

Principal Geologist/Hydrogeologist

## **FIELDS OF EXPERTISE**

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

## **HIGHLIGHTS OF EXPERIENCE**

Mr. Taylor is a geologist with over 20 years of professional experience, project management and problem solving in 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. He has worked with clientele ranging from fortune 500 companies to townships to private individuals. Below is a sampling of key projects he has been involved with.

- 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.
- 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.
- Spring Water Permitting: Hydrogeological study and feasibility analysis on spring to determine source, flow regime, catchment area, water quality, susceptibility, and potential impacts, related to a planned spring water bulk transport and bottling facility.
- Phase I and II Environmental Site Assessments: Numerous 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 a PA Act 2 release at a former heating oil distribution terminal and gasoline service station under the Special Industrial Area (SIA) provisions of the Pennsylvania Land Recycling Act. In accordance with the Act, a Baseline Remedial Investigation was conducted to characterize the site conditions and identify imminent threats to public health or the environment. Using the risk-based, brownfield redevelopment incentives encouraged within the SIA, the widespread 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. Sampling was conducted subsequent to research on the history, processes and by-products of manufactured gas from coal.
- 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. Other responsibilities included management, interpretation, and statistical evaluation of data. Responsible for developing and implementing soil sampling programs for metals using x-ray fluorescence equipment during hazardous waste site characterization and expedited remediation.
- Statistical Evaluation & Data Validation of Sampling Data: 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 or residential sources. The developed methods then assisted in establishing appropriate 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: Geophysical surveys and subsurface investigations to identify potential sinkholes in carbonate regions. Optimization of exploratory test boring locations using geophysics.
- 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 assistant.
- 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.
- Compaction Grouting of Sinkholes: Field oversight of compaction grouting to stabilize sinkhole activity, including stormwater management basins and parking lots along public roadway and commercial

developments.

## **EDUCATION**

Master of Environmental Pollution Control  
Pennsylvania State University (2003)

Emphasis in nitrates in groundwater, bioremediation, watershed management, environmental law and hazardous materials management.

Bachelor of Science – GeoSciences  
Pennsylvania State University (1991)

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 – 2007 PA Section Treasurer)

The National Ground Water Association

Health and Safety Training: 40 hrs. Hazardous Waste Operations (OSHA 1910.120)

Health and Safety Supervisor Training: 8 hrs Hazardous Waste Operations (OSHA 1910.120)

Health and Safety Training: 8 hrs. Refresher Hazardous Waste Operations (OSHA 1910.120)

Borough of Swarthmore Environmental Advisory Council (1998 to present, Chairman 2001 - 2003)

## **PUBLICATIONS**

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

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

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

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

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

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

Taylor, J. Acid Mine Drainage.

Taylor, J. and Hitchens, D. Interceptor Trenches Enhance In-Situ Bioremediation within a Shallow Water Table Aquifer. (abstract)