

## BACKGROUND

2019-Present  
Senior Technical Leader  
Weston & Sampson

2017-2019  
Sr. Supervising Hydrogeologist/  
Technical Fellow  
WSP

1995-2017  
Principal  
Leggette, Brashears & Graham,  
Inc. (acquired by WSP)

1988-1995  
Sr. Hydrogeologist,  
Associate, Sr. Associate  
Leggette, Brashears & Graham, Inc.

1986-1988  
Sr. Hydrogeologist  
Dan Raviv Associates, Inc

1985-1986  
Hydrogeologist II  
Haley & Aldrich

1982-1985  
Hydrogeologist  
Ground Water Associates, Inc

## EDUCATION

1982  
Master of Science  
Geology  
Syracuse University

1978  
Bachelor of Science  
Mathematics  
University of Scranton

## PROFESSIONAL REGISTRATION

Licensed Geologist:  
Delaware, Maine, New Hampshire,  
New York, North Carolina,  
Pennsylvania, South Carolina

Certified Professional Geologist -  
American Institute of Professional  
Geologist

Wetlands Delineator  
- Army Corps of Engineers

Frank, a senior technical leader in hydrogeology, has over 40 years of experience in the management, design, and implementation of subsurface investigations related to groundwater resource development and planning; aquifer hydraulics; groundwater recharge and storage (including ASR); construction, foundation, and quarry dewatering; land use impacts related to building development, wastewater disposal, and extractable resource activities; and delineation and remediation of contaminated vapor, soil, and water. He is a licensed geologist in DE, ME, NC, NH, NY, PA, and SC.



Frank regularly provides technical support and expert witness testimony before local planning boards and courts of law. He has authored numerous papers and provided related presentations at local and national water resource and environmental organization meetings, conferences, and workshops in connection with water supply development and with land use impacts on soil, bedrock, and groundwater conditions and contamination. He is also a regular technical instructor for the NEWWA, GSRWA, GMWA, NYAPWA, NJWA, NYRWA, NYAWWA, AWWA and AIPG/AGI in connection with groundwater and environmental professional certification continuing education programs.

## SPECIFIC PROJECT EXPERIENCE

### Groundwater Supply Development

**Wellfield Expansion and Well-Rehabilitation Services, Monroe Township, New Jersey.** Provided hydrogeologic services to the Monroe Township Utility Department for the rehabilitation and water quality management of an extensive public community and irrigation groundwater supply in the New Jersey Coastal Plain. Developed and managed program to identify possible future well sites based on proximity to NJDEP-established Critical Water Supply boundaries, existing supply wells, and reported contamination sites. Work involved development of a town-wide groundwater resource model developed from the USGS RASA model, which was integrated into a GIS map to identify locations near town-owned properties. Used results as a basis for negotiations with the NJDEP and an industry in an abutting town for the transfer of water allocation permit rights of about 2 mgd. Work also involved the design of two new wells tapping the Old Bridge aquifer and preparation of related bid documents for drilling and aquifer testing services. Modeling was also used to develop possible pumping scenarios for existing MTUD Wells impacted by PFAS and 1,4-Dioxane. The results of this effort were used to develop a detailed sampling and pumpage plan for use in future concentration projections. (with former employer)

**Well Supply Expansion and Resilience Evaluation, Mt Arlington, New Jersey.** Provided design, construction oversight, yield testing, and permitting for a high-

## CERTIFICATIONS

6W PFAS Treatment Methods and Optimization

## PUBLISHED WORKS

"Understanding and Implementing Wellhead Protection Programs," presented at the AWWA New York, June 1994.

"Identifying Hydrologic and Hydrogeologic Conditions Which Impact Ground-Water Supplies in a Bedrock Aquifer," Proceedings of the AIH 1996 Conference on Hydrology and Hydrogeology of Urban and Urbanizing Areas, 1996, Boston, Massachusetts.

"Groundwater: Manual of Water Supply Practices – M21" AWWA, 2003.

"Pursuing Development of a Public Water Supply Under Limited Aquifer Conditions" presented at the 2015 Edwin C. Tiftt Jr. Water Supply Symposium Conference, West Harrison, New York, September 23, 2015, co-authored with K. Benson

"Road Salt and Groundwater: Monitoring, Management, and Mitigation Strategies", AWWA, March 2016, Sustainable Management Conference, Providence, Rhode Island, co-authored with J. Jansen, PhD, PG, and T. Cusack, CPG

"An Approach to Maintaining Groundwater Supply Sustainability in The Critical Water Supply Areas of New Jersey", presented at AWWA ACE2016, June 19-22, 2016, Chicago, Illinois, co-authored with M. Barnes, PE, (MTUD) and K. Benson (LBG).

"New England Aquifer Series Webinars" sponsored by American Geosciences Institute and American Institute of Professional Geologists, August - November 2018

capacity replacement well tapping the local buried valley sand and gravel aquifer system. Assessed the long-term use of the encompassing wellfield relative to the new well and future drought impacts, and its long-term yield. Subsequently provided a well design modification and oversaw its implementation to minimize wellfield capacity impacts from possible future climate change influences on local aquifer recharge. (with former employer)

**Well Supply Water Quality Study, East Rochester and Webster, New York.**

Conducted a study of sodium chloride contamination of a municipal well supply from naturally occurring saline groundwater sources associated with the local glacial deposits and sedimentary bedrock aquifer system. Work included downhole logging of vertical sodium and chloride concentration distributions and characterization of saline groundwater migration under pumping conditions to identify possible well-modification and pumpage optimization options relative to wellhead water quality. (with former employer)

**Well Field Water Quality Characterization and Expansion Study, Seekonk and Wellesley, Massachusetts.**

Field supervision for municipal well field characterization studies, including geophysical prospecting, subsurface exploration, aquifer testing and groundwater-quality monitoring. Collected and evaluated geochemical data associated with an in-situ process for removal of iron and manganese from groundwater (Vyredox) in connection with the long-term operation of unconsolidated aquifer wellfields. Work included conducting downhole/vertical geochemical and flow profiling, and temperature monitoring, prior to, during, and post aerated water injection activities. (with former employer)

**Wellfield Performance Evaluation, Rehabilitation, and Replacement Services, Livingston and Short Hills, New Jersey.**

Managing hydrogeologist for the rehabilitation of an 18-well wellfield for the East Orange Water Commission developed from a combined sand-and-gravel and sedimentary bedrock aquifer system. Work included development of specifications for well-testing and rehabilitation selection, along with construction of replacement wells. Assisted with the selection of drilling contractor and oversight of rehabilitation efforts and post-rehabilitation testing. Provided results in a format appropriate for submittal to the NJDEP in support of compliance requirements related to an ACO. (with former employer)

**Cooling Water Groundwater Supply Well Development, Moncks Corner, South Carolina.**

Managing hydrogeologist for the design, construction, and yield/performance evaluation of a 10-mgd vertical well groundwater supply in the Middendorf/Charleston Aquifer intended for data-center cooling water use. Work involved design and preparation of bid specifications for a ~1,700-foot-deep test well and observation wells, SCDHEC permitting, well construction and aquifer testing oversight, and a groundwater model to provide preliminary projections of aquifer yield and impacts. Reviewed subsurface data in connection with exploration drilling and "test" well design considerations for pre-selected and supplemental well sites. Reviewed prior well and aquifer testing evaluations and coordinated/evaluated groundwater flow modeling efforts to project future impacts on local groundwater and surface-water resources and local private wells. (with former employer)

"Maximizing Well Yields in Unconsolidated and Consolidated Formations Within Restricted Land Areas," NWWA, Stamford, Connecticut, September 1988

Land Subsidence in the Tully Valley, New York," International Association of Hydrology, Houston, Texas, May 1991

"Identifying Hydrologic and Hydrogeologic Conditions Which Impact Ground-Water Supplies in A Rock Aquifer," AWWA, Cincinnati, Ohio, March 1994

"Use of Spreadsheets to Determine Optimum Wellfield Pumping Plans," AWWA Annual Conference, New York, New York, June 1994

"Subsidence and Related Features in the Tully Valley, Central New York," NWWA, Newton, Massachusetts, October 1992

"Helping Under-Capacity Small Systems Meet Water Demands with existing Groundwater Supplies," AWWA, Denver, Colorado, March 1996

"Design and Construction of Small Water Systems: An AWWA Small Systems Resource Book," Contributing author  
AWWA, 1999

Contributing author and researcher for AWWARF publication on Alternative Well Rehabilitation Techniques, 2006

"Potential Water Supply Impacts from Natural Gas Development in the NYC Watershed" Co-Author  
ASCE EWRI Watershed Conference  
Madison, Wisconsin, August 2010

Hydrogeologic and Water Resource Considerations Related to Natural Gas Production in the NYC Water Supply Watershed" Co-Author  
GWPC Water+Energy In Changing Climates Annual Conference,  
Pittsburgh, Pennsylvania,  
September 2010

**Water Supply Value Engineering, New York, New York.** Managing hydrogeologist for a team providing the NYCDEP with an independent peer review of projects being considered by the city to meet its water supply needs to the year 2040. Focused on the hydrogeologic feasibility of developing additional supplies from remote groundwater resources along the Hudson River and artificial recharge and storage in the aquifer system underlying Long Island, as well as the potential for diverting seepage in the Catskill region for subsequent supplements to the existing surface-water supply. (with former employer)

**Well Permitting and Groundwater Resource Impact Evaluation, Morris County Municipal Utilities Authority, Rockaway Township, New Jersey.** Reviewed and evaluated the siting, permitting, and hydrogeologic evaluation of a proposed public water supply well in response to a Water Allocation Permit Major Modification denial. Managed the development of a 3-dimensional model to illustrate the impact of the proposed pumping from the tapped fractured limestone aquifer and its impact on local streamflow, nearby groundwater supplies, and potential contamination sources. Based the model on extensive site-specific aquifer testing results and regional aquifer characteristics available from previously completed published testing. Used the results of the numerical modeling effort to support a proposed modification to the application and as a foundation for addressing downstream surface-water impacts and future operating scenarios for the well. (with former employer)

**Hydrogeologic Exploration and Testing Program, The Related Companies, Tuxedo, New York.** Provided design, management, and oversight of a hydrogeologic exploration and testing program for The Related Companies in connection with development of a 2-mgd groundwater supply for a ~1,600-acre residential and commercial development. Involved in the siting of 300- to 700-foot-deep wells using fracture-trace and geophysical prospecting techniques in a fractured metamorphic bedrock aquifer system with associated historic mine workings. Work included multi-well aquifer tests, NYSDEC permitting, and assessment of possible managed aquifer recharge methods focused on the preservation of shallow overburden groundwater and wetland systems. (with former employer)

**Water Supply for Proposed Development, Tobyhanna, Pennsylvania.** Managing hydrogeologist for hydrogeologic and well design services in connection with the development of a new 2-mgd groundwater supply for a proposed casino at the Pocono Manor from the local fractured sedimentary bedrock aquifer. Work included yield and quality potential evaluations of the targeted aquifer, and evaluation of impacts on nearby supply wells, the flow of several large-scale springs, and the flow of a nearby surface water body identified as a trout production stream. Used results to pursue a water withdrawal permit from the DRBC. (with former employer)

**Well Design and Evaluation, Washingtonville, New York.** Managing hydrogeologist that oversaw design and evaluation, on behalf of MHE and the Village of Washingtonville, of several screened supply wells completed near the Moodna Creek, and several open intake bedrock supply wells at properties being developed. Work included completion of site selections using geophysics and exploratory drilling, along with aquifer testing necessary to support Water Supply Diversion Permit applications submitted to the NYSDEC and NYSDOH. Also developed, coordinated, and oversaw a rehabilitation program of several existing supply wells. (with former employer)

“Impacts to Water Quality, Water Quantity, and Infrastructure from Natural Gas Development in the NYC Water Supply Watershed”  
Co-Author  
AWWA ACE10 Annual Conference,  
Chicago, Illinois, June 2010

“Hydrogeologic and Water Resource Considerations Related to Natural Gas Production in the NYC Water Supply Watershed”  
Co-Author  
AWRA Annual Conference,  
Philadelphia, Pennsylvania,  
November 2010

“Pursuing Development of a Public Community Water Supply Under Limited Aquifer Access Conditions”  
Co-Author  
AWWA ACE13 Annual Conference,  
Denver, Colorado, June 2013

“Groundwater: Manual of Water Supply Practices – M21”  
Contributing Author - AWWA, 2014

“M63: Aquifer Storage & Recovery Manual”, AWWA, 2015, primary contributor and technical reviewer, assisting Fred Bloetscher, PhD, PE.

“An Approach to Maintaining Groundwater Supply Sustainability in the Critical Water Supply Areas of New Jersey”, 2016 AWWA Sustainable Water Management Conference, Providence, Rhode Island, March 2016, co-authored with M. Barnes, PE (MTUD) and K. Benson, PG

“Tools for Managing Groundwater Resources in Karst Environments”, AWWA Missouri Section, March 2016, Annual Meeting, Osage Beach, Missouri, co-authored with K. Benson, PG

“When Can a High Yielding Well Near a Stream Not be a Groundwater Under the Influence?”  
AWWA New York Section Water Event, Saratoga Springs, New York, April 2016, co-authored with K. Benson.

**New Groundwater Supply Development, Milford, Pennsylvania.** Provided hydrogeologic and well design services to MHE and Milford Township in connection with the development of a new groundwater supply from the local fractured sedimentary bedrock aquifer. Work included yield and quality evaluations of the targeted aquifer, and evaluation of impacts on nearby supply wells and the flow of a nearby surface water body used as a public water supply. Used the results to support pursuit of a water withdrawal permit from the DRBC. (with former employer)

**Groundwater Supply Development, Wilmington, Massachusetts.** Provided peer review of an existing wellfield to determine the potential for developing a 1-mgd groundwater supply from a thin, but laterally extensive, glacial sand and gravel aquifer. Based on the reviewed data and subsurface exploration boring information, compared vertical and horizontal well designs to extract the groundwater at the targeted rate. Used results to provide a conceptual pass-through horizontal well design and configuration intended to take advantage of a coarse sand-and-gravel unit occurring about 20 feet below grade. (with former employer)

**Municipal Building Well System, Blairstown, New Jersey.** Managing hydrogeologist for siting, designing, permitting, testing, and maintaining an open-loop geothermal well system for a new municipal building in an agricultural/residential area near a historic downtown area. Work included design of a source well and return well, both in a fractured-limestone bedrock aquifer. Designed the system to meet the buildings’ 80-ton HVAC demand, with consideration for future expansion and possible “karst” concerns associated with the local geology. (with former employer)

**Collector Well Design, Falls City, Nebraska.** Provided technical oversight for the planning, design, construction, and testing of a 3.5-mgd horizontal collector well to replace seven existing vertical wells that provided a safe source of supply. Evaluated multiple design scenarios involving the location and orientation of the lateral array, and screen and gravel pack selection to optimize potential yield while addressing USACE concerns regarding potential damage to the nearby levee along the Missouri River. (with former employer)

**Water Supply Assessment, Cape Town, South Africa.** Assisted Microsoft with identifying alternative water supplies for a proposed data center that was considering switching/augmenting its planned source of cooling water due to prolonged drought impacts. Identified available sources of hydrologic and hydrogeologic information to assess existing and possible future demands on the regional water resources and potential impacts on reliability due to prolonged drought. Collected available information using accessible government contacts and resources. Identified sources including fresh groundwater, captured stormwater, and nearby brackish water sources. Reviewed the available information using GIS tools to identify existing groundwater users and tapped aquifers, as well as ranges in potential yield relative to anticipated facility needs. Also considered existing water quality relative to operational needs of the facility’s cooling system. (with former employer)

**Manufacturing Facility Collector Wells, Decatur, Illinois.** Managing hydrogeologist for bid specification preparation, construction oversight, and management of a project for Archer Daniels Midland involving construction and yield/performance evaluation of two 3.5-mgd collector wells at a food product manufacturing facility. Reviewed subsurface data in connection with exploration drilling and collector

“Groundwater - Aquifers & Well Performance” presented at the Water Works Operator’s Association of Pennsylvania, 89th Annual Conference, State College, Pennsylvania, August 2016, co-authored with K. Benson

“Road Salt and Groundwater: Monitoring, Management, and Mitigation Strategies” New York Rural Water Association 38th Annual Technical Training Workshop & Exhibition, Lake Placid, NY, May 23, 2017, co-authored with Karen Benson, PG.

“Selecting the Appropriate Water Supply Strategy When the ‘Easy Water’ has been Tapped” presented at the Riverbank Filtration Conference hosted by the Louisville Water Company and convened by the American Ground Water Trust in October 2017 in Louisville, Kentucky, co-authored with Martha Silks, PG (LBG).

well design considerations for pre-selected and supplemental well sites. Reviewed well and aquifer testing evaluations and coordinated and evaluated groundwater flow modeling efforts related to projecting future impacts on local surface-water resources and local private wells resulting from the proposed use of the collector wells. (with former employer)

**Office Building Well System, Village of Suffern, New York.** Managing hydrogeologist for siting, designing, permitting, testing, and maintaining an open-loop geothermal well system for a new office building in a downtown location. Work included design of a source well and return well in a prolific sand-and-gravel aquifer in a historic, urban downtown area. Designed the geothermal system to meet the building’s 100-ton HVAC demand. (with former employer)

**Aquifer Testing, Blooming Grove, New York.** Managing hydrogeologist for oversight and evaluation of aquifer testing necessary for MHE and Blooming Grove to support Water Supply Diversion Permit applications submitted to the NYSDEC and NYSDOH. Work included a rehabilitation program for several of the existing bedrock supply wells. (with former employer)

**Lake Osiris Aquifer Test, Walden, New York.** Designed, field supervised, and evaluated an aquifer test to establish the safe yield and potential interference effects resulting from a proposed municipal well completed in a glaciofluvial sand and gravel aquifer. (with former employer)

**Groundwater Supply Development/Aquifer Delineation Studies, Rockaway Township, New Jersey.** Provided design, management, and field supervision for groundwater supply development/aquifer delineation studies in connection with the development of a minimum 1-mgd public community water supply well for Garden Homes. Investigated various local sand-and-gravel and fractured bedrock aquifers. Gathered and evaluated hydrogeologic and land-use data and performed site reconnaissance, surface geophysical prospecting, and subsurface explorations, along with numerous pumping and aquifer tests. Conducted numerical modeling and pilot testing in support of the design and construction of a hydraulic barrier system required for installation of 1-mgd public community supply well in accordance with NJDEP Water Allocation Permit approval criteria. Also developed and conducted an aquifer testing program targeting the use of historic mine workings as a subsurface reservoir and groundwater resource for future water supply use. (with former employer)

**Groundwater Supply Development/Aquifer Delineation Study, Deptford Township, New Jersey.** Managed a groundwater supply development/aquifer delineation study for the Mt. Laurel sand aquifer system. Involved gathering and evaluating hydrogeologic and land-use data and completing test-well installations and aquifer testing. Used evaluation results to support a Water Allocation Permit for use of the developed groundwater supply as an alternative to the PRM Aquifer system in New Jersey Critical Water Supply Area 2. (with former employer)

**Groundwater Supply Expansion and Well-Rehabilitation Services, New Windsor, New York.** Managing hydrogeologist that provided hydrogeologic and well design and rehabilitation services to MHE and the Town of New Windsor, in connection with the development of a supplemental 2-3 mgd supplemental groundwater supply from existing and new sources. Initially the work involved performance evaluations of existing wells and implementation of necessary rehabilitation efforts. In addition,

two existing wells were evaluated for possible inclusion into the system. Based on the results of this work, the design, testing, and permitting of a 4-5 mgd wellfield in a glaciofluvial aquifer system along a major tributary to the Hudson River was implemented and accomplished. The completed evaluations focused on determining well performance and yield, aquifer sustainability, and potential for impacts on local surface water flow and the possibility of groundwater under surface-water influences on water quality. The other part of the work included yield and quality potential evaluations of the deep aquifer deposits underlying the bed of the nearby Hudson River by completing a series of angle borings/test wells from shore using the “sonic” method with respective drilling angles of about 22° to 30° to maximize penetration of the targeted aquifer materials. The results were used to design a large diameter angle well for future installation at the site. (with former employer)

**Wellfield Performance and Expansion Evaluation, Lucasville, Ohio.** Provided hydrogeologic and well design services to the Scioto County Regional Water District in connection with the rehabilitation and expansion of a regional groundwater supply developed in a relatively thin, buried valley, sand-and-gravel aquifer near the Scioto River. Work included establishing performance of the existing wells, identifying appropriate rehabilitation measures, characterizing influence of the local river stage on wellfield operation, and providing design and construction input for replacement wells to maintain wellfield overall yield. (with former employer)

**Groundwater Supply Development Investigation, Village of Red Hook, New York.** Managed and field supervised a groundwater-supply development investigation of sand-and-gravel and bedrock aquifers using fracture-trace analysis, surficial geophysical prospecting, subsurface explorations and pumping test evaluations of existing production wells. (with former employer)

**Groundwater Supply Development Investigation, Kingston, New York.** Managed and field supervised a groundwater-supply investigation utilizing geophysical prospecting, subsurface explorations and pumping test evaluations of production wells. (with former employer)

**Wellfield Expansions, Hackettstown, New Jersey.** Managed and designed wellfield performance, permitting, and expansion programs for the Hackettstown MUA which develops public community water supplies from local aquifers. Work included a preliminary assessment of groundwater supply development potential at six sites, and a related fracture-trace analysis to identify areas of potentially high groundwater yield for subsequent test well exploration. Prioritized and explored selected locations using test well installations and short-term pumping tests. Conducted pumping tests of bedrock supply wells to verify reported yields and provide information needed for NJDEP water allocation permit modifications. (with former employer)

**Hydrogeologic Program for IBM Office Campus, Somers, New York.** Designed and implemented a hydrogeologic program consisting of groundwater supply development from overburden and fractured bedrock aquifers, production well design, and water-quality monitoring at an adjoining landfill. (with former employer)

**Municipal Well Field, Jamestown, New York.** Evaluated aquifer safe yield, optimal pumping rate, and optimal pumpage sequencing for four sand-and-gravel aquifer production wells at a municipal well field. Used analytical and 2-D computer

modeling techniques. (with former employer)

**Bottled Water Source Evaluation, Blairstown, New Jersey.** Managed evaluation of sustainable yield of a naturally occurring 1,700 gpm limestone spring to be used as bottled water supply for Mountainwood Springs. Provided expert testimony on spring use and potential impact on off-site well owners. (with former employer)

**Groundwater Inventory and Capacity Study, Bedminster, New Jersey.** Managed and designed a township-wide groundwater resource inventory and carrying capacity study using existing data. Work involved the completion of a fracture-trace analysis and geologic mapping. Incorporated study results into the township's wastewater management plan and individual subsurface disposal system code. (with former employer)

**Groundwater Supply/Aquifer Delineation Investigation, Houlton, Maine.** Provided management and field supervision for a groundwater supply/aquifer delineation investigation involving the completion of geophysical surveys, test well installations, and pumping tests. Evaluated the aquifer, a narrow band of sand and gravel associated with a glacial esker that was hydraulically connected to a local surface-water resource. (with former employer)

**Groundwater Supply Exploration Program, Belfast, Maine.** Provided design, management and field supervision for an exploration program to identify potential locations for future municipal groundwater-supply development. Work involved use of drive-and-wash technology to identify the location and extent of glacially deposited sand and gravel beneath a glacial marine clay formation. (with former employer)

**Collector Well Feasibility Study, York, Pennsylvania.** Performed a seismic refraction survey to evaluate the feasibility of a location for installing a collector well within abutting shoreline/river-bottom sediments. (with former employer)

**Groundwater Supply Exploration and Development Program, Fort Drum, New York.** Involved in the design, evaluation and field management of an exploration and development program for a 5-mgd groundwater supply for the US Army. Work included the design of production wells and evaluation of aquifer safe yield. (with former employer)

**Glacial Aquifer Hudson River Infiltration System, Bethlehem, New York.** Evaluated the design, operation and efficiency of a glacial aquifer riverbank infiltration system proximal to the Hudson River to determine adequacy relative to a required 6 mgd public community supply. The completed work included the analyses of extensive aquifer testing and modeling data along with streambed hydraulic and leakance studies of the local river source. The existing system and subsequently completed alternative angled-well supply were evaluated relative to elevated iron concentrations and long-term effects on wellfield performance. (with former employer)

**Groundwater Supply Monitoring, Rockland County, New York.** Design and management of an ongoing county-wide groundwater supply/resource monitoring program used for the operational consideration of SUEZ for its privately-owned sixty-well public community supply system. The developed network consists of selected "test" wells, inactive supply wells, and dedicated observation wells and stream gauges. The network is designed to take into account the hydrogeologic

and watershed diversity of the system. The collected water-level data is downloaded on a semi-annual basis and reviewed relative to current and past operational and hydrologic information to help manage the system demands. (with former employer)

**Aquifer Evaluation, Bedford, New York.** Designed, managed and field supervised a hydrogeologic investigation to determine the potential for developing a small public community water supply from a fractured bedrock aquifer. The investigation included the completion of a fracture-trace analysis, test well installation, and aquifer test implementation and evaluation. (with former employer)

**Groundwater Monitoring, Rockland County, New York.** Designed and oversaw installation of observation well and piezometer networks for monitoring groundwater levels and river stage changes relative to varying hydrogeologic conditions proximal to several SUEZ reservoir dams, and a Town-owned flood control levee system along the Hackensack River. The networks were designed to characterize lateral and vertical head changes and were outfitted with automated data logger units. Regular downloads were implemented and used to identify and establish trends. (with former employer)

**Groundwater Supply Development Services, Town of Newburgh, New York.** Managing hydrogeologist that provided hydrogeologic services to the Town of Newburgh in connection with the possible development of a 1 mgd groundwater supply from an existing well. The work involved a performance evaluation of the well relative to aquifer yield and the capacity of the existing well design. The completed evaluation also focused on potential for impacts from the nearby Hudson River and past use of AFFF (PFAS) on the local groundwater quality. (with former employer)

**Hydrogeologic Services, Bergen County, New Jersey and Rockland County, New York.** Management of hydrogeologic services for SUEZ's bi-state, regional public water-supply with over 60 wells, which tap an extensive, fractured bedrock/glacial aquifer system. Typical services include wellfield expansion studies, well design and wellfield performance evaluations, off-site impact and future expansion assessments and related water diversion permitting. In addition, periodic studies are completed on an approximately ten-year recurring schedule with respect to well-performance, regional groundwater resource sustainability, land-use impacts, and regulatory changes. (with former employer)

**Groundwater Resource Study, Lunenburg, Massachusetts.** Designed and managed a groundwater resource study involving the collection and evaluation of hydrogeologic and land use data to identify potential sites for the installation of future municipal production wells. (with former employer)

**Bakersfield, Vermont.** Designed and conducted a geophysical survey (seismic refraction and resistivity) and "drive-and-wash" test-well drilling program to evaluate the potential for developing a municipal water supply from a combined glaciofluvial and alluvial, sand and gravel aquifer. (with former employer)

**Newport Center, Vermont.** Designed, field supervised and evaluated aquifer tests associated with assessing the potential for developing a municipal water supply from existing agricultural wells completed in a fractured bedrock aquifer. (with former employer)



**Groundwater Supply Well Reactivation, Portsmouth, New Hampshire.** Designed and managed a testing program in conjunction with the reactivation of a permitted public community supply well for the City of Portsmouth. The testing program was conducted in accordance with NHDES ENV-DW-700 and involved pumping the sand and gravel well continuously at a rate of 300 gpm for 5-days. Water levels were measured using a stratified network of observation wells completed in the tapped multi-unit sand and gravel aquifer system, and the underlying bedrock aquifer along with the collection of groundwater samples for use in confirming water quality compliance and performance parameters.

## Groundwater Impact Evaluations

**Reservoir Dam Seepage Evaluation and Monitoring, Lambertville, New Jersey.** Developed and oversaw a hydrogeologic investigation of the Lambertville Reservoir dam to characterize the groundwater flow and possible bypass and establish a long-term water-level monitoring program. (with former employer)

**Levee Seepage Evaluation, Clarkstown, New York.** Developed and oversaw a hydrogeologic investigation along the Hackensack River downstream of the Lake Deforest Reservoir dam to characterize the groundwater/surface-water relationship under normal and flood conditions as part of a levee repair/modification program. Work included siting, installation oversight, monitoring and evaluation of a long-term water-level monitoring program in connection with future levee modifications. (with former employer)

**Quarry Impact Investigation, Bernardsville, New Jersey.** Designed and managed an investigation to evaluate impacts of past and proposed traprock quarrying and reclamation activities on a local fractured bedrock aquifer system (basalt and sedimentary rock units) and related groundwater supplies. Oversaw similar investigations completed by others. Work included management of a NJPDES/DGW permit compliance program, and provision of expert testimony before local planning boards, regulators, and the New Jersey State Supreme Court. (with former employer)

**Impact Evaluation for Proposed Development, Erving, Massachusetts.** Assisted with the development of a 3-D numerical groundwater model to evaluate the potential impact on DEQ-designated aquifer protection zones from a proposed industrial/commercial development. (with former employer)

**Proposed Office Development Investigation, Florham Park, New Jersey.** Designed and managed an investigation to evaluate impacts of a proposed office campus development on the recharge to a regional glacial sand and gravel deposits aquifer system and related groundwater supplies. Work included provision of expert testimony at deposition and attendance at Morris County Court before settlement. (with former employer)

**Groundwater Resource Assessment, Town of Ramapo, New York.** Provided a town-wide assessment of the groundwater resources for use by the Town with future land use decisions and planning. The assessment relied on available GIS-based mapping and hydrogeologic studies to identify areas and land parcels of significance relative to groundwater protection and recharge preservation. The assessment results were summarized in a report and GIS-linked map for future

use and updating by the town planning board. (with former employer)

**Master Plan Groundwater Resource Updates, Harmony, Hope, and Fredon Townships, New Jersey.** Updated township-wide studies of overburden and bedrock (mostly limestone) groundwater resources and related water supply and wastewater disposal carrying capacity (nitrate-dilution modeling) as part of a master plan update. Completed groundwater recharge analyses using available streamflow data, GIS-based Method GSR-32, and conducted nitrated dilution modeling. Provided input on ordinance development relative to private well testing and sustainability, as well as karst/sinkhole susceptibility and related groundwater resource and supply protection. (with former employer)

**Former Quarry Evaluation, The Goldstein Group, Village of Suffern, New York.** Designed and managed on behalf of The Goldstein Group an evaluation of the possible use of an abandoned quarry for stormwater storage and as a drinking water reservoir. The work included completion of soil borings and installation of observation wells, evaluation of soil quality, and monitoring of local groundwater levels in order to assess the local bedrock aquifer system hydraulics and the potential impacts from the past quarry activities and infilling with dredge materials. (with former employer)

**Prospect Park, New Jersey.** Managed a quarry expansion investigation for Tilcon, and a subsequent reclamation study for Posillico involving the hydrogeologic characterization of the local and regional bedrock aquifers underlying the quarry. The evaluations were completed in support of dewatering system designs and impacts on local surface and groundwater resources. Responsibilities included planning the installation of piezometer/ observation wells, studying long-term monitoring of surface/groundwater elevations, evaluation of diabase cores collected during mining operations and the execution and evaluation of bedrock aquifer performance tests for dewatering purposes and future NJDEP permitting.

**Planning Board Hydrogeologic Review Services, South Hadley, Massachusetts.** Completed review of proposed reclamation plan for sand and gravel aquifer relative to future impacts on local groundwater recharge and water quality as they relate to proposed resource removal and stormwater management plans. Provided the Town with an opinion regarding the potential risks to the on-site and surrounding groundwater resources and possible options for control of these risks. The review considered available hydrogeologic data, well completion reports, and modeling efforts provided in support to the proposed site development.

**Master Plan Update, Hamilton, Massachusetts.** Provided support services in connection with the preparation of an update to a township-wide plan for protection and management of overburden and bedrock (mostly limestone) groundwater resources and related water supply and wastewater disposal impact concerns. Provided input on ordinance development relative to protection of well yield and quality, and sustainability relative to possible climate-change impacts.

**Impact Assessment, Village of Suffern, New York.** Designed and managed an evaluation of the potential effects of the deepening of an open-pit mine on the local surface- and groundwater supply resources. Work included completion of soil borings and installation of observation wells, evaluation of soil quality,

and monitoring of local groundwater levels to assess the potential impacts from the quarry activities and possible reclamation plans. (with former employer)

**Drilling Impact Assessment for NYCDEP, Delaware, Orange, Sullivan, and Ulster Counties, New York.** Managing hydrogeologist for an evaluation of hydrogeologic and natural gas resources, and corresponding potential risks resulting from future development of the Marcellus Shale in the West of Hudson New York City watershed. Used extensive infrastructure and water quality databases and historical maps, coupled with GIS mapping of geologic features, land use, and subsurface infrastructure routes (including depths) to assess risk potential. The work resulted in the delivery of two comprehensive impact assessment documents that presented the results of literature and scientific/analytical data analyses, along with recommendations for long-term water quality monitoring. Several workshops presenting the findings were provided for stakeholders and other public water supply utilities concerned with future Marcellus Shale natural gas development within their respective water supply areas. (with former employer)

#### **Groundwater/Well Contamination**

**Water-Supply Well Contamination Evaluation, Rockaway Township, New Jersey.** Performed peer review, preparation of comments and provision of an expert report in connection with litigation concerning gasoline (BTEX and MTBE) contamination of domestic water-supply wells and a fractured crystalline bedrock aquifer by a former service station in Morris County, New Jersey. (with former employer)

**PFAS Impact Assessment, Various Water Supplies (Florida, Illinois, Kentucky, Mississippi, and Nevada).** Retained as an expert hydrogeologist to evaluate possible sources of PFAS (including those related to AFFF) impacting public water utilities and the potential extent of these impacts. Work involved reviewing available environmental agency records, supply-source and local resource water quality data, supply-source construction data, hydrogeologic and hydrologic conditions, and current and historic land use information. This information was evaluated using GIS mapping and spatial analyses, along with the completion of focused water sampling and analyses efforts.

**Manufacturing Facility Investigation & Remediation, Reading, Pennsylvania.** Design and management of an investigation of soil and groundwater contamination for Chesbrough-Ponds at a polymer manufacturing facility overlying a karst limestone terrain. Developed and oversaw a remediation program focused on numerous chemical tank abandonments, and disposal well abandonments, and impacted contaminated soil and groundwater. (with former employer)

**Oil Tank Investigation, Boston, Massachusetts.** Performance of a hydrogeologic investigation of leakage from a former fuel oil storage tank located in an apartment complex basement, and preparation of a remediation plan. Involved mapping of subsurface utilities and subway system dewatering points, and incorporation into groundwater flow and contaminant transport projections. (with former employer)

**Former Dry Cleaners, Southington, Connecticut.** Performed an evaluation of groundwater and soil contamination by PCE from past dry-cleaning operations; supervision of soil remediation program, and completion of aquifer testing

in connection with projections of risk to nearby off-site receptors including a public community supply well. (with former employer)

**Quarterly Sampling Program, Plainville, Connecticut.** Field management of quarterly sampling program in connection with CVOC groundwater contamination and remediation system performance monitoring at GE industrial site located within a historically industrialized area of the municipality. The analytical results were reviewed and used to support CT SPDES permit compliance requirements, and recovery well and treatment system performance goals. (with former employer)

**Hydrogeologic Evaluation, Hoffman-LaRoche, Tuxedo, New York.** Management and development of a hydrogeologic evaluation for the Cinitichem division of Hoffman-LaRoche to determine the extent of Iodine 131/133 in overburden and fractured bedrock aquifers underlying a medical radioisotope manufacturing facility. Management and development of supplemental hydrogeologic evaluations to implement during the decommissioning of the facility. (with former employer)

**Road Salt Storage Impact Evaluation at Private Trucking Facility, Wallkill, New York.** Provided hydrogeologic review services and prepared expert report with recommendations regarding hydrogeologic studies completed by others in connection with road salt storage activities and proposed BMPs for a privately owned trucking facility. The report was based on the review of long-term groundwater monitoring efforts at on-site wells and off-site private drinking water supply wells and corresponding patterns of elevated chloride concentrations in the local groundwater, along with GIS-based mapping of geologic features affecting the transport of elevated chloride groundwater. The findings were used to refine/modify current BMPs for the facility and assist the municipality with issuance of permits for the facility. (with former employer)

**PFAS Impact Review, Portsmouth, New Hampshire.** Provide ongoing review and evaluation services relative to long-term monitoring and remediation of PFAS impacted groundwater in the local unconsolidated deposits and fractured bedrock aquifers underlying an air-national guard base as a result of past AFFF use. The review results are used to assist the local public water purveyor determine the potential adequacy of treatment and hydraulic control of the PFAS plumes by others relative to its supply well system.

**Freon Impact Assessment, Village of Hilburn, New York.** Provided technical direction to the local public community water suppliers in connection with contamination impacts to their respective supply wells resulting from activities at an upgradient refrigerant recycling facility. The work included establishing the facility as the source of freon detected at several supply wells and providing projections of the future extent and duration of the impacts. The results were used to help design appropriate pumping scenarios and treatment for the wells and provide support to the NYSDEC in directing the facility to conduct satisfactory remedial measures. (with former employer)

PFAS Impact Assessment, Various Water Supplies (Florida, Illinois, Kentucky, Mississippi, and Nevada). Retained as an expert hydrogeologist to evaluate possible sources of PFAS (including those related to AFFF) impacting public water utilities and the potential extent of these impacts. Work involved reviewing available

environmental agency records, supply-source and local resource water quality data, supply-source construction data, hydrogeologic and hydrologic conditions, and current and historic land use information. This information was evaluated using GIS mapping and spatial analyses, along with the completion of focused water sampling and analyses efforts.

**Petroleum and Methane Impacted Regional Aquifers and Wells, Central Appalachians Region.** Evaluated on behalf of Equitable Resources the sources and migration routes of petroleum product and methane, along with associated poor-quality groundwater, which was impacting extensive fractured bedrock aquifers in the central Appalachian region of Kentucky. Developed sampling and hydraulic testing protocols for establishing conceptual hydrogeologic models to address the possible methods of methane, petroleum, and “saline” water migration in various study areas and resulting potential for water-supply well impacts. Isotope analyses and secondary water quality data along with petroleum and gas fingerprinting were used extensively, along with groundwater level data to help identify possible sources such as coal beds, shallow formations, gas-well casing leaks, wetlands, and bulk petroleum storage tanks. (with former employer)

**Remediation of Dry-Cleaning Facility, Staten Island, New York.** Developed and managed for Brookfield Properties an ongoing remedial investigations and cleanup efforts in connection with the source, longevity, and transport of tetrachloroethene (PCE) at a long-term retail dry-cleaning facility, which was classified as a Class II Inactive Hazardous Waste Site, and subsequently re-classified as a VCP site. The conducted evaluations included horizontal and vertical delineation of PCE and its daughter products (CVOCs) in soil and groundwater associated with the local glacial sand formation and underlying weathered bedrock, identification of residual sources related to the local stormwater system, and soil vapor and indoor air impact characterizations, and determination of PFAS presence in local groundwater as per recent NYSDEC regulations. The results were used to design an in-situ reductive-dechlorination enhancement remediation system using sodium lactate, and sub-slab depressurization program for existing tenant spaces. (with former employer)

**Norwood and Wayland, Massachusetts.** Designed and provided field supervision of an investigation of gasoline leakage from on-site underground storage tanks at Mobil service stations. The work involved the design and installation of appropriate monitoring well networks and subsequent implementation of soil and groundwater sampling programs. (with former employer)

**Contaminant Projections & Groundwater Recovery System Design, Chemical Manufacturing Facility, Phillipsburg, New Jersey.** Developed 3-D computer model for use in projecting contaminant distribution and transport in soils and groundwater at a chemical manufacturing facility, and for designing a groundwater recovery system. (with former employer)

### **Aquifer Storage and Recovery**

**Aquifer Storage and Recovery (ASR) System and Replacement Well, Atlantic City, New Jersey.** Overall hydrogeologic-related management of aquifer storage and recovery (ASR) system and replacement well project for the ACMUA. The work involved the gathering and evaluation of existing hydrogeologic and land-use data,

the performance of site reconnaissance, subsurface geophysical prospecting and subsurface explorations. The first phase of the project concluded with the installation and testing of a "test" ASR Well in 800-Foot Sand Aquifer. Related tasks included projection of ASR feasibility for additional sites, projecting water-resource related impacts, and associated permitting. (with former employer)

**ASR Well Evaluation and Rehabilitation, Toms River, New Jersey.** Participated as part of a technical/peer review team for SUEZ consisting of water utility engineers, drilling contractors, and hydrogeologists in connection with an assessment of the initial design and installation, and proposed rehabilitation/construction modification options for a 1,750-foot-deep aquifer storage and recovery (ASR) well completed in the Potomac-Raritan-Magothy (PRM) aquifer system underlying the New Jersey Coastal Plain. Reviewed downhole videos and geophysical logs, performance testing, and original design specifications for the ASR well. Evaluated feasibility of using liners and operational controls to prolong the lifespan of the well and return its capacity to as close as possible its original yield of 2,000 gpm. (with former employer)

#### **Wastewater Disposal Evaluations**

**WWTF Construction and Hydrogeologic Performance Evaluation, Mt Arlington, New Jersey.** Design and oversight of dewatering system for large water treatment plant foundation for SUEZ proximal to its existing wellfield. Subsequently managed an evaluation of the hydrogeologic impacts resulting from the proposed use of the on-site wastewater facility and disposal beds including the use of analytical and numerical models to determine the vertical and horizontal extent of the related "mounding" effect. The results were summarized and submitted to the NJDEP in support of a NJPDES/DGW permit application. (with former employer)

**Waste Disposal System Evaluation, Plymouth, Massachusetts.** Design and performance of an evaluation of impact on groundwater resource from a failing community sanitary waste disposal system. Involved utilization of 2-D computer modeling of contaminant transport in conjunction with hydrogeologic and water-quality data obtained from an on-site monitoring well network. (with former employer)

**Septic Waste Contamination, Fairfield, New Jersey.** Performed peer review of reports and preparation of comments in connection with State and Federal litigation concerning groundwater contamination resulting from the former disposal of domestic and industrial septic wastes over a regional buried valley aquifer system. (with former employer)

**Septic System Contamination Evaluation, Eatontown, New Jersey.** Management and development of an evaluation of the occurrence of groundwater contamination by BTEX and solvents (TCE) in an overburden aquifer resulting from the past use of a septic/dry-well system at an automotive dealership. Provided expert testimony on source and transport of contaminants. The results of the investigation were used to determine the potentially responsible parties and seek cost recovery from past insurance coverage. (with former employer)

**Proposed Leach Field Evaluation, Westford, Massachusetts.** Design and performance of an evaluation of a proposed 90,000 gallons per day sanitary

waste leach field for a commercial office facility. The collected data were used to conduct mounding and dilution analyses relative to the proposal disposal system and local environment. (with former employer)

#### Landfills

**Municipal Landfill Closure, Saugerties, New York.** Managed a subsurface investigation in connection with the closure of a municipal sanitary landfill. The completed work included the installation and sampling of monitor wells, characterization of groundwater flow in the underlying overburden and fractured bedrock aquifers, and submittal of a Subsurface Investigation Report to the NYSDEC. (with former employer)

**Landfill Site Expansion, Haverhill, Massachusetts.** Design and management of an investigation of existing groundwater and soil conditions at a proposed landfill expansion site, and evaluation of the potential impacts from an adjoining landfill on groundwater quality and off-site receptors including private and public water-supply wells. (with former employer)

**Landfill Groundwater Monitoring, Borough of Hopatcong, New Jersey.** Managed the implementation of a monitor-well installation and quarterly groundwater sampling program at an operative municipal sanitary landfill as part of an NJPDES/DGW compliance effort. The efforts were expanded to evaluate the potential impacts on these groundwater resources resulting from the municipal wastewater treatment facility. (with former employer)

#### Expert Witness and Litigation Support

**Expert Testimony, Highlands Region, New Jersey.** Reviewed and provided expert testimony on behalf of the County Freeholders of Hunterdon and Warren Counties regarding the lack of technical validity of the hydrogeologic bases for the Highlands Water Protection and Planning Act. Specifically, the expert testimony focused on the use of appropriate groundwater recharge values and characteristics for use in determining minimum lot size associated with on-site wastewater disposal options for properties within the Highlands Physiographic Province of New Jersey. (with former employer)

**Kitson v. Aetna Insurance.** Management and development of an evaluation of the occurrence of groundwater contamination by gasoline and solvents (TCE) in an overburden aquifer resulting from the past use of a septic system at an automotive dealership in central New Jersey. Provided expert testimony on source and transport of contaminants. The results of the investigation were used to determine the potentially responsible parties and seek cost recovery from past insurance coverage. (with former employer)

**Borough of Park Ridge, New Jersey v. Handy & Harmon, et al.** Provided peer review and expert testimony services in connection with a Cost Recovery action regarding the contamination of a nineteen well public community water supply in northern New Jersey by CVOCs (PCE, TCE, DCE, and TCA) associated with a former industrial injection well system. The services included the use of extensive aquifer testing and vertical borehole profiling along with isotope and tracer analyses to establish the fate and transport of the subject CVOCs in a regional fractured

sedimentary bedrock aquifer. (with former employer)

**Berlin Township v. Remington & Vernick.** Review and evaluate the siting, permitting, construction, and hydrogeologic evaluation of a public water supply well as part of a cost recovery action in the Pinelands region of New Jersey. Prepared expert certifications regarding the inappropriate siting and testing of a new public water supply well relative to the site-specific hydrogeologic and hydrologic conditions, and its inability to provide a potable supply and not impact local regulated surface-water bodies. The work included completion of extensive aquifer testing and groundwater sampling efforts on a watershed level scale. (with former employer)

**Litgo New Jersey Inc. & Sheldon Goldstein v. Mauriello, et als., Civil Case No.: 06-2891.** Prepared expert reports and provided expert testimony at deposition and trial in connection with the impact of chlorinated solvents associated with a former defense manufacturing facility and federal government drum storage site on local groundwater, soil, and underlying fractured bedrock, as well as the potential for impacts on several public community supply wells in Somerville, New Jersey. The completed evaluations focused on the sources, longevity, and transport mechanisms of chlorinated solvents including PCE, TCE, and related breakdown compounds from the identified sources, as well as the respective timing and volumes of the releases and corresponding contributions to the overall on-site and off-site impacts. The evaluations were based on the completion of GIS-based mapping, and analytical techniques, and extensive historical database review. (with former employer)

**Pio Costa Enterprises v. Borough of Montville.** Completed peer review of experts' reports regarding groundwater and aquifer recharge, and projected impacts on a municipal well supply from proposed land use and development in northern New Jersey. Prepared expert report and provided expert testimony at deposition and at Morris County Court. (with former employer)

**Brunswick Topsham Water District v. Layne Christensen Company and Travelers Casualty and Surety Company of America.** Prepared an expert report and provided expert testimony at deposition and before a jury regarding the adequacy of the design, construction, and development of a public community water supply well in Brunswick, Maine, relative to the respective contract documents, specifications, and relevant "state of the art" for such wells. Specific testimony was provided about the influence of local hydrogeologic conditions and contractor activities associated with the well, and the connection with the inability of the post-completion well to perform satisfactorily, as well as the possibility of adequately rehabilitating the well. (with former employer)

**New Jersey Farm Bureau v. New Jersey Department of Environmental Protection.** Provided expert testimony before a State of New Jersey Administrative Law Judge in connection with a lawsuit against the NJDEP regarding the lack of technical validity of the hydrogeologic bases for the Highlands Water Protection and Planning Act. Specifically, the expert testimony focused on the use of appropriate groundwater recharge values and characteristics for use in determining minimum lot size associated with on-site wastewater disposal options for properties within the Highlands Physiographic Province of New Jersey. (with former employer)



**Farley Waterworks v. Morris County Municipal Utilities Authority.** Review and evaluate the siting, permitting and hydrogeologic evaluation of a proposed public water supply well as part of a property condemnation action in northern New Jersey. Prepared expert certifications and provided deposition testimony regarding the adequacy of the yield and likely permitting of the proposed public water supply well for an alternative use as a bottled water supply relative to the site-specific hydrogeologic and hydrologic conditions, and the existing regulatory considerations. (with former employer)

**R.L. Vallee, Inc. v. American International Surplus Lines, Inc.** Completed peer review of expert's reports regarding sources, extent, duration, remediation costs, and appropriation of contributions for diesel and gasoline releases at an active service station located in northern Vermont. Prepared an expert report and provided testimony of findings including opinions on adequacy and costs of proposed remedial activities, and sources of BTEX and MTBE in local overburden and fractured bedrock aquifers. (with former employer)

**Stites v. Gulf Oil Company, et al.** Performance of a peer review, preparation of comments and provision of an expert report in connection with litigation concerning gasoline and MTBE contamination of domestic water-supply wells and fractured crystalline bedrock aquifer by former service station in Morris County, New Jersey. (with former employer)

**United Water New York, Inc. v. Amerada Hess Corp., et al.** Prepared expert reports and provided expert testimony at deposition in connection with the impact of MTBE on the potability of several UWNY public community supply wells in Rockland County, New York. The completed evaluations focused on the sources, longevity, and transport mechanisms of MTBE from the identified sources to the respective wells for use in damage calculations for possible cost recovery. The evaluations were based on the completion of analytical modeling, GIS-based mapping and spatial analyses for zone of contribution delineations, and extensive historical database review. (with former employer)

**Town of Bethlehem v. J. Kenneth Frasier & RUST.** Review and evaluate the design, construction and hydrogeologic evaluation of an infiltration gallery and associated wellfield expansion along the Hudson River in New York, as part of a cost recovery action. Prepared expert report regarding the inadequacy of the design and construction of the infiltration gallery relative to the site-specific hydrogeologic conditions, and its inability to provide its expected supply. (with former employer)

**Catena v. Raytheon, et als., Docket No. BER-L-001267-11.** Prepared expert reports and provided expert testimony at deposition in connection with the source and timing of the release(s) of tetrachloroethene (PCE) at a former WWII aircraft manufacturing facility, which was subsequently used as an industrial dry-cleaning facility and automotive retailer in a historically industrial area in northern New Jersey. The completed evaluations focused on the sources, longevity, and transport mechanisms of PCE and related breakdown compounds (CVOCs) from the identified sources in the underlying glacially deposited overburden, as well as the respective timing and volumes of the releases and corresponding contributions to the overall on-site and off-site impacts. The evaluations were based on the

completion of supplemental subsurface investigations and sampling, GIS-based mapping and spatial analyses, and analytical fate and transport modeling techniques, and extensive historical database review. (with former employer)

**Maier Services, Inc. v. Subsurface Technologies, Inc.** Prepared an expert report and provided expert testimony before a mediator for Federal Court regarding an alleged patent infringement relative the use of carbon dioxide injection as a well rehabilitation technique. Specific testimony was provided about the development and application of the technique, its historical use relative to well types and conditions, and corresponding hydrogeologic influences. (with former employer)

**Ridgewood Water v. ITT, et al.** Provided peer review and expert testimony services in connection with a Cost Recovery action regarding the contamination of a public community water supply wellfield by CVOCs (PCE, TCE, DCE, and TCA) associated with a former industrial facility in northern New Jersey. The services included the use of extensive aquifer testing and vertical borehole profiling to establish the fate and transport of the subject CVOCs in a regional fractured sedimentary bedrock aquifer. (with former employer)

**Bernardsville Quarry v. Bernardsville.** Design and management of an investigation to evaluate impacts of past and proposed traprock quarrying activities on a local fractured bedrock aquifer and related groundwater supplies, and oversight of similar investigations completed by others. The completed work included provision of expert testimony before local planning boards, regulators, and New Jersey State Supreme Court. (with former employer)

**Ridgewood Water v. Shell Oil, et al.** Conducted hydrogeologic evaluations of the sources of gasoline affiliated contaminants and MTBE at a public community supply well and regional sedimentary bedrock aquifer. Work conducted included the implementation and analysis of an aquifer pumping tests and review of existing background information. The results of the evaluation were used to prepare an expert's report and provide expert testimony in support of litigation against several oil companies, as well as a New Jersey Spillfund Claim. (with former employer)

**Rockefeller Development, Gale Companies, and Florham Park, New Jersey v. Borough of Madison & Borough of Chatham.** Design and management of an investigation to evaluate impacts of proposed office campus development on the recharge to a regional glacial deposits aquifer and related groundwater supplies. The completed work included provision of expert testimony at deposition and attendance at Morris County Court, before settlement. (with former employer)

**Hobart Corporation, Kelsy-Hayes Company, and NRC Corporation v. The Dayton Power And Light Company, et als., CASE NO. 3:13-cv-115-WHR.** Prepared expert report and provided expert testimony at deposition in connection with the source and mechanisms for migration of chlorinated volatile organic compounds (CVOCs) at a USEPA designated superfund site resulting from former landfill activities and nearby industrial activities in southwestern Ohio. The completed evaluations focused on the potential source area(s) and transport mechanisms for PCE, TCE, and related breakdown compounds to migrate through soil gas, soil, and groundwater, and impact indoor air quality. The evaluations included the use of GIS-based mapping, groundwater-flow modeling, and environmental analytical database review and evaluations.