Public Service District's existing water treatment plant in providing service to nearly 2,000 customers in the northern end of Mineral County. Vanscoy Engineering and Surveying (now RK&K) was involved in this project from the inception. We conducted the initial feasibility study to determine the plant processes capacity, intake alternatives and configuration, evaluated various sites for the facility; assisted with the funding applications; completed the final plans and specifications as well as provided engineering and inspection services during construction.

### Engineering Services

The Patterson Creek WTP has a capacity of 1 mgd using Patterson Creek as the source of raw water. Water flows by gravity through the intake screens to the raw water well. Pumps then pump water to the concrete sediment basins for coagulation and sedimentation. Water is pumped from the sediment basins through one of two 350-gpm Trident packaged filter plants. Water leaving the filters is monitored for turbidity then chlorinated and discharged into a clear well awaiting pumping to the distribution system.

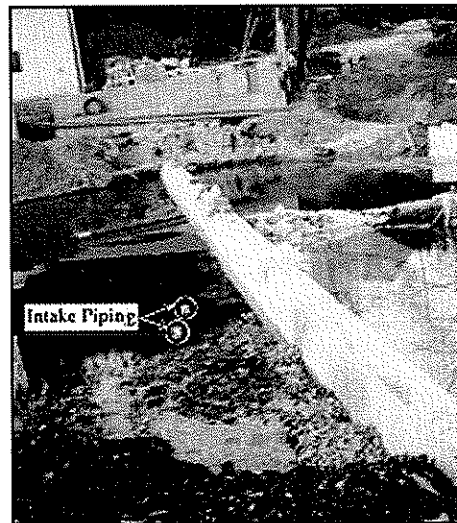
A concrete weir creates an approximate 5-foot-deep pool of water behind it as a source of water for two 12-inch tee screens that were placed upstream of the weir. Each screen has a compressed air purge system for cleaning and debris removal. Each screen is connected to a pipe which flows by gravity to a raw water pump station located on the stream bank.

Prior to completing the WTP construction documents, and in response to a severe water shortage, we assisted Fort Ashby Public Service District in developing an emergency 100-gpm well to supplement the water supply at their existing plant. Water was chlorinated, treated and pumped directly into the distribution system.

We have also provided additional engineering services for Fort Ashby Public Service District on several water main extensions and other on-call type work over the past several years.



Patterson Creek Water Treatment Plant



Weir and Intake Piping During Construction  
(Screens Have Not Been Installed)

Client: Fort Ashby Public Service District  
Cost: \$1.5 Million  
Date: 1994



# Frankfort Public Service District - Wiley Ford Water Line Replacement

## Mineral County, West Virginia

### Introduction

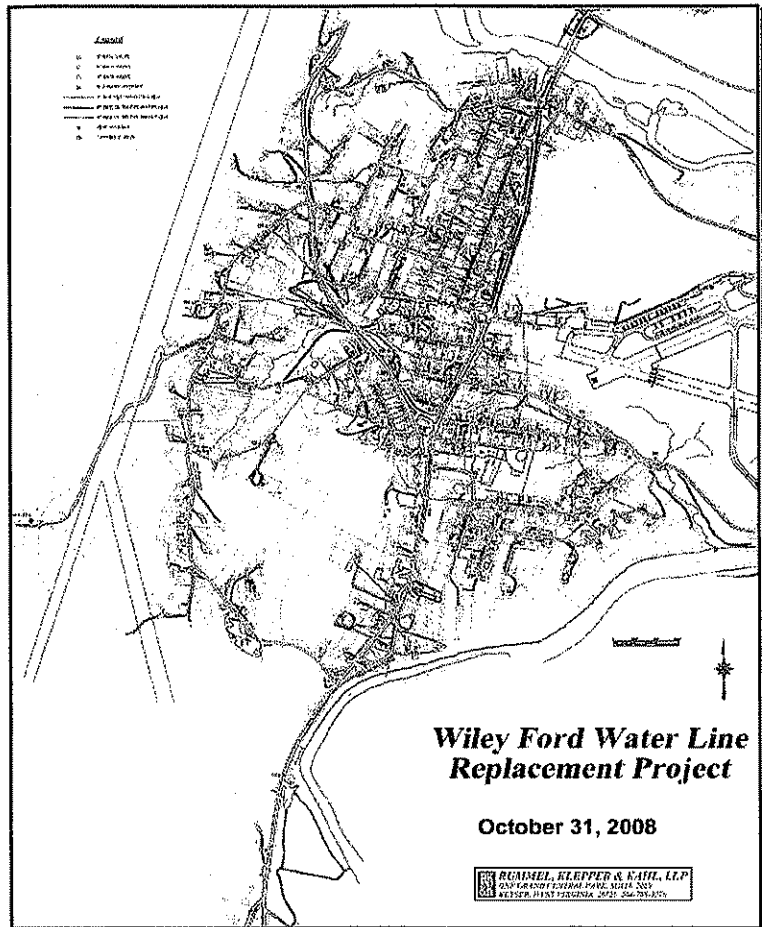
In early 2008 the Frankfort PSD which owns and operates a water system in northern Mineral County finalized the necessary paperwork and received Public Service Commission approval to purchase the Wiley Ford Water System which was a privately owned system consisting of approximately 430 customers. The existing system purchases water from the City of Cumberland, Maryland and is experiencing significant water loss due to the majority of the system having been in service for nearly 80 years and has deteriorated over time due to lack of maintenance. The system also has low pressure and troubles meeting demand in areas, due to undersized lines, and lacks adequate fire protection. RK&K was contracted to design an entire water system replacement project to serve all of the existing 430 customers plus an additional 70 customers that desired public water. In addition, the Wiley Ford System will be connected to the existing Frankfort PSD's water system which owns and operates a water treatment plant. This system will also maintain an emergency water connection with the City of Cumberland.

### Design Services

In 2007 RK&K began design on a two phased project to improve service and to provide adequate fire protection to the area. The first phase of the project once completed will consist of approximately 14,200 LF of 8", 28,900 LF of 6", and 12,300 LF of 2" PVC water line, fire hydrants to provide adequate fire protection, the addition of a 300,000 gallon water storage tank with booster station, installation of over 400 new water meters with an additional 100 water meter radio upgrades.

The second phase of the project will consists of locating a suitable well(s) source to supplement the water connection with the existing Frankfort PSD system.

In addition, the PSD also desired to have radio reading meters along with a SCADA system to assist in the monitoring and billing of the water usage. RK&K assisted the PSD in scheduling meetings with various equipment manufactures for determining the best equipment suitable to meet their needs. The ultimate goal of the PSD is to have their entire service area on the radio read system.



### Funding

Prior to design, RK&K assisted the Frankfort PSD in evaluating the existing Wiley Ford Water System, developed the Preliminary Engineering Report and secured funding for the necessary improvements. As a result this project is being funded by a \$0.8 million Small Cities Block Grant with the remainder being an IJDC Loan.

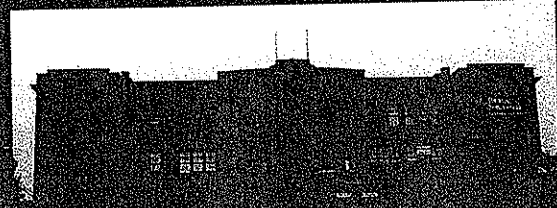
### Construction Services

In addition to providing design services, RK&K has been retained by the PSD to perform construction management and resident project inspection services for the duration of the project. RK&K is currently obtaining all State and Environmental Permits necessary for the project to go to construction. The anticipated construction is scheduled for early spring 2009.

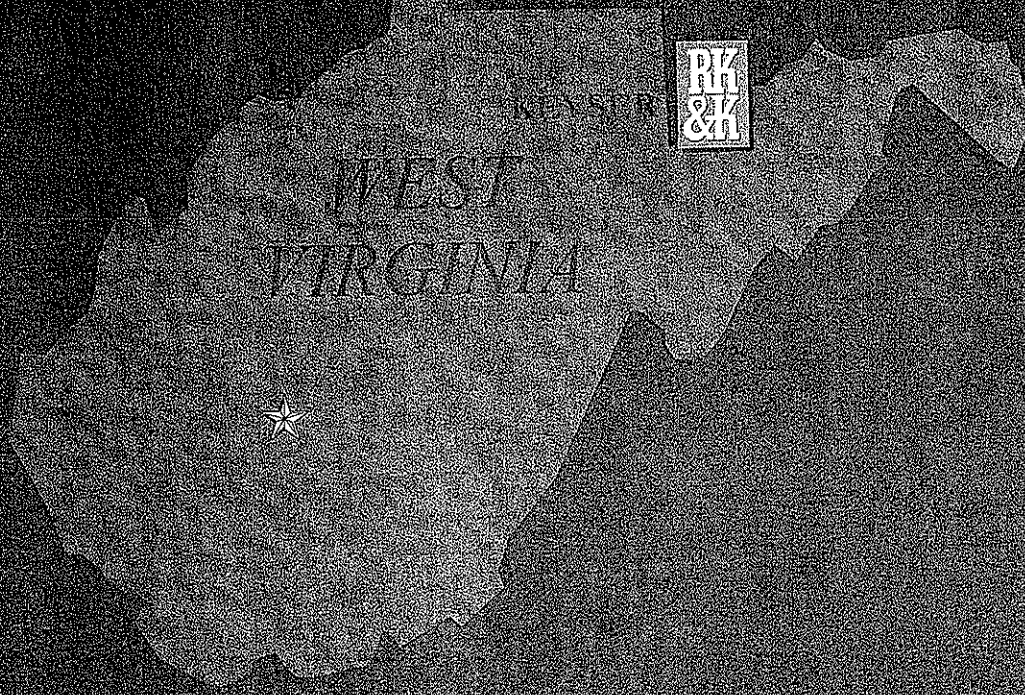
Client: Frankfort Public Service District  
Cost: \$5.8 Million (Construction Estimate)  
Date: 2008



*Rummel, Klepper & Kahl, LLP  
Office Location*



Grand Central Business Center  
"Old Keyser High School"



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