



BRIAN E. McANINCH, C.P.G. **Hydrogeologist**

Education

Graduate Studies (1994)
Hydrogeology, University of Connecticut, Storrs, Connecticut

M.Sc. (1987)
Geological Sciences, Brown University, Providence, Rhode Island

B.A. Geology (1985)
Geology, Oberlin College, Oberlin, Ohio

Short Courses

Waterloo Hydrogeologic
3-D Groundwater Flow & Transport using Visual MODFLOW, Ontario, 2000

Waterloo Educational Serv.
DNAPL Characterization & Remediation, San Francisco, 1996

ASTM Education Serv.
Risk Based Corrective Actions (RBCA), Portland, 1996

University of Wisconsin
Groundwater Flow Through Fractured Media, Madison, 1989

Certifications

Licensed Professional Geologist, New Hampshire

Affiliations

American Geophysical Union

Assoc. of Ground Water Scientists and Engineers

Central NY Association of Professional Geologists

Sigma Xi, The Scientific Research Society

EXPERIENCE:

Brian has been working on environmental and hydrogeological problems for over 15 years. He has managed and directly worked on water supply and watershed management projects, landfill expansion projects, and environmental site assessments (ESAs) along with follow-up RI/FS projects. In addition, Brian has worked on and managed remedial and contaminant investigations involving coal tar, chrome, lead, mercury, nickel, cyanide, chlorinated solvents (including DNAPL), PCBs, brine, and petroleum fuels (including MTBE) on projects in Massachusetts, Rhode Island, Connecticut, New Hampshire, Maine, New York, Pennsylvania, Maryland, Delaware, Michigan, and California. This experience includes:

- over 160 environmental and hydrological projects involving environmental investigation, water supply evaluation, landfill investigations, modeling, aquifer testing, quality assurance/quality control (QA/QC) support, litigation support, and research.

Environmental Investigations

- providing technical support on expert litigation for the Onondaga Lake Superfund Site, Syracuse, NY. Stearns & Wheeler, LLC is providing the technical lead and coordinating activities for a team of National-level technical experts for Onondaga County in a lawsuit relative to the clean-up of one of the nation's largest and most complex Superfund sites. Activities have included re-writing the Remedial Investigation Report, critiquing and reanalyzing pumping test data, and providing over-site services for investigatory activities.
- providing site investigative and consulting services to Knolls Atomic Power Laboratories (KAPL) as principal hydrogeologist for project activities. Work includes performing follow-up environmental investigations at sites within the Kesselring KAPL facility in West Milton, New York.
- performing follow-up investigations on former manufactured gas plant (MGP) facilities located in Central New York for several large New York corporations. Site concerns involve the presence of coal tar in the subsurface, possibly as DNAPL, and its impact on groundwater.
- designing and implementing an 850 gpm, 72-hour aquifer test at the City of Santa Monica's Charnock Wellfield, in west Los Angeles, California. This test was part of a basin-wide study to determine the source of methyl tertiary butyl ether (MTBE) contamination of the wellfield. As part of this aquifer test, 35 wells were monitored utilizing down-well pressure transducers with on-board data logging systems. During the course of the test more than 3.5 million gallons of groundwater were treated and discharged with on-site analysis conducted to insure that proper treatment occurred. Upon completion of the test, Mr. McAninch supervised the testing of production and monitoring wells

with an electronic borehole flow meter (EBF). This testing was conducted to determine the vertical variability of hydraulic conductivity at each of the wells.

- implementing an investigation involving assessment of deeper hydrogeologic conditions and groundwater quality at a site in Ventura County, CA, where upper aquifer zones have been impacted with chlorinated solvents, and the presence of DNAPL has been documented. This investigation included a deep zone drilling program, and a series of aquifer tests to assess the hydraulic conditions in both upper and deeper hydraulic zones, to help develop remedial strategies. Analysis of hydraulic testing data included boundary-distance calculations in a complex fluvial depositional environment.
- completing comprehensive site assessment and remedial investigation for Massachusetts DEP Priority Disposal site and State Superfund site. Site concerns included >25-acre plume of TCE and Freon contaminated groundwater and potential impacts to down gradient elementary school, residential homes, wetlands, and municipal wells.
- completing comprehensive site assessment for Massachusetts DEP priority disposal site. Site concerns involved elevated concentrations in groundwater for over 30 volatile and semi-volatile compounds at a bulk chemical packaging facility and their impact on an abutting river.
- completing order of deficiency investigation and follow-up comprehensive site assessment for former gasoline service station located in southeastern Massachusetts. Site concerns included on-site and off-site impacts to residential wells and impact on abutting drinking water reservoir.
- conducting RCRA corrective action investigation and RCRA groundwater monitoring for capped wastewater lagoon at Massachusetts DEP priority and disposal site. Site concerns included chrome and chlorinated solvent contamination of on-site and off-site groundwater and soil and impacts to abutting freshwater wetlands.
- completing comprehensive site assessment at uncontrolled waste disposal site in northeastern Massachusetts. Site concerns included PCB and chlorinated solvent contamination of on-site wetlands and bedrock aquifer and potential impacts to off-site private wells.
- supervising underground storage tank (more than 30 tank installations), contaminated soil removal, and follow-up contaminant delineation investigation at Department of Defense facility in central Massachusetts.

Water Supply Evaluation

- consulting on water supply project for confidential client in central New York State. Project included installing wells and conducting aquifer tests to

determine if sufficient groundwater resources are available at the site for the proposed project. Work included evaluating cost for developing water supply and wastewater disposal at the site.

- consulting on large watershed development plan for a region in rural Sonoma County, CA. Plan involved collection hydrologic data to support development of long-term groundwater extraction plan.
- evaluating water supply conditions for an open-pit mine facility in San Bernardino County, CA. Climatic data, published data on regional recharge rates, historic water level information, and historic groundwater extraction data were utilized to analyze the long-term reliability of groundwater supply. Existing geologic and hydrogeologic reports and maps, along with lineament mapping from air reconnaissance photos, were utilized to identify potential areas for water supply test well drilling. Analysis results of water samples collected (including tritium and oxygen isotope results) were utilized to determine the age, recharge history, and long term reliability of groundwater supply. Upon completing the analysis, water supply options and their comparative cost-benefit were evaluated for providing future supply to the facility.

Brownfields Investigations

- conducting investigations as lead field investigator at a series of adjacent properties in support of a Brownfields redevelopment project for the Syracuse Housing Authority. Site concerns included historic and recently operated metal recycling facilities, and other industrial and commercial operations.
- consulting on initial investigatory drilling programs for two state-funded Brownfields projects in metropolitan Boston.

Landfill Investigations

- completing implementation of a landfill monitoring system as principal hydrogeologist. Project work includes productive interaction between field personnel and Maryland Department of the Environment personnel. Fieldwork includes the installation of a network of bedrock monitoring wells in Karst-type limestone formations, and surface-water sampling facilities around the perimeter of a new landfill facility, which was recently permitted by Stearns & Wheler.
- implementing and analyzing a series of aquifer tests for a propose expansion at the Puente Hills Landfill, Los Angeles County, CA.. The tests (more than 100 in number) were performed using both manual and electronic data collection methods. Mr. McAninch interpreted data using both manual and software-based solution methods. Step-drawdown tests and slug tests were performed to select wells and assess their optimal pumping rates prior to starting the

constant discharge tests. Analytical work included analysis of data from bounded and fractured bedrock aquifers, and analytical techniques for well bore storage and leaky confined aquifer conditions. In addition, recently published work at the time (1996) was utilized to analyze the response in an observation well during slug tests. Aquifer test data were used in conjunction with groundwater gradient and geologic information, to assess hydraulic properties of the geologic formations tested to help develop a groundwater-monitoring program for the expansion area.

- conducting hydrogeologic investigations for the Los Angeles County Sanitation Districts in support of landfill expansions at two landfills in Los Angeles County, CA. Investigatory efforts included evaluating the geology and hydrogeology of the two sites through geologic mapping, drilling, and extensive single well and multiple well hydrologic testing.

Modeling

- developing of a conceptual hydrogeologic model for the Charnock sub-basin in west Los Angeles, CA as part of a corporate team to determine the source of methyl-tertiary butyl ether (MTBE) contamination to the city of Santa Monica's Charnock Wellfield. The model involved a comprehensive review of geologic boring, oil well, water supply well, and monitoring well data for the study area. Historical groundwater extractions and water use in the study were researched, the basin's geology and hydraulic boundaries were interpreted, and water balance for the basin was developed.
- developing a detailed seven-layer 3-D numerical model at a chlorinated solvent release site in California's Central Valley for a confidential client as part of a corporate modeling team. Modeling was conducted in order to develop a scenario whereby contaminant distribution was controlled and impact to nearby production wells was minimized.
- performing contaminant attenuation calculations utilizing analytical and computer modeling techniques to develop contaminant transport models at several sites in Los Angeles, Orange, Ventura, and San Diego Counties, CA.
- employing 2-D numerical models for evaluating groundwater flow and contaminant transport at several sites in Massachusetts.

Aquifer Testing

- critiquing and reanalyzing aquifer test data from the Onondaga Lake Superfund Site, Syracuse, NY. Data included strong open-boundary effects, barometric effects, and step test data sets.
- designing and implementing small- and large-scale aquifer testing programs at several sites in California, Massachusetts, Connecticut, and New York,

including work at two large municipal landfills, several private industrial facilities, and the City of Santa Monica Charnock Wellfield. Tests implemented included step test, slug tests, long-term pump tests, packer tests, borehole flow meter testing, and low-flow purging experiments. Analysis included examining partial penetration, open and closed boundary phenomena, well casing and well-bore storage phenomena, aquifer leakage, fracture flow, and aquifer anisotropy.

Quality Assurance/Quality Control Support

- serving as quality assurance task leader for the MTBE regional assessment for the Charnock Wellfield, in west Los Angeles, CA. In this capacity, wrote and implemented the EPA and LA-RWQCB approved quality assurance program plan (QAPP) for the project, and then subsequently designed, managed, and reviewed all work for the QA/QC database, which was utilized to track and insure that all QAPP goals were met. In addition, interviewed and audited a series of analytical laboratories in order to insure QAPP goals would be met.

Litigation Support

- providing technical support on expert litigation for the Onondaga Lake Superfund Site, Syracuse, NY. Stearns & Wheler, LLC is providing the technical lead for Onondaga County in a lawsuit relative to this Superfund Site.
- consulting in two court cases involving chlorinated solvent releases, which impacted drinking water wells in Connecticut. To this end, Brian reviewed reports; installed wells; collected samples; performed air quality surveys; prepared affidavits; and provided depositions and technical advice regarding the reliability of opposing consulting work, contaminant transport calculations, biodegradation calculations, and investigative methodologies. Court cases involved CERCLA, RCRA, and civil rights issues.
- performing hydrological study in central Massachusetts on plaintiff's behalf in successful civil suit against municipal authority involving alleged brine contamination of private wells by a sewage treatment facility.

Research

- conducting research on anaerobic biodegradation of gasoline constituents, with particular attention to the geochemical changes in groundwater and soil gas associated with the degradation process. Redox sensitive indicators (iron sulfur, nitrogen, carbon, oxygen, etc.) were primarily investigated, to delineate dominance zones and relate these to compound specific degradation rates.
- conducting research involving large-scale soil gas surveys at petroleum containment sites, measuring variations in VOCs, O₂, CO₂, H₂S, and soil air permeability. Sites involved in study were located in Delaware and Michigan.

- assisting in ongoing research involving multi-level groundwater sampling at petroleum and chrome contaminant sites, including work on converting standard monitoring wells into multi-level sampling installations. Designed various on-line atmospherically isolated sampling systems, for sampling of reduced groundwater. Research utilized spectrophotometer and electrode analysis techniques in field analysis of groundwater samples.

Technical Expertise

- supervising drilling programs utilizing hollow-stem auger, mud-rotary (with and without casing), cable tool, air-rotary, dual-air percussion, rockcoring drill rigs, and direct-push techniques (GeoProbe, CPT, Vibra-Core). Logged samples and cuttings utilizing the Unified Soil Classification System (USCS)
- collecting and preparing varying types of soil samples for geotechnical and chemical laboratory analysis in accordance with procedures outlined by ASTM and various county, state, and federal agencies.
- utilizing various types of pressure transducers, diffusion-multilevel samplers (DMLS), electronic bore hole flow (EBF) meters, surface water flow meters, and water quality analysis instruments and techniques (including specific-ion electrodes, Eh electrodes, turbidity and conductivity instruments, and alkalinity analysis techniques).
- supervising demolition, construction, and sampling activities under rigorous QA/QC and H&S requirements, including projects involving U.S. Environmental Protection Agency, Dept. of Energy, and U.S. Army Corp oversight.

PRESENTATIONS:

“Politics and Hydrogeology of Methyl Tertiary Butylether (MTBE),” Oberlin College, Geology Department, Oberlin, OH, April 30, 1999.

“Biodegradation of Gasoline: Investigative Techniques and Implications for Hydrogeologic Consulting,” Pomona College, Geology Department, Claremont, CA, September 20, 1995.

“Groundwater and Soil Gas Chemistry Associated With Biodegradation of Organic Contaminants, or ‘What Happens At Those Abandoned Gasoline Stations’,” Oberlin College, Geology Department, Oberlin, OH, April 12, 1995.

PUBLICATIONS:

Robbins, G. A, McAninch, B.E., Gavas, F.M., and Ellis, P.M., 1995. Soil gas surveying for H₂S: A potential method for locating gasoline contamination. *Ground Water Monitoring & Remediation*, vol. 15, No. 1 pp. 124-132.

**Brian E. McAninch
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Bradshaw, B.K., Robbins, G.A., Troskosky, C., Billick, K.A., Binkhorst, G.K., and McAninch, B.E., 1995. Use of chloride in the evaluation of factors affecting vertical contaminant spreading from gasoline contamination in glacial strata. Geological Society of America, 30th Annual Northeastern Section, Vol. 27, No. 1, pg. 31, March 20-22, 1995, Cromwell, CT.

McAninch, B.E., Robbins, G. A, Gavas, F.M., and Ellis, P.M., 1994. Hydrogen sulfide soil gas distributions associated with hydrocarbon fuel contamination: EOS (American Geophysical Union) Transactions, Vol. 75, pg. 245.

Nikolaidis, N.P., Robbins, G.A., Scherer, M., Shen, H., McAninch, B.E., Binkhorst, G.K., Asikainen, J., and Suib, S., 1994. Vertical distribution and partitioning of chromium in a glaciofluvial aquifer. *Ground Water Monitoring & Remediation*, Vol. 14, no. 3, pp. 150-159.

McAninch, B.E., Binkhorst, G.K., & Powell, M.A., 1993. Neubig Earth Excavation; Geology and hydrogeologic implications. Kings Mark Resource Conservation and Development Area, Inc., Review Team Report, North Haven, Connecticut.

Nikolaidis, N.P., Robbins, G.A., Shen, H., Grassoit, C., Suib, S., Scherer, M., Binkhorst, G.K., McAninch, B.E., Asikainen, J., Heitert, J., and Banwart, S., 1992. Sampling techniques in geochemical characterization of chromium contamination in groundwater: Proc. Gordon Conference, New Hampshire.

Nikolaidis, N.P., Robbins, G.A., Scherer, M., Shen, H., McAninch, B.E., Binkhorst, G.K., and Suib, S., 1992. Geochemical characterization of chromium contamination in groundwater: EOS (American Geophysical Union) Transactions, Vol. 73, pg. 219.