



Experience

ESS Group, Inc. – 2011 to present

Years of Prior Related Experience – 39

Education

BS, Chemistry, University of Massachusetts-Lowell

Graduate Courses in; Chemistry, University of Massachusetts-Lowell and Environmental Engineering, Northeastern University

Qualifications

Mr. Bacon has 43 years of successful experience in the power industry in Project Development, Environmental Engineering, Permitting and Licensing, Public Outreach, and the management of multi-disciplinary teams of engineers, scientists, legal, and financial support to develop new energy projects in the US.

Mr. Bacon has significant experience in developing a wide range of environmental control/mitigation plans for new energy projects and has supported numerous independent environmental/engineering reviews of proposed energy development projects to support clients with project financing including projects located throughout the U.S., and some international projects located in Canada, Australia, England, North Africa, and Guam.

Mr. Bacon’s project experience includes a wide range of energy facility designs including gas-fired simple and combined cycle electric generators participating as part of an EPC team or part of the Owner’s engineering team. His experience also includes managing site selection efforts for new energy development projects and managing project teams preparing permit applications to secure permits/approvals for construction/operation of new energy facilities.

Specializing in all areas of Water Management and Chemistry Control for power projects, including development and implementation of water and wastewater treatment systems utilizing available water supplies to meet facility requirements for steam generation and cooling. Chemistry control systems have been designed for a wide variety of power facilities including systems for maintenance of cooling water chemistry, boiler/steam cycle chemistry control, sampling and chemical monitoring, boiler makeup demineralization, condensate polishing and the design of steam and condensate return systems for cogeneration applications that provide protection of high pressure boiler/turbine systems.

He has participated in numerous Independent Engineer engineering and environmental Due Diligence reviews of Cogeneration, Independent Power, and Merchant Power Projects for owners, prospective buyers, and financial institutions. These assignments have been associated with construction financing, and generation asset purchase/sale transactions for oil-fired, coal-fired, and gas-fired power plants, gas turbine/combined cycle cogeneration projects, and independent power production (IPP) projects.

Prior Experience

Pure Energy Resources, LLC Burlington, MA

2006 to 2011

VP, Development

Responsibilities

Mr. Bacon joined Pure Energy Resources, LLC as a founding member of the company in May 2006 as Vice President – Development participating in the engineering, planning, public outreach, permitting, detailed engineering and construction contracting of the Bayonne Energy Center in Bayonne New Jersey. The BEC project was a new brownfield 512 MW mid-merit generating facility consisting of eight fast-start Rolls Royce Trent 60 simple cycle units. Although located in Bayonne, NJ, the BEC Project will supply all of its output to New York City through a dedicated 3-phase 345 kV submarine transmission cable interconnected to Brooklyn, NY. Mr. Bacon participated in many public presentations and meetings with NJ/NY regulatory agencies during the development process and provided successful testimony to New York State Public Service Article VII process addressing the NYISO “Needs Analysis” for this generating facility.



Among other responsibilities, Mr. Bacon successfully managed the completion of the BEC's site remediation with NJDEP, interfaced directly with ExxonMobil Environmental on transmission cable burial on an adjacent contaminated property, secured a favorable Water Agreement with BMUA, secured a Wastewater Discharge Permit with the Passaic Valley Sewerage Commissioners, and secured temporary land leases for project construction laydown areas.

**Calpine Corporation, Boston, MA
2004 to 2006**

Director, Water Technology

Responsibilities

As Calpine's Director of Water Technology managed an engineering team responsible for development of water management plans for new Calpine energy power projects, including detailed engineering, and procurement of water and wastewater treatment systems and associated discharge permits. Early development support included; assisting Calpine Project Development in site selection, evaluation of alternative water management systems, and support to Project permitting and licensing activities. Calpine's Water Technology group also provided operational support for Calpine's fleet in the area of chemistry control including systems for maintenance of cooling water chemistry, boiler/steam cycle chemistry control, sampling and chemical monitoring, demineralization, condensate polishing and steam/condensate return systems for cogeneration applications providing protection of high pressure boiler/turbine systems.

**Calpine Corporation, Boston, MA
2000 to 2004**

Director, Project Development

Responsibilities

As Development Manager in Calpine's Eastern Regional Office was assigned to develop future Calpine generation assets in Ohio. Mr. Bacon managed a multidisciplinary team of Calpine internal resources and sub-contracted engineering, environmental and legal firms to fully develop and secure all permits and approvals for the 705 MW Fremont Energy Center and the 1100 MW Lawrence Energy Center. As Calpine's Developer for these two generation assets, Mr. Bacon personally managed community support and directly interfaced with all regulatory agencies including securing the Ohio Power Siting Board Site Certificates, negotiated the electrical interconnect agreements with both First Energy and AEP and provided testimony to the Ohio Public Utilities Commission regarding the siting and development. Mr. Bacon also provided assistance in the development of many other Calpine generation assets throughout the US and Mexico.

**Stone & Webster Boston, MA
1973 to 2000**

Environmental Project Manager

Responsibilities

Mr. Bacon held many key positions over a 27 year career with Stone & Webster participating in engineering of numerous national and international steam/electric generation projects (conventional gas/oil/coal and PWR & BWR nuclear technologies) responsible for environmental engineering, water/wastewater management plans, chemical operations, mitigation of environmental impacts, development of regulatory compliance plans, managing environmental audits of existing facilities, and participation in condition assessments and asset evaluations for many existing generation facilities.

Working with Stone & Webster Management Consultants, Mr. Bacon participated in numerous Independent Engineer Due Diligence reviews of Cogeneration, Independent Power Projects (IPP), and Merchant Power Projects for owners, prospective buyers, and financial institutions. These assignments

were associated with pre-construction financing, and generation asset purchase/sale transactions for oil-fired, coal-fired, and gas-fired power plants and post-construction re-financing of many projects.

Mr. Bacon also provided commissioning support in the area of boiler/steam cycle chemistry for a number of new electric generation projects in the US and projects in Australia and England. In these assignments, Mr. Bacon was the only contracted Stone & Webster representative present providing direction to the Consortium responsible for development of these projects.

Representative Project Experience

Inenergy Thermal Development, LLC – Clear River Energy Center, Burrillville, RI. Participating as part of a multi-disciplinary project team to provide technical analyses and project development support for the project's environmental permits/approvals for this proposed 1,000 MW combined cycle power plant.

Confidential Energy Development Project – Arizona. Provided project development support for a proposed new energy facility required to balance the variable energy output of renewables in the Phoenix area. Support included developing the overall water supply plan for the proposed facility, characterization of source water chemistry, development of the conceptual design for a reclaimed water treatment system, and development of water/chemistry balances for the proposed water supply system.

Confidential Acquisition Diligence – New York City, NY. Participated as a member of a Client's select Acquisition Diligence Team to assess physical, operational, and regulatory compliance issues for a large cogeneration asset in the NYC area. Specific activities included participation in informational presentations by the current owner of the facility, visual inspections of the existing facility, review of all permits/licenses to assess environmental compliance, review of independent engineering reports used for the facility's original financing, review of operating contracts, development of an assessment of potential impacts of pending environmental regulations on current operations and preparation of a findings report.

Oregon Clean Energy, LLC – Oregon, OH. Participated in the early development of the nominal 800MW gas fired combined cycle electric generation plant in the City of Oregon, in northwest Ohio. Specific activities included assessments of the City of Oregon Ohio's existing Lake Erie raw water supply system, the City's municipal water, and wastewater treatment facilities, resulting in a recommendation for the conceptual design of the water supply system to meet the makeup water supply and wastewater discharge requirements for this large combined cycle generation facility.

Pure Energy Infrastructure, LLC – NY. Managed an Environmental Critical Issues Assessment of a proposed NY Energy Highway project to be sited in New York City. The Assessment highlighted potential construction and/or operational impacts and assessed whether the identified impacts posed a potential fatal flaw to permitting of the project. The Environmental Critical Issues Assessment reviewed the proposed project against the requirements of the new NYS Article X process and was used in presentations to potential investors.

Bayonne Energy Center – Bayonne, New Jersey. Participated in the conceptual engineering, planning, public outreach, permitting, detailed engineering and construction contracting for the brownfield 512 MW mid-merit generating facility. Successfully managed the completion of the project site remediation with NJDEP, interfaced directly with ExxonMobil on transmission cable burial on an adjacent contaminated property, secured a favorable Water Agreement with BMUA, secured Air Permit, contracted with the Owners Environmental and Owners Engineer, and secured temporary land leases for project construction laydown areas for this project. Managed the water supply, water treatment and wastewater permitting for this advanced simple cycle gas turbine project including PVSC sewer discharge permit and the BMUA Water Supply Agreement.

Fremont Energy Center – Fremont, Ohio. As the Project Developer, managed a multidisciplinary team including sub-contracted engineering, environmental and legal firms to develop and secure all permits and approvals for this 705MW energy project. Managed community outreach and directly interfaced with all regulatory agencies including securing an Ohio Power Siting Board Site Certificate, negotiating the electrical interconnect agreement, and providing testimony to the Ohio Public Utilities Commission regarding the siting and development. Responsibilities included a Water Supply Agreement and Wastewater Discharge permit for this facility.

Lawrence Energy Center – Lawrence County, Ohio. As the Project Developer, managed a multidisciplinary team including sub-contracted engineering, environmental, and legal firms in order to develop and secure all permits and approvals for this 1100 MW combined cycle generating project. Managed community outreach and directly interfaced with all regulatory agencies, including securing a Ohio Power Siting Board Site Certificate, negotiating the electrical interconnect agreement, and providing testimony to the Ohio Public Utilities Commission regarding the siting and development.

Brooklyn Navy Yard Cogeneration Partners (BNYCP), Independent Technical Review of the BNYCP Proposed Water Treatment System – Brooklyn, NY. Conducted a review of BNYCP's plans to contract for the design and construction of a 2,800 GPM (4 MGD) boiler makeup water treatment to supply the BNYCP cogeneration facility in Brooklyn, New York. The proposed water treatment plant will utilize treated effluent from the Red Hook Water Pollution Control Plant and provide high pressure boiler makeup water to be used in the steam supply system operated by BNYCP. Proposed system concepts, design documents, and the completed contract for the proposed facility were reviewed to determine the efficacy and economics of the proposed treatment plant.

Island Cogeneration Partners, Island Cogeneration Project – Vancouver, British Columbia, Canada. As part of a team, provided Owners Engineering Services to Island Cogeneration Partners, for a 254 MW (net) the natural gas fired combined-cycle cogeneration facility located adjacent to Fletcher Challenge Canada's Elk Falls Pulp Mill located at Duncan Bay near Campbell River, Vancouver Island, British Columbia.

Dresdner Australia Limited, Independent Technical Review of Redbank Power Project – Hunter River Valley, New South Wales, Australia. Participated as part of a two-member team to provide Independent Pre-Construction review of a 128 MW CFB coal-fired power plant located in the Hunter River Valley, New South Wales, Australia for the project financier, Dresdner Australia Limited. This power plant was fueled by beneficiated dewatered coal tailings from a large, open-pit local coal mine. Activities included a complete review of all environmental issues; proposed environmental pollution control systems; review of all permitting and licensing documents and applications; completion of walk-downs of the mine and proposed power plant site; and participation in numerous meetings with the prospective EPC contractor, coal mine operator, power purchaser, and environmental consultant. A final report was developed for the project that provided Independent Technical Review of the proposed project.

Western Power – Australia. Provided independent commissioning services in Australia to Western Power for a recently completed combined cycle cogeneration facility designed to provide steam and electric power to a large alumina refinery operation located in southwest Australia. This assignment required engineering reviews of the condensate and feedwater systems of the Alumina Refinery and interviewing EPC Contractor, steam host Alumina Refinery and the Western Power project managers to identify solutions and physical modifications that would allow the completed facility to begin operations.

Healy Clean Coal Project – Alaska Industrial Development and Export Authority, Healy, Alaska. Provided commissioning support services to AIDEA to address ongoing feedwater chemistry control problems for the Healy Clean Coal Project (HCCP). Activities included a site visit, interviews with management and operating staff, reviews of water treatment and chemistry control systems, review of

historical operating data and development of a report with recommendations for future operations. The HCCP facility is a pulverized coal fired 50 MW net electrical generating plant constructed near Healy, Alaska, designed to demonstrate an advanced coal combustion system.

Supercritical Water Oxidation Data Acquisition — U.S. Department of Energy. As Project Manager of this DOE contract, managed a project team and sub-contractor, MODAR, Inc. of Natick, Massachusetts, to conduct pilot plant testing of MODAR's Supercritical Water Oxidation process to determine the effectiveness of the technology to treat various DOE and U.S. Department of the Navy wastes. SCWO is a process that operates at supercritical temperatures and pressures to oxidize and destroy various hazardous wastes. The product of the oxidation and water, inorganic salts and various environmentally safe gases. The Project included numerous technical challenges to engineer, construct and operate the pilot plant to obtain the performance data required by DOE and the U.S. Navy.

Clover Power Plant — ABB Combustion Engineering Systems, Clover, Virginia. Provided Commissioning Consulting to ABB Combustion Engineering for this 425 MW coal fired power plant. The commercial operations had been delayed by failure to achieve operating conditions related to boiler/steam cycle chemistry. The purpose of this investigation was to identify the source of silica contamination and make recommendations to eliminate the impact of silica on commercial acceptance of the Unit. This assignment was successfully completed on October 6 when this 425 MW Unit was declared commercial by the Owners, Virginia Power and Old Dominion Electric Cooperative.

225 MW Combined Cycle Repowering Project — England. As Environmental Consultant participated in the development of environmental permits/approvals for a 225 MW combined cycle gas turbine used to repower a Central Electricity Generating Board power plant site. The facility site had become a critical habitat for wintering birds as a result of the once-through cooling system impacting the winter temperature of the discharge bay. This site was classified as a "Site of Special Scientific Interest" and as such any construction plans are reviewed with particular attention to the environmental impacts associated with the new facility. The Environmental Statement was successful and planning approval was obtained after a thorough review by the Pollution Inspectorate, the River Authority, the Planning Authority, and the Nature Conservancy Council. This project will be the first independent power producer project approved under the new electricity privatization arrangement in England.



William H. Bailey, Ph.D.

Principal Scientist

Occupational & Environmental Health Risk Assessment

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Dr. Bailey specializes in applying state-of-the-art assessment methods to environmental and occupational health issues. His 30 years of training and experience include laboratory and epidemiologic research, health risk assessment, and comprehensive exposure analysis. Dr. Bailey has investigated exposures to alternating current, direct current, and radiofrequency electromagnetic fields, 'stray voltage', and electrical shock, as well as to a variety of chemical agents and air pollutants. He is particularly well known for his research on potential health effects of electromagnetic fields and has served as an advisor to numerous state, federal, and international agencies. Currently, he is involved in research on exposures to marine life from submarine cables and respiratory exposures to ultrafine- and nanoparticles.

Dr. Bailey is a visiting scientist at the Cornell University Medical College and has lectured at Rutgers University, the University of Texas (San Antonio), and the Harvard School of Public Health. He was formerly Head of the Laboratory of Neuropharmacology and Environmental Toxicology at the New York State Institute for Basic Research, Staten Island, New York, and an Assistant Professor and NIH postdoctoral fellow in Neurochemistry at The Rockefeller University in New York.

CREDENTIALS & PROFESSIONAL HONORS

Ph.D., Neuropsychology, City University of New York, 1975

M.B.A., University of Chicago, 1969

B.A., Dartmouth College, 1966

Sigma Xi

The Institute of Electrical and Electronics Engineers/International Committee on Electromagnetic Safety (Subcommittee 3, Safety Levels with Respect to Human Exposure to Fields (0 to –3 kHz) and Subcommittee 4, Safety Levels with Respect to Human Exposure to Radiofrequency Fields (3 kHz to 3 GHz)

Elected member of the Committee on Man and Radiation (COMAR) of the IEEE Engineering in Medicine and Biology

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PUBLICATIONS

Bailey WH. Review of epidemiology of electromagnetic fields, Martin Rössli, Editor. *Health Physics* 2015; 109:606–607.

Chang ET, Adami H-O, Bailey WH, Boffetta P, Krieger RI, Moolgavkar SH, Mandel JS. Validity of geographically modeled environmental exposure estimates. *Crit Rev Toxicol* 2014 May; 44:450–466. doi: 10.3109/10408444.2014.902029.

Alexander DD, Bailey WH, Perez V, Mitchell ME, Su S. Air ions and respiratory function outcomes: A comprehensive review. *J Negat Results Biomed* 2013 Sep 9; 12(1):14. doi: 10.1186/1477-5751-12-14.

Perez V, Alexander DD, Bailey WH. Air ions and mood outcomes: A review and meta-analysis. *BMC Psychiatry* 2013 Jan 15; 13(1):29. doi: 10.1186/1471-244X-13-29.

Bailey WH, Johnson GB, Bishop J, Hetrick T, Su S. Measurements of charged aerosols near ± 500 kV DC transmission lines and in other environments. *IEEE Transactions on Power Delivery* 2012; 27:371–379.

Shkolnikov YP, Bailey WH. Electromagnetic interference and exposure from household wireless networks. 2011 IEEE Symposium on Product Compliance Engineering (PSES), October 1–5, 2011.

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Bailey WH, Wagner M. IARC evaluation of ELF magnetic fields: Public understanding of the $0.4\mu\text{T}$ exposure metric. *Journal of Exposure Science and Environmental Epidemiology* 2008; 18:233–235.

Bailey WH, Erdreich L. Accounting for human variability and sensitivity in setting standards for electromagnetic fields. *Health Physics* 2007; 92:649–657.

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Kavet R, Stuchly MA, Bailey WH, Bracken TD. Evaluation of biological effects, dosimetric models, and exposure assessment related to ELF electric- and magnetic-field guidelines. *Applied Occupational and Environmental Hygiene* 2001; 16:1118–1138.

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De Santo RS, Bailey WH. Environmental justice tools and assessment practices. *Proceedings, American Public Transit Association*, 1999.

Bailey WH, Su SH, Bracken TD. Probabilistic approach to ranking sources of uncertainty in ELF magnetic field exposure limits. *Health Physics* 1999; 77:282–290.

Bailey WH. Field parameters. *Proceedings, EMF Engineering Review Symposium, Status and Summary of EMF Engineering Research*. Bracken TD and Montgomery JH (eds), Oak Ridge National Laboratory, Oak Ridge, TN, April 28–29, 1998.

Bailey WH. Policy implications. *Proceedings, EMF Engineering Review Symposium, Status and Summary of EMF Engineering Research*. Bracken TD and Montgomery JH (eds), Oak Ridge National Laboratory, Oak Ridge, TN, April 28–29, 1998.

Bailey WH. Probabilistic approaches to deriving risk-based exposure guidelines: Application to extremely low frequency magnetic fields. In: *Non-Ionising Radiation*. Dennis JA and Stather JW (eds), Special Issue of *Radiation Protection Dosimetry* 1997; 72:327–336.

Bailey WH, Su SH, Bracken TD, Kavet R. Summary and evaluation of guidelines for occupational exposure to power frequency electric and magnetic fields. *Health Physics* 1997; 73:433–453.

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Weiss JM, Goodman PA, Losito BG, Corrigan S, Charry JM, Bailey WH. Behavioral depression produced by an uncontrollable stressor: Relationship to norepinephrine, dopamine, and serotonin levels in various regions of rat brain. *Brain Research Reviews* 1981; 3:167–205.

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Book Chapters

Bailey WH. Principles of risk assessment and their limitations. In: *Risk Perception, Risk Communication and its Application to EMF Exposure*. Matthes R, Bernhardt JH, Repacholi MH (eds), International Commission on Non-Ionizing Radiation Protection, Oberschleißheim, Germany, 1998.

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Technical Reports

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Presentations

Bailey WH. Update on scientific developments regarding extremely low frequency and radiofrequency fields and health. Committee on Man and Radiation (COMAR) of the IEEE Engineering in Medicine and Biology Society, January 11, 2016.

Bailey WH. Measurements of charged aerosols around DC transmission lines and other locations. International Committee on Electromagnetic Safety TC95/ Subcommittee 3: Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0 – 3 kHz, December 2011.

Bailey WH, Erdreich LS. Human sensitivity and variability in response to electromagnetic fields: Implications for standard setting. International Workshop on EMF Dosimetry and Biophysical Aspects Relevant to Setting Exposure Guidelines. International Commission on Non-Ionizing Radiation Protection, Berlin, March 2006.

Bailey WH. Research-based approach to setting electric and magnetic field exposure guidelines (0-3000 Hz). IEEE Committee on Electromagnetic Safety, December 2005.

Bailey WH. Conference Keynote Presentation. Research supporting 50/60 Hz electric and magnetic field exposure guidelines. Canadian Radiation Protection Association, Annual Conference, Winnipeg, June 2005.

Bailey WH. Scientific methodology for assessing public health issues: A case study of EMF. Canadian Radiation Protection Association, Annual Conference, Public Information for Teachers, Winnipeg, June 2005.

Bailey WH. Assessment of potential environmental effects of electromagnetic fields from submarine cables. Connecticut Academy of Science and Engineering, Long Island Sound Bottomlands Symposium: Study of Benthic Habitats, July 2004.

De Santo RS, Coe M, Bailey WH. Environmental justice assessment and the use of GIS tools and methods. National Association of Environmental Professionals, 27th Annual Conference, Dearborn, MI, June 2002.

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Bailey WH. Principles of risk assessment: Application to current issues. Symposium on EMF Risk Perception and Communication, World Health Organization, Ottawa, Canada, August 1998.

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Bailey WH. Methods to assess potential health risks of cell telephone electromagnetic fields. IBC Conference—Cell Telephones: Is there a Health Risk? Washington, DC, June 1997.

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Bailey WH, Weiss JM. Psychological factors in experimental heart pathology. Visiting Scholar Presentation, National Heart Lung and Blood Institute, March 1977.

Presentations

Williams AI, Bailey WH. Toxicologic assessment of air ion exposures in laboratory animals. Poster presentation at 53rd Annual Meeting of the Society of Toxicology, Phoenix, AZ, March 26, 2014.

Perez V, Alexander DD, Bailey WH. Air ions and mood outcomes: A review and meta-analysis. Poster presentation at the American College of Epidemiology, Chicago, IL, September 8–11, 2012.

Shkolnikov Y, Bailey WH. Electromagnetic interference and exposure from household wireless networks. Product Safety Engineering Society Meeting, San Diego, CA October 2011.

Nestler E, Trichas T, Pembroke A, Bailey W. Will undersea power cables from offshore wind projects affect sharks? North American Offshore Wind Conference & Exhibition, Atlantic City, NJ, October 2010.

Nestler E, Pembroke A, Bailey W. Effects of EMFs from undersea power lines on marine species. Energy Ocean International, Ft. Lauderdale, FL, June 2010.

Pembroke A, Bailey W. Effects of EMFs from undersea power cables on elasmobranchs and other marine species. Windpower 2010 Conference and Exhibition, Dallas, TX, 2010.

Bailey WH. Clarifying the neurological basis for ELF guidelines. Workshop on Practical Implementation of ELF and RF Guidelines. The Bioelectromagnetics Society 29th Annual Meeting, Kanazawa, Japan, June 2007.

Sun B, Urban B, Bailey W. AERMOD simulation of near-field dispersion of natural gas plume from accidental pipeline rupture. Air and Waste Management Association: Health Environments: Rebirth and Renewal, New Orleans, LA, June 2006.

Bailey WH, Johnson G, Bracken TD. Method for measuring charge on aerosol particles near AC transmission lines. Joint Meeting of The Bioelectromagnetics Society and The European BioElectromagnetics Association, Dublin Ireland, June 2005.

Bailey WH, Bracken TD, Senior RS. Long-term monitoring of static electric field and space charge near AC transmission Lines. The Bioelectromagnetics Society, 26th Annual Meeting, Washington, DC, June 2004.

Bailey WH, Erdreich L, Waller L, Mariano K. Childhood leukemia in relation to 25-Hz and 60-Hz magnetic fields along the Washington DC—Boston rail line. Society for Epidemiologic Research, 35th Annual Meeting, Palm Desert CA, June 2002. *American Journal of Epidemiology* 2002; 155:S38.

Erdreich L, Klauenberg BJ, Bailey WH, Murphy MR. Comparing radiofrequency standards around the world. Health Physics Society 43rd Annual Meeting, Minneapolis, MN, July 1998.

Bracken TD, Senior RS, Rankin RF, Bailey WH, Kavet R. Relevance of occupational guidelines to utility worker magnetic-field exposures. Second World Congress for Electricity and Magnetism in Biology and Medicine, Bologna, Italy, June 1997.

Weil DE, Erdreich LS, Bailey WH. Are 60-Hz magnetic fields cancer causing agents? Mechanisms and Prevention of Environmentally Caused Cancers, The Lovelace Institutes 1995 Annual Symposium, La Fonda, Santa Fe, NM, October 1995.

Bailey WH. Neurobiological research on extremely-low-frequency electric and magnetic fields: A review to guide future research. Sixteenth Annual Meeting of the Bioelectromagnetics Society, Copenhagen, Denmark, June 1994.

Blondin J-P, Nguyen D-H, Sbeghen J, Maruvada PS, Plante M, Bailey WH, Goulet D. The perception of DC electric fields and ion currents in human observers. Annual Meeting of the Canadian Psychological Association, Penticton, British Columbia, Canada, June 1994.

Erdreich LS, Bailey WH, Weil DE. Science, standards and public policy challenges for ELF fields. American Public Health Association 122nd Annual Meeting, Washington, DC, October 1994.

Bailey WH, Charry JM. Particle deposition on simulated VDT operators: Influence of DC electric fields. 10th Annual Meeting of the Bioelectromagnetics Society, June 1988.

Charry JM, Bailey WH. Contribution of charge on VDTs and simulated VDT operators to DC electric fields at facial surfaces. 10th Annual Meeting of the Bioelectromagnetics Society, June 1988.

Bailey WH, Charry, JM. Dosimetric response of rats to small air ions: Importance of relative humidity. EPRI/DOE Contractors Review, November 1986. Charry JM, Bailey WH, Bracken TD (eds). DC electric fields, air ions and respirable particulate levels in proximity to VDTs. International Conference on VDTs and Health, Stockholm, Sweden, June 12–15 1986.

Charry JM, Bailey WH. Air ion and DC field strengths at 104 ions/cm³ in the Rockefeller University Small Animal Exposure Chambers. EPRI/DOE Contractors Review, November 1985.

Charry JM, Bailey WH. DC Electrical environment in proximity to VDTs. 7th Annual Meeting of the Bioelectromagnetics

Society, June 1985.

Bailey WH, Collins RL, Lahita RG. Cerebral lateralization: Association with serum antibodies to DNA in selected bred mouse lines. Society for Neuroscience, 1985.

Kavet R, Bailey WH, Charry JM. Respiratory neuroendocrine cells: A plausible site for air ion effects. Seventh Annual Meeting of The Bioelectromagnetics Society, June 1985.

Bailey WH, Charry JM. Measurement of neurotransmitter release and utilization in selected brain regions of rats exposed to DC electric fields and atmospheric space charge. 23rd Hanford Life Sciences Symposium, Richland, WA, October 1984.

Bailey WH, Charry JM, Weiss JM, Cardle K, Shapiro M. Regional analysis of biogenic amine turnover in rat brain after exposure to electrically charged air molecules (air ions). Society for Neuroscience, 1983.

Bailey WH. Biological effects of air ions: Fact and fancy. American Institute of Medical Climatology Conference on Environmental Ions and Related Biological Effects, October 1982.

Goodman PA, Weiss JM, Hoffman LJ, Ambrose MJ, Bailey WH, Charry, JM. Reversal of behavioral depression by infusion of an A2 adrenergic agonist into the locus coeruleus. Society for Neuroscience, November 1982.

Charry JM, Bailey WH. Biochemical and behavioral effects of small air ions. Electric Power Research Institute Workshop, April 1981.

Bailey WH, Alonson DR, Weiss JM, Chin S. Predictability: A psychologic/ behavioral variable affecting stress-induced myocardial pathology in the rat. Society for Neuroscience, November 1980.

Salman SL, Weiss JM, Bailey WH, Joh TH. Relationship between endogenous brain tyrosine hydroxylase and social behavior of rats. Society of Neuroscience, November 1980.

Bailey WH, Maclusky S. Appearance of creatine kinase isoenzymes in rat plasma following myocardial injury produced by isoproterenol. Fed Assoc Soc Exp Biol, April 1978.

Bailey WH, Maclusky S. Appearance of creatine kinase isoenzymes in rat plasma following myocardial injury by isoproterenol. Fed Proc 1978; 37:889.

Bailey WH, Weiss JM. Effect of ACTH 4-10 on passive avoidance of rats lacking vasopressin (Brattleboro strain). Eastern Psychological Association, April 1976.

PRIOR EXPERIENCE

President, Bailey Research Associates, Inc., 1991–2000

Vice President, Environmental Research Information, Inc., 1987–1990

Head of Laboratory of Environmental Toxicology and Neuropharmacology, New York State Institute for Basic Research, 1983–1987

Assistant Professor, The Rockefeller University, 1976–1983

PROFESSIONAL AFFILIATIONS

The Health Physics Society (Affiliate of the International Radiation Protection Society)

Society for Risk Analysis

International Society of Exposure Analysis

New York Academy of Sciences

American Association for the Advancement of Science

Air and Waste Management Association

Society for Neuroscience/International Brain Research Organization

Bioelectromagnetics Society

The Institute of Electrical and Electronics Engineers/Engineering in Medicine and Biology Society

Conseil International des Grands Réseaux Électriques

ACADEMIC APPOINTMENTS

Visiting Fellow, Department of Pharmacology, Cornell University Medical College, New York, NY, 1986–present

Visiting Scientist, The Jackson Laboratory, Bar Harbor, ME, 1984–1985

Head, Laboratory of Neuropharmacology and Environmental Toxicology, NYS Institute for Basic Research in Developmental Disabilities, Staten Island, NY, 1983–1987

Assistant Professor, The Rockefeller University, New York, NY, 1976–1983

Postdoctoral Fellow, Neurochemistry, The Rockefeller University, New York, NY, 1974–1976

Dissertation Research, The Rockefeller University, New York, NY, 1972–1974

CUNY Research Fellow, Dept. of Psychology, Queens College, City University of New York, Flushing, NY, 1969–1971

Clinical Research Assistant, Department of Psychiatry, University of Chicago; Psychiatric Psychosomatic Inst., Michael Reese Hospital, and Illinois State Psychiatric Inst, Chicago, IL, 1968–1969

Teaching Appointments

Lecturer, University of Texas Health Science Center, Center for Environmental Radiation Toxicology, San Antonio, TX, 1998

Lecturer, Harvard School of Public Health, Office of Continuing Education, Boston, MA, 1995, 1997

Lecturer, Rutgers University, Office of Continuing Education, New Brunswick, NJ, 1991–1995

Adjunct Assistant Professor, Queens College, CUNY, Flushing, NY, 1978

Lecturer, Queens College, CUNY, Flushing, NY, 1969–1974

Edinaldo Tebaldi, Ph.D.

14 Dixon St

Cumberland, RI 02864 - USA

Email: etebaldi@bryant.edu

Cell phone: +1-401-523-1349

Home phone: +1-401-537-1971

Work phone: +1-401-232-6901

Education

Ph.D. in Economics, 2005, University of New Hampshire (UNH)

MA in Economics, 2003, University of New Hampshire (UNH)

MA in Economics, 2000; Universidade Federal do Ceará, Brazil

BA in Economics, 1998; Universidade Estadual de Maringa, Brazil

**Professional
experience****Bryant University - Department of Economics**

Tenured Associate Professor of Economics, 08/01/2012 – current

Director – Bryant Scholars, 02/01/2016 – current

Director – Center for Global and Regional Economic Studies, 03/01/2012 – 04/01/2016

Assistant Professor of Economics, 08/01/2007 – 07/31/2012

Courses: Econometrics (I & II), Economic Growth; International Trade; Principles of Economics

New England Economic Partnership – NEEP

State Forecast Manager, 2008 – current

Federal Reserve Bank of Boston

New England Public Policy Center, Member of the Advisory Board, 2015 – Current

Universidade Estadual de Maringa – Brazil

Summer Visiting Scholar (2010, 2012, 2014)

The World Bank (Washington - USA)

Consultant, Feb/Mach 2012

Project: Institutions and Violence

University of New Hampshire - Department of Economics

Visiting Assistant Professor of Economics, 08/21/2006 – 07/31/2007

Courses: Mathematical Economics, Time Series Analysis; Intermediate Macroeconomics

The World Bank (Fortaleza - Brazil)

Consultant, 08/01/2005 – 03/30/2006

Project: Evaluation of CrediAmigo.

Federal University of Ceará (Fortaleza -Brazil) - Department of Applied Economics

Assistant Professor of Economics, 01/10/2005 – 08/01/2006

Courses: Econometrics I, Mathematical Economics II, Economic Growth

The World Bank (Washington, DC)

Consultant, 06/07/2004 – 08/27/2004

Research: Geography and development in Northeast Brazil: equity, efficiency and environment

Awards

Merit Award for Research Excellence, 2015, 2013, 2011 and 2009 (Bryant University)

PBN 40 Under Forty Award for career success and community involvement, 2010. (Providence, RI)

Successful Research and Publication Award, 2010 (Bryant University)

The Master of Economics Professor of the Year 2006-2007 (University of New Hampshire)

X Prêmio Banco do Nordeste de economia Regional, 2006 (Banco do Nordeste do Brasil)

Outstanding Teaching Award – May 2005 (University of New Hampshire)

The Elizabeth Bogan Prize in Economics – 2003 (University of New Hampshire)

Outstanding Graduate Assistant - 2003 (University of New Hampshire)

IIV Parana Prize of Economics, 1999– Brazil (Best Undergraduate Thesis – 2nd Place)

- Research Interests**
- ✓ Applied Econometrics
 - ✓ Economic Development & Poverty
 - ✓ Discrimination & Social Issues
- Select Journal Publication**
- Tebaldi, E. and Kim, J. (2015). Is Income Growth in the United States Pro-Poor? A State Level Analysis. *Eastern Economic Journal*, 41(2): 251-272.
- Schumacher, F., Dias, J., Tebaldi, E. (2014). Two tales on human capital and knowledge spillovers: the case of the US and Brazil. *Applied Economics*, 46(23), 2733-2743.
- Tebaldi, Edinaldo and Elmslie, Bruce (2013). Does Institutional Quality Impact Innovation? Evidence from Cross-country Patent Grant Data. *Applied Economics*, 45:7,887-900.
- Dias, Joilson and Tebaldi, Edinaldo (2012). Institutions, human capital, and growth: The institutional mechanism. *Structural Change and Economic Dynamics*, 23: 300–312.
- Tebaldi, Edinaldo (2011). The Determinants of High-Technology Exports: A Panel Data Analysis. *Atlantic Econ Journal* 39:343–353.
- Tebaldi, Edinaldo and Mohan, Ramesh. (2010). Institutions and Poverty. *Journal of Development Studies*, 46(6), 1047 - 1066.
- Journal Publications**
- Tebaldi, E. and Beaudin, L. (2015). Climate change and economic growth in Brazil, *Applied Economics Letters*, 23(5), 377-381.
- Gittell, R., Sohl, J., Tebaldi, E. (2014). Do Entrepreneurship and High Tech Concentration Create Jobs? Exploring the growth in employment in U.S. metropolitan areas from 1991 to 2007. *Economic Development Quarterly*.
- Elmslie, B. T., Tebaldi, E. (2014). The determinants of marital happiness. *Applied Economics*, 46(28), 3452-3462.
- Schumacher, F., Dias, J., Tebaldi, E. (2014). Geographic and Sector Externalities from Highly Qualified Human Capital. *Applied Economics Letters*, 21(5): 329-334.
- Tebaldi, Edinaldo & Kelly, Logan (2012): Measuring economic conditions: an extension of the Stock/Watson methodology. *Applied Economics Letters*, 19(18): 1865-1869.
- Jongsung Kim and Edinaldo Tebaldi, (2011) 'Does international trade impact wage discrimination?', *Economics Bulletin*, 31(3), 2709-2724.
- Tebaldi, Edinaldo (2011). The Determinants of High-Technology Exports: A Panel Data Analysis. *Atlantic Econ Journal* 39:343–353.
- Jongsung, Kim and Tebaldi, Edinaldo. (2011). The Immigrants Odds of Slipping Into Poverty: Double Jeopardy? *The Eastern Economic Journal*, 37, 530-552.
- Gittell, R. and Tebaldi, E. (2010). Poverty in U.S. Metropolitan Area: What Are The Key Determinants And What Is The Role Of Local Fiscal Structure? *Public Finance and Management*, 10(3), 411-442.
- Elmslie, Bruce and Tebaldi, Edinaldo (2010). Teaching Economic Growth Theory with Data. *Journal of Economic Education*, 41 (2): 110-124.
- Tebaldi, Edinaldo and Kim, Jongsung. (2010). Two Tales on the Returns to Education: The Impact of Trade on Wages. *Review of Development Economics*, 14(4):768–782.
- Tebaldi, Edinaldo and Elmslie, Bruce (2008). Institutions, Innovation and Economic Growth. *Journal of Economic Development*, 33 (2), 27-54.
- Gittell, R. and Tebaldi, E. (2008). Are Research and Development Tax Credits Effective? The Economic Impacts of a R&D Tax Credit in New Hampshire. *Public Finance and Management*, 8(1): 70-101.
- Elmslie, Bruce and Tebaldi, Edinaldo. (2008) "So, What Did You Do Last Night? The Economics of Infidelity". *Kyklos*, 61(3): 391-410.
- Gittell, Ross and Tebaldi, Edinaldo. (2007). Did a Strong Economy in the 1990s Affect Poverty in U.S.

Metro Areas. *Economic Development Quarterly*, 21(4).

Elmslie, Bruce and Tebaldi, Edinaldo. (2007). Sexual Orientation and Labor Market Discrimination. *Journal of Labor Research*, 28(3), 436-453.

Gittell, Ross and Tebaldi, Edinaldo. (2006). Charitable Giving: Factors Influencing Giving in the U.S. States. *Nonprofit and Voluntary Sector Quarterly*, 35(4), 721-36, December 2006.

Ataliba, Flavio; Manso, Carlos and Tebaldi, Edinaldo. (2006). O Desequilíbrio Regional Brasileiro: Novas Perspectivas a Partir das Fontes de Crescimento Pró-Pobre. *Revista Econômica do Nordeste*, 37(3) Jul-Set. 2006.

Cavusoglu, N. and Tebaldi, E. (2006). Evaluating Growth Theories and their Empirical Support: An Assessment of the Convergence Hypothesis. *Journal of Economic Methodology*, 13(1), 49-75.

Tebaldi, Edinaldo and Elmslie, Bruce. (2006). Sexual Orientation and Labor Supply. *Applied Economics*, 38(5), 549-562, March 2006.

Verner, D. and Tebaldi, E.. (2004). Convergence, Dynamics and Geography of Economic Growth: The Case of Municipalities in Rio Grande do Norte, Brazil, *Policy Research Working Paper Series*. World Bank-DC, n.3302.

Tebaldi, E. Marinho, E. and Ataliba, F. (2003). Efeitos da Integração Nacional e Difusão e Conhecimento sobre a Trajetória de Crescimento Econômico. *Revista Estudos Economicos*, 33(3): 467-508.

**Professional
Conferences/
seminars**

Associates Degrees, the Quality of the U.S. Workforce, and the Sources of U.S. Economic Growth, 42nd Annual Conference, Eastern Economic Association, Washington, DC (February, 2016).

The dynamics of total factor productivity and institutions. Conference Developments in Economic Theory and Policy. Bilbao, Spain (June, 2015)

Crescimento Econômico:Avanços e Desafios. XVII Encontro De Economia Da Região Sul, Universidade Estadual de Maringa, Brazil, (August 8, 2014).

Economic Growth: What we (think we) know about it!, XXIX Semana do Economista 2014, Universidade Estadual de Maringa, Brazil, (August 5, 2014).

The Role of Technology Diffusion on Economic Growth of Emerging Economies, 40th Annual Conference of the Eastern Economic Assoc., Eastern Economic Association, Boston, (March 8, 2014).

A Dinâmica Global da Industria de Alta Tecnologia", Conjuntura 20 Anos, Universidade Estadual de Maringa, Brazil (August 27, 2013).

Do institutions Impact Violence? 2013 Eastern Economic Association Conference, Eastern Economic Association, New York, May 2013.

Is Income Growth in the United States Pro-Poor? A State Level Analysis. Presented at the Eastern Economic Association 2012 Meetings, Boston, March 2012.

Two Tales on the Dynamics of Human Capital Accumulation. Presented at the Southern Economic Association, 81st Annual Meetings, Washington-DC, Nov, 2011.

The Determinants of High Tech Exports: A Panel Data Analysis. Presented at the 70th International Atlantic Economic Conference (Oct, 2010).

The Rhode Island Economic Outlook and Forecast: A Strategy for Reducing the State Budget Deficit. Federal Reserve Bank of Boston, Nov 21, 2010.

Delivered Inaugural Lecture of the economics doctoral program at Universidade Estadual de Maringa–Brazil. 08/23/10.

Pro-poor growth in Brazil: Where does the country stand? Presented at InWent-DIE Workshop on 'Strategies to Achieve Pro-Poor Growth in Brazil, China, India and Europe: The Case of the Education Sector' (Berlin,10-11 December 2009).

Two tales on the dynamics of human capital accumulation. Presented at the *IV Ciclo de Palestras em Economia – PCE*, UEM - Brazil, July 2009.

The Rhode Island Economic Outlook And Forecast: Can Rhode Island Afford the Future?. Delivered at

New England Economic Partnership conference, Federal Reserve Bank of Boston, May 21, 2009

Two tales on the dynamics of human capital accumulation. Presented at the University of New Hampshire, Economics Seminar Series, May 2009.

Institutions Augmented Solow Model with Poverty Trap. Presented at the Southern Economic Association, 78th Annual Meetings, Nov, 2008.

Poverty, Geography and Institutional Path Dependence. Presented at the Southern Economic Association, 78th Annual Meetings, Nov, 2008.

The Rhode Island Economic Outlook and Forecast: Feeling the Crunch. Delivered at New England Economic Partnership conference, Federal Reserve Bank of Boston, November 20, 2008

The high technology trade Balance: should we care? Presented at the Economic Summit, Bryant University, 2008.

Poverty, Geography and Institutional Path Dependence. Presented at Eastern Economic Association Annual Conference 2008, Boston- USA, 2008.

Invited Speaker: Union College – NY - Do Institutions Impact Innovation? January 18, 2008.

Does International Trade Impact the Returns to Education? Presented at the 2nd Faculty Research Day. Bryant University, January 2008.

Does International Trade Impact the Returns to Education? Presented at the Southern Economic Association Conference. November, 2007.

Do Institutions Impact Innovation? Presented at the University of New Hampshire, Economics Seminar Series, January 2007.

Institutions, Innovation and Growth. Presented at *the XI Encontro Regional de Economia – Brazil – July 2006.*

Innovation and Institutions: Examining the Black Box. Presented at the 31st Conference of the Eastern Economic Association (EEA), NY- USA, 2005.

Innovation and Institutions: Examining the Black Box. Presented at Economics Seminar Program, University of New Hampshire -USA, 2004.

Dynamics of Manufacturing Specialization across U.S. States. Presented at the 30th Conference of the Eastern Economic Association (EEA), Washington- DC-USA, 2004.

Evaluating Growth Theories and their Empirical Support: An Assessment of the Convergence Hypothesis. Presented at the 29th Conference of the Eastern Economic Association (EEA), New York, USA, 2003.

Efeitos da Integração Nacional e Difusão de Conhecimento na Trajetória de Crescimento Econômico. I Encontro EPGE-FGV / CAEN-UFC de Políticas Públicas e Crescimento Econômico. Brazil, 2000.

**Fellowship/
Assistantship**

Summer Research Grant, Bryant University, 2008-2009

Teaching Fellowship, University of New Hampshire, 2004 - 2005

Teaching Assistant Fellowship, University of New Hampshire, 2001 - 2004

Summer Teaching Assistantship - University of New Hampshire, 2003 - 2004

Summer Research Grant - Small Business Development Center (Durham-NH), 2002-2003

CAPES Assistantship, Fortaleza – Brazil, 1999-2000

CNPq – Scientific Initiation Program. Maringa - Brazil, 1997-1998

**Bryant University
Service**

A&S Strategic Planning: Co-chair Graduate Program Development Committee

Coordinator of the proposal to create a MS in Applied Economics (2013-2015)

Provost Search Committee (2014)

E-learning Committee (2014/2015)
A&S Graduate Curriculum Committee (2011- current)
General Education Curriculum Committee (2012)
Bryant 2020 Strategic Plan (2010)
Undergraduate Grievance Committee (2008-2010 – served as Chair in 2010)
Served in several departmental roles/committees

Professional Services

Served as referee for: World Development, Journal of the European Economic Association, Journal of Development Studies, Review of Economics and Institutions, Journal of Economic Education, The Social Science Journal, Southern Economic Journal, Eastern Economic Journal, SOBER, International Review of Economics Education.

Research Fellow: RI College & University Research Collaborative

Delivered several presentations to business and State leaders about the regional economic outlook.

Testimony for Rhode Island State House Finance Committee hearings, May, 2010.

Testimony for New Hampshire Senate hearings: R&D Tax Credit - Bill SB 134-FN-A – 03/06/07 and 05/10/07.

Faculty Development

AEA Econometrics Continuing Education Program: 2011, 2013, 2014; and 2015

Blackboard Collaborate (e-learning, 2014)

Bryant Slate Program (2011)

E-Portfolio (2010)

Language

English (fluent); Portuguese (native), Spanish (working proficiency)

Computer Skills

Stata, Matlab, Eviews, SPSS, HTML.

References

Dr. Bruce Elmslie

Professor, University of New Hampshire
Durham, NH 03824
1-603-862-3347
bte@unh.edu

Dr. Ross Gittell

Chancellor, Community College System of New Hampshire
Concord, NH 03301-7407
1-603-230-3501
e-mail: rgittell@ccsnh.edu

Dr. Ramesh Mohan

Associate Professor, Bryant University
Smithfield, RI 02917
1-401-232-6379
E-mail: rmohan@bryant.edu



GRAY & PAPE, INC.
ARCHAEOLOGY · HISTORY · HISTORIC PRESERVATION

Christopher L. Donta, Ph.D
Senior Principal Investigator
Gray & Pape, Inc.
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Providence RI 02909
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office (401) 273-9900
cell (413) 992-7593

Education:

1993 **Ph.D.** Anthropology, Bryn Mawr College
1988 **M.A.** Anthropology, Bryn Mawr College
1986 **A.B.** History, College of the Holy Cross

Research Interests: Cultural ecology, archaeological method and theory
Native cultures of North America: Northeast, Arctic, Southwest
Complex societies, political organization

Research Experience:

- Experience includes five years of archaeological excavation in Alaska, two years of excavation in Arizona, and 23 years directing over 300 archaeological projects throughout the Northeast
- Archaeological projects include both Native American and historic period sites, ranging from Paleoindian sites in Massachusetts; Archaic and Woodland sites throughout the Northeast; Archaic and agricultural sites in the Southwest; Archaic through Contact period sites in Alaska; to 18th through 20th century historic and industrial sites in the Northeast. The specific projects and reports are detailed below.

Present Employment:

January 2013 –

Senior Principal Investigator, Northeast Regional Manager of Archaeology
Gray & Pape, Inc.
Providence, Rhode Island

Primary company role includes managing client contacts and proposals, agency communications, overseeing fieldwork and report procedures, and pursuing research themes and publications in the Northeast. Project experience and oversight includes all areas of New England, as well as New York, New Jersey and Pennsylvania.

Previous Employment:

Senior Project Archaeologist 1993-2012

Archaeological Services
Department of Anthropology
University of Massachusetts
Amherst, Massachusetts 01003

Projects: Directed approximately 250 archaeological studies throughout the northeastern United States, from New Jersey to Maine, with extensive research conducted in all six New England states, with an emphasis on Massachusetts, Vermont, and Maine. Projects conducted in Massachusetts have included nearly 150 different towns in all 14 counties. Projects have also included a multi-year natural gas pipeline from Portland to Gilead, Maine (1995-1998), a multi-year electrical line expansion from New Haven to South Burlington, Vermont (2006-2009), Master Services Agreements with National Grid and multiple DOTs in the Northeast.

Results: Some 250 completed archaeological reports, documenting Native American presence in New England as far back as 12,000 years, from Paleoindian sites in Canton and Montague, to sites throughout the Archaic and Woodland Periods. Historic archaeological sites investigated have included mill sites, wharf development, burial grounds, homesteads and farmsteads, and taverns.

Consulting Field Archaeologist, Alaska, 1987-1994

Bryn Mawr College
University of Arkansas
University of Alaska, Anchorage
Exxon Co., USA

Projects: Directed and participated in excavations and surveys of the Kodiak and Aleutian archipelagos in south central Alaska. The focus was on Native American culture, and the development of social and political hierarchy among the Koniag and Aleut peoples in pre-Contact times.

Results: Excavations produced over 10,000 artifacts from the New Karluk site on western Kodiak, which is one of the best preserved sites in Alaska, and documented culture change over the past 1,000 years. Excavations were also conducted at the Uyak site in Larsen Bay, Alaska, on Monashka Bay on Kodiak, and on Reese Bay on Unalaska, documenting late pre-Contact Koniag and Aleut cultures. Excavations on Kodiak helped to provide the materials and inspiration for a cultural revitalization movement, including the construction of a museum of Native American culture on Kodiak Island, which won a presidential award in the year 2000.

Consulting Field Archaeologist, Arizona, 1990-1992
Archaeological Consulting Services, Tempe
Northland Research, Tempe

Projects: Site survey in central and southern Arizona, documenting of Native American sites dating over the past 8,000 years in the Hohokam, Mogollon, and Anasazi areas

Results: Large scale mapping of the distribution of Hohokam and Salado sites in the vicinity of Lake Roosevelt and Horseshoe Lake, Arizona; mapping and sampling of sites in northern, eastern and southern Arizona

Teaching Experience:

Fall 2005	University of Massachusetts, Amherst, MA 01003 Anthropology 369 – North American Archaeology
Spring 2002	Holyoke Community College, Holyoke, Massachusetts Anthropology 102 – Archaeology and Prehistory
Spring 1998	Holyoke Community College, Holyoke, Massachusetts Anthropology 101 – Introduction to Cultural Anthropology
Fall 1996	University of Massachusetts, Amherst Department of Continuing Education Anthropology 150 -- Ancient Civilizations
Spring 1996	Skidmore College, Saratoga Springs, NY Anthropology 345 -- Ecological Anthropology
Spring 1996	Westfield State College, Westfield, Massachusetts Seminar for Educators American Indians and New England Archaeology
Spring 1990	Bryn Mawr College, Bryn Mawr, Pennsylvania Teaching Assistant Anthropology 102 -- Introduction to Cultural Anthropology
Fall 1989	Bryn Mawr College, Bryn Mawr, Pennsylvania Teaching Assistant Anthropology 101 -- Physical Anthropology and Archaeology
Summer 1989	Field Instructor, Bryn Mawr College Archaeological Field School, Kodiak Island, Alaska

Publications:

Donta, Christopher L., F. Timothy Barker, and Timothy L. Binzen

2009 Jasper Endscrapers from the Connecticut River Valley, Massachusetts. *Current Research in the Pleistocene* 26:44-46.

Hart, Siobhan, Elizabeth Chilton, and Christopher L. Donta

2009 Before Hadley: Archaeology and Native History, 10,000 BC – 1700 AD. In *Cultivating A Past: Essays on the History of Hadley, Massachusetts*, edited by Marla R. Miller, pp. 43-67. University of Massachusetts Press, Amherst.

Donta, Christopher L. and Antonio Medina

2008 Woodland Adaptations at the Vergennes Substation (VT-AD-1474) Native American Site, Vergennes, Vermont. *North American Archaeologist* 29(3-4): 369-382.

Donta, Christopher L.

2008 A Raw Material Cache in Northfield, Massachusetts. *Bulletin of the Massachusetts Archaeological Society* 69(2): 68-71.

Donta, Christopher L.

2006 Michaud-Neponset Phase Finds from Canton, Massachusetts. *Current Research in the Pleistocene* 23:93-94.

Donta, Christopher L.

2005 The Neponset Site Locus 4: More Evidence of a Michaud-Neponset Phase Occupation. *Bulletin of the Massachusetts Archaeological Society* 66(2): 76-87.

Donta, Christopher L.

2003 The Oak Knoll Site: An Orient Campsite in Lincoln, Massachusetts. *Bulletin of the Massachusetts Archaeological Society* 64(2): 12-21.

Donta, Christopher L.

2002 A Native American Archaeological Site in the Plymouth Commemorative Landscape. *Northeast Anthropology* 64: 31-42. [with Timothy Binzen]

Donta, Christopher L.

1994 Continuity and Function in the Ceremonial Material Culture of the Koniag Eskimo. In *Reckoning with the Dead: the Larsen Bay Repatriation and the Smithsonian Institution*, pp. 122-136. Edited by Tamara L. Bray and Thomas W. Killion. Smithsonian Institution, Washington.

Donta, Christopher L.

1993 *Koniag Ceremonialism: An Archaeological and Ethnohistoric Analysis of Sociopolitical Complexity and Ritual Among the Pacific Eskimo*. Ph.D. dissertation in Anthropology, Bryn Mawr College. University Microfilms, Ann Arbor.

Donta, Christopher L.

1992 Incised Slate Images and the Development of Social and Political Complexity in South Alaska. In *Ancient Images, Ancient Thought: The Archaeology of Ideology*, edited by A. Sean Goldsmith, pp. 11-18. University of Calgary, Calgary. University of Calgary.

Donta, Christopher L.

1988 *Archaeological Indications of Evolving Social Complexity on Kodiak Island, Alaska*. M.A. Thesis, Department of Anthropology, Bryn Mawr College, Bryn Mawr, PA.

Papers Presented at Professional Meetings:

2015 Small Stemmed in the Northeast: Technology and Cultural Continuity in the Late Archaic. Paper presented at the Annual Meeting of the Society for American Archaeology, April 18, 2015, San Francisco.

2010 Updating the Contexts for Incised Stones from Southern Alaska. Paper presented at the Annual Meeting of the Alaska Anthropological Association, March 25, 2010, Anchorage, Alaska.

2008 New and Old Archaeology of the Late Woodland Occupation in the Central Connecticut River Valley. Paper presented at Native Peoples and Cultures of the 15th-17th Centuries: Historical and Archaeological Perspectives, November 1, 2008, Department of Anthropology, University of Massachusetts, Amherst.

2008 Insights into Native American Occupations in the Lake Champlain Lowlands Based on Research in the Proposed VELCO Corridor, 2006-2007. Paper presented at the Fall Meeting of the Vermont Archaeological Society, October 11, 2008, Burlington, Vermont.

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1999 Community-Wide Archaeological Reconnaissance Survey of West Tisbury, Massachusetts. University of Massachusetts Archaeological Services Report 282b.

Mulholland, Mitchell T., Timothy L. Binzen, and Christopher L. Donta
1999 Community-Wide Archaeological Reconnaissance Survey of Oak Bluffs, Massachusetts. University of Massachusetts Archaeological Services Report 282a.

Donta, Christopher L.
1999 Archaeological Site Examination of the Blassberg Site for the Turners Falls Heritage Park, Montague, Massachusetts. University of Massachusetts Archaeological Services Report 281.

Donta, Christopher L., and Thomas L. Arcuti
1999 Archaeological Intensive (Locational) Survey for the Proposed Route 2 Crosby Corner Transportation Improvements Project, Concord and Lincoln, Massachusetts. University of Massachusetts Archaeological Services Report 280.

Donta, Christopher L., Richard D. Holmes, Claire C. Carlson and Thomas L. Arcuti
1998 Archaeological Site Locational Survey for the Proposed Boltwood Walk Parking Garage, Amherst, Massachusetts. University of Massachusetts Archaeological Services Report 278.

Donta, Christopher L., Thomas L. Arcuti, Sharon Swihart, Mitchell T. Mulholland, and Nancy Muller
1998 Phase 1 Archaeological Survey for the Eastern Express Gas Pipeline, Massachusetts. University of Massachusetts Archaeological Services Report 277.

Mangan, Patricia H., Christopher L. Donta, Mitchell T. Mulholland, and Thomas L. Arcuti
1999 Archaeological Intensive (Locational) Survey for the Carroll Holmes Recreational Area, Lake Wyola State Park, Shutesbury, Massachusetts. University of Massachusetts Archaeological Services Report 276.

Eldridge, Stuart R., Christopher L. Donta, Peter Morrison, John Cross, Leslie Shaw, Sharon Swihart, Timothy L. Binzen, Mitchell T. Mulholland, and Thomas L. Arcuti
1999 Archaeological Survey and Architectural Reconnaissance for the Portland Natural Gas Transmission System, Gilead to Westbrook, Maine, Line Changes, Areas Not Previously Accessed, Access Roads, and Cathodic Protection Stations, Vol. 3. University of Massachusetts Archaeological Services Report 272/273.

Donta, Christopher L.
1998 Archaeological Site Locational Survey for the Ashfield Historical Society Museum, Ashfield, Massachusetts. University of Massachusetts Archaeological Services Report 269.

Donta, Christopher L., and Timothy L. Binzen
1999 Preservation Approach and Treatment Plan (Phase II) for the Cultural Resources Inventory, Analysis and Preservation Plan, Pilgrim Memorial State Park, Plymouth, Massachusetts. University of Massachusetts Archaeological Services Report 267c.

Donta, Christopher L., Mitchell T. Mulholland, and Thomas L. Arcuti,
1999 Archaeological Field Survey and Assessment for the Cultural Resource Inventory, Analysis, and Preservation Plan, Pilgrim Memorial State Park Plymouth, Massachusetts. University of Massachusetts Archaeological Services Report 267a.

Donta, Christopher L., and Thomas L. Arcuti

1998 Archaeological Survey and Architectural Review of the Harlow House and Farmstead, Ellisville Harbor State Park, Plymouth, Massachusetts. University of Massachusetts Archaeological Services Report 266.

Donta, Christopher L., and Thomas L. Arcuti

1998 Archaeological Site Locational Survey for the BBB Properties, Billerica, Massachusetts. University of Massachusetts Archaeological Services Report 265.

Donta, Christopher L., Thomas L. Arcuti, and Mitchell T. Mulholland

1998 Archaeological Investigation of Plymouth Comfort Station, Pilgrim Memorial State Park, Plymouth, Massachusetts. University of Massachusetts Archaeological Services Report 263.

Mulholland, Mitchell T., Thomas L. Arcuti, and Christopher L. Donta

1998 Archaeological Reconnaissance Survey for the Bristol Brothers Golf Course Development, Weymouth, Massachusetts. University of Massachusetts Archaeological Services Report 262.

Donta, Christopher L.

1998 Archaeological Intensive (Locational) Survey for the Proposed Hockanum School Stabilization Project, Hadley, Massachusetts. University of Massachusetts Archaeological Services Report 261.

Donta, Christopher L., and Thomas L. Arcuti

1998 Archaeological Site Locational Survey for the Proposed Gordon Owen Riverway Extension Project, Taunton, Massachusetts. University of Massachusetts Archaeological Services Report 260.

Donta, Christopher L., Thomas L. Arcuti, Carolyn D. Hertz, Richard D. Holmes, and Mitchell T. Mulholland

1998 A Site Examination Archaeological Survey of a Small Historic Site for the Montachusett Industrial Park Expansion Project, Fitchburg, Massachusetts. University of Massachusetts Archaeological Services Report 259.

Christopher L. Donta, Thomas L. Arcuti, Carolyn D. Hertz, Richard D. Holmes, and Mitchell T. Mulholland

1998 Archaeological Site Reconnaissance and Locational Surveys for the Proposed Massachusetts Cemetery for Veterans, Agawam, Massachusetts. University of Massachusetts Archaeological Services Report 258.

Donta, Christopher L., and Thomas L. Arcuti

1998 Archaeological Site Locational Survey for the Apple D'Or Residential Development, Littleton, Massachusetts. University of Massachusetts Archaeological Services Report 257.

Mulholland, Mitchell T., Christopher L. Donta and Timothy L. Binzen

1999 Community-Wide Archaeological Reconnaissance Survey of Chilmark, Massachusetts. University of Massachusetts Archaeological Services Report 254.

Morrison, Peter A., Stuart R. Eldridge, Christopher L. Donta, John C. Cross, Leslie Shaw, and Mitchell T. Mulholland

1997 Phase I Archaeological Survey and Phase I Extension Surveys for the Portland Natural Gas Transmission System Maine Segment. University of Massachusetts Archaeological Services Report 252.

Donta, Christopher L., Thomas L. Arcuti, Carolyn D. Hertz, and Richard D. Holmes
1998 Archaeological Site Reconnaissance and Locational Surveys for the Proposed Falulah and Regional Water Filtration Facilities, Westminster and Fitchburg, Massachusetts. University of Massachusetts Archaeological Services Report 250.

Donta, Christopher L., and Thomas L. Arcuti

1997 Archaeological Site Reconnaissance and Locational Survey for the Westfield Middle School, Westfield, Massachusetts. University of Massachusetts Archaeological Services Report 248.

Donta, Christopher L., and Thomas L. Arcuti

1997 Archaeological Site Reconnaissance, Locational, and Examination Surveys for the Hanson Middle School, Hanson, Massachusetts. University of Massachusetts Archaeological Services Report 247.

Donta, Christopher L., and Thomas L. Arcuti

1997 Archaeological Site Reconnaissance and Locational Survey for the Middleborough Middle School, Middleborough, Massachusetts. University of Massachusetts Archaeological Services Report 246.

Donta, Christopher L., and Richard Greenwood

1998 Archaeological Investigation of the Blackstone Canal Millbury Segment, Spillway Structure, Millbury, Massachusetts. University of Massachusetts Archaeological Services Report 244.

Donta, Christopher L., Ellen-Rose Savulis, and Thomas L. Arcuti

2000 Archaeological Site Locational Surveys for Proposed Improvement Projects Hancock Shaker Village, Hancock, Massachusetts. University of Massachusetts Archaeological Services Report 150/208/243.

Donta, Christopher L., and Thomas L. Arcuti

1997 Shattuck Farm '96: Archaeological Site Locational Survey for the Niuna River, Inc., Proposed Office/Research and Development Complex, Andover, Massachusetts. University of Massachusetts Archaeological Services Report 238.

Donta, Christopher L., Thomas L. Arcuti, and Mitchell T. Mulholland

1996 Archaeological Site Locational Survey for the Proposed Lee Business Park, Lee, Massachusetts. University of Massachusetts Archaeological Services Report 237.

Donta, Christopher L., and Thomas L. Arcuti

1996 Archaeological Site Locational Survey for the Routes 6/132 Interchange Park-and-Ride, Barnstable, Massachusetts. University of Massachusetts Archaeological Services Report 236.

Riess, Warren, Mitchell T. Mulholland, and Christopher L. Donta

1997 Remote Sensing and Underwater Archaeological Survey, Hyannis Harbor Navigation Improvement Study, Barnstable and Yarmouth, Massachusetts. University of Massachusetts Archaeological Services Report 235.

Donta, Christopher L., and Thomas L. Arcuti
1996 Archaeological Site Locational and Architectural Survey for the Proposed Williamstown Executive Park, Williamstown, Massachusetts. University of Massachusetts Archaeological Services Report 234.

Donta, Christopher L., and Norene A. Roberts
1996 Archaeological Site Locational and Examination Surveys for the Proposed Cape Cod National Golf Course, Brewster and Harwich, Massachusetts. University of Massachusetts Archaeological Services Report 229/232.

Johnson, Eric S. and Christopher L. Donta
Archaeological Overview and Assessment of the Fort Stanwix National Monument, Rome, New York. University of Massachusetts Archaeological Services Report 230.

Donta, Christopher L., and Norene A. Roberts
1997 Archaeological Reconnaissance Survey of the Eastern Corridor for the Proposed MMWEC Stony Brook Natural Gas Pipeline, Hampden, Wilbraham, and Ludlow, Massachusetts. University of Massachusetts Archaeological Services Report 228.

Donta, Christopher L., and Thomas L. Arcuti
1996 Archaeological Locational Survey at the Woodbridge and Jenkins Family Cemetery, Andover, Massachusetts. University of Massachusetts Archaeological Services Report 227.

Donta, Christopher L., and Mitchell T. Mulholland
1997 Archaeological Intensive (Locational) Survey of Five Parcels for the Connecticut River Bank Stabilization Project, Gill and Northfield, Massachusetts. University of Massachusetts Archaeological Services Report 225.

Donta, Christopher L., and Mitchell T. Mulholland
1996 Extended Archaeological Site Examination (Phase II) of the Connor Prehistoric Site, Northampton, Massachusetts. University of Massachusetts Archaeological Services Report 224.

Donta, Christopher L., and Mitchell T. Mulholland
1996 Site Examination Archaeological Survey on Alignment F at the Mohawk Meadows West Prehistoric Site 19-FR-250, Greenfield, Massachusetts. University of Massachusetts Archaeological Services Report 223.

Donta, Christopher L., and Thomas L. Arcuti
1996 Archaeological Site Locational Survey for the Proposed Wastewater Collection, Treatment and Disposal System, West Island, Fairhaven, Massachusetts. University of Massachusetts Archaeological Services Report 220.

Donta, Christopher L., Thomas L. Arcuti, F. Timothy Barker, and Mitchell T. Mulholland
1997 Archaeological Site Reconnaissance and Site Locational Surveys for the Proposed Sewer System, Southwick, Massachusetts. University of Massachusetts Archaeological Services Report 219.

Donta, Christopher L., and Thomas L. Arcuti
1996 Archaeological Site Locational Survey for the Bridgewater Public Golf Course, Bridgewater, Massachusetts. University of Massachusetts Archaeological Services Report 217.

Donta, Christopher L., Richard D. Holmes, and Carolyn D. Hertz
1995 Archaeological Site Reconnaissance and Locational Surveys for the Proposed Burning Tree Subdivision, Great Barrington, Massachusetts. University of Massachusetts Archaeological Services Report 197/216.

Donta, Christopher L., and Thomas L. Arcuti
1996 Archaeological Site Locational Survey for the Myrtle Street Bridge Replacement Project, Millis and Norfolk, Massachusetts. University of Massachusetts Archaeological Services Report 213.

Eldridge, Stuart A., Peter H. Morrison, John R. Cross, Christopher L. Donta, and Mitchell T. Mulholland
1996 Archaeological Reconnaissance Survey for the Proposed Portland Natural Gas Transmission System, Gilead to Westbrook, Maine. University of Massachusetts Archaeological Services Report 211.

Donta, Christopher L., Thomas L. Arcuti and Mitchell T. Mulholland
1996 Archaeological Reconnaissance Survey of Falmouth, Massachusetts. University of Massachusetts Archaeological Services Report 210.

Donta, Christopher L., and Mitchell T. Mulholland
1995 Archaeological Site Examination of the Otter River Knoll Prehistoric Site, Gardner, Massachusetts. University of Massachusetts Archaeological Services Report 207.

Donta, Christopher L., and Thomas L. Arcuti
1995 Archaeological Site Locational Survey for Renovations and Additions to Frontier Regional High School, Deerfield, Massachusetts. University of Massachusetts Archaeological Services Report 206.

Donta, Christopher L., Mitchell T. Mulholland, and Richard D. Holmes
1995 Archaeological Site Examination of the Mohawk Meadows Prehistoric Site, Greenfield, Massachusetts. University of Massachusetts Archaeological Services Report 205.

Donta, Christopher L., and Thomas L. Arcuti
1995 Archaeological Site Locational Survey for the Proposed Water System, Gardner, Massachusetts. University of Massachusetts Archaeological Services Report 204.

Donta, Christopher L., and Thomas L. Arcuti
1995 Archaeological Site Locational Survey for the East Street Bridge Replacement and Realignment Project, Pittsfield, Massachusetts. University of Massachusetts Archaeological Services Report 203.

Donta, Christopher L., Richard D. Holmes, Carolyn D. Hertz, and Mitchell T. Mulholland
1995 Archaeological Site Locational Survey for the I-290 Exit Ramp Project, Marlborough and Northborough, Massachusetts. University of Massachusetts Archaeological Services Report 202.

Donta, Christopher L., and F. Timothy Barker
1995 Archaeological Site Locational Survey for the Proposed Wetland Replication Areas for the Proposed Pleasant and Turnpike Streets Reconstruction Project, Stoughton, Massachusetts.

University of Massachusetts Archaeological Services Report 200.

Donta, Christopher L., Mitchell T. Mulholland, and Richard D. Holmes
1995 Archaeological Site Examination for the Proposed Main Alford Road Bridge Replacement Project, West Stockbridge, Massachusetts. University of Massachusetts Archaeological Services Report 199.

Holmes, Richard D., Mitchell T. Mulholland, and Christopher L. Donta
1995 Archaeological Reconnaissance Survey for the Proposed Treatment Plant Site, Effluent Disposal Site, and Collection Systems, Oak Bluffs and Tisbury, Massachusetts. University of Massachusetts Archaeological Services Report 196.

Donta, Christopher L., Richard D. Holmes, and F. Timothy Barker
1994 Archaeological Site Locational Survey for the Proposed Water Treatment Facility at Gravelly Pond, Hamilton, Massachusetts. University of Massachusetts Archaeological Services Report 194.

Donta, Christopher L., Lorinda B.R. Goodwin, F. Timothy Barker, and Mitchell T. Mulholland
1995 Archaeological Monitoring and Investigations for the Central Wharf Site Development, Salem Maritime National Historic Site, Salem, Massachusetts. University of Massachusetts Archaeological Services Report 172/192.

Holmes, Richard D., Christopher L. Donta, and Mitchell T. Mulholland
1995 Archaeological Site Locational Survey and Site Examination of Three Sites, Route 66 Highway Improvement Project, Northampton, Massachusetts. University of Massachusetts Archaeological Services Report 185/189.

Donta, Christopher L., Richard D. Holmes, and Mitchell T. Mulholland
1994 Archaeological Site Locational Survey for the Cranberry Meadow Road Bridge Replacement Project, Spencer, Massachusetts. University of Massachusetts Archaeological Services Report 188.

Donta, Christopher L., Mitchell T. Mulholland, and Richard D. Holmes
1994 Archaeological Site Locational Survey for the Proposed Water Pollution Control Outflow Pipe, Greenfield, Massachusetts. University of Massachusetts Archaeological Services Report 187.

Donta, Christopher L., Mitchell T. Mulholland
1994 Archaeological Site Locational Survey for a Portion of the Charlestown Meadows Site, Westborough, Massachusetts. University of Massachusetts Archaeological Services Report 186.

Donta, Christopher L., Richard D. Holmes, and Mitchell T. Mulholland
1994 Archaeological Site Locational Survey for the Proposed Walmart Site VHB Project 3548.26, Orange, Massachusetts. University of Massachusetts Archaeological Services Report 183.

Donta, Christopher L.
1994 Archaeological Site Locational Survey for the Highland Light Relocation Alternatives Study, North Truro, Massachusetts. University of Massachusetts Archaeological Services Report 181.

Donta, Christopher L., Carolyn D. Hertz, and Mitchell T. Mulholland
1994 Archaeological Site Locational Survey for the Wannacomet Water Project, Nantucket,

Massachusetts. University of Massachusetts Archaeological Services Report 177.

Donta, Christopher L., and Richard D. Holmes

1994 Archaeological Site Locational Survey for the Proposed Water Disinfection System, Acton, Massachusetts. University of Massachusetts Archaeological Services Report 175.

Donta, Christopher L., and Carolyn D. Hertz

1993 Archaeological Site Locational Survey for the Proposed Route 133 (Haverhill Street) Reconstruction Project, Rowley, Massachusetts. University of Massachusetts Archaeological Services Report 174.

Donta, Christopher L., and Carolyn D. Hertz

1993 Archaeological Site Locational Survey for the Proposed Newton Street Bridge Reconstruction Project, Amesbury, Massachusetts. University of Massachusetts Archaeological Services Report 173.

Donta, Christopher L., and Mitchell T. Mulholland

1993 Archaeological Site Examination of Parcel B, Nantucket Housing Authority, Nantucket, Massachusetts. University of Massachusetts Archaeological Services Report 171.

Donta, Christopher L., Carolyn D. Hertz, and Mitchell T. Mulholland

1993 Archaeological Site Locational Survey for the Shrewsbury Street Safety Improvement Project, West Boylston, Massachusetts. University of Massachusetts Archaeological Services Report 169.

Holmes, Richard D., Carolyn D. Hertz, Christopher L. Donta, and Eric S. Johnson

1993 Archaeological Site Locational Survey for the Proposed Southbridge Water Distribution Extension, Charlton, Massachusetts. University of Massachusetts Archaeological Services Report 168.

Holmes, Richard D., Carolyn D. Hertz, Christopher L. Donta, and Mitchell T. Mulholland

1993 An Archaeological Site Locational Survey for the Proposed Stratus Computer, Inc. Expansion Project, Marlborough, Massachusetts. University of Massachusetts Archaeological Services Report 167.

Donta, Christopher, L., Richard D. Holmes, and Mitchell T. Mulholland

1993 Archaeological Site Locational Survey at the Location of Possible Burials, Edgartown, Massachusetts. University of Massachusetts Archaeological Services Report 166.

Holmes, Richard D., and Christopher L. Donta

1993 Archaeological Site Locational Survey for the Proposed Wastewater Treatment Plant in Plymouth, Massachusetts. University of Massachusetts Archaeological Services Report 165.

Donta, Christopher L., Mitchell T. Mulholland, and Eric S. Johnson

1995 Data Recovery at the Long Pond River (19-PL-791) and Pond Cemetery (19-PL-211) Native American Sites, Lakeville, Massachusetts. University of Massachusetts Archaeological Services Report 161a.

Richard D. Holmes, Mitchell T. Mulholland, Christopher L. Donta, J. Edward Hood

1995 Archaeological Data Recovery at Sampson's Tavern Historic Site (LAK-HA-1), Lakeville, Plymouth County, Massachusetts. University of Massachusetts Archaeological Services Report 161b.

Memberships:

Society for American Archaeology

Eastern States Archaeological Federation

Northeastern Anthropological Association

Conference on New England Archaeology

Massachusetts Archaeological Society

Vermont Archaeological Society

Alaska Anthropological Association

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SUMMARY of QUALIFICATIONS

Forward-thinking, pragmatic urban planning professional with twenty (20+) years of practical experience. Skilled in a variety of neighborhood and commercial planning and zoning activities, frequently in a supervisory or managerial capacity. Solid track records with proven effectiveness in, but not limited to, the following areas:

⇒ **Zoning Boards of Review** ⇒ **Community Planning and Consulting**
⇒ **Planning Boards / Commissions** ⇒ **Subdivision Review and Planning**
⇒ **City / Town Councils** ⇒ **Superior Court** ⇒ **Code Enforcement**
⇒ **Residential, Commercial and Industrial Development**

SELECTED EXAMPLES of ACCOMPLISHMENT

- Testified before numerous boards, commissions and councils on matters of residential, commercial, and industrial development, as well as changes / amendments to Zoning Ordinances and Comprehensive Plans.
- Testified before Municipal and Superior Court on matters of code enforcement and general land use planning.
- Authored various documents including Cost of Community Services Study, Revitalization Plans, Zoning Ordinances, Comprehensive Plan Amendments and the first Telecommunications Ordinance in the State of Rhode Island.
- Responsible for reviewing all development associated with the Quonset Point / Davisville Industrial Park, an approximately 3,500 acre industrial park, site of the former Sea Bee Navy Base, numerous mill rehabilitation projects, including Pocasset Mill, Johnston, RI (Comprehensive Plan Amendments).
- Responsible for reviewing numerous residential subdivisions, especially expert in the field of Comprehensive Permits (Affordable Housing). Work product cited by the Rhode Island Supreme Court.
- Represented clients before numerous Zoning Boards of Review throughout the State of Rhode Island, on a variety of variance and special use permit petitions, with a greater than 90% success rate.

EDUCATION

MASTERS OF COMMUNITY PLANNING AND DEVELOPMENT
University of Rhode Island - Masters Received 1994

University of Florida - Studied City Planning - 1991 / 1992

BACHELOR OF ARTS – URBAN AFFAIRS; MINORS IN MATHEMATICS AND PHILOSOPHY
University of Rhode Island - BA Received 1990

ACCREDITATION: AMERICAN INSTITUTE of CERTIFIED PLANNERS – May 1996

PROFESSIONAL EXPERIENCE

Land Use Consultant
East Providence, Rhode Island

PIMENTEL CONSULTING, INC.

Zoning Officer
East Providence, Rhode Island

CITY OF EAST PROVIDENCE

Consulting Town Planner
Barrington, Rhode Island

TOWN OF BARRINGTON

Town Planner
Wayland, Massachusetts

TOWN OF WAYLAND

Principal Planner
North Kingstown, Rhode Island

TOWN OF NORTH KINGSTOWN

Assistant Planner
East Providence, Rhode Island

CITY OF EAST PROVIDENCE

Planning Consultant
Newport, Rhode Island

NEWPORT COLLABORATIVE

Planning Intern
Orange City, Florida

CITY OF ORANGE CITY

RHODE ISLAND AIR NATIONAL GUARD

Plans and Implementation Communications Specialist
Rhode Island Air National Guard 1995 – Retired 2013

Security Police Officer
Rhode Island Air National Guard 1987 – 1990

CIVIC

WGBH – Community Advisory Board Member

Cambridge, Massachusetts

2000 - 2003

SPECIAL SKILLS AND TRAINING

- Fluent in Portuguese



MICHAEL E. FEINBLATT Vice President & Practice Leader Energy & Industrial Services

Experience

ESS Group, Inc. –
April 1993 to present

Years of Prior Related
Experience – 2

Education

BS, Mechanical
Engineering, Tufts
University

Qualifications

Mr. Feinblatt has more than 24 years of environmental consulting experience. As a Vice President and the Practice Leader for Energy & Industrial Services at ESS, he is responsible and accountable for overall practice area performance and productivity, including meeting planned revenue generation, staffing, business development, and integration of services with other ESS practices. His duties include day-to-day management of staff, projects, and sales activities, client and business issues management, as well as short and long term business planning and goal setting for the practice.

As a Principal Scientist at ESS, Mr. Feinblatt provides quality control and technical and project management services, as well as business development activities, for a variety of energy and industrial clients and projects. Mr. Feinblatt has provided environmental consulting services at a variety of industrial facilities, including power plants, natural gas compressor stations, resource recovery facilities, hazardous waste incinerators, pulp and paper mills, sugar mills, asphalt plants, renewable energy facilities, as well as at semiconductor, coating, manufacturing, and chemical processing facilities.

Representative Project Experience

Invernergy Thermal Development, LLC – Clear River Energy Center, Burrillville, RI. Provided project management and contributed technical analyses in support of the filing of an application with the Rhode Island Energy Facility Siting Board, as well as a Major Source Air Permit Application with RIDEM and other environmental permit applications for a proposed 1,000 MW combined cycle power plant.

Covanta Energy – Pittsfield, Springfield, and Rochester, MA. Completed air dispersion modeling of compliance stack results from three separate Covanta energy-from-waste facilities in Massachusetts. Modeling is conducted after each stack test at each facility to demonstrate facility compliance with the NAAQS and the MassDEP's TELs and AALs beyond the property line.

ARC Technologies, Inc. – Amesbury, MA. Prepared several limited plan applications for new process equipment for a manufacturing facility with multiple locations in Amesbury, Massachusetts.

New Athens Generating Company – Athens Generating Plant – Athens, NY. Prepared a Title V renewal application for a 1,080 MW electric generating facility. Also conducted several annual stack test programs, including relative accuracy test audits of the installed continuous emissions monitoring systems.

Pioneer Valley Energy Center, LLC – Pioneer Valley Energy Center – Westfield, MA. Provided project management and contributed technical analyses in support of the filing of a Petition with the Energy Facility Siting Board, as well as an Environmental Impact Report with the Executive Office of Energy and Environmental Affairs; a Major Comprehensive Plan Approval with the MassDEP; and a Prevention of Significant Deterioration Permit Application with the EPA for a proposed 400 MW combined cycle power plant. Also provided technical support on other project filings, including the preparation of a wastewater discharge permit application to the City of Westfield and a sewer use permit application to the MassDEP.

Iroquois Transmission System, Natural Gas Compressor Stations – NY and CT. Conducted emissions compliance testing on combustion turbines at several natural gas compressor stations in New York State and Connecticut. Worked with facility operators and regulatory agency contacts to resolve measured permit exceedances to ensure full compliance with applicable state and federal air pollution control regulations.

A Plus Waste & Recycling, A Plus Waste & Recycling – Middleborough, MA. Completed an environmental impact assessment for a proposed composting and single stream recycling facility. The assessment includes noise, odor, and traffic impacts from the facility. Provided expert testimony on the results of the assessment to the Middleborough Zoning Board.

Presstek, Inc. – Hudson, NH. Prepared a State Permit to Operate renewal application; developed an emissions tracking system for the facility; assisted with RCRA compliance, including an update to the facility's Contingency Plan; and provided performance testing for an oxidizer and associated enclosure systems.

Millennium Power – Charlton, MA. Conducted an applicability determination and NSR permitting analysis for a proposed facility modification.

Genzyme Corporation – Framingham, MA. Conducted an air emissions inventory and developed an emissions tracking database to assist with annual reporting for the facility.

EA Engineering, Cape Cod Air Force Station – Bourne, MA. Prepared a Restricted Emission Status application for a military installation to cap actual emission from the facility below major source thresholds.

Ballard Material Products – Lowell, MA. Provided emissions compliance testing to demonstrate compliance with permitted emission limits. Also assisted with annual emissions reporting including MassDEP Source Registration filings and TURA/TRI Reports.

Albany Medical Center – Albany, NY. Prepared a compliance calendar for a newly constructed CHP facility and completed startup and annual performance testing to demonstrate compliance with the applicable NSPS and EPA emission limits. Also completed a noise survey to demonstrate compliance with local and state noise policy guidelines.

Piantedosi Baking Company – Malden, MA. Prepared plan approval applications for proposed facility modifications and provided emissions reporting services, including annual GHG reports for submittal to the MassDEP.

SCS Energy, LLC, PurGen One IGCC Facility – Linden, NJ. Prepared a Preconstruction Permit and PSD Application, as well as provided technical analyses in support of the Environmental Impact Report for a proposed Integrated Gasification Combined-Cycle electric generating facility.

Laidlaw Energy, Burgess BioPower – Berlin, NH. Provided technical analysis and assisted in the preparation of EFSEC and Air Permit applications, as well as other required permit applications, such as for industrial wastewater discharge, for a proposed 70 MW biomass power plant.

Cape Wind Associates, Cape Wind Energy Project – Horseshoe Shoal, MA. Provided engineering support, including the preparation of a Notice of Intent and an Air Permit Application, in order to comply with the federal Outer Continental Shelf Regulations for a proposed alternative energy project. Also provided engineering support and technical analysis for the General Conformity Analysis, which was conducted for the project, as well as for other project filings.

Skyworks Solutions, Inc. – Woburn, MA. Prepared a plan approval application for a facility modification and completed annual greenhouse gas emissions reports for a semiconductor manufacturing facility in order to comply with the MassDEP's and EPA's mandatory GHG reporting regulations.

Biogen Idec, Inc. – Cambridge, MA. Managed the completed of emissions compliance testing and CEMS auditing of a combustion turbine and a pair of auxiliary boilers at the central heat and power plant for a biotech facility. Also completed annual greenhouse reports for the facility for both the MassDEP and the EPA, as well as Source Registration for the MassDEP.

Covanta Energy, SEMASS Resource Recovery Facility – Rochester, MA. Prepared air and solid waste applications for modifications of a solid waste management handling facility associated with a facility building expansion project and a natural gas auxiliary fuel project.

Pure Energy Resources – Bayonne Energy Center, NJ. Presented noise assessment technical analyses in support of the filing of an Article VII Application with the New York State Department of Environmental Conservation for a cross-harbor submarine transmission cable project. A noise assessment was conducted for the horizontal directional drilling activities required at the project landfall to demonstrate compliance with the New York City Noise Code, as it applies to construction activities.

BG North America, Lake Road Generating Plant – Dayville, CT. Prepared Air Permit Application for a proposed 400 MW expansion of an existing power plant.

Aspen Aerogels, Inc. – East Providence, RI. Managed startup emissions compliance testing program for an insulating material manufacturing plant to demonstrate compliance with permitted emission limits. Management responsibilities included the preparation of a Pre-Test Protocol and Final Test Report for submittal to RIDEM. Also prepared several minor source air permit applications for new process and emissions control equipment at the facility.

Vermont Public Power Supply Authority, Swanton Station – Swanton, VT. Prepared Air Permit Application for a proposed 40 MW peaking facility.

Aggregate Industries – Watertown, MA. Prepared a plan approval application for modification of an asphalt plant, which included potential emissions calculations, and assessments of air quality impacts and noise.

TransCanada, Ocean State Power – Burrilville, RI. Prepared and filed an Acid Rain Permit application and assisted with certification procedures and submittals for this newly affected facility.

Aggregate Industries – Saugus, MA. Provided noise measurements and analysis for an existing batch asphalt plant, including an assessment of background noise levels and noise levels during plan operation at various locations at the property line and at nearby residential receptors. The results of these analyses were used to demonstrate compliance with the MassDEP Noise Policy and local noise ordinances.

Aggregate Industries – Saugus, MA. Developed a predictive model software tool for ten different asphalt production facilities located in Massachusetts. The predictive model considers future plant production, predicts the fuel use and emissions associated with the forecasted production levels, and reports compliance with permitted production, fuel use, and emission limits over the next 12-month period.

GVD – Cambridge, MA. Provided technical analyses to estimate the emissions and ambient air impacts from a highly specialized R&D coating process. Also provided regulatory analyses on applicable requirements related to the storage and usage of chemicals associated with the coating process.

Parker Hannifin Corp., Parker Chomerics – Woburn, MA. Managed and conducted industrial hygiene air measurements for worker exposure related to paint mixing, milling, and spray booth operations. Provided recommendations to minimize worker exposure levels to monitored pollutants.

Aggregate Industries, Peabody Quarry – Peabody, MA. Managed a multi-year perimeter ambient air quality-monitoring program at an asphalt plant to demonstrate compliance with air quality standards and exposure limits.

BG North America, Lake Road Generating Plant – Dayville, CT. Managed and conducted background measurements of PM_{2.5} in support of a modeling analysis for the expansion of an existing power plant.

Chelsea Energy, LLC – Chelsea, MA. Provided emissions calculations and prepared other documentation in support of the preparation of an Air Permit Application for this 250 MW simple cycle peaking facility.



Genzyme Corporation – Framingham, MA. Prepared an analysis of operating scenarios for the proposed expansion of the facility while allowing emissions to be capped at minor source levels. These calculations provided the basis for the facility to accept an emissions cap for the proposed expanded facility while allowing for sufficient operating flexibility.

Taylor Recycling, Taylor Biomass Energy – Montgomery, NY. Provided engineering support in the preparation of an Air Permit application. Completed detailed emissions calculations for gasifier and combustion turbine power trains and gathered process information to determine potential emissions from a bypass gas flare. Also analyzed applicability of various state and federal air quality regulations to determine applicable emissions limitations and control requirements.



Experience

ESS Group, Inc.: 1998 to present

Years of Prior Related Experience: 9

Education

MS, Geology, University of Massachusetts, 1992

BS, Geology, Juniata College, 1985

Professional Registrations and Affiliations

Professional Geologist Registration, Pennsylvania (PG-002185-G; inactive)

Professional Geologist Registration, New Hampshire (No. 276)

National Groundwater Association - Association of Groundwater Scientists and Engineers

American Water Works Association and New England Water Works Association

OSHA Hazardous Materials for Hazardous Waste Site Workers (40-hour training in accordance with 29 CFR 1910.120[e]), 1989, and annual refresher training

RI Water Resources Board, Water Allocation Program Advisory Committee, Out-of-Basin Transfer Committee, member, 2003-2004

Town of Upton, Water and Wastewater Advisory Committee, member, 2003-2008

Qualifications

Mr. Hershberger's professional experience includes over 26 years of environmental consulting focusing on the assessment of impacts to soil and groundwater resources, hydrogeologic investigations and water supply feasibility evaluations, permitting and development. His experience emphasizes evaluation and quantification of hydrogeologic processes as related to groundwater flow and contaminant transport, aquifer remediation, aquifer yield, capture zone modeling for remedial design and wellhead protection, analysis of the fate and transport of contaminants in the subsurface, and development of conceptual site models of hydrogeology and contaminant distribution. Mr. Hershberger has significant experience at CERCLA National Priority List sites as the technical lead or project manager for the Remedial Investigation/Feasibility Study (RI/FS), Pre-Design and Remedial Action Implementation work phases at sites throughout New England. Project management experience also includes site investigations and feasibility evaluations under various state regulations, complex field investigation and sampling programs and water supply development and groundwater resource assessments.

Representative Project Experience

Federal CERCLA Superfund Sites, RCRA Site Investigations and Remediation

Confidential Client – Groundwater Remedy Pre-Design Investigation, Davis Liquid Waste Superfund Site, North Smithfield, RI. Project Manager and Senior Hydrogeologist for implementation of field activities, technical assessments and supporting regulatory negotiations. Initial work included development and negotiation of the Pre-Design Work Plan, including compilation and evaluation of existing data and development of a conceptual site model. The pre-design investigation focused on evaluation of alternative remedial approaches acceptable to the PRPs and Agencies (USEPA and RIDEM). The Pre-Design activities, including an extensive subsurface investigation of the former Source Areas, have been completed. Extensive regulatory negotiations were subsequently conducted with USEPA, Department of Justice and RIDEM to support development of the Statement of Work for Operable Unit No. 2 (Overburden Groundwater). Provided detailed technical, regulatory and budgetary support to the PRPs during these negotiations and participated actively in negotiations. The Consent Decree for Operable Unit No. 2 has been signed and implementation of the Statement of Work has commenced, including the development of detailed work plans for the Remedial Design (RD) phase. Implementation of the RD Work Plan has been largely completed and included a detailed evaluation of bedrock groundwater conditions, wetland hydrogeology and surface water and sediment conditions to support an evaluation of remedial approaches for these media. Recent findings have been incorporated into a significant refinement of the Conceptual Site Model. Next steps are anticipated to include updating the Human Health Risk Assessment and performance of a focused feasibility study to determine the remedial approach for groundwater.

Confidential Client – Source Area and Management of Migration Remedial System Operation, Picillo Farm Superfund Site, Coventry, RI. Assistant Project Manager and Senior Hydrogeologist for the operation of the Remedy at the Site. Responsible for data collection and evaluation of the operation of the remedy in relation to groundwater dewatering within the Source Area and hydraulic containment within the Management of Migration Area. Directed a team of hydrogeologists and engineers during data collection and evaluation activities and served as the senior technical QA/QC representative for hydrogeologic issues. Coordinated ongoing numerical model evaluation of the dynamic groundwater flow system and contaminant fate and transport at the Site. Provided technical evaluations and review in support of the shutdown of the Source Remedy.

Confidential Client – Management of Migration Remedy, Somersworth Landfill Superfund Site, Somersworth, NH. Task Manager for the implementation of the Management of Migration remedy. Provided technical support and document review for the PRPs on the Source Area remedy, an innovative technology being implemented under the USEPA DART program. As the project progressed, the Source Area remedy also included an exhaustive data collection and evaluation program related to the natural attenuation of VOCs downgradient of the landfill.

Confidential Client – Savage Well Superfund Site, Milford, NH. Designed and implemented a long-term aquifer pumping test to evaluate the hydrogeologic characteristics of a highly productive aquifer adjacent to the Souhegan River. The task also included the analysis and presentation of pump test data and aquifer characteristics and the development of recovery well capture zones to assist in the design of a groundwater pump and treat containment system for an extensive plume of VOC-impacted groundwater within a significant water supply aquifer.

MassDEP SARSS Program – Remedial Investigation/Feasibility Study, PSC Resources Superfund Site, Palmer, MA. Field Manager and Assistant Project Manager for the hydrogeologic investigation and multi-media sampling program at the site. Coordinated and implemented the subsurface investigation; EPA Contract Laboratory Program soil, sediment, and groundwater sampling; aquifer testing; estimation of the hydraulic characteristics of the aquifer; and development of the conceptual hydrogeologic model of the site. Assisted in the preparation of the Remedial Investigation report and the Feasibility Study.

Water Supply Investigations

Town of Sharon – Hydrogeologic Evaluation of Potential Municipal Water Supply Sites, Sharon, MA. Project Manager and Senior Hydrogeologist for the ongoing evaluation of potential water supply sites within the Town. The initial phase of the project consisted of the desktop evaluation of five potential well sites using MassDEP Site Screening Criteria. Based on the results of the initial phase and discussions with the Superintendent of Public Works and various Town boards, four locations were proposed for further evaluation. The second phase is currently underway, including test drilling and aquifer testing to develop comparable hydraulic data for each site. As the project has progressed, field investigations have been performed to assess additional potential water supply sites. Developed and presented a matrix providing a summary of the information collected for each potential site and ranking the sites relative to each other to support decision-making by Town representatives. Based on the findings, the town has decided to move forward with state and local permitting of a new groundwater source. Initial permitting has been completed in support of the long-term testing of the proposed site which was completed in fall 2010. Data evaluation and modeling of zones of contribution to the proposed wellfield are ongoing.

Covanta – SEMASS – Water Resources Permitting Support, Wareham, MA. Managed the permitting of the transition of an existing potable water supply well to non-potable use. Work included obtaining approval for the increased withdrawal from the other existing potable supply well and submittal of the permit application to the MADEP for the associated distribution system modifications. This Project has been approved and completed. Also, prepared and submitted the application for the renewal of the Water

Management Act permit for the ongoing groundwater withdrawals (potable and non-potable) at the facility, including communications with MADEP staff.

Winchester Country Club – Water Management Act Permit Renewal, Winchester, MA. Managed and coordinated the renewal of the Water Management Act that allows the country club to pump groundwater and surface water to provide irrigation water for the 18-hole golf course. Renewal process required coordination with golf course personnel, compilation of historic use records, evaluation of potential water demand for proposed golf practice facility, documentation of any modifications to the Water Conservation Program and development of a Seasonal Demand Management Plan. The permit renewal application has been submitted to the MassDEP.

Club Motorsports, Inc – Potable Water Supply Investigation and Permitting, Valley Motorsports Park, Tamworth, NH. Project Manger for the development of the potable water supply source(s) for proposed road course on 230 acres. Responsible for obtaining the necessary permit approvals from the New Hampshire Department of Environmental Services and design and implementation of technical and field assessments. Prepared for and represented project information at public meetings and hearings before the Tamworth Conservation Commission and Planning Board.

Confidential Client – Cooling Water Source Investigation, Independent Power Project, Barre, MA. Senior Hydrogeologist for the evaluation and investigation of potential sources of cooling water and potable water for a proposed power generation facility. Performed site reconnaissance and evaluated existing hydrogeologic information to assess and develop alternatives for water sources. Scoped and managed the implementation of subsurface drilling and testing programs to assess Site conditions, including baseline water quality. Developed planning-level cost estimates for the client for the permitting and development of potential water sources.

The Launie Group – Irrigation Water Supply Source, The Harmon Club, Rockland, MA. Project Manager and Senior Hydrogeologist for the development of an irrigation water source for the proposed golf facility. Assisted developer and golf course designer in estimation of anticipated water demand for the facility and evaluated existing geologic and hydrogeologic information for Project area. Field activities included subsurface exploration program, bedrock fracture trace analysis, bedrock drilling program, and yield testing of potential bedrock well. Testing identified high-yielding bedrock water source that would meet the water demands of the facility. Also performed environmental due diligence activities including multiple Phase I ESAs and a Phase II subsurface investigation on the approximately 90-acre property.

MassDEP SARSS Program – New Source Approval of a Replacement Municipal Water Supply Source, Holbrook, MA. Project Manager/Field Manager for New Source Approval. The reactivation of the Donna Road aquifer under Operable Unit 4 of the Record of Decision for the Baird and McGuire Superfund site is anticipated to replace the 0.31 million gallons per day of municipal water lost due to the contamination of the South Street Wellfield. Field activities included extensive surveying of surrounding land uses; installation of numerous exploration, observation, and monitoring wells; geophysical and bedrock fracture trace and fracture fabric analyses; installation of pilot production well(s); discharge water and groundwater sampling; and performance of a long-term aquifer pumping test. Project work also included temporary road design; preparation of draft bylaws and wellhead protection district documents; delineation of the zone of contribution (Zone II) of the proposed supply well; and preparation of documents to satisfy Massachusetts Division of Water Supply guidelines and regulations. Division of Water Supply approval of the source and the Zone II delineation was received in May 1994.

Winchester Country Club – Irrigation Supply Project, Winchester, MA. Assistant Project Manager and Hydrogeologist responsible for permitting and construction of the water supply component of an irrigation supply project that involved construction of a gravel pack water supply well adjacent to Upper Mystic Lake and associated appurtenances, dredging and lining of an existing on-site pond to provide adequate storage for irrigation water, installation of approximately 2,500 feet of piping and electrical

feeds, and installation of a pump station. Permitting activities included Water Management Act permitting and reporting, associated wetland and biological monitoring, Wetland Protection Act permitting in Arlington and Winchester and subsequent water quality testing and reporting as required under the Order of Conditions for the project.

Town of Littleton – Zone II Delineation, Littleton, MA. Task Manager and hydrogeologist for the delineation of the Zone II area for the Spectacle Pond municipal supply well. The Zone II delineation was approved by the MassDEP.

Down Island Golf Club – Irrigation Supply Development and Permitting, Oaks Bluff, Martha’s Vineyard, MA. Task Manager for the development and permitting of an irrigation water supply (0.5 million gallons per day) for a proposed golf course. Project work included design and oversight of initial test drilling program to assess subsurface conditions on the property and determine feasible supply well locations; oversight of installation of final irrigation supply wells; design of overburden (hydraulic monitoring) and monitoring (water quality monitoring) well networks; design and performance of long-term aquifer test to determine aquifer parameters; evaluation of aquifer test data; modeling of hydraulic impacts from final wells; evaluation of impact of proposed well relative to other water withdrawals and the available basin yield; and preparation of final technical report and Water Management Act (Chapter 21G) permit application.

Town of Abington – Evaluation of Existing Supply Well and Potential Irrigation Water Demands, Abington, MA. Task Manager and Senior Hydrogeologist for the evaluation of the capacity of the existing supply well and also estimated the water demands to support the potential expansion of the existing irrigation system at the town-owned Strawberry Valley Golf Course. The project evaluated the capacity of the existing water supply system (supply well and irrigation pond) to meet the estimated water demands of the expanded irrigation system.

Hopkinton Country Club – Evaluation of Potential Potable and Irrigation Water Sources and Irrigation Supply Permitting, Hopkinton, MA. Task Manager for evaluation of potential water supply sources and local permitting. Initial tasks included evaluations of potential potable and irrigation water sources using readily available USGS and MassGIS data, bedrock fracture trace analysis, and field reconnaissance. Based on this evaluation, an existing test well was proposed for the irrigation water source and bedrock exploration wells were completed on the property. Designed and managed an extended pumping test, which included monitoring of nearby existing residential bedrock wells; performed groundwater modeling of the proposed water withdrawal; completed evaluation of the potential impact of the proposed withdrawal on the residential wells; Whitehall Brook, and its associated wetlands and the overall watershed; and prepared technical reports and presentation of findings to local agencies.

Rhode Island Water Resources Board – Water Supply System Management Plan database, RI. Project Manager for the development of components of the database to facilitate data population and querying. The initial phase of the project included the development of a user interface to enable a user to query certain water supply information. The second phase of the project included the design of a comprehensive user-friendly data import tool to be distributed to Rhode Island’s major water suppliers. This data entry tool was designed to assist the RIWRB with their proposed enhanced annual reporting goals.

Division of Capital Planning and Operations – Evaluation of Potential Supply Well Locations and Existing Water Supply Infrastructure, Shirley, MA. Project Manager for the evaluation of potential potable supply well(s) locations and modeling of existing water supply distribution system for proposed expansion of the Massachusetts Correctional Institution’s Shirley facility. Scope of work also included evaluation of nearby public water systems for potential interconnections to meet the anticipated demand. Final evaluations concluded that establishing a permanent interconnection with the Devens water supply system represented the most cost-effective alternative.

Hydrogeologic Investigations

Private Residential Developer – Hydrogeologic Investigation to Support Major Groundwater Discharge Permit Application, Cotuit, MA. Project Manager and Senior Hydrogeologist for the performance of a hydrogeologic investigation performed to support the application for a Major Groundwater Discharge Permit for a combined wastewater treatment facility to serve a proposed 124-unit residential development. Designed and directed the subsurface investigation of the property and the groundwater modeling of the hydraulic impact of the proposed groundwater discharge. Technical activities also included evaluation of nitrogen loading and development of a water quality monitoring program. Work included presentation of findings at Town of Hyannis Zoning Board of Appeals hearings.

Cat Island LLC – Environmental Impact Assessment and Hydrogeologic Investigation, Cat Island Beach Resort, Cat Island, The Bahamas. Directly responsible for the assessment of baseline and proposed groundwater conditions and associated mitigation measures in support of the preparation of the Environmental Impact Assessment, and Environmental Management Plan. Provided senior technical leadership during the completion of subsurface investigations on the property in support of groundwater quality investigations, well yield assessments, and design of intake wells for the proposed reverse osmosis water treatment facility.

Town of Westford – Drawdown Feasibility Assessment, Nabnasset Lake, Westford, MA. Senior Hydrogeologist to determine the nature of impacts that could be anticipated as a result of a proposed winter lake drawdown for the purpose of controlling nuisance aquatic plants. The evaluation focused on potential adverse impacts to certain municipal water supply wells located proximal to the lake as well as other potential supply wells located on the lake.

Town of Wrentham – Wrentham Lakes Study, Wrentham, MA. Task Manager for the hydrogeologic assessment and evaluation of potential impacts to existing and proposed municipal water supply wells due to potential sewer installation. The scope of work included evaluation of available hydrogeologic information from the Town of Wrentham, the U.S. Geological Survey, and the Charles River Watershed Association; collection of groundwater samples from existing monitoring wells and two existing municipal supply wells to evaluate nutrient loading within the unconsolidated aquifer; evaluation of watershed characteristics in conjunction with the concurrent surface water assessment; preparation of a final technical report; and public presentation of findings.

Village Crossing Residential Development – Application for a Major Groundwater Discharge Permit, Plymouth, MA. Task Manager and Senior Hydrogeologist supporting the preparation of the application for a proposed development including a centralized wastewater treatment and disposal system designed for approximately 20,000 gallons per day. Project work included regional hydrogeologic research, identification of potential sensitive receptors, installation of observation wells to monitor groundwater elevations and determine site stratigraphy, physical laboratory testing of soil samples, predictive modeling of potential groundwater mounding, and preparation of a technical report to support the application to the MassDEP for a Major Groundwater Discharge Permit in accordance with Massachusetts regulation 314 CMR 5.00 (Ground Water Discharge Program).

The Mayaguana Development Company – Study of the Water Quality and Aquatic Life Associated with Coastal Ponds and Embayments, Mayaguana Island, The Bahamas. Responsible for the assessment of baseline conditions for the groundwater resources associated with the proposed project area and for preparing the corresponding sections of the Environmental Impact Assessment document for submission to the Bahamas, Environment, Science, and Technology Commission. The Project proposed is a boutique resort and associated utilities, marina, real estate development, airport improvements and community projects and involves development of three geographic areas (Flamingo Island/North Beach, Pirate's Well Creek/Northwest Point, and the Airport).

Professional Training

NGWA, 1991, Analysis and Design of Aquifer Tests

NGWA, 1994, Groundwater Flow and Mass Transport Modeling

NGWA, 1996, Natural Attenuation for Remediation of Contaminated Sites

NEWWA, 2000, Integrated Water Resource Management and Conservation

LSP Association, 2002, Principles and Field Techniques for Characterizing Contaminant Migration in Fractured Rock

NEWMOA, 2004, What Regulators Want: The Conceptual Site Model Approach

NGWA, 2005, Focus Conference on Eastern Regional Ground Water Issues

Fractured Rock Educational Services, 2007, Hydrogeology of Fractured Rock – Characterization, Monitoring, Assessment and Remediation

U.S. EPA/TIO, 2008, A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems

ITRC, 2009, In-Situ Bioremediation of Chlorinated Ethene – DNAPL Source Zones

ESTCP (DOD), 2009, FAQs Regarding Management of Chlorinated Solvents in Soil and Groundwater

NEWMOA, 2010, Enhanced In-situ Bioremediation

ITRC, 2010, Use and Measurement of Mass Flux and Mass Discharge

ITRC, 2012, Integrated DNAPL Site Strategy

Groundwater Resources Assoc. of California, 2013, 1,4-Dioxane – The Emerging Contaminant that keeps on Emerging

NGWA, 2013, BayState Groundwater Forum

EPA, 2014, Why Are So Many Groundwater Contaminant Plumes Persistent? Insight from Modeling and Characterization

EPA, 2014, Borehole Geophysics Applied to Bedrock Hydrogeologic Evaluations

NEWMOA, 2015, 1,4-Dioxane Assessment and Remediation

Publications and Presentations

“Hydrogeology and Water Resources of Shelburne and Colrain, Massachusetts”, Masters Thesis, University of Massachusetts, 1992.

Finney, D.F., Hershberger, J.G., and Nangeroni, P.E., *Use of Angled Drilling Techniques to Characterize Fractured Crystalline Bedrock and Minimize Migration of Suspected Non-Aqueous Phase Liquids (NAPL)*, Proceedings - 2004 U.S. EPA/NGWA Fractured Rock Conference: State of the Science and Measuring Success in Remediation, September 13-15, 2004.

“Maximizing Water Use Potential Through Cost Efficient Hydrogeologic Studies”, 8th Annual Regional Turfgrass Conference & Show, Providence, Rhode Island, March 9, 2005.

EDUCATION

Bachelor of Science, Civil Engineering, Georgia Institute of Technology, 2001

REGISTRATIONS

Professional Engineer, FL, LA, OH, PA, TX, WV

ISI Envision Sustainability Professional, Pennsylvania, United States

Chad Jacobs, PE**Project Manager**

Chad is HDR's Oil and Gas northeast region lead and has been involved in FERC linear projects and oil and gas treatment projects. He has served as project manager and owner's engineer on civil, environmental and construction service related projects. He is experienced with site/civil design including heavy industrial process and environmental work and is competent in hydraulics, hydrology and environmental related subjects.

Chad has served as project manager and owner's engineer on a variety of civil, environmental and construction service related projects. He is experienced with site/civil design and is competent in hydraulics, hydrology and environmental related subjects. Project highlights include the redevelopment of the Fort Rucker, AL water distribution system, working as a construction manager for Jacksonville's Better Jacksonville Program, a \$1 billion dollar infrastructure improvement program, and serving as a project engineer on a City's of Valdosta's water main replacement program.

RELEVANT EXPERIENCE**Antero Resources, National Gas Pipeline Environmental Surveying and Permitting, WV**

HDR completed environmental and cultural surveying for a planned pipeline project in the Marcellus region and deliver an Environmental Clearance Report to determine the extent of environmental and cultural impact, the type of permits required to move forward with pipeline development, and hold informal negotiations with the USACE and environmental regulatory authorities.

Role: Project Manager

Bay County Engineering Division, Bay County Alternative Water Supply, FL

HDR is providing design services to complete the planning, design, permitting, and construction phase services for a six well wellfield with transmission main for an alternate water supply for Bay County, FL. Services include: civil, environmental, mechanical, instrumentation and electrical design, permitting, bidding assistance, construction observation and general services.

Role: Project Manager

Bay County Engineering Division, Transient Analysis, FL

HDR performed development, validation, and analysis for a water hydraulic model of a 23-mile-long potable water transmission main in Bay County, Florida.

Role: Project Manager

Bowen Engineering Corporation, Fort Belvoir Initial Systems Deficiency Corrections (ISDC), DC

Providing services for a Design-Build project on Fort Belvoir. Project includes replacement of existing water lines and force mains, elevated tank replacement, and streambed improvements.

City of Jacksonville, Better Jacksonville Plan (Roadway), FL

HDR is providing Program Management and other related professional services necessary to oversee the design and construction of \$283 million of road widening

and drainage projects in Jacksonville, Florida. Services include financial/accounting support, general administrative services, professional services support, public awareness/communication, permitting, design administration, right-of-way acquisition, construction engineering and inspection, and training for the City of Jacksonville and the Jacksonville Transportation Authority. The program schedule is aggressive (7 to 10 yrs.) and utilizes an extensive internet-based project controls system.

Role: Project Representative

Confidential Client, Design-Build, Oil & Gas Exploration And Production Waste Processing Atascosa Facility

HDR provided integrated design-build services for multiple oil/water processing and separation facilities in various locations throughout the southern, southwestern, and Rocky Mountain regions of the United States. These facilities receive and treat liquid and solid oilfield Exploration and Production (E&P) wastes.

Confidential Client, Raw Water Transmission Main in Western PA, PA

HDR provided preliminary planning, design and budgeting services for a 36 mile mine water transmission line. The project included 6" through 12" pipe installed through conventional trenching and horizontal directional drill, five common point pump stations and four booster pump stations. These services were completed within four weeks of the notice to proceed.

Role: Lead Design Engineer

CONSOL Energy, Inc., Fresh Water Pipeline Conceptual Design, WV

Consol approached HDR to develop the conceptual design for a fresh water pipeline from a location along the Ohio River in WV near Moundsville to a location in Sand Hill, WV, covering approximately 30 miles. Upon completion of this analysis, HDR performed a second analysis looking at continuing the pipeline approximately 7 miles from West Virginia into southwestern Pennsylvania. The pipeline would be utilized to supply fresh water to Consol Energy operations in this area of West Virginia.

Role: Project Manager

EXCO Resources, Owner's Engineer Services, PA

HDR has been retained as owner's engineer to aid in the planning, design and construction management of EXCO's East Marcellus water facilities in Lycoming County PA. These facilities are currently in operation serving EXCO's hydro fracturing needs. Mr. Jacobs served as both client manager and project manager attending regular office and site meetings, reviewed designs from other consulting companies, acted as field engineer during construction to solve conflicts and prepared budgets for future phases of work.

Freeport-McMoRan Tenke Fungurume Mine, FCX-Tenke Fungurume Mine Tailings Storage Facility New Return Water Pond Pump Modification

for this project providing modeling for a new return water pumping system and providing pump recommendations. Work includes designing pump system piping and tie-in to the existing distribution network.

Hanson Professional Services, Inc., Cairns Wastewater Treatment Plant Facility Inspection, Ft. Rucker, Dothan, AL

Bowen Engineering Co. contracted HDR to conduct an onsite facility inspection of the Cairns WWTP. The task included conducting a process and mechanical review in order to make recommendation for maintenance and/or Renewal and Replacement projects and compile the results of the facility inspection and prepare a Facility

Inspection Technical Memorandum that included the general assessment of the current conditions of the facility as well as recommendations for Renewal and Replacement projects.

Role: Project Manager

HDR Engineering, Design-Build Watermain Replacement CIP, Fort Rucker (U.S. Army), AL

HDR is providing plan, design and construction phase service for replacement of the water distribution system within Fort Rucker. The distribution system is comprised of 43 miles of watermain ranging in size from 4"-16" diameter. Methods of construction include conventional trenching, horizontal directional drilling and pipe bursting.

Construction phase services include weekly observation of progress and quality in regard to adherence to plans and specifications. This project was completed in 2010.

Role: Project Manager

HDR Engineering, Hunter Douglas Headquarters, NY

HDR was retained by Hunter Douglas to prepare site development drawings for a new headquarters building in Pearl River, NY. The proposed site is 22.6 acres and will contain two buildings, each containing approximately 50,000 square feet of office space, parking, stormwater system and utilities. HDR was also responsible for preparing permits for United Water of New York, New York State DEC, Rockland County and the Town of Orangetown. Chad Jacobs served as design engineer responsible for water, sewer and stormwater design including site grading and erosion control plan and preparation of permit applications.

Role: Design Engineer

Homer City Generation, LP, GE Financial Services Homer City FGD Retrofit Project - OE Support Services, PA

Owner's engineering services for flue gas desulphurization retrofit project to reduce SO₂ emissions on two 640 MW supercritical coal-fired units to comply with CSAPR regulations. HDR also performed environmental permitting services for construction activities and renewal of Homer City's industrial wastewater treatment facilities; modifications to their industrial treatment process to meet new TMDL discharge limitations; and assistance with permit applications.

Hydro Recovery, LP, Produced Water Reclamation Facility, PA

HDR performed a treatability analysis and developed a basis of design for a new 15,000 BPD produced water reclamation facility. The facility will receive produced water and drilling muds, treat the water in preparation for returning back into the well field for hydro fracturing purposes, dewater/dispose of the drilling muds, and have available long-term storage of treated produced water. HDR completed the mass balance, process flow diagram and general arrangement for the facility.

Role: Project Manager

Invenergy LLC, PADEP Permit and Engineering Services, PA

HDR performed environmental permitting services for the Lackawanna Power Facility, including permit compliance review, Phase I Environmental Site Assessment, wetland and stream impact permitting, cultural resource investigation and documentation completion, stormwater operation and construction permitting, process discharge permitting and post construction permitting.

Jacksonville Electric Authority, Beach Blvd Water and Sewer Relocation Plans Preparation, FL

JEA provided pipe sizing for water and sewer relocations required as part of the utility

coordination for the reconstruction of SR 212 (Beach Blvd.) from FCCJ to San Pablo Road in Jacksonville, Duval County, Florida. HDR prepared the relocation plans detailing location, depth and appurtenances required (tees, fitting, valves, etc.) and obtained required permits.

Role: Project Engineer

Jacksonville Electric Authority, Better Jacksonville Plan (Utilities), FL

HDR is providing Program Management and other related professional services necessary to oversee the design and construction of \$283 million of road widening and drainage projects in Jacksonville, Florida. Services include financial/accounting support, general administrative services, professional services support, public awareness/communication, permitting, design administration, right-of-way acquisition, construction engineering and inspection, and training for the City of Jacksonville and the Jacksonville Transportation Authority. The program schedule is aggressive (7 to 10 yrs.) and utilizes an extensive internet-based project controls system.

Role: Project Representative

Midwest Generation LLC, Homer City AQCS Owner's Engineer Services, PA

HDR is performing environmental permitting services for construction activities and renewal of Homer City's industrial wastewater treatment facilities. HDR is also performing modifications to their industrial treatment processes to meet new TMDL discharge limitations. HDR is assisting with permit applications including E&S, NPDES, GP4 and GP5, which are obtained through PADEP.

Role: Project Manager

NiSource, Tri-County Bare Steel Replacement Project, PA

HDR was selected to provide environmental support services for the Columbia Gas Pipeline replacement project in southwestern Pennsylvania. The project includes approximately 34 miles of Line 1570 pipeline and associated aboveground and appurtenant facilities in three replacement segments. HDR is currently supporting Columbia through the FERC Pre-filing Process.

Role: Senior Technical Lead

Northwest FL Transpo Corridor Authority, Northwest Florida Transportation Corridor Authority Master Plan, FL

HDR completed a corridor master plan for over 200 miles of US 98 from the Florida/Alabama State Line to the Wakulla/Jefferson County Line. The study developed a comprehensive corridor improvement plan consisting of intersection improvements, adding lanes and over 100 miles of new alignment highway. Two PD&E studies are currently underway to begin implementation of the Master Plan.

Nuverra Environmental Sol. (Form. HWR), Haynesville Pipeline Design, LA

Preliminary engineering services included review of the current water/wastewater facilities; hydraulic modeling; wastewater characterization; cost evaluation; pipeline material chemical compatibility and pressure rating; treatment processes evaluation; and monitoring and controlling systems evaluation. HDR Constructors then provided design-build services for 24 miles of pipe; two oil/water separation systems and booster pump stations; pipeline under the Sabine River; and a control system.

Nuverra Environmental Sol. (Form. HWR), Haynesville Pipeline, LA

Preliminary engineering services included review of the current water/wastewater facilities; hydraulic modeling; wastewater characterization; cost evaluation; pipeline material chemical compatibility and pressure rating; treatment processes evaluation;

and monitoring and controlling systems evaluation. HDR Constructors then provided design-build services for 24 miles of pipe; two oil/water separation systems and booster pump stations; pipeline under the Sabine River; and a control system.

Role: Project Manager

Nuverra Environmental Sol. (Form. HWR), Phase 2RA Pipeline Replacement, Logansport, LA

HDR providing impact evaluation, Section 404 permitting, and restoration planning services in support of a planned discharge of drilling mud and sand in to a wetland occurred during a horizontal directional drilling installation of a water pipeline.

Role: Project Manager

Nuverra Environmental Sol. (Form. HWR), Salt Water Disposal Above-Ground Facility Design-Build Project - Goff Site, Norwich, OH

HDR provided progressive design-build services for this facility that accepts and deep well injects produced water from fracking operations. Design services included site, civil, structural, electrical, instrumentation, and process design, as well as equipment procurement, construction support, start up and commissioning of the system. In addition, HDR was the general contractor on site and furnished all supervision, labor, tools, equipment, materials and supplies to construct the facility.

Role: QA/QC

NYCDEP - BEDC, Total Residual Chlorine Reduction Improvements, Coney Island and North River Wastewater Treatment Plants, NY

HDR was retained by NY DEP to design the implementation of the recommended dechlorination facilities at the Coney Island and North River WWTPs to meet the new total residual chlorine (TRC) limits in the plants' State Pollutant Discharge Elimination System (SPDES) permits. The project included a new dechlorination building and integration of the process into the existing WWTP. The project also included CFD modeling and optimization for the influent flows into the existing chlorine contact tanks.

Pearl River Veterans, LLC, Site Development Drawings, Pearl River, NY

HDR was retained by Pearl River Veterans, LLC to prepare site development drawings for a new 35 acre residential home site development. HDR was responsible for developing paving, grading, water, sewer, stormwater construction drawings. HDR was also responsible for preparing permits for United Water of New York, New York State DEC, Rockland County and the Town of Orangetown. Chad Jacobs served as design engineer responsible for water, sewer and stormwater design including site grading and erosion control plan and preparation of permit applications.

Role: Design Engineer

Port Authority of Port St. Joe, Port St. Joe Engineering Services, FL

Port St. Joe Engineering Services, Port St. Joe, Gulf County, FL. The Port Authority (PA) is located in a small coastal town of about 1,600 residents. HDR was contracted as a General Engineering Consultant for a period of up to 10 years (contract termination 2019). The first task order was to obtain permits for the planned construction on Parcel A. The PA has plans to reclaim 23.3 acres of Sovereign and Submerged Lands and dredge 3.2 million cubic yards of St. Joseph Bay to construct a 3 ship berth terminal, turning basin and access channel to the existing Federally Maintained Ship Channel. The 3 ship berths are planned at 600 feet in length with 100 feet between the berths to provide room for maneuvering. Other improvements to the site include paving the site to 85% impervious with plans for open storage and a rail line connecting Parcels A and B. The PA does not currently have a committed

Client, so the efforts have been focused at permitting a "build to suit" port plan.

Chad Jacobs served as design engineer and assistant project manager during the course of this project. Responsibilities included stormwater modeling and design of a 136 acre port facility, FDEP and USACE permitting and client management.

Role: Design Engineer / Assistant Project Manager

Preble-Rish, Inc., Bay County Hwy 77 Force Main, FL

HDR provided hydraulic modeling for Bay County's 16" wastewater force main within the Hwy 77 alignment to confirm the suitability of a new triplex lift station and pipeline design. This project supported the development of additional wastewater collection and conveyance capacity in the busy highway corridor and created the opportunity to add service to existing and future residential and commercial developments in the area.

Role: Project Manager and modeler

Raw Water Transmission Main, Northwestern Louisiana

HDR provided preliminary planning, design and budgeting services for 300 miles of raw water and produce water transmission line. The project included pipe sizes of 6" through 24" pipe installed through conventional trenching and horizontal directional drill. Multiple phasing and regionalizing of the system were analyzed including budgetary costs and schedules were developed using a design build model approach.

Role: Lead Design Engineer

Rex Energy, Produced Water Processing Facility Design-Build Project - Lewis Site, IL

This new injection facility and tank battery includes produced water storage, containment, and pump conveyance to nearby injection wells in Rex's oil flood operations, along with a vapor collection system which includes a tank vent and blower system, a condensate knockout pot, and a flare. The project has been split into two phases, tank battery and injection facility. HDR has designed both phases and is currently building the tank battery phase.

Rex Energy, Produced Water Processing Facility Design-Build Project-Pocket Site, IN

This new facility includes a disposal facility with one truck unloading bay with associated pumping and filtration equipment, connection to a client-installed produced water pipeline, suspended solids reduction, storage, and pump conveyance to nearby disposal wells; an injection facility with oil/water separation, storage, containment, and pump conveyance; and a vapor collection system. The system was designed to dispose/inject up to 5,000 barrels/ day of produced water.

Spectra Energy, Nexus Gas Transmission Line, MI, OH

Nexus Gas Transmission (NEXUS) proposes to construct a 255-mile interstate natural gas transmission pipeline. HDR is tasked with providing FERC compliance oversight on engineering documents prepared for the FERC 7C filing, environmental inspection services, evaluation of erosion and sediment control compliance, coordination with the construction contractor to determine appropriate resolution for non-compliances, and documenting non-compliances, and post-construction and restoration monitoring.

Role: Project Manager

St. Joe Land Co., Osprey Landing Water & Sewer Analysis, FL

HDR was retained by St. Joe Land Company to provide an analysis of the Callaway Water and Sewer Systems for Osprey Landing Project in Bay County, Florida. Tasks include inventory of existing water and sewer systems in Callaway, developing a report on the state of the existing Callaway Water and Sewer Systems and necessary improvements for the construction of Osprey Landing, performing hydraulic models for water and sewer systems, developing line costs for water and sewer system improvements, developing a plan for water storage facilities, preparing a construction costs for the new facilities, and providing technical support to help St. Joe reach a utility agreement to recapture the upfront money that will have to be advanced to construct the Osprey Landing Phase 1.

Role: Project Engineer

USACE - MiddleEast District, USACE NAMRU-3, B67 & WST Repair, Bethesda security contract, Cairo, EGY

This task order provides A-E design services to implement the first major phases of the NAMRU-3 installation modernization plan. It included campus-wide Fire Protection Infrastructure investigation and ATPF vehicular entrances upgrades, 100% designed for the \$31M renovations of 6,700 SF Building 41 warehouse and the 41,938 SF Building 67 secure research and administrative building. Project applies LEED Silver rating system.

NON-HDR EXPERIENCE**BFP Installation Mobile AL, CSX Transportation**

Backflow preventer installations, Sibert Yard, Mobile AL. Planned, designed, assisted in Contractor procurement and provided construction administration and periodic inspections for backflow prevention devices installed at points of connection to City of Mobile Water systems.

Role: Project Coordinator

Chemical Storage Building, Sawgrass Country Club, St. Johns County, Florida

Designed and permitted a chemical storage building for Sawgrass Country Club Maintenance Department. The masonry building allowed the storage, loading and unloading of liquid fertilizers, herbicides and pesticides for various sized application equipment. The project included stormwater management systems, site development, material storage bins, building design, equipment pads, and landscaping.

Role: Project Coordinator and Design Engineer

Concrete Batch Plant Lift Stations, St. Johns County, FL

Designed two duplex pump stations for sanitary waste transmission for TarMac and Grizwald Concrete Batch Plants. These pump stations were connected to a manifold system.

Role: Project Coordinator and Design Engineer

Environmental Compliance Management, CSX Transportation

Performed environmental permitting, reporting and compliance sampling for four CSX Intermodal and Transportation facilities in Northeast and Central Florida. Contaminants monitored included heavy metals, microbial organisms (coliform) and petroleum products.

Role: Project Coordinator

Hard Rock Concrete Batch Plant, Green Cove Springs, FL

Designed and permitted a 5.7 acres concrete batch plant for Hard Rock Materials,

Inc., valued at \$400,000. The project included stormwater and wastewater management systems, site development, material storage bins, equipment foundations and pads, landscaping, and parking.

Role: Project Coordinator and Design Engineer

I-95 Utility Extension, St. Johns County, FL

Aided in the design and permitting of two water and sewer projects for St. Johns County infrastructure improvement projects valued at \$3.4M. Approximately 5,100 L.F. of 12-inch sanitary force main and 27,500 L.F. of water mains ranging from 6 to 30 inches in diameter. Aided in the selection and approval of contract awardees. Construction management services included installation and test inspections, approving pay requests and change orders, and approving field conflict resolutions.

Role: Design Engineer and Construction Manager

S.R. 207 Utility Relocation, St. Johns County, FL

Aided in the design and permitting for the Rehabilitation of the Anastasia Island Wastewater Treatment Facility Outfall discharging into the Matanzas River valued at \$2M. This project included the installation of 140 linear feet of 30-inch ductile iron pipe anchored to eight pile bents, a new manhole, bypass piping, removal of 120 linear feet of existing pipe and a 5-foot diameter manhole. All work will take place within protected wetlands and be done from barges. Project objectives were to minimize wetland disturbances, mitigate impacted areas due to construction activities and maintain normal operations at the plant.

Role: Design Engineer

Small Diameter Watermain Replacement Program, City of Valdosta, Georgia

Aided in design of City-wide improvements to the water distribution system, including the replacement of approximately \$5,000,000 in small diameter water mains. This project is being performed in five phases, with each phase correlating to a section of the City. Particular emphasis is being directed to minimizing traffic disruptions and maintaining water service during construction.

Role: Staff Engineer

Special Forces Airborne Training Refresher Facility, Camp Blanding Training Facility, Florida National Guard

Mr. Jacobs served as the design engineer and project coordinator for the design and construction of a unique Special Forces Airborne Training Facility for the Florida National Guard. This project included design of a 34 ft?? parachute deployment tower; C-130 and Blackhawk helicopter mock-ups, static and dynamic jump training equipment, parking and restroom facilities. Construction manager responsibilities included periodic inspection, administration of construction documents (pay requests, shop drawings, etc.) and field conflict resolution.

Role: Design Engineer and Project Coordinator

U.S. Hwy. 19 Utility Project, Crystal River, FL

Aided in the design and permitting of sanitary sewer and force main improvements valued at \$1.2M. Approximately 2,300 L.F. of 8-inch sanitary sewer, 5,200 L.F. of force main ranging from 4 to 6 inches in diameter and duplex lift station. Project objective was to minimize wetland disturbance and mitigate impacted areas due to construction activities.

Role: Design Engineer

Various Restroom Facilities, Camp Blanding Training Facility, Florida National Guard

Mr. Jacobs served as the design engineer for five restroom pavilion areas to augment Camp Blanding's Kingsley Lake Recreational Facilities. The project objective was the design of two variant masonry block restrooms to be selected and utilized at five locations along Kingsley Lake. Project emphasis was placed on-site adapting the proposed structures and removing existing facilities with minimal impact to the other recreational facilities.

Role: Design Engineer

Water System Improvements, Water Main Replacement and Ancillary Work Items CSX Transportation

Water distribution system replacement, Hamlet Yard, Hamlet, NC. Coordinated pre-design surveys (subcontracted from local surveyor); selected specific water main rating; managed preparation of construction drawings and quantity takeoffs/cost estimate for a program of approximately 5,000 L.F. of new high pressure 6-inch PVC distribution mains, including jack and bored steel cased track crossings; new fire hydrants and transfers of potable water service connections with pressure reducers at each station. The project was fast-tracked to alleviate problems with numerous failures of existing 50-year old asbestos cement mains, which resulted from increased operating pressures available by means of new public system connection.

Role: Design Engineer

JOHN C. CARTER
960 Boston Neck Road
Narragansett, RI 02882

PROFESSIONAL REGISTRATIONS

Registered Landscape Architect,
Rhode Island #206
Connecticut #735
Massachusetts #1229

Soil and Water Conservation Society - Certified Professional Soil Erosion and Sediment
Control Specialist #687

Rhode Island Licensed Arborist #2497

Certified Horticulturist – Rhode Island Nursery and Landscape Association, 2012

EDUCATION

University of Rhode Island, Kingston, RI
Bachelor of Science, Natural Resources 1977

Rhode Island School of Design, Providence, RI
Bachelor of Fine Arts, 1984
Bachelor of Landscape Architecture, 1985

Harvard University Graduate School of Design
Course: Creative Landuse Planning, Spring 1985

Community College of Rhode Island
Course: Introduction to Surveying, Fall 1986

University of Massachusetts, Amherst, Mass.
Course: Wetland Delineation, August 1992

PROFESSIONAL EXPERIENCE

Adjunct Professor – University of Rhode Island

Adjunct Professor in the Department of Landscape Architecture 2013 - 2015

John C. Carter & Company, Inc. Narragansett, RI

Owner and Principal Landscape Architect, 1998 - present.

Landscape architecture including residential and commercial landscape design, land use planning, environmental permitting, cost estimating and construction management.

Joseph W. Frisella Civil Engineers, Wakefield, RI

Associate: Environmental Engineer and Landscape Architect, 1986 -1998.

Commercial and residential site planning, on-site sewage disposal design, preparation of environmental impact statements, environmental permit applications, revegetation and erosion control plans, run-off calculations, drainage design, wetland delineation's, tree and landscape appraisals.

Everett Associates, Landscape Architects, Providence, RI

Assistant Landscape Architect, Summer 1984

Department of Public Parks, Providence, RI

Staff Horticulturist, 1978 - 1980

Supervisor of a five person staff with responsibilities of restoring and maintaining various small parks throughout the city, including greenhouse and nursery operations.

AWARDS

American Society of Landscape Architects - Certificate of Honor for Excellence in the Study of Landscape Architecture, May 1985

PROFESSIONAL MEMBERSHIPS

Rhode Island State Board of Examiners of Landscape Architects,

Member 1991 - present, Chairman, 1995 - 2010.

Governor's Advisory Commission on Natural Heritage Preservation , 1987 - 1999.

Narrow River Land Trust, Board of Directors, 1988 - 2001.

Rhode Island Tree Council, Board of Directors, 2002 - 2010

Black Point Advisory Commission - Town of Narragansett

Soil and Water Conservation Society

Rhode Island Nurserymen's Association

JOHN E. NILAND

PROFILE

Energy professional with 30+ years of experience in power project engineering, development and energy markets. Described as having a dedicated work ethic, deep technical knowledge, exceptional interpersonal ability and a clean, systematic approach. Solid project management and client relationship skills. Managed and participated in many strategic projects, combining knowledge of technology with prior experience in design and contracting to consistently deliver results on time and within budget.

Highlights of Achievements:

- Project management experience of multi-discipline team (environmental, engineering, legal, commercial operations, financial, media and public relations), direct interface with regulatory and government agencies, (including providing expert testimony to PSC and legislative panels), third party management of gas and electric utility interfaces all within budget.
- Management of partnership relations with strategic partners including developers, private equity firms and energy companies including Siemens, GE, Mitsui, ArcLight Capital Partners LLC, while pursuing development opportunities.
- Market knowledge and experience includes NY ISO (NYPA, LIPA), PJM, (FirstEnergy), and NE ISO (MA DOER, and CT DPUC), FRCC (TECO, FPL), SERC and Ontario, (OPA).
- Project management and development resulting in over 5,000 MW of projects developed and constructed in NY, ME, RI, PA, SC, OH, FL and Ontario.
- Experience with all manner of power generation technologies and manufacturers (GE, Siemens, MHI) including combustion turbine peaking and combined cycle, IGCC, coal, nuclear, wind, solar and large scale energy storage.

PROFESSIONAL EXPERIENCE

INVENERGY LLC DIRECTOR BUSINESS DEVELOPMENT	CHICAGO, IL	2013-PRESENT
<ul style="list-style-type: none">▪ Pure Energy Infrastructure is focused on acquisition and repowering of existing assets and the deployment of flexible and renewable generation to meet specific utility needs.▪ Responsibilities include company formation, capital fundraise program as it relates to providing the technical and development program plans and goals to potential equity investors.▪ Provided numerous proposals to utilities, such as NYPA and other confidential clients for a variety of opportunities pertaining to repowering existing assets, combined cycle, combustion turbine peaking, solar and wind.		
PURE ENERGY RESOURCES LLC VICE PRESIDENT BUSINESS DEVELOPMENT	BURLINGTON, MA	2008-2013
<ul style="list-style-type: none">▪ Responsible for pursuing development opportunities with strategic partners including developers, private equity firms and energy companies.▪ Responsibilities include identifying the specific development, M&A or RFP opportunities, management of the overall development process (design, siting, budgeting and contracting for the development opportunities), as well as interfacing with government and regulatory agencies involved in the permitting and contracting for the facilities.▪ Involved in the development of the Bayonne Energy Center in Bayonne, NJ and lead market development opportunities in Ontario, (OPA) and NY ISO (zones A, B, G, J, K) examining opportunities in combustion turbine peaking, combined cycle, solar and wind.		
GREATPOINT ENERGY DIRECTOR BUSINESS DEVELOPMENT	CAMBRIDGE, MA	2007-2008
<ul style="list-style-type: none">▪ Responsible for overall development for efforts with GreatPoint Energy (GPE), a startup company involved with the commercialization of a catalytic coal gasification process.▪ Responsible for pursuing development opportunities with strategic partners including developers, coal suppliers and power companies.▪ Lead the development of the Mayflower Clean Energy Center, a pilot scale facility constructed at Dominion's Brayton Point Power station.		

JOHN E. NILAND

NRG ENERGY INC.

PRINCETON, NJ

2006-2007

VICE PRESIDENT BUSINESS DEVELOPMENT

- Responsible for overall development and project management for development projects being proposed on existing NRG sites in Connecticut and Massachusetts.
- Responsibilities included government entity interface, project permitting, project finance support, contract negotiations, multi-discipline team management (environmental, engineering, legal, commercial operations, financial), media and public relations support, project budget development, and gas and electric utility interconnections.
- Accomplishments included participation in the CT DPUC 2006 RFP process whereby NRG was successful in the development of Devon (200 MW) and Middletown (200 MW) peaking projects and the development of CosCob expansion (22 MW).

CALPINE CORPORATION

BOSTON, MA

1999-2006

DIRECTOR PROJECT DEVELOPMENT, DIRECTOR ASSET MANAGEMENT, ENGINEERING MANAGER

- As a Director of Project Development he was responsible for overall development and project management for several projects being in multiple states simultaneously. Projects included, Greenfield Energy, (1000 MW) in Ontario, Bethpage 3 on Long Island (80 MW), Columbia Energy in South Carolina (700 MW), Osprey (540 MW) in Florida, Hillabee, (700 MW) in Alabama, Fremont (700 MW) plant in Ohio and Ontelaunee (540 MW) in Pennsylvania. Accomplishments included successful development and financing for all projects.
- As Director of Asset Management, Mr. Niland was responsible for assets in the PJM region which included operations management, overall plant financial performance. Accomplishments included negotiated contract restructuring agreements with First Energy and PSEG that lead to the monetization of contracts for two facilities which created earnings of \$108MM for the Corporation.
- As Engineering Manager (from August 1999 to December 2001) responsibilities included standard plant design development, project design and EPC support of development for several combined cycle projects.

STONE AND WEBSTER ENGINEERING CORPORATION BOSTON, MA

1981-1999

PROJECT ENGINEERING MANAGER

- Project Engineering Manager for two 265 MW combined cycle EPC projects being designed and constructed simultaneously (Tiverton and Rumford). Responsibilities include overall design, schedule, multi-discipline engineering management and performance analysis in support of project guarantees.
- Power Business Development Manager, Responsible for overall project bid preparation and RFP response, including project description, plant design and layout, target price and detailed estimate, performance analysis in support of project guarantees, consortium negotiations including, Division of Work, Consortium Agreements and Executive review presentation. Projects won included two 300MW coal fired power plants (Pha Lai II with EVN) and two combined cycle plants (Tiverton and Rumford).
- Project Engineer for several diverse projects utilizing coal, nuclear and natural gas. Clients included Duquesne Light, (Beaver Valley Unit 2), Texas Utilities, Virginia Power, TVA, Energy Management Inc. (EMI), Korea Atomic Energy Research Institute, East China Electric Power Design Institute, Shanghai, PRC. Responsibilities included project planning, bid estimate, budget control, system design and specifications for various power systems. Results included successful completion of the project within the estimated budget. Responsibilities included project planning and budget control, overview and direction of client engineering staff. Results included redesign of the facility's systems, and successful completion of the project within the estimated budget.

EDUCATION

NORTHEASTERN UNIVERSITY,
MECHANICAL ENGINEERING

BOSTON, MA
GRADUATED WITH HONOR

1977-1981

UNIVERSITY OF MASSACHUSETTS
MAJOR IN PHYSICS NO DEGREE RECEIVED

BOSTON, MA

1974-1976

LICENSES AND REGISTRATIONS

PROFESSIONAL ENGINEER, MECHANICAL
CURRENTLY ACTIVE)

MASSACHUSETTS, MAINE, RHODE ISLAND (NOT



MAUREEN CHLEBEK, P.E., PTOE
Associate &
General Manager—Taunton,
MA/Providence, RI

Education

- B.S., Civil Engineering, University of Rhode Island, 1984
- Partial completion of M.S., Traffic Engineering, Northeastern University

Professional Registrations

- Registered Professional Engineer in Massachusetts, Rhode Island and Connecticut
- Certified Professional Traffic Operations Engineer

Experience

Maureen Chlebek, P.E., PTOE, Associate is the General Manager of the Taunton, MA and Providence, RI offices. Ms. Chlebek has over 32 years of transportation engineering experience. She has managed numerous projects for state, municipal and private clients. Her duties have included performing transportation planning and traffic analyses for freeway interchange studies, circulation studies, signalization projects, parking studies, impact studies, traffic calming, transit studies, corridor studies, and municipal master plans. Her traffic analyses experience has included estimating existing and projected traffic volumes, capacity analyses, accident studies, traffic signal warrant analyses, and the planning, design, and the evaluation of traffic controls, roadway features, pedestrian and bicycle amenities, construction staging, and traffic management. In addition, she has developed and managed proposed improvement plans, including highway and signal design, construction staging, and prepared environmental assessments and evaluations to quantify the socio-economic and environmental impacts of the project alternatives. Ms.

Chlebek has appeared before numerous municipal boards and commissions to provide expert witness testimony/presentations, as well as presented as an expert in her field to schools, professional society chapters, and at conferences.

Some of her technical responsibilities have included dealing with:

- Detailed traffic impact studies
- Parking & circulation studies
- Expert witness testimony & public presentations
- Roadway & access design & permitting
- Municipal & DOT reviews
- Access management & conceptual designs
- Signal designs
- Local-to-regional planning studies
- Traffic calming studies & improvement designs

Professional Affiliations

In addition to her work responsibilities, Ms. Chlebek is involved and active in several professional affiliations. She has been a member of and/or involved with:

- Institute of Transportation Engineers (ITE)
- Rhode Island Chapter of the Institute of Transportation Engineers (RIITE) (2009-2014)
- Women's Transportation Seminar (WTS), Rhode Island – Director of Fundraising (2012); Director of Membership (2010-2011); Director of Student Outreach (2008-2009)
- Women's Transportation Seminar (WTS), Boston (2011-present)
- Tau Beta Pi Engineering Honor Society

Professional Qualifications

Michael Hankard



Education:

B.S., Electrical Engineering
Acoustics Specialization
University of Maine, 1990

Professional Affiliations:

Institute of Noise Control Engineering
Acoustical Society of America

Agency Experience:

Public Service Commissions (various)
World Bank/ IMF
Local, state, and Federal court testimony
Colorado and other state DOTs
US EPA, USFS, and BLM
Municipal hearings (various)

Background:

Mr. Hankard has been practicing in the fields of acoustics and noise control engineering for the past 25 years. In 1996 he started and remains president of Hankard Environmental Inc. The firm consults in environmental noise and has successfully completed over 500 projects, including combined cycle thermal power plants, wind turbine energy facilities, oil and gas extraction facilities, highways, mines, entertainment venues, and land development projects.

Mr. Hankard has experience in almost all aspects of environmental noise, including field measurements, predictions, impact assessments, mitigation design, and expert testimony. He has conducted ambient noise surveys lasting from days to years; used a variety of models to predict noise from power plants and other industrial facilities, wind turbine farms, gen-sets, and roadways; designed a wide variety of mitigation measures such as walls, enclosures, baffles, and silencers; and has testified at local and state hearings.

Vibration experience includes the measurement and prediction of ground-borne and structure-borne levels from sources such as rail lines, blasting, and roadways; and the assessment of impact according to internationally accepted methods and standards.

Thermal Power Plant Noise Control Experience:

Noise Level Compliance Measurements

Mr. Hankard has conducted a number of far-field (neighborhood) and near-field (equipment guarantee) noise level measurement surveys for both simple-cycle and combined-cycle power plants across the U.S. Community compliance surveys range in scope from one-day property line assessments, to multi-week or even year-long measurement campaigns. Mr. Hankard has developed data analysis methods based on ISO S12.9 that use time and frequency to distinguish between facility noise and non-facility noise. Near field surveys have involved measuring noise levels at a distance of one meter from dozens of individual pieces of equipment, such as fans and inlets, ultimately involving hundreds of measurements.

Modeling

The acoustic model of large combined-cycle thermal power plants is complex. Models are different for each design, each location, and are used to demonstrate compliance with various state and local noise regulations during project development. Mr. Hankard has 25 years of experience, dozens of projects, of visiting and understanding the communities in which a project is proposed, and developing an acoustic model of the plant based on vendor-supplied noise emission data, site layout, topography, and industry standard propagation methods such as ISO 9613-2.

Mitigation Design

Community and in-plant noise levels can be reduced by specifying low-noise equipment, erecting barriers or enclosures around equipment, revising the layout of the facility, or constructing walls around portions of the perimeter of the plant. Mr. Hankard has over two decades of experience with the design and specification of barriers, silencers, lagging, buildings and enclosures, low-noise fans and other cooling systems, and working with vendors to reduce equipment noise emissions.

Expert Testimony

Mr. Hankard has testified in support of the professional character of his work, the accuracy of noise level predictions, and the assessment of potential noise impact before state utility boards, local and federal court proceedings, and CUP hearings at the local level. He has also presented the results of his work to the citizens of dozens of communities across the U.S., and at professional conferences.

Ambient Noise Measurements

Mr. Hankard has conducted over 100 ambient sound surveys for the power generation, land development, mining, and transportation industries. He has 25 year of experience in the design, execution, and reporting of these studies. A successful study begins with the careful consideration of the project environment, the relative location of the facility and residences, applicable regulations, and potential seasonal fluctuations. The selection of the measurements locations is paramount, as is the need to measure levels for days to weeks, wind screen selection, and microphone mounting and placement. Finally, the analysis of the data is complex, needing to separate ambient sounds from those made by the wind, those resulting from microphone-wind interaction, and transient events.

Representative Noise Projects

Clear River Energy Center, RI: Ambient noise measurements and noise level predictions (Present)
Allegheny Energy Center, PA: Ambient noise measurements, noise level predictions (Present)
Lackawanna Energy Center, PA: Noise level predictions and expert testimony (2015)
Highland Wind Farm, WI: Noise level predictions and expert testimony (2013)
West Point Converter Station, NY: Noise level predictions and expert testimony (2012)
Marshfield Utilities Gas Plant: Near-field and far-field noise compliance measurements (2011)
Grays Harbor Energy Center: Noise measurements and mitigation assessment (2009)
Fox Energy Center, WI: Ambient and compliance noise level measurements (2005)
Greater Des Moines Energy Center: Near-field noise compliance measurements (2004)

MICHAEL S. MAROUS

STATEMENT OF QUALIFICATIONS

Michael S. MaRous, MAI, CRE, is president and owner of MaRous and Company. He has appraised more than \$15 billion worth of primarily investment-grade real estate in more than 25 states. In addition to providing documented appraisals, he has served as an expert witness in litigation proceedings for many law firms; financial institutions; corporations; builders and developers; architects; local, state, county, and federal governments and agencies; and school districts in the Chicago metropolitan area. His experience in partial interest, condemnation, damage impact, easement (including aerial and subsurface), marital dissolutions, bankruptcy proceedings, and other valuation issues is extensive. He has provided highest and best use, marketability, and feasibility studies for a variety of properties. Many of the largest redevelopment areas and public projects, including Interstate 355, the O'Hare International Airport expansion, the Midway Airport expansion, and the McCormick Place expansion, are part of Mr. MaRous' experience. Also, he purchases and develops real estate for his own account.

APPRAISAL AND CONSULTATION EXPERIENCE

Business Parks Distribution Centers	Industrial Properties Manufacturing Facilities Research Facilities	Self-storage Facilities Warehouses
Auto Sales/Service Facilities Banquet Halls Big Box Stores	Commercial Properties Gasoline Stations Hotels and Motels Office Buildings	Restaurants Shopping Centers Theaters
Bowling Alleys Cemeteries Farms Golf Courses	Special-Purpose Properties Lumber Yards Nurseries Riverboat Gambling Facilities Schools Stadium Expansion Issues	Tank Farms Underground Gas Aquifers Utility Corridors Waste Transfer Facilities
Apartment Complexes Condominium Conversions	Residential Properties Condominium Developments Single-family Residences	Subdivision Developments Townhouse Developments
Agricultural Alleys Commercial	Vacant Land Easements Industrial Residential	Right of Ways Streets Vacations
Corporations Financial Institutions	Clients Law Firms Not-for-profit Associations	Private Parties Public Entities

EDUCATION

B.S., Urban Land Economics, University of Illinois, Urbana-Champaign
Continuing education seminars and programs through the Appraisal Institute
and the American Society of Real Estate Counselors and real estate brokerage classes

PUBLIC SERVICE

Mayor, City of Park Ridge, Illinois (2003-2005)
Alderman, City of Park Ridge, including Liaison to the Zoning Board of Appeals and Planning and Zoning and
Chairman of the Finance and Public Safety Committees (1997-2005)

PROFESSIONAL AFFILIATIONS AND LICENSES

Appraisal Institute, MAI designation, Number 6159
Counselors of Real Estate, CRE designation
Illinois Certified General Real Estate Appraiser, License Number 553.000141 (9/17)
Wisconsin Certified General Real Estate Appraiser, License Number 1874-10 (12/17)
Minnesota Certified General Real Estate Appraiser, License Number 40330656 (8/18)
Pennsylvania Certified General Real Estate Appraiser, License Number GA004181 (6/17)
Iowa Certified General Real Estate Appraiser, License Number CG03468 (6/17)
Licensed Real Estate Broker (Illinois)

PROFESSIONAL ACTIVITIES

Mr. MaRous is past president of the Chicago Chapter of the Appraisal Institute. He is former chair and vice chair of the National Publications Committee and has sat on the board of *The Appraisal Journal*. In addition, he has served on and/or chaired more than fifteen other committees of the Appraisal Institute, the Society of Real Estate Appraisers, and the American Institute of Real Estate Appraisers.

Mr. MaRous served as chair of the Midwest Chapter of the Counselors of Real Estate in 2006 and 2007 and has served on the National Board since 2011. He has sat on the Chicago Chapter Board of Directors, the Editorial Board of *Real Estate Issues*, and on various other committees.

Mr. MaRous also is past president of the Illinois Coalition of Appraisal Professionals. He also has been involved with many other professional associations, including the Real Estate Counseling Group of America, the Northwest Suburban Real Estate Board, the National Association of Real Estate Boards, and the Northern Illinois Commercial Association of Realtors.

PUBLICATIONS AND PROFESSIONAL RECOGNITION

Mr. MaRous has spoken at more than 20 programs and seminars related to real estate appraisal and valuation.

Author

“Low-income Housing in Our Backyards,” *The Appraisal Journal*, January 1996
“The Appraisal Institute Moves Forward,” *Illinois Real Estate Magazine*, December 1993
“Chicago Chapter, Appraisal Institute,” *Northern Illinois Real Estate Magazine*, February 1993
“Independent Appraisals Can Help Protect Your Financial Base,” *Illinois School Board Journal*, November-December 1990
“What Real Estate Appraisals Can Do For School Districts,” *School Business Affairs*, October 1990

Awards

Appraisal Institute - George L. Schmutz Memorial Award, 2001
Chicago Chapter of the Appraisal Institute - Heritage Award, 2000
Chicago Chapter of the Appraisal Institute - Herman O. Walther, 1987 (Distinguished Chapter Member)

Reviewer or Citation in the Following Books

Appraisal of Real Estate, Fourteenth Edition, 2013
Appraisal of Real Estate, Thirteenth Edition, 2008
Appraisal of Real Estate, Twelfth Edition, 2001
Subdivision Valuation, 2008
Real Estate Damages, 2008
Valuation of Apartment Properties, 2007
Valuation of Billboards, 2006
Appraising Industrial Properties, 2005
Valuation of Market Studies for Affordable Housing, 2005
Valuing Undivided Interest in Real Property: Partnerships and Cotenancies, 2004
Analysis and Valuation of Golf Courses and Country Clubs, 2003
Dictionary of Real Estate Appraisal, Fourth Edition, 2002
Dictionary of Real Estate Appraisal, Sixth Edition, 2015
Valuing Contaminated Properties: An Appraisal Institute Anthology, 2002
Hotels and Motels: Valuation and Market Studies, 2001
Land Valuation: Adjustment Procedures and Assignments, 2001
Appraisal of Rural Property, Second Edition, 2000
Capitalization Theory and Techniques, Study Guide, Second Edition, 2000
Guide to Appraisal Valuation Modeling Land, 2000
Appraising Residential Properties, Third Edition, 1999
Business of Show Business: The Valuation of Movie Theaters, 1999
GIS in Real Estate: Integrating, Analyzing and Presenting Locational Information, 1998
Market Analysis for Valuation Appraisals, 1995

REPRESENTATIVE WORK OF MICHAEL S. MAROUS

Headquarters/Corporate Office Facilities in Illinois

Fortune 500 corporation facility, 200,000 sq. ft., Libertyville
Corporate headquarters, 300,000 sq. ft. and 500,000 sq. ft., Chicago
Fortune 500 corporation facility, 450,000 sq. ft., Northfield
Major airline headquarters, 1,100,000 million sq. ft. on 47 acres, Elk Grove Village
Former communications facility, 1,400,000 million sq. ft. on 62 acres, Skokie and Niles
Corporate Headquarters, 1,500,000+ sq. ft., Lake County
Former Sears Headquarters Redevelopment Project, Chicago

Office Buildings in Chicago

401 South LaSalle Street, 140,000 sq. ft.
134 North LaSalle Street, 260,000 sq. ft.
333 North Michigan Avenue, 260,000 sq. ft.
171 West Randolph Street, 360,000 sq. ft.
20 West Kinzie Street, 405,000 sq. ft.
55 East Washington Street, 500,000 sq. ft.
10 South LaSalle Street, 870,000 sq. ft.
222 West Adams, 1,000,000 sq. ft.
175 West Jackson Boulevard, 1,450,000 sq. ft.
227 West Monroe, 1,800,000 sq. ft.
10 South Dearborn Street, 1,900,000 sq. ft.

Hotels in Chicago

10 E. Grand Avenue (Hilton Garden Inn)
106 East Superior Street (Peninsula Hotel)
140 East Walton Place (The Drake Hotel)
676 North Michigan Avenue (Omni Chicago Hotel)
One West Wacker Drive (Renaissance Chicago Hotel)
320 North Dearborn Street (Westin Chicago River North)
505 North Michigan Avenue (Hotel InterContinental)

Large Industrial Properties in Illinois

Large industrial complexes, 400,000 sq. ft., 87th Street and Greenwood Avenue, Chicago
Distribution warehouse, 580,000 sq. ft. on 62 acres, Champaign
Publishing house, 700,000 sq. ft. on 195 acres, U.S. Route 45, Mattoon
AM Chicago International, 700,000± sq. ft. on 41 acres, 1800 West Central, Mt. Prospect
Nestlé distribution center, 860,000 sq. ft. on 153 acres, DeKalb
Fortune 500 company distribution center, 1,000,000 sq. ft., Elk Grove Village
U.S. Government Services Administration distribution facility, 860,000 sq. ft., 76th Street and Kostner Avenue, Chicago
Self-storage facilities, various Chicago metropolitan locations

Vacant Land in Illinois

15 acres, office, Northbrook	450 acres, residential, Wauconda
20 acres, residential, Glenview	475± acres, various uses, Lake County
25 acres, Hinsdale	650 acres, Hawthorne Woods
55 acres, mixed-use, Darien	650 acres, Waukegan/Libertyville
75 acres, I-88 at I-355, Downers Grove	800 acres, Woodridge
100± acres, various uses, Lake County	900 acres, Matteson
140 acres, Flossmoor	1,000± acres, Batavia area
142 acres, residential, Lake County	2,000± acres, Northern Lake County
160 acres, residential, Cary	5,000 acres, southwest suburban Chicago area
200 acres, mixed-use, Bartlett	Landfill expansion, Lake County
250 acres, Island Lake	

Business and Industrial Parks

Chevy Chase Business Park, 30 acres, Buffalo Grove
Carol Point Business Center, 300-acre industrial park, Carol Stream, \$125,000,000+ project
Internationale Centre, approximately 1,000 acre-multiuse business park, Woodridge

Retail Facilities

20 Community shopping centers, various Chicago, Metropolitan locations
Big-box uses, various Chicago metropolitan locations
Gasoline Stations, various Chicago metropolitan locations
More than 30 single-tenant retail facilities larger than 80,000 sq. ft., various Chicago metropolitan locations

Residential Projects

Federal Square townhouse development project, 118 units, \$15,000,000+ sq. ft. project, Dearborn Place, Chicago
Marketability and feasibility study, 219 East Lake Shore Drive, Chicago
Riverview II, Chicago, Old Town East and West, Chicago, Museum Park Lofts II, Museum Park Tower 4, University Commons, Two River Place, River Place on the Park, Chicago

Market Impact Studies

Land fill projects in various locations
Quarry expansions in Boone and Kendall counties
Commercial development and/or parking lots in various communities
Zoning changes in various communities
Waste transfer stations in various communities

Energy Projects

Oakwood Hills Energy Center, McHenry County Illinois, market impact analysis
Brookhaven, New York, solar energy production facility, consulting
Walnut Ridge Wind Farm, Bureau County, Illinois, market impact analysis
Twin Forks Wind Farm, Macon County, Illinois, market impact analysis
Pleasant Ridge Wind Farm, Livingston County, Illinois, consulting
Commonwealth Edison, high tension lines, market impact analysis
Lackawanna Power Plant, Lackawanna County, Pennsylvania, market impact analysis

Properties in Other States

330,000 sq. ft., Newport Beach, California
Former government depot/warehouse and distribution center, 2,500,000 sq. ft. on 100+ acres, Ohio
Shopping Center, St. Louis, Missouri
Office Building, Clayton, Missouri
Condominium Development, New York, New York

Airport Related Properties

Mr. MaRous has done valuations on more than 100 parcels in and around O'Hare International Airport, Chicago Midway Airport, Palwaukee Municipal Airport, Chicago Aurora Airport, DuPage Airport, and Lambert-St. Louis International Airport

REPRESENTATIVE CLIENT LISTING OF MICHAEL S. MAROUS

Law Firms

Botti Law Firm, P.C.	Holland & Knight LLP	Rosenthal, Murphey, Coblenz & Donahue
Alschuler, Simantz & Hem LLC	Ice Miller LLP	Rubin & Associates, P.C.
Ancel, Glink, Diamond, Bush, DiCanni & Krafthefer	Jenner & Block	Ryan and Ryan, P.C.
Arnstein & Lehr LLP	Jeep & Blazer LLC	Reed Smith LLP
Berger, Newmark & Fenchel P.C.	Kinnally, Flaherty, Krentz, Loran, Hodge & Mazur PC	Sarnoff & Baccash
Berger Schatz	Kirkland & Ellis LLP	Scariano, Himes & Petrarca, Chtd.
Carmody MacDonald P.C.	Klein, Thorpe & Jenkins, Ltd.	Schiff Hardin LLP
Crane, Heyman, Simon, Welch & Clar	McDermott, Will & Emery	Schiller, DuCanto & Fleck LLP
Daley & George, Ltd.	Mayer Brown	Schirott, Luetkehans & Garner, LLC
DLA Piper	Michael Best & Friedrich LLP	Schuyler, Roche & Crisham, P.C.
Dreyer, Foote, Streit, Furgason & Slocum, P.A.	Morrison & Morrison, Ltd.	Sidley Austin LLP
Drinker, Biddle & Reath LLP	Bryan E. Mraz & Associates	Sonnenschien, Nath & Rosenthal LLP
Figliulo & Silverman, P.C.	Neal, Gerber & Eisenberg, LLP	Storino, Ramello & Durkin
Foran, O'Toole & Burke LLC	Neal & Leroy LLC	Thomas M. Tully & Associates
Franczek Radelet P.C.	O'Donnell Haddad LLC	Thompson Coburn, LLP
Freeborn & Peters LLP	Owens, Owens & Rinn, Ltd.	Tuttle, Vedral & Collins, P.C.
Gould & Ratner LLP	Prendergast & DelPrincipe	Vedder Price
Greenberg Traurig LLP	Rathje & Woodward, LLC	vonBriesen & Roper, SC
Helm & Wagner	Raysa & Zimmermann, LLC	Winston & Strawn LLP
Robert Hill Law, Ltd.	Righeimer, Martin & Cinquino, P.C.	Worsek & Vihon LLP
Hinshaw & Culbertson LLP	Robbins, Salomon & Patt, Ltd.	
	Rosenfeld Hafron Shapiro & Farmer	

Financial Institutions

AmericaUnited Bank and Trust	First Northwest Bank	Northern Trust Bank
Charter One	Glenview State Bank	Northview Bank & Trust
Citibank	Harris Bank	Private Bank & Trust Co.
Cole Taylor Bank	Itasca Bank and Trust	State Financial Bank
Covest Banc	Lake Forest Bank & Trust	Winfield Community Bank
First Bank of Highland Park	MB Financial Bank	Wintrust Bank Group
First Midwest Bank	Midwest Bank & Trust Company	

Corporations

Advocate Health Care System	CorLands	Loyola University Health System
Alliance Property Consultants	CVS	Marathon Oil Corporation
American Stores Company	Edward R. James Partners, LLC	Meijer, Inc.
Archdiocese of Chicago	Enterprise Development Corporation	Menards
Arthur J. Rogers and Company	Enterprise Leasing Company	Mesirow Stein Real Estate, Inc.
BP Amoco Oil Company	Exxon Mobil Corporation	Paradigm Tax Group
Christopher B. Burke Engineering, Ltd.	Hamilton Partners	Prime Group Realty Trust
Cambridge Homes	Hollister Corporation	Public Storage Corporation
Canadian National Railroad	Imperial Realty Company	RREEF Corporation
Capital Realty Services, Inc.	Invenergy LLC	Shell Oil Company
Chicago Cubs	Kimco Realty Corporation	Union Pacific Railroad Company
Children's Memorial Hospital	Kinder Morgan, Inc.	United Airlines, Inc.
Chrysler Realty Corporation	Kmart Corporation	
Citgo Petroleum Corporation	Lakewood Homes	
	Lowe's Companies, Inc.	

Public Entities

Illinois Local Governments and Agencies

Village of Arlington Heights	Village of Glenview	Village of Orland Park
Village of Barrington	Glenview Park District	City of Palos Hills
Village of Bartlett	Village of Harwood Heights	City of Prospect Heights
Village of Bellwood	City of Highland Park	City of Rolling Meadows
Village of Brookfield	Village of Hinsdale	Village of Rosemont
Village of Burr Ridge	Village of Inverness	City of St. Charles
Village of Cary	Village of Kildeer	Village of Schaumburg
City of Chicago	Village of Lake Zurich	Village of Schiller Park
Village of Deer Park	Leyden Township	Village of Skokie
City of Des Plaines	Village of Lincolnshire	Village of South Barrington
Des Plaines Park District	Village of Lincolnwood	Village of Streamwood
Downers Grove Park District	Village of Morton Grove	Metropolitan Water Reclamation District of Greater Chicago
City of Elgin	Village of Mount Prospect	City of Waukegan
Elk Grove Village	Village of North Aurora	Village of Wheeling
City of Elmhurst	Village of Northbrook	Village of Wilmette
Village of Elmwood Park	City of North Chicago	Village of Willowbrook
City of Evanston	Village of Northfield	Village of Winnetka
Village of Forest Park	Northfield Township	Village of Woodridge
Village of Franklin Park	Village of Oak Brook	

County Governments and Agencies

Boone County State's Attorney's Office	Forest Preserve District of DuPage County	Lake County
Forest Preserve of Cook County	Kane County	Lake County Forest Preserve District
Cook County State's Attorney's Office	Kendall County Board of Review	Lake County State's Attorney's Office
DuPage County Board of Review		

State and Federal Government Agencies

Federal Deposit Insurance Corporation	Illinois Housing Development Authority	Internal Revenue Service
U.S. General Services Administration	Illinois State Toll Highway Authority	The U.S. Postal Service

Schools

Argo Community High School District No. 217	Consolidated High School District No. 230	Niles Elementary District No. 71
Arlington Heights District No. 25 Township High School District No. 214, Arlington Heights	Darien District No. 61	North Shore District No. 112, Highland Park
Barrington Community Unit District No. 220	DePaul University	Northwestern University
Chicago Board of Education	Elmhurst Community Unit School District No. 205	Rosalind Franklin University
Chicago Ridge District No. 127½	Indian Springs School District No. 109	Roselle School District No. 12
College of Lake County	LaGrange School District No. 105	Schaumburg Community Consolidated District No. 54
Community Consolidated School District No. 146	Loyola University	University of Illinois
	Lyons Township High School District No. 204	Wheeling Community Consolidated District No. 21
	Maine Township High School District No. 207	Wilmette District No. 39



Gordon Perkins, GISP

Senior Project Manager



Gordon is a Senior Project Manager with more than 15 years of professional experience. Gordon is one of the leading expert consultants in Visualization and Visual Impact Assessment in the Northeast and is well known to many of our clients and colleagues in the renewable energy industry. Gordon has extensive expertise in digital graphics and uses 2-D and 3-D software applications to create visual simulations and effectively communicate design concepts. Gordon has also conducted research and fieldwork involving riparian restoration design and implementation.

As a Senior Project Manager with EDR, Gordon's responsibilities include the ongoing evaluation and improvement of our technical methodologies used in visual impact assessment, including new techniques in data collection, processing and analysis, and 3-D modeling. Gordon is also responsible for assigning, scheduling and coordinating assistance from the in-house multi-disciplined team of professionals. He remains hands-on throughout the project, overseeing and advising the EDR Team as needed, as well as providing quality assurance.

education

State University of New York College of Environmental Science and Forestry, Syracuse, NY, *Bachelor of Landscape Architecture, Ecology Emphasis*, 2001.

Keystone College, La Plume, PA, *Associate of Arts*, 1998.

registration / certifications

Certified Geographic Information Systems Professional (GISP)

professional affiliations

Member, American Wind Energy Association

Member, Alliance for Clean Energy New York

project experience

Clear River Energy Center, Burrillville, RI – *Prior to EDR*, Conducted fieldwork and prepared viewshed maps and visual simulations to evaluate the visibility and visual impact of a proposed gas fired energy generation facility.

Southern Rhode Island Transmission Project, East Greenwich, RI - Completed photography and field verification for a 7.3-mile 115kV transmission line and associated substation. Created visual simulations representing realistic and accurate right-of-way clearing and proposed improvements. Provided expert witness testimony before the Rhode Island Energy Facilities Siting Board.

Interstate 81 (I-81) Viaduct Project – Visual Impact Assessment, City of Syracuse, Onondaga County, NY – Assistant Project Manager for Visual Impact Assessment conducted in accordance with Federal Highway Administration (FHWA) Visual Impact Assessment protocol as part of NEPA review as part of a consultant team with Parsons, AKRF, Inc., and TWMLA for the replacement of approximately 5 miles of elevated highways (NYSDOT PIN 3501.60, D031085).

employment history

Senior Project Manager, Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C., Syracuse, NY, 2016-Present.

Project Scientist – Visualization and GIS Specialist, ESS Group, Inc., East Providence, RI, 2011-2016

Senior Visual Analyst – Project Manager, Saratoga Associates Landscape Architects, Architects, Engineers, and Planners, P.C., Syracuse, NY, 2008-2011.

Project Manager and Visualization Specialist, Environmental Design & Research, Syracuse, NY, 2001-2008.



Gordon Perkins, GISP Senior Project Manager

Project Icebreaker, Erie County, Cleveland, OH – Project Manager for Visual Impact Assessment for a proposed 20 megawatt (MW) offshore wind project.

Galloo Island Wind Project, Jefferson County, NY – Prepared Visual Impact Assessment and technique support for proposed 30-turbine wind energy facility located on an island in Lake Ontario.

Kenmore Mercy Hospital, Buffalo, NY – Visual Specialist for the John Repetski Memorial Garden at Kenmore Mercy Hospital.

Penn Forest Wind Project, Town of Penn Forest, Carbon County, PA – Visual Specialist for a proposed 40 turbine locations, permanent meteorological towers, overhead and underground collection and interconnect systems, a substation, and access roads that included viewshed mapping, obtaining photos from pre-selected viewpoints, and preparing preliminary photo simulations of the proposed project.

Block Island Wind Farm, Block Island, RI – *Prior to EDR*, Visual Specialist for a proposed 30 MW wind farm facility located in the Atlantic Ocean, 3 miles off the coast. On-shore facilities include electrical lines, switchyards, and substations. The project involved the preparation of 28 daytime and nighttime simulations of the offshore turbines from viewpoints on Block Island and the mainland.

Jamestown Board of Public Utilities Power Plant and Operations Center, Jamestown, NY - Prepared a visual impact assessment (VIA) for a 40 MW clean-coal power-generating plant and operations center. EDR performed an analysis of project visibility, including viewshed analysis and field verification. Visual impacts of the project were assessed by creating computer models of the proposed facilities and computer-assisted visual simulations of potential impacts as viewed from representative viewpoints. EDR's report listed conclusions concerning potential visually sensitive receptors and identified mitigation options, which included recommendations regarding design and siting, the color and texture of built materials, and lighting.

Long Island Offshore Wind Park (LIOWP), Long Island, NY - Prepared visual simulations of the Long Island Offshore Wind Park (LIOWP) Project, a proposed 140-megawatt offshore wind power project. Provided daytime simulations of the project from multiple locations on the southern Long Island shoreline. As a sub consultant to ENSR, EDR performed photographic and survey fieldwork and detailed computer modeling to develop realistic simulations of the proposed wind farm. EDR also participated in public outreach meetings and workshops concerning the project.

Meyersdale Wind Power, Meyersdale, PA – Responsible for computer modeling and creating a series of graphics for the public presentation of a proposed 20-unit wind power generating facility. Created five graphic panels with simulations of the proposed facility, along with supporting maps and graphics.

New York Regional Interconnect, New York State - Coordinated field operations for over 1000 visual resources over a 190Mile (570 Square Mile) Study area. Team leader in the selection and production of simulation for over 75 viewpoints. Provided expert witness testimony before the Public Service Commission of New York State.

Cape Wind Offshore Wind Farm, Nantucket Sound, MA – Created survey accurate visual simulations for America's first offshore wind proposal. Completed daytime and, first in the industry nighttime visual simulations, depicting a 420megawatt wind farm. Provided fieldwork oversight and photography from critical points throughout Cape Cod and the Islands.

Maple Ridge Wind Farm, Lewis County, NY - Assisted in the completion of a visual analysis for a 320 megawatt wind farm in upstate New York. Completed Field Verification (Balloon study), visual simulations, viewshed analysis, and nighttime impact assessment. Completed visual impact assessment for the associated 230 kV Transmission line (Article VII).

Tompkins County Public Safety Communications System, Tompkins County, NY – Developed viewshed maps and visual simulations for Visual Impact Assessment component of the Draft Environmental Impact Statement (DEIS) prepared for the siting of nine new towers for wireless communications.

New York State Statewide Wireless Network –Developed visual simulations for the Generic Visual Impact Assessment (GVIA) included as an appendix of the DEIS prepared for the siting of wireless communications towers throughout New York State. The report defined landscape similarity zones and viewer groups, identified sensitive resources/receptors, supervised the development of visual simulations, and participated in the preparation of the GVIA report.

Cohocton Wind Power Project, Town of Cohocton in Steuben County, NY – Developed viewshed maps and created visual simulations for the Visual Impact Assessment (VIA) for an 82 MW, 41-turbine project. The VIA report described visible components of the proposed project, defined the visual character of the study area, and inventoried and evaluated visual resources and viewer groups. The study also evaluated potential project visibility within the study area, identified key views, and assessed visual impacts associated with the proposed wind power project.

 Ryan Hardy

Member of PA's Management Group



Ryan has over 15 years of experience in energy market advisory services to support strategic planning, generation asset financings, power company restructurings and reorganizations, and power and fuel contract litigation and negotiation support. Ryan has managed the valuation process for numerous asset transactions, including thermal (natural gas, coal), renewable (wind, solar, landfill gas, and biomass) capacity and utility scale battery storage. He has been a strategic advisor to both private equity and utility clients on acquisition strategies, and he is an expert on power market structures including capacity market constructs and their impact on asset values.

Primary expertise	Related experience	Qualifications
<ul style="list-style-type: none"> • Power market advisory services • Asset valuation • Financial restructuring and due diligence • Litigation support 	<ul style="list-style-type: none"> • Battery storage valuation • Landfill gas valuation • Formalized capacity market analysis 	<ul style="list-style-type: none"> • MBA with concentration in finance • Member of American Society of Appraisers • Certified Appraiser, Machinery and Technical Specialty

Primary expertise

Power Market Advisory Services – Ryan possesses extensive experience in wholesale energy markets as it relates to market price forecasting, portfolio valuation, due diligence, and contract analysis

Asset Valuation – Ryan has amassed extensive valuation experience with thermal and renewable asset types including coal, natural gas, hydro, geothermal, wind, solar, biomass, landfill gas, and battery storage

Financial Restructuring and Due Diligence – Ryan has led fundamental analysis and forecasting efforts for two of the largest restructuring efforts in the energy industry including valuation, budgeting, and power and fuel contract renegotiations

Litigation Support – Ryan has supported power and fuel contract dispute resolution through providing analysis and strategic guidance to regulatory bodies supporting stakeholders with capacity market development

Key client achievements

Served as project manager and trusted advisor to \$3 B hedge fund providing quarterly power market updates and serving as the analytic arm to this active participant in power market investments. Provided numerous case studies examining complex scenarios around transmission development, demand growth, renewable investment, and environmental legislation.

Retained by a major Southeast utility to provide market insights and articulate the investment climate of power markets outside of its native service territory as part of a corporate initiative to explore strategic asset acquisition opportunities. Analyzed seven power markets including an analysis of major market players, typical contract structures, market operations, and environmental regulations. In addition, PA evaluated the potential acquisition of a major wind developer and our presentation provided supporting materials for the company's board of directors to approve the acquisition of a 100 MW biomass power generating facility.

Served as the strategic advisor to a major Independent Power Producer seeking to develop over \$2 B in new power generation projects in New Jersey, Maryland, New York, and California, among others. I have worked closely with members of management to provide analysis and strategic support for both equity and debt-raising efforts, and I have presented market and asset analysis to potential investors, investment banks, and rating agencies resulting in the successful development of natural gas-fired combined cycle projects.

Retained to provide negotiation support for long-term power contracts, asset analytics and strategic support for

power plant acquisitions and financings. Key strategic support included detailed analysis of potential contract counterparties and in-depth analysis of cogeneration power facilities including optimization analysis around the provision of power (energy and capacity), steam, and ancillary services.

Retained as a strategic advisor by the management group of this IPP to help develop its growth strategy. In particular, I developed a process to evaluate diversification options to the IPP's current power generating portfolio, as a means to reduce overall portfolio risk. As part of this process, I conducted an independent review of the IPP's current power generating portfolio, performed an in-depth analysis of all U.S. power markets, identified areas for strategic growth, and ultimately highlighted specific generation technologies, markets, and specific assets that would complement the client's current portfolio, and presented multiple executive-level presentations for the client to formulate its growth platform.

Served as project manager for PA's engagement with a start-up firm to provide independent market analysis and insight in support of the client's development of utility scale battery storage technology. PA provided a detailed description of U.S. power markets and analyzed the potential for the technology to earn energy, capacity, and ancillary services margins as both a standalone project and in conjunction with wind generation. PA utilized a proprietary storage dispatch model to evaluate the technology and forecast returns and net present value under various market scenarios. PA worked with the client to develop a presentation for use in discussions with potential partners such as utilities and wind developers.

Additional experience

From 2009-2010, Mr. Hardy assisted with the development of a coalition to develop a green bank at the federal level to fund renewables, transmission and distribution. The Coalition was formed in order to advocate and support an entity funded by the government that would provide financing opportunities for clean energy technologies. Ryan's work with the Coalition involved driving initiatives such as analysis and presentations used in discussions with members of Congress and other stakeholders, hosting and speaking at stakeholder conferences and meeting with Congressmen about the Green Bank and its goals. Through its work, the Coalition facilitated the inclusion of the Clean Energy Deployment Administration (CEDA)/Green Bank in the Waxman Markey bill that passed in the House of Representatives, which encompasses many of the goals of the Coalition.

In 2008, Ryan supported a private equity firm in performing a valuation on a portfolio of landfill gas generating assets in the state of New York. PA's valuation of the portfolio was conducted in support of a potential acquisition and included analysis related to energy, capacity, and renewable energy credit (REC) markets. PA also conducted an analysis of the contracts in the landfill gas portfolio, which included landfill gas procurement, REC contracts, and forward capacity contracts. In addition to providing a forecast of plant cash flows, PA submitted a market expert report to the client outlining the Northeast power markets and the portfolio's ability to sell into both the New York and New England markets. The explanation of risk factors and projected cash flows for the portfolio allowed the client to determine a suitable price under which they would complete the transaction.

In 2007, Ryan managed the auction process for the sale of the client's 50 MW peaking facility in ERCOT. Drafted information memorandum and acted as lead arranger in the two-stage auction resulting in the successful sale of the power plant.

Over several years, Ryan led the fundamental valuation effort for Calpine's U.S. generating portfolio consisting of natural gas combined cycles, combustion turbines, cogen facilities, and geothermal plants. Conducted claims analysis for power and steam contracts for various facilities, and contributed to the company's plan for reorganization.

Performed litigation analysis involving the alleged violation of EPA regulations. Project work included interpreting results of the IPP's independent production cost modeling and recreating forecasts using PA's applications. Results of this analysis were incorporated into expert testimony. Due diligence was performed on all company documentation and depositions regarding the violations. Additional analysis was done to prepare rebuttal of opposing side's testimony.

RICHARD S. LIPSITZ, PLS

President

WATERMAN ENGINEERING COMPANY

Established 1894

**46 Sutton Avenue
East Providence, Rhode Island 02914
Tel. (401) 438-5775
Fax (401) 438-5773
www.watermanengineering.net**

o ACADEMIC EDUCATION

- Survey Curriculum
Roger Williams University, Bristol, Rhode Island
- Survey Curriculum
Boston School of Survey, Boston, Massachusetts
- Computer Aided Drafting
Community College of RI, Warwick, Rhode Island
- North Kingstown High School- 1975, No. Kingstown, RI

o PROFESSIONAL REGISTRATIONS

- Professional Land Surveyor:

State of Rhode Island - # 1837, July, 10, 1990
Commonwealth of Massachusetts- # 39691, March 27, 1997

o PROFESSIONAL AFFILIATIONS

- Rhode Island Board of Registration for Professional Land Surveyors:
Chairman – Term; Sept. 2004 to Present
- Rhode Island Society of Professional Land Surveyors:
Past President – 1991 to 1993
- American Congress on Surveying and Mapping
- National Society of Professional Surveyors
- Connecticut Association of Land Surveyors
- Massachusetts Association of Land Surveyors & Civil Engineers
- Providence Engineering Society

RICHARD S. LIPSITZ, PLS

o **FACULTY POSITIONS**

Land Development and Survey Curriculum, 1993-1995
Roger Williams University, Bristol, Rhode Island

o **PROFESSIONAL EXPERIENCE**

Representative Projects- Boundary & Topographic Surveys

Easton Pond Dam / Moat, Newport, RI – Boundary, Topographic & Hydrographic Surveys in support of dam and storm water management facilities upgrades.

Bradford Dam, Westerly, RI – Topographic & Hydrographic surveys in support of dam and fish ladder upgrades.

RI Resource Recovery Corporation, Johnston, RI- Surveys at the Central Landfill.
Surveys of adjacent properties to be acquired by RIRRC for development.

Clariant Corp. /Hoechst Celanese Corp., Coventry, RI- Boundary survey of 100 acre chemical plant for conveyance.

NAPP Pharmaceuticals, Coventry, RI- Boundary survey of existing pharmaceuticals & chemical plant as part of merger/sale.

The Nature Conservancy, Providence, RI - Boundary Surveys of parcels for acquisition including:

South Kingstown, RI- 80 acres
Exeter, RI-250 acres
Exeter, RI-55 acres

Greenville Commons, Smithfield, RI- Boundary, topographic & wetlands surveys for proposed retail mall on a 75 acre parcel of land.

Seekonk Golf Facility, Seekonk, MA- Boundary, topographic & wetlands surveys for proposed 18 hole executive golf course, driving range and practice facility on an 85-acre parcel of land.

Stoneridge, Inc., Hopkinton, RI- Boundary, topographic & wetlands surveys for proposed 137 unit single family/condominium & championship golf course project on a 360 acre parcel of land.

RICHARD S. LIPSITZ, PLS

Representative Projects- Boundary & Topographic Surveys (Continued)

Rhode Island Economic Development Corp., Providence, RI- Boundary surveys of 600+ acres at the Quonset State Airport & Quonset Point/Davisville Industrial Park in North Kingstown, RI

Misquamicut Club, Westerly, RI- Boundary, topographic & Wetlands surveys of 200+ acre existing ocean front golf course in support of a drainage improvement project.

Town of Narragansett, Narragansett, RI- Right of Way Surveys & monumentation of 10+ miles of private roads in the Bonnet Shores area prior to their dedication to the Town.

Town of North Kingstown, North Kingstown, RI- FEMA Flood Insurance Certificates for all Town municipal and school buildings.

Senior Tour Players/ Golfing Partners, LLC, Cranston, RI- Boundary & Topographic surveys for a proposed driving range/golf learning center & sports facility.

Representative Projects – Highway Reconstruction

Rhode Island Department of Transportation, Providence, RI • Right of Way, topographic, wetland and utility location surveys for the following highway reconstruction projects:

US Route 1 & RI Route 4, North Kingstown – South Kingstown, RI
Huntington Expressway (RI Route 10), Providence – Cranston, RI
Oaklawn Avenue (RI Route 5), Cranston, R.I
Post Road (US Route 1), North Kingstown, RI
Bald Hill Road (RI Route 2), Warwick – West Warwick, RI
Interstate Route 95, Cranston – Providence – Pawtucket, RI
Douglas Pike (RI Route 7), Smithfield, RI
New London Turnpike Bridge, Coventry – West Warwick, RI
Stony Lane RR Bridge, North Kingstown, RI
Roger Williams Avenue RR Bridge, Providence, RI

City of Fall River, Fall River MA • North Main Street Reconstruction, As-Built surveys for pavement upgrade project.

City of Warwick, Warwick, RI • Cowesett Road Reconstruction, Right of way, topographic

RICHARD S. LIPSITZ, PLS

& wetlands surveys.

City of Woonsocket, Woonsocket, RI • Main Street Reconstruction, Blackstone Street RR Bridge, right of way, topographic & utility location surveys

Representative Projects – Construction Layout

Olin Microelectronics, North Kingstown, RI

Walgreen's Pharmacy, Providence, RI

Fairfield Suites – Marriott Hotel, West Warwick, RI

Academy Daycare, West Warwick, RI

Davies VoTech High School, Lincoln, RI

Prison Intake Center, Cranston, RI

Cranston Waste Water Facility, Cranston, RI

Fields Point Waste Water Facility, Providence, RI

Memorial Boulevard – Water Place Park, Providence, RI

Marriott Courtyard Hotel, Middletown, RI

Washington Trust Bank Parking Garage, Westerly, RI

Wickford Highlands Subdivision, North Kingstown, RI

CVS Pharmacy, North Kingstown, RI

CVS Pharmacy, Attleboro, MA

Sakonnet Bay Manor, Tiverton, RI

West Bay Manor, Warwick, RI

Greenwich Bay Marina, Warwick, RI

George Mann Chemical Co., Providence, RI

ProvPort, Inc., Port of Providence, RI

Rhode Island Air National Guard, Quonset Point – North Kingstown, RI

Stop & Shop Supermarket, Westerly, RI



Experience

ESS Group: 2016 to present

Years of Prior Related
Experience: 18

Education

BS, Wildlife Biology and
Management, University of
Rhode Island, 1998

Professional Certifications

Certified Wildlife Biologist,
The Wildlife Society

Federal Aviation
Administration Qualified
Airport Wildlife Biologist

Professional Wetland
Scientist #1953, Society of
Wetland Scientists

Rhode Island Certified
Arborist #261, Rhode Island
Department of
Environmental
Management

Rhode Island Coastal
Invasive Manager #25,
Rhode Island Coastal
Resource Management
Council

Qualifications

Jason Ringler is a Senior Scientist with more than 18 years of experience in wildlife assessments, environmental compliance monitoring, and wetland and terrestrial ecology. Mr. Ringler is a Certified Wetland Biologist and Professional Wetland Scientist with field research experience including Atlantic flyway waterfowl and shorebird surveys, bird point counts, eelgrass surveys, and shellfish surveys. He has also conducted extensive small mammal trapping and nighttime amphibian (pitfall) trapping.

Mr. Ringler has supported a wide range of projects for federal, state, and private sector clients. Additionally, he is contributor to the Harvard Museum of Comparative Zoology small mammal specimen collection.

Habitat Assessment and Restoration

Appalachian Power Company: 138-kV Wythe Area Improvements Project, Wythe County, Virginia. Senior environmental Scientist. Mr. Ringler was responsible for developing a desktop habitat assessment methodology for the 17.6-mile-long proposed project route specifically for the state threatened loggerhead shrike (*Lanius ludovicianus*). The habitat assessment was reviewed and approved by Virginia Department of Game and Inland Fisheries, and Mr. Ringler validated the results of the desktop habitat assessment in the field and search for loggerhead shrikes during the 2014 breeding season. The purpose of the habitat assessment was to locate the proposed 100-foot right-of-way in a manner that avoids and/or minimizes impacts to suitable habitat of the loggerhead shrike and to identify areas where ground clearing and tree removal activities cannot occur between April 1 to July 31 of any given year.

Environmental and Social Impact Assessment for the Lekki Port and Harbor Facilities, Lagos, Nigeria. Senior environmental scientist. Mr. Ringler was responsible for a conducting a biological assessment of flora

and fauna which included local avian, mammalian, and threatened and endangered marine turtles to update the environmental and social impact assessment for a proposed port near Lagos, Nigeria. Mr. Ringler assisted in revising several environmental sections of the environmental and social impact assessment per the guidance of the African Development Bank Group and the International Finance Corporation. Upon completion, the Port at Lekki will feature a 1,500-meter-long main breakwater; a 6-kilometer-long, 14.5-meter-deep approach channel; a 1,500-meter-long quay wall; and cargo-handling equipment, enabling the facility to accommodate container vessels of up to 4,000 twenty-foot equivalent units and liquid bulk vessels of up to 45,000 deadweight tons.

Relocation of Winslow Park at T.F. Green Airport, Warwick, Rhode Island. Senior environmental scientist. Responsible for identifying avoidance and minimization measures that could be incorporated into the project design to avoid impacts to freshwater wetlands under RIDEM's jurisdiction. Due to unavoidable impacts to jurisdictional wetlands, Mr. Ringler prepared and submitted a Request for Preliminary Determination to RIDEM pursuant to the Rules and Regulations Governing the Administration and Enforcement of the Fresh Water Wetlands Act. Mr. Ringler also coordinated with the United States Department of Agriculture, Wildlife Services, to review the proposed design in an effort to integrate measures to deter wildlife that pose a strike hazard to aircraft from being attracted to the relocated Winslow Park.

Fort Adams State Park Fixed Pier, Newport, Rhode Island. Senior environmental scientist. RIDEM was constructing a new, pile-supported 24-foot-wide by 240-foot-long fixed pier and wave fence with an

associated 12-foot-wide by 210-foot-long concrete floating dock. The open area to the north of Fort Adams State Park has potential to generate the largest waves due to a fetch of approximately 7 miles, extending to the northern tip of Conanicut Island and the southern tip of Prudence Island. The proposed wave fence would protect the existing Alofsin piers and increase the level of service by reducing the wave climate in the area adjacent to the existing Alofsin timber piers. The new fixed pier would allow Fort Adams to continue to be used as a world class special events facility to host international sailing races while also providing berthing for the State of Rhode Island's Official Sailing Education Vessel, the Oliver Hazard Perry. Mr. Ringler prepared and submitted a Rhode Island CRMC Category B Assent and a Category 2 General Permit to the USACE, New England District.

FirstEnergy, Bruce Mansfield-Glenwillow 345-kV Transmission Line Project, Ohio and Pennsylvania. Senior environmental scientist. Provided routing and permitting services for FirstEnergy's proposed Bruce Mansfield- Glenwillow 345-kV Transmission Line Project. The project will run for more than 100 miles from FirstEnergy's Bruce Mansfield Plant in Beaver County, Pennsylvania, to a new substation in the Cleveland suburb of Glenwillow, Cuyahoga County, Ohio. As a wetland delineator, Mr. Ringler performed the routine delineation method described in the USACE 1987 Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) that consisted of a pedestrian site reconnaissance, including identifying the vegetation communities, soils identification, a geomorphologic assessment of hydrology, and notation of disturbance. During field surveys, the physical boundaries of observed wetlands and other WOUS were recorded using sub-meter accurate Trimble Global Positioning System units. The GPS data were then reviewed, geo-corrected using GPS Pathfinder Office software (version 4.20), and edited for errors. The Ohio Environmental Protection Agency (Ohio EPA) Ohio Rapid Assessment Method for Wetlands v. 5.0 (ORAM) and the qualitative habitat evaluation index (QHEI) were used to determine the relative ecological quality and level of disturbance of a particular wetland and to provide a rapid determination of habitat features assessing physical characteristics of streams most desirable by fish and, to a lesser extent, macroinvertebrates and smaller microinvertebrates, respectively. The Ohio EP Primary Headwater Habitat Evaluation Index, a rapid field assessment method for physical habitat was used to appraise the biological potential of most Primary Headwater Habitat.

Narragansett Bay Combined Sewer Overflow Facilities, Phase II Permitting, Providence, Rhode Island. Senior environmental scientist. For this wetland delineation and environmental permitting of Phase II facilities, Phase II combined sewer overflow facilities consisted of 5 miles of 10- to 40-foot-deep sewer interceptors, 230-foot deep drop shafts and associated facilities that will connect to the previously constructed facilities; two sewershed areas in which sewer separation will be performed; and a wetland storage facility. General program permitting included: RIDEM freshwater wetlands applications (preliminary determination and application to alter), RIDEM 401 Water Quality Certification, Rhode Island CRMC state assent, and USACE Category II application.

South Coast Rail Project, Massachusetts. Senior environmental scientist. Development of a third-party draft and final environmental impact statement intended to advance the restoration of passenger rail between the cities of New Bedford and Fall River and South Station in Boston. Mr. Ringler prepared the biodiversity, threatened and endangered species and wetlands chapters. The project combined the state (MEPA) and federal (NEPA) review into a joint review with two phases. Proposed by The Executive Office of Transportation and Massachusetts Bay Transportation, the project anticipated promoting sustainable economic growth for the South Coast region.



M. JAMES RIORDAN, AICP, LEED AP Project Manager/Director

Experience

ESS Group: 2014 to present

Years of Prior Related
Experience: 20

Education

BA, Psychology, University
of Lowell, 1989

Master of Urban Planning,
Environmental Planning,
New York University, 1993

Professional Registrations

LEED AP
AICP

Affiliations

RI Chapter of American
Planning Association
(President-Elect)

US Green Building Council

Water Environment
Federation

American Institute of
Certified Planners

Yankee Onsite Wastewater
Assoc.

Rhode Island State
Planning Council (Public
Representative)

Related Experience

Rhode Island Department
of Environmental
Management

Awards

USEPA Environmental
Merit Award for Smart
Growth and Stormwater
(2005)

RI APA Chapter President's
Award (2011 and 2014)

Qualifications

Mr. Riordan has more than 23 years of experience as a consultant in managing stormwater projects, nonpoint source pollution, and septic regulation. He has a strong technical background and experience in the environmental and stormwater management business sector, specifically in supervising development and implementation of municipal stormwater projects. Mr. Riordan specializes in Municipal Separate Storm Sewer Systems (MS4) permitting and compliance, and has executed plans for over 30 communities and state agencies. He has led the development of watershed planning projects to address over 20 Total Maximum Daily Loads (TMDLs) for stormwater impairments, assisted four public agencies in updating stormwater design manuals and policy with green infrastructure standards, in addition to mapping stormwater systems and conducting dry-weather sampling in 10 communities. Mr. Riordan has assisted municipalities in developing feasibility studies for the implementation of stormwater utilities. He also developed a statewide stormwater utility feasibility study for the State of Connecticut, which allowed statewide enabling legislation to be advanced. He is currently serving as President-Elect of Rhode Island American Planning Association and as a representative to the Rhode Island State Planning Council.

Representative Project Experience

Invenergy Thermal Development, LLC – Clear River Energy Center, Burrillville, RI. Provided stormwater technical peer review and support for the filing of an application with the Rhode Island Energy Facility Siting Board, as well as a Major Source Air Permit Application with RIDEM and related environmental permit applications for a proposed 1,000 MW combined cycle power plant.

SNC-Lavalin – PSEG Keys Energy Center, Stormwater Designs and Permitting – Brandywine, MD. Technical advisor involved in site design, stormwater best management practices, and final grading plan for a 700 MW gas-fired power facility in Prince George's County, MD. Responsible for design of stormwater and erosion control best management practices, preparation of stormwater calculations, and preparation of plan sets for submission to Prince George's County and Maryland Department of Environment.

Confidential Chemical Distribution Facility – Provide Technical Support for an USEPA's finding of Violation and Administrative Order of Consent. Technical lead responsible for providing support for achieving compliance with USEPA's Finding of Violation and Administrative Order of Consent at a chemical distribution facility. Conducted a comprehensive site

inspection to evaluate the Facility's compliance with applicable federal, state, and local regulatory requirements and to assess the technical feasibility of all available compliance actions. Developed a Hazardous Material Storage Plan (HMSP), which detailed and described site security, emergency management, inventory management, routine operations management, facility monitoring and inspections, and training.

Confidential Energy Facility – Technical Support to Defend against Citizen Suit under the Clean Water Act and continue support of MSGP required sampling. Technical reviewer responsible for providing permitting, compliance, and litigation support for an electric, steam, and chilled water generation

facility served with a 60-day notice of intent to sue under the Clean Water Act. Worked closely with the facility owner and their attorney to develop strategies for resolving the complaint through legal settlement and participated in settlement negotiations. Helped to provide technical solutions that balanced compliance with NPDES MSGP requirements with cost effectiveness and speed of implementation.

Providence Water – Watershed Protection On-Call Services – Providence, RI. Project Manager for nine years for water supply, watershed plan development, and on-call services including field investigations, property acquisition assessments, sampling programs and data analysis, stormwater BMP design and installation, grant assistance, groundwater and soil remediation, and development review.

Town of North Providence – TMDL Compliance and Stormwater Utility Study – North Providence, RI. Project Manager who assisted the Town of North Providence in applying for grants that resulted in a total of \$193,000 in grant awards for stormwater BMP design and stormwater utility planning through implementation. The resulting BMPs include LID-style retrofits, which will abate water quality impairments to Woonasquatucket River. In addition to stormwater utility planning, the project includes full planning design and 3D visualizations of BMP retrofits, as well as construction oversight. This project is also allowing the Town to address an RIDEM NOV and avoid a \$20,000 fine.

Town of West Warwick – Stormwater BMP Design and Utility Study – West Warwick, RI. Project Manager for stormwater utility and BMP implementation. Jim also assisted the Town of West Warwick in applying for two grants that resulted in a total of \$275,000 in grant awards for this project work. The resulting BMPs include LID-style retrofits, which will abate water quality impairments to Hardig Brook and Greenwich Bay and will substantially reduce flooding in the Town. The project includes full planning design of BMP retrofits as well as construction oversight. 3D visualizations are also being developed.

City of Providence, RI – Upper Narragansett Bay Stormwater Utility. Subcontractor for a study to conduct initial investigation of a stormwater utility for six communities including Cranston, Central Falls, East Providence, North Providence, Pawtucket, Providence, and Warwick. (North Providence participated in the early phases of this project only.)

Town of Jamestown – Sheffield Cove Water Quality Monitoring – Jamestown, RI. Project Manager to assist the Town of Jamestown in developing strategies to reopen Sheffield Cove, which includes confirming sources of bacteria, illicit discharge detection and elimination, design of green infrastructure BMPs, and wet-weather flow diversion to a better-flushed area. Designs include bioretention and an innovative subsurface sand filter that is proposed to be installed under pervious pavement on Maple Avenue. 3D visualizations were developed in order to demonstrate the project in its final form. Jim also assisted the Town in applying for grants of approximately \$150,000. The second phase of this project involves final design and structural BMP implementation, which will begin over the winter.

Town of Barrington, RI – Brickyard Pond Phosphorus Reduction Analysis – Barrington, RI. Project Manager for conceptual design of green-infrastructure BMPs in accordance with the Brickyard Pond TMDL for nutrients and to evaluate strategies to manage potential pollution sources. In 2007, the Rhode Island Department of Environmental Management (RIDEM) prepared a TMDL for Brickyard Pond to address impairments due to excessive phosphorus. According to the TMDL, the major sources of phosphorus to Brickyard Pond include waterfowl, shoreline erosion, stormwater and internal cycling.

City of East Providence – Waterfront District Stormwater Management Plan – East Providence, RI. Project Manager for the assessment of water quality retrofits, the development of a financing strategy (e.g., utility district and grants), and the development of local policy on LID and BMP sharing. Also assisted the City in scoping a \$250,000 federal earmark and obtaining a \$600,000 grant for water pollution abatement.

City of East Providence – Sabin Point Stormwater Master Plan and Design – East Providence, RI. Principal-in-Charge for assessment of water quality stormwater retrofits to reopen the beach at Sabin Point

Park. The project focuses on design from concept through final stages of green infrastructure BMPs in a highly constrained urban park and beach setting. The beach has been closed for several years due to bacterial contamination.

Town of Narragansett – Narrow River Stormwater Abatement – Narragansett, RI. Project Manager for the evaluation and design of LID-style controls that reduce bacteria loadings into the Narrow River in order to address a TMDL as a RIDEM demonstration project. Also assisted the Town of Narragansett in obtaining and managing a \$1.3 million water quality grant. Construction of this project was completed in 2010.

Town of Warren – Green Street Retrofit at Water Street – Warren, RI. Project Manager for a water quality assessment and follow-on design of the first “green street” in Rhode Island and one of the first in New England. The design features include bioretention and permeable pavement. This project was recently presented by the project manager on Governor Chafee’s Green Infrastructure Tour.

Town of Fairhaven – Green Infrastructure Master Planning, Design, and Permitting – Fairhaven, MA. Project Manager to assist the Town of Fairhaven in green infrastructure master planning for retrofit of ten outfalls on Sconticut Neck. BMP design will be phased, beginning with GIS-based conceptual design and screening for best cost-benefit using the Simple Method of pollutant reduction modeling. This will be followed with design and permitting of four BMPs and full design of one BMP. Jim assisted Fairhaven in acquiring approximately \$75,000 in grants for this project from the Buzzards Bay National Estuary Program.

Town of Hopedale – Stormwater System Mapping and BMP Design – Hopedale, MA. Jim served as Project Manager and Principal-in-Charge to assist in mapping and sampling the Town’s storm drain system, pinpoint specific sources, and develop stormwater BMPs for water quality restoration. Jim recently assisted the Town in applying for and winning a \$10,000 grant for continued design of a bioretention system that will be implemented on a Town athletic field. The system is designed to allow continued use of the field with construction phased to avoid service interruption.

Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) – Plymouth-Carver Aquifer Action Plan – Plymouth, MA. Project Manager for development of an aquifer action plan to maximize water supply using LID-style approaches. The project involved working with Plymouth-Carver Aquifer Advisory Committee to identify action plan items and develop a MOU that would be acceptable to all seven municipalities in the region.

Connecticut DEEP (CTDEEP) – Low Impact Development and Stormwater General Permits Evaluation – Statewide. Project Manager and author for LID standards development and codification for CTDEEP. Led a series of five workshops to build a consensus among over 50 stakeholder government agencies, nonprofits, and industry organizations. The project resulted in development of LID appendices for the Connecticut Stormwater Quality Manual as well as the Connecticut Guidelines for Soil Erosion and Sediment Control. In addition to project work and project management, Mr. Riordan was responsible for quarterly ARRA reporting.

Town of Vernon – Vernon Low Impact Design Regulatory Review and Stormwater Manual – Vernon, CT. Project Manager for a project involving a consensus-building process between town officials, environmental advocates, and the development community. Also served as Principal Author of Revisions to local land-use regulations, which facilitated LID implementation and a LID-centered stormwater manual.

Publications and Conference Proceedings

State Regulatory and Policy Texts

Connecticut Low Impact Development Appendix for the Stormwater Quality Manual (2011, author)

Connecticut Low Impact Development Appendix for the Guidelines for Soil Erosion and Sediment Control (2011, author)

Rhode Island Stormwater Design and Installation Standards Manual (2011, co-author)

Rhode Island Municipal Septic System Standards and Programs (2001, author)

Septic System Check-Up--The Rhode Island Handbook for Inspection (2000, author)

Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act (April 1998, author)

Rhode Island's Coastal Nonpoint Pollution Control Plan (1995, co-author)

Rhode Island Nonpoint Source Pollution Management Plan (1995, contributing author)

Presentations (Selected Examples)

Speaker: "Thinking Outside the Box: Can We Create Amphibian Habitat as We Manage Stormwater?" *Land and Water Conservation Summit*, March 2016.

Speaker: "Community in Action: Rate Studies, Capital Improvement Plans, Education and Outreach" *Narragansett Bay Stormwater Financing Workshop Series: Part 3*, March 2016.

Speaker: "Green Street Retrofit at Water Street," *Governor Chafee's Green Infrastructure Tour*, November 2013.

Moderator and Speaker: "When Do Stormwater Utility Districts Make Sense," *Southern New England American Planning Association 2012*, September 2012, Hartford, Connecticut.

Speaker: "EPA Storm Water Phase II—Illicit Discharge Detection and Elimination," *American Public Works Association—New England*.

Speaker: "Rhode Island Stormwater Manual Update and Related Regulatory Issues," *American Public Works Association—New England Chapter Spring 2007 Meeting*, April 2007, Manchester, CT.

Interviewed by Christine James: "Plymouth-Carver Aquifer Advisory Commission and Management Plan," *WATD (FM 95.9) Morning Drive Show*, February 2007 & April 2007.

Speaker: "Narrow River Stormwater Abatement Study" *7th Annual Convention—Rhode Island League of Cities and Towns*, January 2007.

Warwick, RI Speaker: "Narrow River Stormwater Abatement Study," *Breaking the Barriers—Moving Forward with LID*, April 2006, Mashpee, MA.

Speaker: "Rhode Island Stormwater Manual Update" and "Establishing Woonsocket's Phase II Ordinances," *Stormwater—Phase II Conference*, December 2005, Alton Jones Conference Center, RI.

Facilitator & Speaker: "Municipal Stormwater Management Planning," "Rhode Island's Capacity for Stormwater Management," *Gutter Talk-Managing Stormwater in Rhode Island*, November 2001, Warwick, RI.



ROBERT A. SMITH, P.E.
Senior Project Manager

Education

- B.S., Civil Engineering, University of Rhode Island, 1983
- Graduate Studies, Civil Engineering, University of Rhode Island, 1984-1986

Professional Registrations

- Registered Professional Engineer in Rhode Island

Experience

Robert A. Smith, P.E., Senior Project Manager, draws on over 33 years of diverse experience in the planning and design of transportation projects. His experience is primarily with the Rhode Island Department of Transportation (RIDOT), where he has overseen hundreds of transportation projects from the initial design scoping, through the entire design process all the way to construction. He has worked closely with elected officials, industry leaders, and the general public to implement the state's Transportation Improvement Program. He has also reviewed and recommended action on hundreds of access permits submitted by private developers. Since joining McMahon he has provided project management and technical guidance on a variety of design tasks.

Some of his technical responsibilities have included dealing with:

- Roadway & intersection design
- Expert witness testimony & public presentations
- Construction plans & contract documents
- Construction oversight

- Peer reviews
- Traffic Management Plans (TMPs)
- Traffic control
- Public outreach and stakeholder coordination
- Quality Assurance/Quality Control (QA/QC)

Professional Affiliations

In addition to his work responsibilities, Mr. Smith is involved and active in several professional affiliations. He has been a member of and/or involved with:

- Tau Beta Pi Engineering Honor Society
- Formerly Rhode Island's designee to AASHTO Subcommittee on Design
- Leadership Rhode Island (2014 Kappa II Class)

September 12, 2016

Via Federal Express/Electronic Mail

Todd Anthony Bianco, EFSB Coordinator
RI Energy Facility Siting Board
89 Jefferson Blvd.
Warwick, RI 02888

Re: Invenergy Docket No. SB-2015-06

Dear Mr. Bianco:

On behalf of Invenergy Thermal Development LLC (“Invenergy”), and to assist the EFSB with scheduling hearings, pending Invenergy’s request to modify the remaining procedural schedule, enclosed please find an original and 10 copies of CVs for the following experts that Invenergy expects will be testifying in this matter, and the primary topics they will address:

- John Niland, Invenergy Thermal Development LLC (Project Overview, Alternatives, Support Facilities, Project Benefits, Mitigation Measures, Compliance Contracts, etc.);
- Michael Feinblatt, ESS Group, Inc. (Environment and Air Emissions)
- Ryan Hardy, PA Consulting, Inc. (Energy Markets, Emissions Data, Emissions Policies, Compliance, Project Benefits, Mitigation Measures, Cost, Need, State Policies and Economics)
- Edinaldo Tebaldi, Bryant University (Economics and Jobs)
- Jeff Hershberger, ESS Group, Inc. (Environment, Ground and Surface Water)
- Jason Ringler, ESS Group, Inc. (Environment, Wetlands and Wildlife/Ecology)
- George Bacon, ESS Group, Inc. (Environment and Wastewater)
- Jim Riordan, ESS Group, Inc. (Environment and Stormwater)

- Michael Hankard, Hankard Environmental, Inc. (Noise Impacts/Analysis)
- William Bailey, Exponent (EMF)
- Christopher Donta, Gray & Pape, Inc. (Cultural and Historic Analysis)
- Maureen Chlebek, McMahon Associates (Traffic Impacts/Analysis)
- Robert Smith, McMahon Associates (Road Conditions Impacts/Analysis)
- Gordon Perkins, Environmental Design and Research, Inc. (Visual Impacts/Analysis)
- Edward Pimentel, Pimentel Consulting, Inc. (State and Local Land Use Planning and Zoning)
- Michael Marous, Marous and Company (Property Valuation Analysis)
- Richard Lipsitz, Waterman Engineering Company (Site Plan)
- John Carter, John C. Carter & Company, Inc. (Landscape Architecture)
- Chad Jacobs, HDR, Inc. (Environmental)

Please let me know if you have any questions.

Very truly yours,



ALAN M. SHOER
ashoer@apslaw.com

Enclosures

cc: Service List

SB-2015-06 Invenergy CREC Service List as of 08/26/2016

Name/Address	E-mail	Phone/FAX
<p>File an original and 10 copies with EFSB: Todd Bianco, Coordinator Energy Facility Siting Board 89 Jefferson Boulevard Warwick, RI 02888</p> <p>Margaret Curran, Chairperson Janet Coit, Board Member Assoc. Dir., Div. of Planning Parag Agrawal Patti Lucarelli Esq., Board Counsel Susan Forcier Esq., Counsel Rayna Maguire, Asst. to the Director DEM Catherine Pitassi, Asst. to. Assoc. Dir. Plann.</p>	Todd.Bianco@puc.ri.gov ;	401-780-2106
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	Margaret.Curran@puc.ri.gov ;	
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<p>Parties (Electronic Service Only, Unless by Request)</p>		
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	enoonan@apslaw.com ;	
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<p>John Niland, Dir. Of Business Development Tyrone Thomas, Esq., Asst. General Counsel Invenergy Thermal Development LLC One South Wacker Drive, Suite 1900 Chicago, IL 60600</p>	jniland@invenergyllc.com ;	312-224-1400
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<p>Town of Burrillville Michael McElroy, Esq., Special Counsel Leah Donaldson, Esq., Special Counsel Schacht & McElroy PO Box 6721 Providence, RI 02940-6721</p>	Michael@mcelroylawoffice.com ;	401-351-4100
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Harrisville Fire District Richard Sinapi, Esq. Joshua Xavier, Esq. 2347 Post Road, Suite 201 Warwick, RI 02886	ras@sinapilaw.com ;	401-739-9690
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Interested Persons (Electronic Service Only)		
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Rhode Island Progressive Democrats of America Andrew Aleman, Esq. 168 Elmgrove Avenue Providence, RI 02906	andrew@andrewaleman.com ;	401-429-6779
Fighting Against Natural Gas and Burrillville Against Spectra Expansion Jillian Dubois, Esq. The Law Office of Jillian Dubois 91 Friendship Street, 4 th Floor Providence, RI 02903	jillian.dubois.esq@gmail.com ;	401-274-4591
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