

Principal Geologist/Hydrogeologist

### FIELDS OF EXPERTISE

Environmental Geology, Hydrogeology, Water Supply, Water Resource Planning, Soil & Groundwater Remediation, Environmental Site Assessments, Groundwater Nitrates, Geological Features Mapping

### HIGHLIGHTS OF EXPERIENCE

Geologist with extensive professional experience, project management and problem solving for hydrogeologic studies, water resources, brownfield redevelopment, environmental site assessments, remedial actions, soil & groundwater contamination studies, geological mapping, stormwater management, geotechnical investigations, water supply permitting, land use planning, and heavy metal remediation. Clientele has ranged from Fortune 500 companies to Municipalities to private individuals. Below is a sampling of key project experience.

- Hydrogeological Investigations for Environmental Corrective Actions: Project manager, technical reviewer and field geologist for numerous hydrogeological investigations related to gasoline service stations, landfills, commercial properties, and industrial facilities. Responsibilities have included preparation of work plans, scheduling, coordinating field activities, sampling, monitoring well installation observation, hydrogeologic interpretations, groundwater flow and contaminant transport, groundwater pumping tests, borehole testing and geophysics, fate and transport modeling, data and trend analysis, hydrogeological interpretation and conceptual model design, review and selection of remediation alternatives, report preparation and budgeting. Sites conditions range from bedrock and unconsolidated aquifers, saturated and unsaturated conditions, and under static and pumping groundwater conditions. Characterizations have established the baseline model for remedy evaluation and effective closure.
- Hydrogeology in Glacial Till Geology: Project manager and field geologist at former gasoline station located with the glacial till region. The characterization and remedial investigation involved hydrogeological conditions associated with glacial till and fracture sedimentary bedrock, and a complicated groundwater flow regime having a strong vertical groundwater flow component and induced flow from residential potable wells.
- Hydrogeology in Coal Mining Region: Task manager for hydrogeologic investigation at RCRA facility in northeastern Pennsylvania coal region. Project responsibilities included monitoring well design and installation observation, rock core analysis, down-hole video, packer testing, preparation of geologic cross-sections and hydrogeologic interpretation. The investigation was conducted within the overburden and unsaturated bedrock rock aquifer above the saturated mine pool.
- Public Water Supply Well Permitting: Water resource studies and permitting for public water supplies, pre-development planning, evaluating potential on-site water supply well locations, characterizing hydrogeologic conditions, supply well installation oversight, evaluating pumping test data, preparing water balances of proposed water usage.
- Spring Water Permitting: Hydrogeological study and feasibility analysis on springs to determine source, flow regime, catchment area, water quality, susceptibility, and potential impacts, related to both planned and existing spring water bulk transport and bottling facilities.
- Water Resource Planning: Hydrogeologic studies to evaluate water budgets for proposed developments, required yields, optimal recharge area, potential impacts from surface water infiltration.
- Groundwater Nitrate Modeling: Hydrogeologic studies and modeling of nitrate dilution and migration for subdivisions proposing to use on-site septic and water supply wells.
- Phase I and II Environmental Site Assessments: Environmental Site Assessments (ESAs) performed to evaluate potential concerns associated with industrial, commercial, agricultural and undeveloped properties. Work scopes include site reconnaissance, historical records review, aerial photograph interpretation regulatory agency reviews, exploratory test pits, fracture trace analysis, geophysical surveys, soil and groundwater sampling, and cursory evaluations for asbestos, lead paint and mold.

- Special Industrial Area: Obtained release of liability at a former heating oil distribution terminal and gasoline service station under Pennsylvania's Act 2 Special Industrial Area (SIA). In accordance with the Act, a Baseline Remedial Investigation was conducted, and using risk-based, brownfield redevelopment incentives encouraged within the SIA, soil and groundwater impact could remain on site through the use of engineering controls and suitable land re-use.
- Manufactured Gas Plant Contamination: Developed sampling program to distinguish whether groundwater contamination originated from historic manufactured gas production or current gasoline service station usage.
- Characterization at Lead Battery Facilities: Sampling coordinator for EPA Emergency Response lead battery site, overseeing multi-year field investigation including soil, surface water and groundwater sampling, and landfill characterization. Developed and implemented soil sampling of metals using x-ray fluorescence for hazardous waste characterization and expedited remediation. Other responsibilities included management, interpretation, statistical evaluation and presentation of data and findings.
- Statistical Evaluation & Data Validation: Prepared RCRA groundwater monitoring statistical program and computer model to evaluate quarterly groundwater quality compliance data for a large steel manufacturing plant. Used non-parametric statistical methodology to evaluate and compare soil lead concentrations associated with smelter and residential sources. Developed statistical methods to establish appropriate soil cleanup levels.
- Soil and Groundwater Remediation: Remedy evaluation, pilot testing, design and implementation of remediation systems for impacted soil and groundwater. Treatment technologies have included soil excavation, soil stabilization, soil vapor extraction, sparging, enhanced bioremediation, bioaugmentation, chemical oxidation, monitored natural attenuation, groundwater pump and treatment, groundwater trench collection, and residential water filtration. Employed various techniques to achieve contact with contaminant zones including interceptor trenches, direct contact, and direct push injections.
- Geological Mapping: Mapping bedrock outcrops and subcrops, and surficial materials, in the Piedmont, Ridge and Valley, and Atlantic Coastal Plain Physiographic Provinces of Pennsylvania, Delaware and New Jersey.
- Soil Mapping: Delineated alluvial soils from residual soils along streams to comply with local ordinances.
- Aerial Photography Interpretation: Aerial photograph stereo pair mapping and fracture trace analysis to identify geologic contacts, previously existing drainageways & wetlands, fractured bedrock zones and sinkhole areas.
- Fracture Trace Analysis: The use of stereoscopic aerial photograph pairs, field observations and geophysical surveys to identify fractured bedrock zones that provide preferential contaminant migration pathways and/or high yielding groundwater monitoring wells.
- Sinkhole Identification & Mitigation: Geophysical surveys and subsurface investigations to identify potential sinkholes in carbonate regions. Optimization of exploratory test boring locations using geophysics. Field oversight of compaction grouting to stabilize sinkhole activity in stormwater management basins and parking lots along public roadway and commercial developments.
- Stormwater Management & Mitigation: Resolved water infiltration problem (groundwater versus surface water) into sub floor of large research center and developed mitigation plan. Assist municipalities and local organizations with stormwater management, infiltration BMPs, and regulation compliance.
- Surveying: Topographic, property and planimetric surveying.
- Geotechnical Investigations: Subsurface investigations associated with geotechnical engineering projects, including exploratory test borings and test pits, hand auger borings, piezometer installations, dynamic cone penetration tests, soil classification, laboratory testing and geophysics.

## **EDUCATION**

Master of Environmental Pollution Control, Pennsylvania State University (2003)  
Emphasis: Nitrates in Groundwater, Bioremediation, Watershed Management, Environmental Law, Hazardous Materials Management.

Bachelor of Science – GeoSciences, Pennsylvania State University  
Geology Undergraduate Coursework – Western State College of Colorado  
Geology Graduate Coursework – West Chester University  
Environmental Engineering Graduate Coursework – Villanova University

Continuing Education Classes: Analysis and Design of Aquifer Tests; Brownfield and PA Act 2 Workshops; Assessment, Control and Remediation of LNAPL Contaminated Sites; Groundwater Flow through Fractured Media; Agricultural Chemicals and Ground Water; Biotechnical Slope Protection and Erosion Control; Slope Protection and Restoration with Geosynthetics; Total Quality Management; Business Management; MTBE Characterization and Remediation; Hydrogeology of Fractured Rock.

## **REGISTRATIONS/CERTIFICATIONS/AFFILIATIONS**

Professional Geologist - Pennsylvania, Delaware  
The American Institute of Professional Geologists (2001 PA Section President, 2000 PA Section Vice-President, 2004 – 2012 PA Section Treasurer)  
The National Ground Water Association  
Health and Safety Training: 40 hrs. & 8 hr. refresher, Hazardous Waste Operations (OSHA 1910.120)  
Health and Safety Supervisor Training: 8 hrs Hazardous Waste Operations (OSHA 1910.120)  
Borough of Swarthmore Environmental Advisory Council (1998 to 2005, Chairman 2001 - 2003)

## **PUBLICATIONS**

Remote Aerial Photogrammetry to Map, Model and Document Rock Outcrops. James R. Taylor, Michael A. Napolitan, Andrew Sokol, and Kevin Earley. 2015. American Institute of Professional Geologists, 52nd Annual Conference, 2015, Anchorage Alaska.

Nitrate Removal for On-Lot Sewage Treatment Systems: The POINT™ System. Hagerty, Paul A. and Taylor, James R. 2005. Technical White Paper.

Evaluating Groundwater Nitrates from On-Lot Septic Systems, a Guidance Model for Land Planning in Pennsylvania. Taylor, James R. 2003. Penn State Great Valley, School of Graduate Professional Studies. Malvern, Pennsylvania.

Watershed Management Plan for the Borough of Swarthmore & Crum Creek Watershed, Draft. Taylor, Jim and Tymchenko, Nick. 1999.

Results of a Soil Lead Study Conducted in a Residential Area. Taylor, J. and Forslund, B. 1997. 12th Annual Conference on Contaminated Soils. University of Massachusetts.

Acid Mine Drainage. 1996. Taylor, J. Technical White Paper.

Interceptor Trenches Enhance In-Situ Bioremediation within a Shallow Water Table Aquifer. Taylor, J. and Hitchens, D. Abstract & Technical White Paper.

Evaluating Residential Water Supply Wells in a Fractured Bedrock Aquifer Contaminated with MTBE: A Case Study. Taylor, J. and O'Brien, T. 1993. Focus Conference on Eastern Regional Ground Water Issues.

Environmental Impacts on Blood Lead Levels in the Vicinity of a Former Battery Recycling Plant. Taylor, J. and Forslund, B. 1991. 25th Annual Conference on Trace Substances in Environmental Health.