STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Case 08-T-1245: Application of Bayonne Energy Center, LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law.

STATEMENT OF COUNSEL IN SUPPORT OF SUBMISSION OF EVIDENCE INTO THE RECORD

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New York, New York
Dated: October 9, 2009

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Case 08-T-1245: Application of Bayonne Energy Center, LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law.

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This Statement of Counsel is submitted in support of the application of Bayonne Energy Center, LLC ("BEC") pursuant to Article VII of the New York Public Service Law for a Certificate of Environmental Compatibility and Public Need ("Certificate"). This Statement: (a) identifies the documents and other materials that constitute the Evidentiary Record in this proceeding, as well as the witnesses sponsoring each item of the Record; (b) provides the qualifications of the individuals who prepared BEC's application and its supporting materials; (c) affirms, on the basis of personal knowledge, information, and belief, that the copies of each item of the Record are complete, true, and correct copies of each item proffered herewith for entry into the Record at the October 9, 2009 Evidentiary Hearing in this proceeding; and (d) affirms that the items proffered for entry into the Record were prepared by witnesses who are experts in their fields, and that those witnesses, consistent with their pre-filed direct testimony, adopt and sponsor the evidence being submitted for inclusion in the Record.

BACKGROUND

On October 17, 2008, BEC filed an application (the "Application") with the New York State Public Service Commission (the "Commission") seeking a Certificate pursuant to Article VII of the Public Service Law for the construction, operation, and maintenance of the New York portion of the Bayonne Energy Center Project ("Project" or "BEC Project"). The BEC Project is a 345 kilovolt alternating current submarine electric cable system and associated upland cable and interconnection equipment, to connect a new 512 megawatt multi-unit, simple-cycle natural gas-fired (with ultra low sulfur diesel oil as a backup fuel) generating facility to be located in Bayonne, New Jersey, to the New York Independent System Operator electrical grid. The BEC Project will interconnect with the NYISO grid at the Consolidated Edison Company of New York, Inc. Gowanus Substation in Brooklyn, New York.

BEC supported the Application with appendices and the pre-filed written testimony of witnesses supporting each substantive exhibit of the Application. BEC augmented the Application with supplemental materials provided in response to requests of the New York State Department of Public Service ("NYSDPS"), and with responses to interrogatories and information requests from NYSDPS and the New York State Department of Environmental Conservation ("NYSDEC"). BEC further provided additional materials in support of its Application, such as relevant correspondence from governmental authorities with jurisdiction over the Project, and a Dispatch and Environmental Analysis prepared at the request of NYSDPS. The items constituting the Evidentiary Record in this proceeding are identified in the Joint Proposal executed and filed with the Commission and Administrative Law Judge Eleanor Stein on October 5, 2009.

EVIDENTIARY RECORD

The Evidentiary Record in this case is set forth in the October 5, 2009 Joint Proposal, and, with more particularity, the table attached as Appendix A to this Statement. Please refer to Appendix A for a complete list of the exhibits, documents, and other materials constituting the Evidentiary Record, as well as the witnesses supporting and sponsoring each item of the Record.

The Evidentiary Record was developed with the cooperation and input of the parties that participated in the negotiation of the Joint Proposal and Proposed Certificate Conditions. The Evidentiary Record is uncontested by any party, and no item of the Record is subject to any objection as to its authenticity, relevance, and sufficiency. I, the undersigned, was personally involved in the preparation and submission of the BEC Application and its supporting materials, in the negotiation of the Joint Proposal, and in the development of the Evidentiary Record. Based upon my personal knowledge, and, where I do not have personal knowledge, upon information and belief, I affirm that the documents, testimony, and other materials in the Evidentiary Record, as proffered herewith, are authentic, true, and complete representations of the matters asserted therein.

WITNESSES

The curricula vitae ("CV") of the individuals who prepared BEC's application and supporting testimony and materials are attached alphabetically in Appendix B. As is clear from the witnesses' CVs and their pre-filed testimony, the witnesses are experts in their respective fields, as each witness possesses special knowledge, skill, experience, training or education within his or her field. Based on my conversations with the witnesses and my personal involvement in the preparation and submission of the BEC Application and supporting materials, I affirm that the witnesses personally prepared or worked closely with others on the preparation

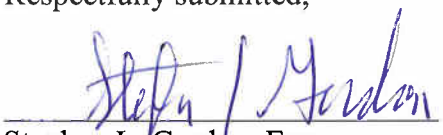
of the documents, testimony, and other materials in the Evidentiary Record. I further affirm that the documents, testimony and other materials prepared by each witness are within that witness's field of expertise. I have discussed with the witnesses their pre-filed testimony, and I affirm that the witnesses confirm and adopt their respective sections of pre-filed testimony.

ENTRY OF EVIDENCE INTO THE COMMISSION'S RECORD

Based on the above affirmations, BEC respectfully requests that the Evidentiary Record as identified in Appendix A, and as marked and proffered at the October 9, 2009 Evidentiary Hearing in this case, be accepted into this case's record for the Commission's consideration and action upon BEC's Application.

Dated: October 9, 2009
New York, New York

Respectfully submitted,



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APPENDIX A

TABLE OF EXHIBITS, TESTIMONY, APPENDICES, AND OTHER MATERIALS CONSTITUTING THE EVIDENTIARY RECORD

Application Exhibit	Pre-Filed Testimony	Related Appendix	Other Exhibit(s)	Supporting Witness
Exhibit 1	Not Substantive			
Exhibit 2	Project Location	--	Figure S-1 Figure S-2 BEC Response to DPS Interrogatory 5 (March 2, 2009) BEC Response to DPS Interrogatory 9 (March 2, 2009)	Payson R. Whitney, III William Heeney
Exhibit 3	Alternatives Analysis	--	BEC Response to DPS Interrogatory 6 (March 2, 2009)	Payson R. Whitney, III William Heeney
Exhibit 4.1	Not Substantive			
Exhibit 4.2	Topography, Geology, Soils, Sediments, and Groundwater	--	BEC Response to DPS Interrogatory 7 (March 2, 2009)	Sarah Faldetta Payson R. Whitney, III
Exhibit 4.3	New York Freshwater and Tidal Wetlands	--	--	Charles J. Natale, Jr.
Exhibit 4.4	Marine Physical Characteristics	Appendix 4.4A Appendix 4.4B	--	Payson R. Whitney, III
Exhibit 4.5	Marine Sediment and Water Quality	Appendix 4.5A	--	Charles J. Natale, Jr. Susan Herz
Exhibit 4.6	Finfish	Appendix 4.6A	--	Charles J. Natale, Jr. Susan Herz
Exhibit 4.7	Benthos & Shellfish	Appendix 4.7A	--	Charles J. Natale, Jr. Susan Herz

Application Exhibit	Pre-Filed Testimony	Related Appendix	Other Exhibit(s)	Supporting Witness
Exhibit 4.8	Terrestrial Wildlife & Protected Species	Appendix 4.8A	--	Charles J. Natale, Jr.
Exhibit 4.9	Marine Protected Species	--	--	Charles J. Natale, Jr.
Exhibit 4.10	Land Use	Appendix 4.10A	Letter from Jeff Zappieri, Supervisor of Consistency Review, NYSDOS, to Payson R. Whitney, III (March 31, 2009)	Payson R. Whitney, III William Heeney
Exhibit 4.11	Cultural & Historic Resources	Appendix 4.11A Appendix 4.11B Appendix 4.11C	Letter from Ruth L. Pierpont, SHPO to Sarah K. Faldetta (May 13, 2008). Letter from Douglas P. Mackey, SHPO to Sarah K. Faldetta, (Oct. 14, 2008). BEC Response to DPS Interrogatory 4 (Feb. 24, 2009)	Sarah Faldetta J. Lee Cox (Dolan Research, Inc.) (Pre-Filed Testimony & Appendices 4.11A&B)
Exhibit 4.12	Visual & Aesthetic Resources	--	--	Sarah Faldetta
Exhibit 4.13	Noise	--	--	Howard Quin (Tech Environmental) Peter Goldberg (Tech Environmental)
Exhibit 4.14	Public Health (EMF)	Appendix 4.14A	--	Peter A. Valberg (Gradient Corp.) Juhi Chandalia(Gradient Corp.)
Exhibit 5	Not Substantive			
Exhibit 6	Economic Effects	--	--	Paul Barnett

Application Exhibit	Pre-Filed Testimony	Related Appendix	Other Exhibit(s)	Supporting Witness
Exhibit 7	Local Ordinances	--	--	Sarah Faldetta NeilCollins
Exhibit 8	Other Pending Filings	--	BEC Response to DPS Interrogatory 3 (Feb. 24, 2009)	Charles J. Natale, Jr. (Pre-Filed Testimony) Payson R. Whitney, III (Interrogatory Response)
Exhibit 9	Cost of Proposed Facility	--	Supplemental Statement of Paul Barnett (Dec. 4, 2008)	Paul A. Barnett
Exhibit E-1	Description of Proposed Transmission Line	--	--	William Heeney
Exhibit E-2	Other Facilities	--	--	William Heeney
Exhibit E-3	Cable System Installation	--	--	Payson R. Whitney, III
Exhibit E-4	Engineering Justification	Appendix E4A	NYISO TPAS Minutes (Oct. 14, 2008) NYISO Operating Committee Minutes (Oct. 23, 2008) Figure S-4 BEC Response to DPS Interrogatory 11 (March 2, 2009)	William Heeney Paul Barnett (Interrogatory Response)
Exhibit E-5	Effect on Communications	--	--	William Heeney
Application: Exhibit E-6	Effect on Transportation	--	Figure S-3	Payson R. Whitney, III

Other Exhibits, and Exhibits Supporting Multiple Application Sections	
Exhibit	**Supporting Witness**
Letter to Stephen L. Gordon, Esq. and Neil Collins, Bayonne Energy Center, LLC, from Jaclyn A. Brilling, Secretary to the Commission, (Nov. 21, 2008), regarding the completeness of application materials under Public Service Law ("PSL") § 122.	--
Letter to Jaclyn A. Brilling, Secretary to the Commission, from Stephen L. Gordon, Esq., counsel to Bayonne Energy Center, LLC, (Dec. 4, 2008), enclosing the following supplemental application materials: Figure S-1; Certified statement of Paul A. Barnett, Addendum to Exhibit 9 of the Application; Minutes of the October 14, 2008 meeting of the NYISO Transmission Planning Advisory Subcommittee; Minutes of the October 23, 2008 meeting of the NYISO Operating Committee.	--
Letter to Stephen L. Gordon, Esq. and Neil Collins, Bayonne Energy Center, LLC, from Jaclyn A. Brilling, Secretary to the Commission (Jan. 13, 2009), regarding the completeness of application materials under PSL § 122.	--
Letter to Jaclyn A. Brilling, Secretary to the Commission, from Stephen L. Gordon, Esq., counsel to Bayonne Energy Center, LLC, (Jan. 20, 2009), enclosing the following supplemental application materials: Figure S-2; Figure S-3; Figure S-4.	--
Letter to Stephen L. Gordon, Esq. and Neil Collins, Bayonne Energy Center, LLC, from Jaclyn A. Brilling, Secretary to the Commission, (Jan. 29, 2009), regarding the completeness of application materials under PSL § 122.	--
BEC Response to DPS Interrogatory 1 (Feb. 24, 2009)	Stephen L. Gordon
BEC Response to DPS Interrogatory 2 (March 2, 2009)	William Heeney
BEC Response to DPS Interrogatory 8 (March 2, 2009)	William Heeney Payson R. Whitney, III
BEC Response to DPS Interrogatory 10 (March 2, 2009)	William Heeney
BEC Response to DPS Interrogatory 12 (Feb. 24, 2009)	Paul Barnett
Letter to Payson R. Whitney, III, ESS Group Inc., from Betsy Hohenstein, NYSDEC (Feb. 3, 2009).	Payson R. Whitney, III
Letter from Payson R. Whitney, III, ESS Group, Inc., to Betsy Hohenstein, NYSDEC (March 12, 2009).	Payson R. Whitney, III
Letter from Payson R. Whitney, III, ESS Group, Inc., to Betsy Hohenstein, NYSDEC (May 20, 2009)	Payson R. Whitney, III
Letter from Payson R. Whitney, III, ESS Group, Inc., to Betsy Hohenstein, NYSDEC (May 28, 2009).	Payson R. Whitney, III

Other Exhibits, and Exhibits Supporting Multiple Application Sections	
Exhibit	**Supporting Witness**
Letter from Betsy Hohenstein, NYSDEC, to Payson R. Whitney, III and Susan M. Herz, ESS Group, Inc. (June 24, 2009).	Payson R. Whitney, III
Letter from Stephen L. Gordon, Esq., counsel to Bayonne Energy Center, LLC, to David Drexler, Assistant Counsel, NYSDPS (September 18, 2009), transmitting the Levitan & Associates, Inc. ("LAI") *Dispatch and Environmental Results* (Sept. 18, 2009).	George Bacon John Elder (Levitan & Associates)
Electronic mail from Stephen L. Gordon, Esq., counsel to Bayonne Energy Center, LLC, to David Drexler, Assistant Counsel, NYSDPS, et al. (September 28, 2009), transmitting the LAI *Factor Inputs -- Bayonne Energy Center Project* (Sept. 28, 2009).	George Bacon John Elder (Levitan & Associates)
Electronic mail from Stephen L. Gordon, Esq., counsel to Bayonne Energy Center, LLC, to David Drexler, Assistant Counsel, NYSDPS, et al. (September 29, 2009), transmitting information responsive to NYSDPS's request for information relating to sulfur dioxide emissions predicted in the LAI *Dispatch and Environmental Results*.	George Bacon John Elder (Levitan & Associates)
Electronic mail from Stephen L. Gordon, Esq., counsel to Bayonne Energy Center, LLC, to David Drexler, Assistant Counsel, NYSDPS, et al. (October 2, 2009), transmitting information responsive to NYSDPS's request for information relating to generation assets owned or controlled by BEC.	Paul A. Barnett Neil Collins
Joint Proposal: App. A -- Certificate Conditions (Att. 1, TSS Plan); App. B. -- Water Quality Certificate.	--

APPENDIX B

CURRICULA VITAE OF WITNESSES SUPPORTING THE BEC APPLICATION

[See Following Pages]

George Bacon

Experience

33 Years in Power Generation Engineering and Construction

Summary of qualifications

Pure Energy Resources, LLC, Burlington MA

2006 to Present **Vice President, Development**

Mr. Bacon joined Pure Energy Resources in May 2006 as Vice President - Development with thirty-three years of power industry experience. As Pure Energy Resources, VP Development, Mr. Bacon's responsibilities will include analyzing, evaluating and managing both greenfield development and acquisition opportunities in the energy infrastructure sector.

Calpine Corporation, Boston MA

2004 to 2006 **Director, Water Technology**

Responsibilities

As Director of Water Technology manages an engineering team responsible for Water Management and Chemistry Control for all Calpine 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. Assists in the early development of new projects to secure water supplies, evaluates alternative water management systems, supports preparation of Water Agreements and Project permitting and licensing activities for new Calpine opportunities. Provides 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 Region assigned to develop future Calpine assets. Managed a multidisciplinary team comprised of Calpine, external engineering, environmental and legal firms to develop the conceptual design of these facilities, execute necessary third-party agreements and secure regulatory approvals and permits for new development opportunities for Calpine. Responsibilities included managing the conceptual design process, identifying numerous alternatives and approaches to site these facilities, and managing development expenses/project milestones. Successfully managed community and public relations with communities through public hearings and personal presentations to fraternal and local community groups. Negotiated enterprise

zone agreements for facilities securing millions in future tax savings.

Stone & Webster Boston, MA Project Manager/Environmental Engineering

1973 to 2000

Responsibilities
26 years of experience in the steam/electric energy generation industry for both national and international projects specializing in water and wastewater treatment, air pollution control and environmental permitting/regulatory compliance. Responsible for environmental engineering of power plants, mitigation of impacts, review of existing and proposed facility regulatory compliance, environmental audits, condition assessments, asset evaluations, and conceptual/detailed engineering design and review of pollution control systems both as an EPC Contractor and Owner's Engineer for many simple-cycle and combined-cycle projects.

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. Have supported Project Developers in the development of environmental permit applications and regulatory submittals.

Typical Independent Engineer reviews have included pre-investment engineering and environmental assessments of proposed projects and sites including reviews of project-related contracts, environmental permits, plant costs and performance input to project Pro Forma. Engineering and environmental audits of operating facilities for owners, prospective buyers, and financial institutions have been conducted to assess plant performance and environmental compliance and when required, assistance in facility modifications and operational changes to achieve regulatory compliance.

Education

Bachelor of Science in Chemistry, University of Massachusetts - Lowell
Graduate Level Studies in Chemistry - University of Massachusetts -Lowell
Graduate Level Studies in Environmental Engineering - Northeastern University
Various Continuing Education Courses and Management Workshops

Detailed Experience

- 32 years of Environmental Engineering Experience with a Wide Range of Power Facilities
- Experienced with Water & Wastewater and Air Pollution Control Systems
- Audited Operating Facilities for Environmental Regulatory Compliance
- Managed Engineering and Scientific Professionals as well as Cost/Schedule Control for Assigned Projects
- Environmental/Engineering Reviews of National and International Projects located in Canada, Australia, New Zealand, India, England, North Africa, and Guam.
- Participated in Many Combined Cycle Power Projects as EPC or Owner's Engineer

- Experience with ABB/GE/Siemens-Westinghouse Combustion Turbines and Power Islands
- Project Experience Includes Wide Variety of Power Plant Designs Including CFB and Pulverized Coal, Heavy and Distillate Oil, Simple and Combined Units.
- Applied Environmental Regulations/Permitting Processes to Secure Project Opportunities
- Developed Environmental Management Plans and Mitigation Strategies
- Applied Alternative Emission Control Technologies (DLN, Steam Injection/SCR/CO&VOC Catalysts)
- Managed Site Selection Teams for Various Facilities
- Managed Interface Between EPC Contractor and Owner/Owner's Environmental Contractor
- Managed Preparation of Permit Applications/Environmental Approval Documents Including PSD/Title V/NPDES Permit Applications and Site Certification Processes
- Managed Environmental Contractor Phase I and Phase II Site Assessments
- Review of Annual Emissions Performance Tests
- Participated in Various Engineering Studies to Assess Existing Power Plant Systems
- Assisted in Plant Commissioning/Startup of Environmental Control Systems
- Due Diligence Reviews for Potential Owners/Bidders for Utility Assets
- Conducted Environmental/Engineering Audits of Operating Units Against Permits and Environmental Commitments
- Managed Engineering Teams to Complete Pre-Operational and Post-Operational Engineering /Environmental Power Plant Condition Assessments
- Managed Annual O&M & Environmental Review of Operating Units for Financial Institutions
- Preparation of Environmental Input to EPC Bids & Contracts
- Reviewed EPC Contractors Engineering as Owner's Engineer
- Reviewed Heat and Material Balances for All Modes of Plant Operation for Input to Environmental Documentation
- Prepared Water Balances Including Development of Effluent Projections for All Operational Modes and Fuels
- Prepared of Both Conceptual and Detailed Designs for Water and Wastewater Treatment

Paul A. Barnett
Managing Director
Pure Energy Resources, LLC

25 Mall Road, Suite 404, Burlington, MA, 01803

Education

- MBA, Business Administration, Whittemore School of Business and Economics at the University of New Hampshire.
- BS, Business Administration, Siena College.

Current Position

- Co-founder and Managing Director, Pure Energy Resources, LLC.

Experience

- Prior to forming Pure Energy Resources, Mr. Barnett was a member of Calpine Corporation's Boston-based Senior Management Team that initiated Calpine's East Coast business operations, including the management and expansion of Calpine's initial portfolio from 700 MW to in excess of 7,000 MW.
- Mr. Barnett directly led the development effort to site and license the Osprey Project, a 660 MW combined-cycle gas turbine facility located in Auburndale, FL, adjacent to the Auburndale cogen plant.
- Mr. Barnett also developed a 50 MW peaker project and 79.9 MW combined-cycle gas turbine project, both located at Calpine's Bethpage, Long Island site.
- In addition, Mr. Barnett led Calpine's successful acquisition of the Cogen America 500 MW portfolio, Statoil's interests in three Long Island, NY, assets, and Edison Mission Energy's interest in the Auburndale Power Partner's project.
- Mr. Barnett led the divestiture of Calpine's interests in the Bayonne Cogen and Lockport projects, and led the successful PPA monetization of the Newark and Parlin, NJ, projects.
- Mr. Barnett's experience includes responsibility for Calpine's Eastern asset optimization efforts where he had direct P&L responsibility for managing and improving over 20 operating and late stage development projects.
- Mr. Barnett's 27 years of experience in the energy sector also includes management responsibilities at Green Mountain Power, Unitil Service Corp., and Fitchburg Gas & Electric, where he held a variety of positions, including responsibility for development and implementation of these organizations' energy services programs.

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617-395-5000

Gradient

Juhi K. Chandalia, M. S.
Environmental Engineer
jchandalia@gradientcorp.com

Areas of Expertise

Statistical analysis, numerical and analytical modeling, air transport modeling, EMF modeling.

Education

Master of Science, Physics, Massachusetts Institute of Technology, 2005.

Bachelor of Science, Electrical Engineering, Massachusetts Institute of Technology, 2006.

Bachelor of Science, Physics, Massachusetts Institute of Technology, 2001.

Introduction to Epidemiology, Harvard Extension School, 2007.

Professional Experience

2007 – Present GRADIENT, Cambridge, MA
Environmental Engineer. Provides technical and management support for litigation and regulatory response in the areas of environmental exposure and risk assessment.

2006 – 2007 MIT LINCOLN LABORATORIES, Lexington, MA
Analyst in Biodefense Group. Studied biological contaminant transport in buildings using a combination of analytical and computational efforts. Performed elementary risk analysis to determine viability of detect-to-protect and detect-to-treat scenarios.

2003 – 2005 MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA
Research Assistant in Computational Biology Laboratory. Developed a growth model for the evolution of the gene regulatory network in model organism *E. coli and* performed stochastic simulations of gene network growth. Created a comprehensive database of the gene networks by varying growth and mutation parameter rates.

2001 – 2003 MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA
Graduate Student in Ultrafast Optics Laboratory. Investigated electric field-dependent effects in semiconductors proposed for use in stabilizing a frequency reference for optical clocks.

Projects

Utility Company: Provided project management for evaluation of the health risks of a proposed expansion of lines. Performed measurements of present-day electric and magnetic fields and modeled electromagnetic fields in support of proposed expansion of lines. Wrote a report detailing electromagnetic health risks relative to everyday risks and provided support for Gradient principal's expert testimony.

Steel Manufacturing Company *via* Law Firm: Assisted with modeling particulate matter flow from multiple sources to determine exposure in a community. Helped differentiate emitters and analytically determine culpability.

International Construction Firm: Assisted remedial response actions by participating in ecological risk assessment. Performed data analysis and identified appropriate statistical techniques to use.

Trade Organization: Conducted parametric and non-parametric statistical meta-analyses of controlled human NO_2 exposure studies.

Energy Company: Modeled electric and magnetic fields to assist in licensing of new power plant. Results presented to Massachusetts Energy Facilities Siting Board.

Major Chemical Manufacturer: Performed analytical and numerical modeling of contaminant release in an indoor space. Characterized exposure and human health risks.

Publications and Presentations

Chandalia, JK; Eggleton, BJ; Windeler, RS; Kosinski, SK; Liu, X; Xu, C. 2001. "Adiabatic coupling in tapered air-silica microstructured optical fiber." *IEEE Photonics Technology Letters* 13:52-4.

Chandalia, JK; Eggleton, BJ; Windeler, RS; Kosinski, SK; Liu, X; Xu, C. 2001. "Adiabatic Coupling in Tapered Air-Silica Microstructured Optical Fiber." Talk at Optical Fiber Communications conference, Anaheim, CA.

Liu, X; Xu, C; Knox, WH; Chandalia, JK; Eggleton, BJ; Kosinski, SK; Windeler, RS. 2001. "Soliton self-frequency shift in a short tapered air-silica microstructure fiber." *Optics Letters* 26:358-60.

Jiang, LA; Grein, ME; Chandalia, JK; Yokoyama, H. 2002. "Retiming dynamics of modelocked semiconductor laser." *Electronics Letters* 38:1446-7.

Jones, DJ; Holman, KW; Notcutt, J; Ye, J; Chandalia, JK; Jiang, LA; Ippen, EP; Yokoyama, H. 2003. "Ultralow-jitter, 1550-nm mode-locked semiconductor laser synchronized to a visible optical frequency standard." *Optics Letters* 28:813-5.

NEIL COLLINS, JD

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617-504-5502
Neil_Collins@verizon.net

SYNOPSIS

- *Environmental Business Management*
- *Complex Environmental Permitting*
- *EHS Management in Design, Construction, and Operations*
- *EPA, OSHA, FDA Regulatory Review*
- *Crisis & Contingency Planning*
- *Environmental and Zoning Law*
- *Risk Assessment and Hazard Reviews*
- *Due Diligence*

Highly effective consultant experienced in national and international projects, successfully representing clients before stakeholders in complex, controversial development initiatives.

Expert in environmental law, policy, and permitting.

Strategic and operational expert in developing and executing safety, health, and environment management programs.

Broad scope of experience includes regulatory and environmental experience in energy, pharmaceutical, chemical, and industrial permitting and operations.

HIGHLIGHTS

- ☑ Successfully established first-time environment, health, and safety management systems for five power facilities, all in operation today, and won the **EPA Environmental Leadership award**.
- ☑ **Invited to participate in the White House Conference on Global Warming,** discussed the concept of global emissions trading credits.
- ☑ Delivered a **White House briefing** on industry mentoring initiatives to improve transfer of best management practices and environmental technology.
- ☑ **Co-founded the non-profit Trade & Environment Council**, to develop consensus opinions on international trade issues among industry and environmental groups. Corporate members included Fortune 500 companies and leading international environmental organizations.
- ☑ **For ISO 14000 and 14001**, as a member of the U.S. Technical Advisory Group to the ISO Technical Committee 207 on Environmental Management, worked with industry representatives and US EPA to incorporate compliance assurance within ISO 14000 management systems.

EXPERIENCE

PURE ENERGY RESOURCES, LLC

BURLINGTON, MA

Director, Permitting & Community Outreach (3/2008 to present): Oversee permitting and community and public communications related to new project opportunities in the energy sector, from initial conceptualization and permitting through construction completion.

THE LOUIS BERGER GROUP

Needham, MA

Senior Program Manager (8/2007 to 2/2008): Brought back to rebuild Louis Berger services to the energy development business. See, 1998 to 2002 experience. Currently concentrating on natural gas combined cycle, coal gasification, wind, and HVCD transmission projects.

MASSACHUSETTS DEPARTMENT OF HOUSING & COMMUNITY DEVELOPMENT
Boston, MA

Assistant Director (2004 to 5/2007): Managed $100 million in procurement initiatives for the Project Management Unit of the Bureau of Housing Development & Construction, whose primary function is to develop, design, and build public housing. Managed and coordinated with project managers, asset managers, architects, engineers, external design consultants, and local government officials. Prepared five-year capital spending reports to project cash flow and identify resource demand bottlenecks. Worked with energy consultants to establish internet-accessible, real-time tracking of energy and water use in 25,000 housing units. Worked with energy service companies to privatize funding for green upgrades through capitalization of energy savings.

US BIOCHIPS CORP.

Waban, MA

Principal (2002 to 2004): As one of three start-up partners, created the business to license and manufacture microfluidic, miniaturized DNA assay technology for detection of mold and other environmental pathogens. Garnered the support of the EPA National Exposure Research Laboratory (NERL) and gained support of the world-renowned Massachusetts General Hospital as an initial test site.

THE LOUIS BERGER GROUP

Needham, MA

Senior Program Manager (1998 to 2002): Launched the environmental consulting service for the power **generation, transmission, and pipeline** business of this international engineering firm. Defined the market approach for fossil fuel projects, identified key actors in the industry and cultivated professional relationships with industry and government. Held senior budget and profit responsibility.

Directed environmental needs assessment during design and gained approval of an innovative water use system for the Tampa area's largest consumptive water user within the Most Impacted Zone of a Water Use Caution Area, **during a 100-year drought**. Proved complex hydrological issues by drilling and analyzing data from test wells sufficient to demonstrate access to high brine content water, ensuring non-reliance on agricultural water, and non-infiltration of saltwater from Tampa Bay.

Prepared environmental permit **manuals** and undertook GIS-based **analyses and priority ranking** of power generation sites.

EHS, INC.

Waban, MA

President (1995 to 1998): Established this practice, which provided environmental consulting on national and international projects.

Provided **due diligence on petroleum products pipeline** and prepared environmental permitting studies for planned pipeline projects in Canada.

Prepared **pipeline routing reviews** for Portland Natural Gas Transmission System. Reviewed benefits of fuel switching among pulp and paper mills in expansion constraints steep valley locations.

Projects included an all-inclusive **water use reduction** audit for a chemical processing plant. Recommended a series of water reduction initiatives within their current manufacturing processes, which would position the plant for expansion without additional permitting.

Provided regulatory reviews for **power generation** projects in Britain and India.

J. MAKOWSKI COMPANY

Boston, MA

Director, Environment, Health, and Safety (1987 to 1995): For this independent power company, directed site reviews, environmental permitting, construction, operations risk assessment, compliance management, and led communications and negotiations with government agencies and the public for power development sites throughout the U.S. Managed environmental permitting, construction issues, and health and safety systems for five new power generation facilities in New England, valued at $2 billion in capital costs. Also, gained permits for a 5 BCF high deliverability **natural gas storage** facility.

Successfully established first-time environment, health, and safety management systems for the company's five power facilities. All facilities are in operation today. Led corporate policy, compliance assurance, pollution prevention, chemical use management, emergency preparedness, high-involvement teams, management of change, and audits.

- Gained the US EPA **Environmental Leadership Award** for this system, granted to only 13 industrial facilities nationally who passed an extensive federal and state program and operations reviews.
- The Management of Change program designates a plant champion to advocate for a process or procedure improvement by demonstrating the cost benefits before a plant improvement committee.
- High-involvement teams cultivate continuous improvement and build consensus among facility personnel.
- Oversaw training, SOP development, mock emergency exercises, root cause assessment, and actual emergency events.
- Provided real-time HQ oversight for an uncontained breach of a 1,000,000 gallon oil storage tank, which, due to quality emergency training and preparedness, was contained on-site and no citations were issued.
- Provided real-time HQ oversight on facility response to a vapor plume release during a student field trip. Recommended an emergency environmental consultant certify the safe release of the children back

onto their buses. Recommended a medical doctor be made available to the public. Not a single parent filed suit or even wrote a complaint.

EDUCATION

JURIS DOCTOR, Georgetown University Law Center **Washington, DC**

BACHELOR OF ARTS, PHILOSOPHY, (Pre-Med) Holy Cross College **Worcester, MA**

PROFESSIONAL LICENSURE

Admitted to Practice Law, Massachusetts 1986

TRAINING

Crisis, Communication, & Contingency Planning for Senior Management 1992

Mediation Certification 1995

Regulatory Affairs Training, Regulatory Affairs Professionals Society 2004

PUBLICATION

Environmental Leadership Program, Final Report, Ocean State Power 1996

HONORS

U.S. EPA National Leadership Award 1994

For the development and direction of an environment, health, and safety management system.

White House Briefing 1998

On industry mentoring initiatives to improve EHS practices and technology transfer.

White House Conference on Global Warming 1993

Participated in round-table discussions on global warming emission reduction credits.

ISO Technical Committee on Environmental Management 1995

Participated in the US Technical Advisory Group partnering with government and industry to incorporate compliance assurance within ISO:14000.

J. LEE COX, M.A.
PRINCIPAL INVESTIGATOR / MARITIME ARCHAEOLOGIST

EDUCATION:
M.A., Maritime History/Underwater Archaeology, East Carolina University, 1985
B.A., Anthropology/Archaeology, Duke University, 1981

SUMMARY OF EXPERIENCE:
J. Lee Cox is a professional Maritime Archaeologist with 25 years of professional experience in cultural resources management, historic preservation planning and marine survey. Mr. Cox has participated on more than 150 underwater archaeological projects in 24 states, Puerto Rico, Cayman Islands, Bermuda, Azore Islands, and Trinidad and Tobago since 1983. He has served as the Principal Investigator on more than 75 of those projects since 1987. He has obtained a thorough knowledge of Section 110 and Section 106 and of the National Historic Preservation Act as amended (NHPA) and applying the National Register of Historic Places (NRHP) eligibility criteria to cultural resources. Mr. Cox is widely recognized in his field and has numerous professional publications. In addition, Mr. Cox has designed and directed remote sensing projects to locate and identify underwater debris and utilities for commercial clients in a wide variety of marine environments.

In 1989, Mr. Cox formed Dolan Research, Inc (DR)., where he currently serves as Principal Investigator and President. DR is an underwater archaeological consulting and remote sensing surveying firm, specializing in the identification, documentation and evaluation of submerged cultural resources. In addition, DR has the capability to complete hydrographic and waterfront surveys. Prior to forming Dolan Research, Mr. Cox served as Maritime Consultant to the Philadelphia Maritime Museum and to the Maritime Historical Institute. He has participated in numerous NHPA compliance projects and has been a key member of numerous research and planning teams. He has been a contributing or principal author of more than 75 technical reports.

By profession, Mr. Cox is a trained underwater archaeologist certified in 1988 by the Society of Professional Archaeologists in underwater archaeology, marine survey, and museology. Mr. Cox is also HazMat certified**.** Mr. Cox has a broad knowledge of cultural resource management principals and practices, remote sensing survey, evaluation, and data recovery methodologies on underwater archaeology projects and has presented research results within Federal and state agency, academic, and public sector venues. His areas of specialization include:

- Underwater Archaeological Field Methods
- Acoustic, Magnetic, Sub-bottom and Bathymetric Remote Sensing
- Identification of Underwater Debris and Utilities
- Navigation and Positioning
- Historic Watercraft and Ship Construction Techniques
- Conservation, Curation of Archaeological Material, and Museology
- Archival Research, Maritime and Naval Research

SELECTED PROJECT EXPERIENCE:

2005 Principal Investigator. Atlantic Ocean, Ocean County, New Jersey. Phase I and II underwater archaeological investigation of 11 shipwreck sites and two offshore borrow areas in conjunction with the New Jersey Beach Renourishment Project. Work conducted for U.S. Army Corps of Engineers, Philadelphia District.

2005 Principal Investigator. Atlantic Ocean, Cape May County, New Jersey. Phase I and IB underwater archaeological investigation at Great Egg Harbor Inlet and Cape May Inlet Borrow Areas in conjunction with the New Jersey Beach Renourishment Project. Work conducted for U.S. Army Corps of Engineers, Philadelphia District.

2005 Principal Investigator. Delaware Bay, Sussex County, Delaware. Phase II underwater archaeological investigation of 18th century shipwreck site off of Lewes Beach. Work was done in conjunction with the Delaware Beach Beach Renourishment Project. Work conducted for U.S. Army Corps of Engineers, Philadelphia District.

2005 Directed a remote sensing survey at seven different bridge (and tunnel) crossings in New York City. Acoustic data were used to locate utilities on the bottom surfaces and create basemaps for each of the bridge corridors. Work was completed in association with S.T. Hudson Engineers for the TBE Group.

2003 Directed a remote sensing survey at a pipeline crossing under the Delaware River between Paulsboro, NJ and Philadelphia, PA. Magnetic, acoustic, and seismic data were used to create a basemap for the crossing corridor. Work was completed in association with S.T. Hudson Engineers for ExxonMobile Pipeline Company.

2003 Principal Investigator. Weems Creek, MD.. Phase I underwater archaeological investigation for the proposed replacement of MD 70 bridge, Anne Arundel County, MD. Work was completed for MD State Highway Administration.

2002 Directed a remote sensing survey to identify debris and utilities in the vicinity of the NJ Route 7 (Wittpen) Bridge across the Hackensack River, Jersey City, NJ. Work was completed in association with S.T. Hudson Engineers for Sverdrup and Parcel Consultants.

SELECTED PUBLICATIONS:

2001 *Underwater Archaeological Investigations of the Crosswicks Creek Canal Boat Site, Mercer County, New Jersey*. Bulletin of the Archaeological Society of New Jersey. No. 56. South Orange, New Jersey.

1997 *An Early 19th-Century Canal Boat Wreck in the Delaware River.* Bulletin of the Archaeological Society of New Jersey. No. 52. South Orange, New Jersey.

1996 *The Wreck of the Side Paddle Wheel Steamboat Excelsior.* Bulletin of the Archaeological Society of New Jersey. No. 51. South Orange, New Jersey.

1990 *USS Shipwreck: Underwater Archaeology and U.S. Navy Divers*. Underwater Archaeology Proceedings from the Society for Historical Archaeology Conference. Tuscon, Arizona.

1988 Ironclad Intruder: U.S.S. MONITOR: A collection of essays on the history, symbolism and archaeological importance of the importance of the U.S.S. MONITOR. Co-edited with Jehle. Philadelphia Maritime Museum, Philadelphia, PA.

1988 *Shipwrecks*. The Delaware Estuary: Rediscovering a Forgotten Resource. University of Delaware Seagrant Program, Newark, DE.

1987 *Preliminary Investigation of a Revolutionary War Era Vessel in Crosswicks Creek, Bordentown, New Jersey*. Underwater Archaeology Proceedings from the Society for Historical Archaeology Conference, Savannah, GA.

PROFESSIONAL AFFILIATIONS:

Society for Historical Archaeology
Society of Professional Archaeologists (certified in museology, marine survey, and underwater archaeology)

Sarah K. Faldetta, CPG

Senior Scientist

ESS Group, Inc., 888 Worcester Street, Wellesley, MA 02482

EXPERIENCE

- ESS Group, Inc., Wellesley, MA: *Senior Scientist* - January 1994 to Present.
- GZA GeoEnvironmental Technologies, Newton, MA: *Geologist* – 1988 to 1991.
- Cities Service Oil and Gas Corporation (subsidiary of Occidental Petroleum), Houston, Texas: *Staff and Senior Exploration Geologist* -1981 to 1986.
- Michigan-Wisconsin Pipeline Company, Houston, Texas: *Geologist* – 1979 to 1981.

EDUCATION

- MA, Geology, Boston University
- MBA, Business Administration, University of Houston
- BA, Geology and English, Harvard/Radcliffe College

SUMMARY OF RESPONSIBILITIES AND PROJECT EXPERIENCE

Ms. Faldetta has more than 26 years of experience in the environmental and geological sciences and regulatory permitting. She is a nationally-designated Certified Professional Geologist (CPG) who brings a broad range of technical and management experience to advance complex multi-disciplinary projects through federal and state regulatory processes. Ms. Faldetta's specialties include geologic investigations, management of marine and upland cultural resource investigations, visual assessments, environmental justice analyses and other specialty studies. As Senior Scientist, Ms. Faldetta directs technical staff to design and carry out resource evaluations and impact analyses, and maintains project scopes, schedules, and budgets while coordinating with clients and regulators. Ms. Faldetta focuses on translating highly technical data and findings into deliverables understandable to regulators and the public, and has worked with many regulatory agencies on successful projects throughout the Northeast and the Bahamas. Her representative project experience includes the following:

- **Hudson Transmission Energy Project, Bergen County, New Jersey to Manhattan, New York.** Ms. Faldetta managed upland and marine cultural investigations and conducted visual assessments for this proposed High Voltage Direct Current (DC) and 345kV AC overland and submarine transmission cable project, to bring electric power from the New Jersey transmission system to mid-town Manhattan in New York City. The proposed regional electric transmission project also involves permitting an Alternating Current (AC)-DC converter station in Ridgefield, New Jersey. The New York portions of the project are being reviewed under the Article VII regulatory process. The New Jersey portions of the project will be reviewed under the New Jersey Department of Environmental Protection and other agencies.

- **Reliant Resources – 1816 MW Astoria Repowering Project, Queens, NY.** Ms. Faldetta managed the geologic and seismic assessments and oversaw the cultural resources and visual impact assessments for this natural gas repowering of an existing electric generating facility on the East River in Queens Borough, New York. Ms. Faldetta also completed the environmental justice analysis for the project, in accordance with EPA Region II guidelines. Ms. Faldetta was accepted as an expert on geology in the State of New York, and provided expert testimony in the Article X proceedings on geologic and seismic issues. The Article X application was approved by the New York Public Service Commission (NYPSC), all necessary permits were issued, and the repowering was completed. ESS coordinated and managed monitoring and compliance activities during construction.

- **New York Regional Interconnect, Inc., New York Regional Interconnection Project, NY.** Ms. Faldetta is part of the team responsible for the environmental impact assessments and preparation of the Article VII application for this proposed 200-mile electrical transmission line in east-central New York State. Ms. Faldetta contributed to multiple iterative routing evaluations, directed a photographic field team documenting potential project visibility from dozens of sensitive sites along the route, and assisted in the preparation of the Article VII permit applications, which have been submitted to the NYPSC.

- **Cape Wind Associates, LLC – Cape Wind Renewable Energy Project, Nantucket Sound, MA.** Ms Faldetta is overseeing the geologic investigations, the marine and upland cultural resource surveys, and the visual studies for this offshore wind energy project -- the first of its kind in the United States. She authored several technical sections of the Draft and Final Environmental Impact Reports (DEIR and FEIR) submitted under the Massachusetts Environmental Policy Act (MEPA), and the Energy Facilities Siting Board permit application, which has been approved. Ms. Faldetta worked with the U.S. Army Corps of Engineers and now the Minerals Management Service (MMS) of the Department of the Interior, as lead federal agency, on the Draft Environmental Impact Statement (DEIS). The MMS will decide on the project following review by up to 17 local, state, and federal regulatory agencies and extensive public comment.

- **Deerfield Wind LLC – 45 MW Deerfield Wind Project, Searsburg and Readsboro, Vermont.** Ms. Faldetta is responsible for preparing the geologic and recreational impact analyses, and overseeing the cultural surveys, for the NEPA EIS, in conformance with the US Forest Service's implementing regulations. ESS is third party contractor to the U.S. Forest Service, which is seeking to expand an existing wind project, operating on a privately-held ridgeline, onto adjacent Green Mountain National Forest lands, the first project of its kind in the U.S.

- **Horizon Wind Energy, LLC – Marble River Wind Farm, Clinton County, NY.** Ms. Faldetta conducted geologic studies and oversaw cultural resource investigations for this renewable energy project that includes 109 wind turbines, each capable of generating 2.0 MW of electricity. Once constructed, the project will provide electricity to approximately 50,000 New York homes. The project is dispersed across approximately 19,000 acres of farmland in two towns in northeastern New York State near the Canadian border, and is undergoing review by the New York State Department of Environmental Conservation (NYSDEC) under the State Environmental Quality Review (SEQR) process. Phase IA and IB archaeological surveys have been conducted, in consultation with the State Historic Preservation Office (SHPO) at the New York State Office of Recreation and Historic Preservation (OPRHP), to comply with Section 106 of the National Historic Preservation Act and applicable state regulations. The application has been submitted and is currently under SEQR review.

- **PSEG Power, LLC – Cross Hudson Project, Lower Hudson River Between NJ and Manhattan.** PSEG's Cross Hudson Project entailed the construction of a seven-mile long upland and submarine electric and fiber optic cable system to transmit 500 megawatts (MW) of electricity and data from PSEG's Bergen Station in New Jersey, beneath the Hudson River to New York City. Ms. Faldetta was oversaw the marine and upland cultural resource studies in New York and New Jersey, conducted by outside technical experts. Ms. Faldetta worked with the respective SHPOs and other regulators, archaeologists, architectural historians, interveners, and PSEG engineers to avoid or minimize impacts to several submerged shipwrecks and upland historic properties, resulting in a Memorandum of Agreement executed among the consulting parties. The Project was approved without hearings by the New York Department of Public Service (NYDPS) under Article VII, New Jersey, and the USACE—New York District.

- **LIPA/KeySpan and CL&P/Northeast Utilities – Long Island Submarine Cable Replacement Project, Norwalk, CT to Northport, NY.** ESS led technical studies and prepared regulatory permit applications to replace seven existing fluid-filled submarine cables with new solid dielectric cables to transmit 300 MW of power over an 11-mile corridor between Connecticut and Long Island. Ms. Faldetta served oversaw the geological and cultural resource evaluations for this Project and oversaw a comprehensive review by an outside marine archaeologist of more than 400 miles of geophysical survey data to identify anomalies that could represent historic resources such as shipwrecks. Ms. Faldetta coordinated with the Connecticut and New York SHPOs and achieved compliance with both agencies, and assisted in preparation of numerous state and federal permit applications. The Project has been granted the Certificate of Environmental Compatibility and Public Need from the Connecticut Siting Council and the New York State Coastal Consistency Concurrence. Currently, the Project Team is in final negotiations to obtain the remaining permits from NYDPS, USACE and the Connecticut Department of Environmental Protection (CTDEP) Office of Long Island Sounds Programs (OLISP).

- **Hull Municipal Light Plant** – **Offshore Wind Energy Project, Hull, MA.** ESS Group, Inc. is assisting the Town of Hull in the development of a wind generation project comprised of one offshore and one onshore wind turbine, with the potential to add up to three additional offshore turbines in the future. All turbines are assumed to be 3.6 MW capacity units at this time. The offshore turbine(s) are proposed to interconnect with the Hull and New England electricity grids along the eastern shoreline of Hull. ESS is providing environmental consulting, regulatory permitting, site selection, and engineering services to the Hull Municipal Light Plant (HMLP) for the proposed Hull No. 2 Wind Generation Project in Hull, Massachusetts. Ms. Faldetta is managing the project's cultural and visual studies, and will be contributing to the geological and geophysical surveys.

- **National Gas & Energy Transmission, Inc. – 1,080 MW Gas-Fired, Combined Cycle Independent Power Plant, Athens, NY.** National Energy Gas & Transmission proposed a new 1,080 MW natural gas-fired electric generating facility, located in the Hudson River Valley. ESS provided full environmental consulting services and submitted the permit application in August 1998. Managed comprehensive investigations for the project in the areas of cultural resources, visual assessment, due diligence, and geologic and seismic assessments. Responsibilities included management and coordination of professional archaeologists and visual experts. Contributed to obtaining regulatory agency approvals of proposed technical studies, coordinated agency reviews to ensure compliance, and assisted in preparation of the Article X permit application. The application was the first deemed complete by the New York State Board on Electric Generating Siting under the State's Article X approval process. The 1,080 MW plant has been constructed and is now operational.

- **American National Power – 1,100 MW Gas-Fired, Combined Cycle Independent Power Plant, Ramapo, New York.** Ms. Faldetta was responsible for geologic and seismic assessments, and oversaw cultural resource surveys, visual impact assessments, and the blasting plan for the licensing of this 1,100 MW gas-fired combined cycle independent power plant under Article X of New York State's Public Service Law. Ms. Faldetta was accepted as an expert in the field of geology in New York State, and provided expert testimony in the areas of geologic and seismic conditions at the Article X hearings.

- **SemGas, Wyckoff Gas Storage Project – Steuben County, New York**. Ms. Faldetta oversaw the cultural resource studies in support of an application to FERC to Amend a Certificate for this underground natural gas storage facility and 3.6 mile gas pipeline. All archaeological surveys conducted for the application were approved by the State Historic Preservation Office and FERC, and the project is under construction.

- **Steuben Pipeline, Inc. – Federal Energy Regulatory Commission (FERC) Certification Filing, Southern Tier Region, New York.** Ms Faldetta conducted geologic and land use and oversaw cultural

resource studies in support of a FERC Certificate application to authorize the construction of a 40+-mile brine pipeline. The certification process involved the preparation and submittal of an applicant-prepared environmental assessment and the supporting Environmental Resource Reports. Ms. Faldetta contributed to the preparation and submittal of all required federal and state environmental permit applications.

- **Avoca Natural Gas Storage – Federal Energy Regulatory Commission Certification Filing, Avoca, New York.** Ms. Faldetta managed geologic, land use, groundwater and cultural resource studies in support of an application for FERC Certification of this underground natural gas storage project. The certification process (described in the previous entry) resulted in FERC approval to construct storage for 5 billion cubic feet of natural gas in underground caverns constructed in bedded salt. Approvals were also obtained for the consumptive use of water and the deep well injection of solution-mined brine.

PROFESSIONAL CERTIFICATIONS AND AFFILIATIONS

- Certified Professional Geologist (CPG No. 10647) with the American Institute of Professional Geologists
- Member, Society for Underwater Technology
- Member, Geological Society of America

CONFERENCE PRESENTATIONS

"Identifying Archaeologically Sensitive Paleosols in the Offshore Environment: An Integrated Approach" presented November 7 and 8, 2007 at the 19th Biennial Conference of the Estuarine Research Federation, Providence, Rhode Island

TECH environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

Peter H. Guldberg, CCM
Managing Principal

Education

B.S. Mathematics
MIT, 1973

M.S. Atmospheric Science
University of Michigan, 1974

Certification

Certified Consulting

Meteorologist (AMS #393)

Affiliations

Environmental Business Council,
Board of Directors

Air and Waste Management
Association

Institute of Noise Control Engineering

Acoustical Society of America

Mr. Guldberg has 35 years of experience as an air quality and noise consultant, providing permitting assistance, strategic planning, monitoring, modeling and impact assessment to industry and government on projects in the energy, manufacturing, solid waste disposal, real estate and transportation sectors. Mr. Guldberg has taught air quality permitting and dispersion modeling courses for the EPA, Air Pollution Training Institute, AWMA, and the Northeast States, training over 1,400 professionals in the field. He has given expert testimony at hundreds of public hearings and before State Environmental Boards and Legislative Committees in Connecticut, Illinois, Indiana, Maine, Massachusetts, New Hampshire, New York, Texas, and Vermont, and in court. He served on the Governor's Committee that wrote the Massachusetts Greenhouse Gas Emission Policy and Protocol.

Project Experience – Traditional Energy

1800 MW Astoria Repowering Project. The existing Astoria Generating Station in New York City is being re-powered as a combined-cycle facility using six Siemens/Westinghouse 501F turbines. Mr. Guldberg prepared the noise study for the NYS DPS Article X application that includes comprehensive baseline sound level monitoring, acoustic modeling, impact sound isopleths, and cumulative impact modeling of the project with two other nearby combined-cycle projects that have been proposed. He gave expert testimony before the NYS DPS.

FPL Bellingham Power Plant. Mr. Guldberg assisted Florida Power & Light with a noise enforcement action brought by the DEP against their Bellingham, Massachusetts plant regarding pure tones in a nearby residential neighborhood at night. A comprehensive acoustic audit of plant sources was performed along with nighttime

monitoring in the affected areas. Two unshielded noise sources were identified that produced the pure tone problem: un-insulated natural gas piping and valves, and an exposed high pressure steam line joint. Lagging and sound blanket insulation were specified by TE and installed by FPL. Mr. Guldberg also provided assistance in meetings with DEP enforcement staff.

PSEG Cross-Hudson Cable Project, NJ/NY. This submarine cable project connects Manhattan with the PSEG Power Bergen Generating Station in Ridgefield, NJ. Mr. Guldberg directed the noise impact studies that included extensive baseline monitoring in NYC and in NJ, acoustic modeling and mitigation design to demonstrate compliance with regulatory limits.

Ramapo Energy Project. The project is a 1,100 MW gas-fired combined cycle power plant proposed for Ramapo, New York. Mr. Guldberg performed all air quality modeling and impact assessment for the federal PSD permit, including extensive complex terrain modeling for a long list of interacting sources in New York and New Jersey, and acid deposition calculations for New York State. He prepared the pre-construction monitoring waiver request for EPA Region II and gave expert testimony given before NYS DPS/Public Service Commission in the Article X process.

Phillips Academy Power Plant, Andover, Massachusetts. Mr. Guldberg prepared a Comprehensive Plan Application for new boilers and emergency generator at Phillips Academy. He also devised a NO_x RACT compliance strategy and assisted Phillips Academy in negotiations with DEP on the air permit.

Expansion to the Gowanus Generating Station. The addition of two LM-6000 gas turbine generators is proposed for the 540-MW US PowerGen Gowanus Generating Station in Brooklyn, New York. Mr. Guldberg performed a preliminary noise impact study for project planning and will be providing a refined noise impact assessment for the EIS under New York State's SEQR Act.

Chelsea Peak Energy Facility. The project is a 250-MW gas turbine peaking plant on an industrial site in Chelsea, Massachusetts. Mr. Guldberg prepared the noise impact analysis including Cadna-A acoustic modeling and a Noise BACT analysis. Expert testimony was given before the Energy Facilities Siting Board.

Expansion of the Lake Road Generating Station. Two noise-consulting assignments were done by Mr. Guldberg for BG Energy, the owner of the Lake Road Generating Station in Dayville, CT. Noise complaints from steam jet huggers were investigated with monitoring and acoustic modeling and mitigation options were analyzed. A noise reduction strategy was implemented for the three existing units. A noise impact analysis was performed for the expansion of the Generating Station that included baseline monitoring and acoustic modeling with the Cadna-A model.

Goodyear Cogeneration Project PSD and State Air Permit. An air permit was obtained for a 575 MMBtu/hour circulating fluidized bed (CFB) boiler cogeneration plant fired with coal and shredded tires at the site of an existing Goodyear facility in Niagara Falls, New York. The work included refined dispersion modeling and a control technology analysis.

CIPS Coffeen Station SIP Revision. Mr. Guldberg obtained an alternate SO2 emission limit for the Central Illinois Electric Power's Coffeen Station to allow the burning of Monterey basin coal. Refined dispersion modeling with other interacting regional sources was performed and expert testimony was given before the Illinois Environmental Board.

Canal Electric Generating Station. As technical consultant to the Town of Sandwich's Board of Selectmen, Mr. Guldberg analyzed the air quality, noise, and visual impacts of the proposed repowering project at Canal Station, prepared a technical report submitted to the Town and the Cape Cod Commission, and gave expert testimony in four public hearings on the Cape.

Air Permit for the Dartmouth College Energy Plant. An air permit was obtained for the four power boilers at the Dartmouth College energy plant in Hanover, New Hampshire. Assistance was also provided in complying with NOx RACT rules and Title V permitting.

Free State Electric Power Project. For a 1,650 MW combined-cycle power project in Charles County, Maryland, Mr. Guldberg conducted a noise impact study. Baseline sound level monitoring and acoustic modeling were performed to calculate impacts at sensitive receptors. Mitigation options were evaluated and compliance with the Maryland Department of the Environment (MDE) Noise Regulation was demonstrated. Expert testimony was given before the Maryland Public Service Commission for the Certificate of Public Convenience and Necessity (CPCN).

Island End Co-generation Project. Mr. Guldberg directed the noise impact assessment for a new 350 MW gas-fired power plant in Everett, Massachusetts (Westinghouse series G turbines). A Best Available Noise Control Technology (BANCT) analysis was performed for the DEP Air Plans Approval application. TE also obtained the CPA air permit from MassDEP. He gave expert testimony before the Massachusetts Energy Facilities Siting Board.

PROJECT EXPERIENCE – RENEWABLE ENERGY

Air Quality and Noise Permit for the Russell Biomass Power Project. Mr. Guldberg prepared the Major CPA air permit application for a 50 MW wood chip fired power plant in western Massachusetts that uses Bubbling Fluidized Bed boiler technology with SCR and fabric filter controls. Permitting work also included modeling of cooling tower fogging/icing impacts, a noise impact analysis and air dispersion modeling in complex terrain for criteria pollutants and HAPs. Expert testimony was given before the Mass. EFSB and Dept. of Telecommunications and Energy.

Sound and Vibration Studies for the Cape Wind Project. For the 420 MW wind farm project in Nantucket Sound, Mr. Guldberg performed comprehensive baseline sound level monitoring studies (in air and underwater), acoustic modeling studies of sound and vibration (in air and underwater), and provided a detailed impact assessment for the coastal communities of Cape Cod and Martha's Vineyard as well as the project's effects on marine mammals. Expert testimony was provided in hearings before the Massachusetts Energy Facilities Siting Board and text was written for the federal EIS.

Air Permit for the Ryegate Wood Energy Project. Mr. Guldberg was responsible for all air permitting of a 25 MW wood-fired power plant in East Ryegate, Vermont. The project included

dispersion modeling, control technology review, and expert testimony in public hearings. Modeling addressed issues of interaction with an adjacent paper mill and complex terrain Follow-on projects included modeling of fogging and icing from cooling spray ponds, a permit amendment to allow auxiliary fuels, including refined dispersion modeling and MSER analysis, and Public Service Commission (Act 248) hearings.

Noise Study of the Fairhaven Wind Project. For the Massachusetts Technology Collaborative and the Town of Fairhaven, Mr. Guldberg predicted the sound level effects of a 3.3 MW wind turbine project in Little Bay Cove using the Cadna-A acoustic model (ISO 9613.2). Long-term sound level monitoring on the site established existing conditions and paired with on-site 80-meter wind measurements identified the ambient sound levels during turbine operating conditions. Compliance with the DEP Noise Policy and the Town Noise By-Law were demonstrated.

Air Permit for Burlington Electric Department Biomass Power Plant, Vermont. Mr. Guldberg obtained an air permit for the McNeil Generating Station, a 50 MW wood-fired power station to allow co-firing of oil and gas. The work included refined dispersion modeling, a comprehensive control technology analysis, and negotiation of permit conditions with agency officials.

PROJECT EXPERIENCE – MANUFACTURING / INDUSTRIAL SERVICES

Air Permitting and Consulting for Toray Plastics of America, North Kingstown, RI. Mr. Guldberg obtained State air quality permits for expansion to the coated film manufacturing plant. Dispersion modeling for criteria and hazardous air pollutants was performed to assess the impacts from new polymerization production lines at the facility. Tech Environmental also provided comprehensive air quality services to Toray Plastics in estimating emissions from process lines and wastewater treatment, obtaining pre-construction and operating permits, developing emissions record-keeping software, providing compliance assistance with regard to EPA and State air quality regulations, and performing stack emission tests.

Air Permitting for Expansion to the OMYA Verpol Plant. For OMYA's Florence, Vermont marble crushing plant, Mr. Guldberg obtained a State air quality permit covering expanded capacity for mechanical crushers and spray dryers, and a second permit for an on-site cogeneration plant. Refined dispersions modeling was performed as part of the permit application.

Industrial Permitting – Technical Support to the Rhode Island Department of Environmental Management. Mr. Guldberg served as Project Manager for a seven-year contract to provide a wide range of technical assistance to RI DEM on a task order basis. Seventy-three task-order assignments were completed for manufacturing, industrial and energy facilities in the areas of reviewing permit applications, writing draft permits and operating conditions, air quality dispersion modeling, design/review of pollution control equipment, health risk assessments, continuous emissions monitoring, and air toxics evaluations.

Wyeth Nutritionals, Inc. Air Permits. Mr. Guldberg obtained State air quality permits for two Wyeth Nutritionals manufacturing plants in Milton, Vermont: one that produces powdered infant formula and another that produces dairy whey. The permits covered expanded operations, the installation of new boilers and additional process lines (agglomerators, spray dryers). The air permit applications included a refined dispersion modeling analysis.

Odor Impact Study for Bird Roofing Division of Certainteed Corporation. For Bird's asphalt shingle manufacturing plant in Norwood, MA, Mr. Guldberg performed an air pollution modeling and odor impact study of the facility's asphalt blowing system, asphalt tank farm, and process line. Odor control measures involving re-ducting of emissions to different stacks were studied. Stack testing of VOC, aldehyde and sulfur compound emissions was performed. Mr. Guldberg gave expert testimony at public hearings.

Air Toxics Compliance Analysis for the CITGO Lake Charles Oil Refinery. For the CITGO Refinery and Lube Plant in Lake Charles, Louisiana, Mr. Guldberg directed a dispersion modeling study of 24 air toxic compounds to show compliance with State air toxic standards. Concentration contour maps were produced for use in public hearings.

PROJECT EXPERIENCE – SOLID WASTE SERVICES

Air Quality and Noise Permitting for Seven Solid Waste Transfer Stations. For seven 1,000 to 1,800 ton per day MSW and C&D waste transfer stations in Abington, Stoughton, Devens, Raynham, Revere, and Brockton, Massachusetts, Mr. Guldberg performed studies of air quality, odor and noise impacts on the nearby community to support local permitting. Air and noise compliance monitoring was provided. Expert testimony was given in Site Assignment hearings.

Air Quality and Odor Studies for Three ERS Composting Plants. Environmental Recovery Systems proposed facilities to co-compost MSW and sewage sludge at sites in Wrentham, Somerset and Leominster, MA. As part of an EIR, Mr. Guldberg estimated air pollution and odor emission rates, performed a BACT analysis for VOC, and conducted refined dispersion modeling to predict 1-second odor concentrations as well as time-averaged air toxic pollutant concentrations in the surrounding communities. A mitigation strategy for residual odor was developed. Mr. Guldberg gave expert testimony in public hearings.

Air Quality and Health Risk Anlaysis for the Irwindale Resource Recovery Facility. Mr. Guldberg performed the refined dispersion modeling and human health risk analysis for a 3,000 tpd MSW mass burn facility in Irwindale, California.

Environmental and Risk Assessment Studies of the Haverhill Resource Recovery Facility. Working as a consultant for the City of Haverhill Board of Health, Mr. Guldberg conducted air quality, water quality and risk assessment studies of a 1,650 ton per day mass-burn MSW incinerator equipped with dry scrubber/ESP control technology and an adjacent ash landfill. Expert testimony was provided to the Board during the Site Assignment hearings.

Air Quality and Noise Analysis of an Asphalt Shingle Recycling Facility and Landfill. Bird Roofing Division of Certainteed Corporation operates an existing landfill for asphalt shingles in

Walpole, MA at which a 330-ton per day recycling facility is proposed. Shingle grinding and screening will produce an aggregate-like material for re-sale. The air quality study examined PM_{10} emissions rates and concentrations, demonstrating compliance with the NAAQS. The noise study demonstrated the facility would comply with the DEP Noise Policy.

Project Experience – Construction Industry Services

Air/Noise Permits for St. Lawrence Cement / Holcim US. To support expansion of the cement unloading terminal at Providence Port, Mr. Guldberg obtained an air permit from RI DEM for a new ship unloader and process changes. A CPA air permit application including a noise impact study and dispersion modeling was also prepared for a new cement terminal in the South Boston Marine Industrial Park owned by Massport.

Permits for Two New Vermont Quarries. Mr. Guldberg provided air quality and noise studies for the 1,300 tpd quarry proposed in Moretown, Vermont. Testimony was given for the Act 250 land use permit and in the Vermont Environmental Court. He also provided noise consulting services to OMYA in analyzing the site for a new granite quarry. Noise monitoring was performed at OMYA's existing Hogback Quarry in Pittsford, Vermont.

Air Permits for a Cement Plant and Two Asphalt Batch Plants for P.A. Landers, Inc. Mr. Guldberg obtained air quality and noise permits from DEP for a new cement plant and two asphalt batch plants (one drum mix, one batch mix) at facilities in Hanover and Plymouth, MA, including air dispersion modeling and BACT analysis. Expert testimony was given in public hearings to support local permitting.

Air Quality Permits for Four Pike Industries, Inc. Asphalt and Rock Crushing Facilities. Mr. Guldberg obtained a State air quality permits for Pike Industries' 300-tpd granite crushing operating in Websterville, Vermont that provides aggregate for road building throughout New England, showing compliance with hazardous ambient air standards. He also provided dispersion modeling studies for three other asphalt and aggregate plants in New Hampshire.

Air Permitting for Mt. Hope Rock Products. Air permitting assistance was provided for Tilcon's 1,200 tph crushed stone plant in Mt. Hope, New Jersey.

Air Quality Permit for Industrial Bituminous Products, Inc. A Comprehensive Plan Approval application was prepared for a 350 ton per hour asphalt batch plant in Wrentham, MA, including a BACT analysis and dispersion modeling.

Health Risk Assessment for Asphalt Terminal. As part of local public hearings on Belcher New England's asphalt terminal in Chelsea, MA, Mr. Guldberg performed a health risk assessment of VOC compounds and dispersion modeling of PAH, toluene, ethyl-benzene, benzene and xylene concentrations in the nearby residential areas. He also provided expert testimony.

PROJECT EXPERIENCE – REAL ESTATE DEVELOPMENT SERVICES

Greenhouse Gas (GHG) Studies for Massachusetts Development Projects. Mr. Guldberg has conducted GHG emissions and mitigation studies for nine real estate development projects subject to the MEPA GHG Emissions Policy and Protocol, including residential, retail and mixed use projects. This work involved energy modeling for each development, development of a CO_2 emission inventory for on-site fuel use, off-site electric generation and associated transportation to the site, and analysis of mitigation measures to reduce CO_2 emissions.

Air Quality, Noise and Lighting Study for NED Retail Center. New England Development (NED) proposed a large shopping center on Route 117 near I-290 in Leominster, MA containing a Super Wal-Mart, Lowe's Home Improvement Store, and Kohl's. Mr. Guldberg performed an air quality, noise and lighting impact study for the project to assess the potential effects on nearby residential areas. A noise mitigation strategy was developed involving noise barriers, and expert testimony was given in public hearings to support the project.

Air Quality and Noise Impact Studies for the Stockbridge-Munsee Casino in Thompson, New York. In support of a federal EIS for a new casino in upstate New York, Mr. Guldberg directed an air quality and noise impact study. The air quality work examined both stationary and mobile source emissions, permitting requirements, construction impacts and future levels of criteria pollutants near the casino. The noise analysis involved baseline monitoring, and assessment of construction and future traffic impacts.

Local Permit Approvals for Over 80 Super Stop & Shop Supermarkets in the Northeast. Mr. Guldberg has provided cost-effective environmental consulting services for over 80 new and redeveloped Stop & Shop Supermarkets throughout New England, New York, and New Jersey. Noise and air quality studies were performed that included measurement of baseline sound levels, modeling of future sound levels from mechanical equipment and trucking, design of cost-effective noise barriers to ensure compliance with local by-laws, air quality modeling of motor vehicle emissions, and expert testimony at public hearings. Mr. Guldberg has helped Stop & Shop Supermarket Company bring new Super stores on-line faster by shortening the local planning and zoning approval process through his ability to answer concerns with detailed mitigation plans and offer clear public presentations.

Planning and Zoning Approvals for The Home Depot and Lowe's Home Improvement. Mr. Guldberg has helped The Home Depot and Lowe's obtain local planning and zoning approvals for 14 stores in Pennsylvania, Maine, Connecticut, New Hampshire, Massachusetts, and Vermont. His work has involved noise impact and mitigation studies for the lumber/hardware stores. Baseline sound level monitoring, coupled with acoustic modeling of sound from trucking, lumber deliveries, HVAC systems, generators, compactors and outside speakers was performed in each study to identify potential impacts. Site-specific mitigation programs were developed to ensure compliance with State and local regulations. Mr. Guldberg also provided expert testimony in public hearings.

PROJECT EXPERIENCE – TRANSPORTATION SERVICES

Massport – Hanscom Field. Mr. Guldberg performed air quality studies at Hanscom Airport for the 1995 GEIR, and the 2000 and 2005 ESPRs. This work involved ambient monitoring of NO_2 at the runway ends, compilation of emission inventories for all criteria pollutants from aircraft operations, ground service equipment, refueling activities, associated motor vehicle traffic, and development of land at Hanscom Field under several future growth scenarios. Dispersion modeling of air pollutant levels in the surrounding four communities was performed, and expert testimony was given in public hearings.

Interstate 93 Central Artery/Tunnel Project – Noise Control Plans. For contracts C09B3 I-90 Fort Point Channel, C11A1 I-93 Northbound Tunnel/Atlantic Avenue, C14C1 Utility Relocation, C15A3 Parcel 7 Facility, C17A2 State to North Street, C17A1 I-93 NB Congress to High / I-93 SB High to Oliver, C17A3 Vent Building #3, C17A9 I-93 Mainline Tunnel / Aquarium Station, C01A3 South Boston Interchange/MBTA World Trade Center Station, and C17A3 I-93 Artery Vent Building No. 3, noise predictions and quarterly noise control plans were prepared for the construction phase of numerous CA/T sections. This included developing construction noise mitigation to meet stringent noise daytime and nighttime criteria for commercial and residential property. When necessary, ambient noise measurements were performed prior and during construction periods to certify compliance.

Noise Impact Study of Otis ANGB F-15 Operations on a Proposed Section 40B Housing Development in Sandwich. Mr. Guldberg performed an acoustic monitoring and modeling study of F-15 operations at Otis Air National Guard Base on Cape Cod and the potential impacts on a proposed nearby Section 40B affordable housing subdivision. Noise monitoring was performed for a week at three locations on the site. Expert testimony was provided before the Massachusetts Housing Appeal Committee and the Sandwich Board of Appeals.

Air Quality and Noise Analysis of Food Warehouse and Trucking Terminal Facilities in New England. Mr. Guldberg has performed air quality and noise monitoring, modeling and impact assessment studies for 13 refrigerated food warehouse and trucking terminal facilities in Massachusetts, Connecticut, and New Hampshire. These studies have supported permitting at the State and local level, and been used to investigate complaints from nearby abutters. Expert testimony was given in public hearings on most of these projects. The projects sites were: Poland Springs/Perrier (Seabrook, NH); Watkins Motor Lines (Windsor Locks, CT); DeMoulas Supermarkets (Tewksbury, MA); SYSCO (Norton, MA); General Mills (Haverhill, MA); Crystal Cold Storage (Medford, MA); Cirelli Foods (Middleborough, MA); Perkins Paper (Taunton, MA); Green St. Warehouse (Foxboro, MA); Haffner Truck Stop (Amesbury, MA); Condyne Warehouse (Franklin, MA); P&O Cold Logistics (Taunton, MA); and Concord Oil Truck Stop (Plainville, MA).

Air Quality Permitting for the Central Artery/Tunnel Project Vent Building No. 3 and 500 Atlantic Avenue Building. Mr. Guldberg performed air quality studies for the Mass. Highway Dept. and a private land owner involving both physical (wind tunnel) modeling and analytical dispersion modeling of NO_2, CO and PM_{10} impacts from the underground portion of I-93 through Boston (the Central Artery/Tunnel Project). This work supported an air rights hotel and

condominium, and required close coordination with the Mass. Highway Dept., Mass. Turnpike Authority, and DEP air quality staffs.

Route 146 – Mass. Turnpike Interchange EIS/EIR. As consultant to the Massachusetts Highway Department (MHD), Mr. Guldberg performed all of the air quality mesoscale and microscale studies for the project, which involved the widening of Route 146 and the construction of a new interchange with I-90. The CAL3QHC and MOBILE models were used. The air quality impacts of hazardous air emissions from excavation of contaminated soil at the site were also analyzed. Mr. Guldberg gave expert testimony in public hearings for the MHD.

Massport - Logan International Airport. Mr. Guldberg assisted the Massachusetts Port Authority on ten major environmental projects at Logan International Airport. For the Logan Airside Improvements Planning Project (LAIP) Feasibility Study, he performed analyses demonstrating the air quality and odor reductions associated with new taxiway and runway construction to reduce aircraft operation delays. This work included complete emission inventories for the airport and dispersion modeling to determine community concentrations. Mr. Guldberg gave expert testimony at community workshops and public meetings. For the Logan Mobile Gasoline Refueling Emissions and Emission Offsets study, he quantified emission reductions related to fuel conversion of Massport and tenant service vehicles. For the International Gateway EIS/EA, he provided the air quality analysis that included emission inventories to document the change associated with a new Terminal E building and wrote portions of the MEPA and NEPA filings. For the Logan 2000 Improvements to the Central Heating/Cooling Plant, Mr. Guldberg performed dispersion modeling to determine the height and location of new stacks for the three steam boilers and new emergency generators in the North Annex, and he evaluated the downwash effects of alternative designs for the new Hilton Hotel on the Central Plant. For the Logan Growth and Impact Control (LOGIC) Study Phases I and II, Mr. Guldberg provided the air quality and cumulative noise (EPNdB) analyses of how Logan can accommodate growth while keeping community impacts at or below current levels.

EXAMPLES OF EXPERT TESTIMONY

Maryland Public Service Commission. CPV Maryland, LLC. Case 9129. Noise impacts of a 640 MW combined-cycle power plant.

Vermont Environmental Court. Appeal of Rivers Development, LLC, Docket 7-1-05, 68-3-07. Noise and air quality impacts of a proposed 1,300 tpd granite quarry in Moretown, Vermont.

Massachusetts EFSB / Department of Telecommunications and Energy. Russell Biomass Energy. Case DTE/DPU 06-60. Air quality and noise from a 50-MW biomass power plant in Russell, Mass.

Vermont Public Service Board. UPC Vermont Wind. Docket No. 7156. Noise impacts of a 45 MW wind turbine project in northern Vermont.

Vermont District Environmental Commission #5. Moretown Quarry. Case # 5W1455. Air quality impacts of a new granite quarry.

Massachusetts Superior Court. Quirk et al. v. Quarry Hills Associates, Nos., 98-00995 and 909-00445. Air quality impacts of truck hauling and land-filling activity on adjacent commercial property.

Vermont Environmental Court. Curtis et al. vs. Verizon Wireless, Case No. 203-11-03. Noise impacts of a wireless telecommunications facility in a residential area.

Boston Municipal Court. Jake, Inc. vs. Murray Fine, Case No. 2004-CE-73. Noise impacts of a nightclub on a residential, luxury condominium.

Massachusetts Energy Facilities Siting Board. Cape Wind Associates, LLC. Case 02-2/DTE 02-53. Noise and vibration effects of a 450 MW offshore wind turbine project in Nantucket Sound.

Maryland Public Service Commission. Free State Electric, LLC. Case 8843. Noise impacts of a 1,650 MW combined-cycle power plant.

New York Department of Public Service. Astoria Generating Company, LP. Case No. 00-F-1522. Noise impacts of an 1,800 MW combined cycle re-powering project in Queens, NY.

Massachusetts Energy Facilities Siting Board. Cabot Power Corporation. Case 91-101A. Air quality and noise impacts of a 350 MW co-generation power plant.

Massachusetts Housing Appeals Committee. Farmview Affordable Homes v. Sandwich BOA. Case 2002-32. Noise impacts of F-15 aircraft at Otis ANGB on a Section 40B housing subdivision.

Vermont District Environmental Commission #1. The Home Depot. Case 1R0048-12. Noise impacts of a redeveloped retail center in Rutland.

District Court, Paducah, Kentucky. Rudolph v. EEI. Air quality impacts of the 1100 MW Joppa Steam Electric Station, Joppa, Illinois.

Massachusetts Hazardous Waste Facility Site Safety Council. Air quality impacts of the 45,000 tpy Clean Harbors hazardous waste incinerator in Quincy, Massachusetts.

Illinois State Environmental Board. Air quality impacts of the Central Illinois Public Service Company Coffeen Steam Electric Generating Station, Coffeen, Illinois.

Vermont Public Service Commission. Air quality impacts of the 240 tpd Vermont Integrated Waste Solutions incinerator, Rutland, Vermont.

Rhode Island State Environmental Board. Air quality impacts of the Fort Barton hazardous waste incinerator, Warwick, R.I.

SELECTED PUBLICATIONS AND PRESENTATIONS

"Massachusetts Greenhouse Gas (GHG) Policy and Practice," Project Permitting in Massachusetts Seminar, Boston Society of Civil Engineers Section (BSCES) and the Massachusetts Association of Land Surveyors and Civil Engineers (MALSCE), Westborough, MA, May 2009.

"Greenhouse Gas Emissions Policy and Protocol," MEPA & NEPA Workshop, Law Seminars International, Boston, June 2008.

Guest speaker for "Environmental Law Practice: Skills, Methods and Controversies," Harvard Law School, April 2009 and 2008.

"Outdoor Wood Boilers – New Emissions Test Data and Future Trends," presented at the EPA 16th Annual International Emissions Inventory Conference, Raleigh, NC, May 2007.

"Managing Change in the Environmental Industry," presentation to the Environmental Business Council, Lexington, MA, October 2001.

"Understanding the Clean Air Act," Environmental Regulatory Course, Boston, 1998 and 1999.

"Advanced Air Pollution Modeling Course," a two-day course given for the Air & Waste Management Association, November 1996.

"The Use of Hourly Meteorological Data in CAL3QHC2 to Improve 8-Hour CO Predictions," presented at the 87th Annual Meeting of the Air & Waste Management Association, Cincinnati, OH, June 1994.

“Gasoline and Vapor Exposures in Service Station and Leaking Underground Storage Tank Scenarios,” Journal of Exposure Analysis and Environmental Epidemiology, 2:1, 1992.

“Treatment of Industrial Air Discharges,” a lecture given as part of the 3rd Annual Environmental Science for Lawyers Series, Boston Bar Association and the Center for Environmental Management, Tufts University, Fall 1991.

"Developing Protocols for Motor Vehicle Air Quality Modeling," presented at the ASCE Specialty Conference on Transportation Planning and Air Quality, Santa Barbara, CA, July 1991.

“Outdoor Air Pollution,” a lecture given as part of the Environmental Science for Lawyers Series, Boston Bar Association and the Center for Environmental Management, Tufts University, Fall 1989.

"The Health Risks of Fugitive Ash Emissions from the Haverhill Resource Recovery Facility Ash Monofill," paper 89-6.9, presented at the 82nd Annual Meeting of the Air & Waste Management Association, Anaheim, CA, June 1989.

"EPA Dispersion Models for Air Pollution Control," in Encyclopedia of Fluid Mechanics, Volume 6: Complex Flow Phenomena and Modeling, Gulf Publishing Company, Houston, 1987.

"A Generalized Model for Estimating the Concentration of PAH in Urban Air," in Polynuclear Aromatic Hydrocarbons: Formation, Metabolism, and Measurement, Battelle Press, Columbus, OH, 1983.

"A Validation Study of Horizontal Dispersion Rates for Tall Stacks During Class A Events," Proceedings of AMS Fifth Symposium on Turbulence, Diffusion and Air Pollution, Atlanta, GA, 1981.

"A Comparative Validation of Air Dispersion Models for Short-Term SO_2 Concentrations in Two Urban Areas," JAPCA, 28:907, September 1978.

"Secondary Impacts of Major Land Use Projects," Journal of the American Institute of Planners, 43:260, July 1977.

"A Comparison Study of Plume Rise Formulas Applied to Tall Stack Data," Journal Applied Meteorology, 14:1402, October 1975.

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William A. Heeney

Professional Experience

2007 - present Pure Energy Resources, LLC Burlington, MA

Director – Development and Development Engineering

- As Director of Development and Development Engineering at Pure Energy Resources, primary responsibilities include evaluating and developing new project opportunities in the energy sector as well as overseeing the technical support activities associated with the development of new projects from initial conceptualization and permitting through construction completion.

- As a lead development team member and primary technical representative, currently engaged in advanced development efforts starting from project conceptual design through the permitting and approval stage and up to financial close for the Bayonne Energy Center, a 512 MW planned gas fired simple cycle power plant located in Bayonne, New Jersey. Pure Energy Resources is also contracted to be the owner's representative through the duration of the construction phase. The Bayonne Energy Center is anticipated to feed power into the NYISO system via a submarine cable to an interconnect point in the NYC metropolitan area. The Bayonne Energy Center Project is expected to enter into its commercial operation phase in late 2010.

2006 - 2007 Calpine Corporation Boston, MA

Director – Business Development

- As Director of Business Development, primary responsibilities include identifying new business opportunities in the power sector which closely match company directional goals, while maximizing long term profit opportunities. For opportunities that succeed in moving forward, manage a development team in a step-by-step process from early development stages through closure with financial institutions.
- Identify, evaluate, and manage asset sale opportunities in conformance with company near and long term goals, focusing on strategic market forward looking plans.
- Evaluate existing asset contractual arrangements to further expand or enhance Calpine's flexibility and strategic position within a given market.

2001 - 2006 Calpine Corporation Boston, MA

Regional Engineering Manager

- As Engineering Manager, directly supports Business Development and Marketing and Sales functions within the company, providing technical support and expertise on new business opportunities.
- Primary responsibilities within the above role are to perform directly, and manage a group of Project Engineers to provide technical expertise including;
  - addressing and assessing all "up front" technical risk issues related to new project development
  - developing plant conceptual designs
  - supporting the site specific development and permitting efforts related to technical

issues

- managing internal technical support groups such as estimating and scheduling, equipment performance, and other engineering functions
- RFP preparation, including coordinating and managing all technical issues related to bid documents for new project opportunities
- assessing outside bid proposals and awarding contracts for engineering and construction of new power plant projects
- preparing project's technically for financing and ultimate hand–off to the construction teams

- Participated as lead technical representative on a fast track, team effort asset sale of the gas fired combined cycle 170 MW Dighton Power Project. Over twenty qualified bidders were evaluated. Each bidder followed a detailed bid process including participating in one on one informational exchange meetings with the Calpine evaluation team. The sale was approved and closed successfully within six months at an agreed price of just over ninety million dollars.
- As lead technical representative, led development efforts from site selection through the permitting and approval phase to financial lender review for the Greenfield Energy Centre, a 1015 MW gas fired combined cycle power plant located in St. Clair Township, Ontario, Canada. The Greenfield Energy Centre Project was selected in early 2005 as part of an extensive RFP effort solicited by the government of Ontario and is expected to enter into its contractual operational phase in early 2008.
- As lead technical representative, led development efforts from site selection through the permitting and approval phase to financial lender review for the Bethpage III Energy Center, an 80 MW gas fired combined cycle power plant located in Bethpage, New York. The Bethpage III Energy Center was selected in 2004 as part of an RFP effort solicited by LIPA. The plant was constructed and entered its commercial operation phase in 2005.
- Prepared and issued guideline and training manual for execution plan of Regional Engineering job description.

1998 - 2001 Calpine Corporation Houston, TX & Boston, MA

Senior Project Engineer

- Performed all tasks consistent with above support level descriptions. Contributed as a team member preparing bid documents and proposals for various merchant and cogeneration power plant opportunities on the East Coast, Mid West, and Texas.
- Supported the development and construction of multiple energy projects including "Pasadena II", "Magic Valley", and "Lost Pines" in Texas as well as "Westbrook" in Maine, "Ontelaunee" in PA, and "Hillabee" in Alabama.
- Assisted with construction closeout of Calpine's Pasadena 1 Cogeneration Power Plant, located in Pasadena, TX. The Pasadena plant serves the Phillips Houston Chemical Complex and consists of a single SWPC 501F combustion turbine and associated MHI steam turbine.

1996 - 1998 Stone & Webster Engineering Jakarta, Indonesia

Senior Mechanical Engineer

- Supported construction and commissioning activities for BOP consortium contract associated with the Suralaya Power Station located on West Java, Indonesia. Plant consisted of three, 600 MW Mitsubishi steam turbine generators and associated B&W coal fired boilers. Carried out contract execution associated with the balance of plant systems associated with the steam cycle and emergency systems of the power plant. Managed multiple sub-contactors with respect to construction, testing, training, and commissioning of the various power plant systems within the scope of the contract.

Interfaced directly with the owner of the power plant "PLN" on a daily basis with respect to status and progress against contract schedule and deliverables.

1991 - 1996 Stone & Webster EngineeringBoston, MA & Denver, CO

Mechanical Engineer

- Performed various tasks related to contract support for multiple clients. Roles included designing various power plant systems, testing and O&M procedure generation, preparing feasibility and cost estimating reports, and performing bid evaluations. Performed resident engineering duties during construction, commissioning, and operation of the Binghamton Cogeneration Power Plant in Binghamton, NY. Plant consisted of a LM5000 GE combustion turbine. Also, performed resident engineering duties during construction and commissioning of the Coyote Springs Cogeneration Power Plant in Oregon. Plant consisted of a GE 7FA combustion turbine and associated steam turbine.

1988 - 1991 United States Merchant Marine

Engineering Officer

- Performed engineering duties aboard various ocean going vessels employing both steam and diesel shipboard operating systems. Major overall responsibility as engineering officer was for the safe operation and control of the main propulsion systems. Other roles included performing design, operation, trouble shooting, and preventative maintenance tasks for all main and auxiliary systems. These roles were undertaken on various ships consisting of oil tankers, passenger liners, and military vehicle cargo ready reserve vessels.

Education

1984 - 1988 Massachusetts Maritime Academy

Bachelor of Science, Marine Engineering

Licenses

USCG, 2nd Assistant Engineer, Steam or Motor Vessels, Unlimited Horsepower

Susan M. Herz
Senior Project Scientist

ESS Group Inc., 888 Worcester Street, Wellesley MA 02482

EXPERIENCE

- ESS Group, Inc, Wellesley MA: *Senior Project Scientist* - January 1997 to Present.
- ENSR International, Acton, MA: *Environmental Scientist* - 1996 to 1997.
- North Carolina Coastal Federation, Newport, NC: *Technical Researcher* – 1995.
- National Marine Fisheries Services, Beaufort, NC: *Fisheries Technician/Research Analyst* – 1994 to 1995.
- DynCorp Viar, Alexandria, VA: *Technical Analyst/Environmental Program Coordinator* – 1991 to 1993.
- US Forest Services, Girdwood, AK: *Fisheries Technician* – 1990.

EDUCATION

- MEM, Coastal Environmental Management, Duke University School of the Environment, 1995
- BS, Biology, St. Lawrence University, 1990
- Sea Education Association (SEA) Program, Marine & Nautical Sciences, Woods Hole, MA, 1988

SUMMARY OF RESPONSIBILITIES AND PROJECT EXPERIENCE

Ms. Herz has over 15 years of experience in a wide range of projects involving coastal and fisheries resource evaluations, water quality investigations, energy and environmental permitting, and environmental impact assessments. She has extensive experience with water quality, sediment, fisheries, and oceanographic field sampling and research; energy facility siting and permitting (including electric utilities and underwater cable crossings); strategic regulatory permitting; and environmental resource assessments and impact analyses throughout the northeast. As a Senior Project Manager, Ms. Herz conducts environmental resource evaluations, directs multidisciplinary technical staff, coordinates the preparation of environmental documents, and maintains project scopes, schedules, and budgets.

Ms. Herz's representative submarine electric cable experience includes the following:

- **Bayonne Energy Center, LLC – Bayonne Energy Center Project, Bayonne, New Jersey to New York City (Brooklyn).** Task manager for marine resources, marine protected species and fisheries assessments for the submarine electric cable aspect of the Bayonne Energy Center Project. Also providing regulatory and technical support for permit applications that will be submitted to the New York State Public Service Commission, New Jersey Department of Environmental Protection and US Army Corps of Engineers. The project entails the construction of a 512 MW simple cycle generating plant in Bayonne, NJ. The plant will be connected to the New York electrical grid via a 6.4

mile long, 345 kV submarine electric cable with an interconnection at the ConEd Gowanus substation in Brooklyn.

- **LIPA/KeySpan and CL&P/Northeast Utilities - Long Island Submarine Cable Replacement Project, Norwalk, CT to Northport, NY.** Project Manager (since 2005) overseeing marine surveys, environmental impact evaluations, and regulatory permitting for an 11-mile, 300 MW Alternating Current (AC) submarine cable system that will replace an existing series of electric transmission cables connecting existing power stations in Connecticut and Long Island. The seven existing fluid-filled submarine cables will be taken out of service and replaced with three new solid dielectric AC cables within the existing cable corridor.

  ESS was responsible for project permitting under the Connecticut Siting Council, Connecticut Department of Environmental Protection (CTDEP) Office of Long Island Sounds Programs (OLISP), New York State Department of Public Service (NYSDPS) Article VII, and U.S. Army Corps of Engineers (USACE) permitting processes. The major environmental resource evaluations presented in the permit application filings included: marine resources (fisheries, benthos, shellfish, essential fish habitat), avian resources, endangered and threatened species, water and marine sediment quality, and coastal wetlands.

  The Project has been granted the Certificate of Environmental Compatibility and Public Need from the Connecticut Siting Council and the New York State Public Service Commission, the New York State Coastal Consistency Concurrence, the US Army Corps of Engineers Permit, and the CTDEP OLISP Permit.

  Currently, the Project is under construction and ESS is conducting environmental inspections during key phases of construction. ESS is also managing environmental monitoring efforts including TSS monitoring during cable removal and embedment, and a multi-year biological monitoring program in Connecticut waters.

- **Hudson Transmission Partners, LLC – Hudson Transmission Energy Project, New Jersey to New York.** Serving as Senior Scientist and reviewer of water and sediment quality, fisheries, and protected marine species assessments for an AC electric transmission cable system across the Lower Hudson River from New Jersey to New York. Also providing regulatory and technical support for permit applications that will be submitted to the New York State Public Service Commission, New Jersey Department of Environmental Protection, and the US Army Corps of Engineers. Currently also managing the completion of analytical modeling and aquatic risk assessments required by New York State agencies to evaluate the potential sediment suspension impacts from jet plow embedment. Working closely with the New York State Department of Environmental Conservation, New York State Public Service Commission, and New York State Department of State to assess impacts and develop certificate conditions and a monitoring plan that will be acceptable to the client and to the agencies.

- **PSEG Power LLC – Cross-Hudson Project, Lower Hudson River Between NJ and Manhattan, NY.** Managed the completion of environmental impact assessments and regulatory permitting for the construction of a submarine electric cable system between New Jersey and New York City. Responsible for the completion of marine environmental resource and impact evaluations including aquatic resources (fisheries, benthos, shellfish), endangered and threatened species, and water and marine sediment quality assessments. Due to the known level of contaminants in the Hudson River, detailed analytical modeling and aquatic risk assessments were required by New York State agencies to evaluate the potential sediment suspension impacts from jet plow embedment. Managed these analytical modeling and risk assessment studies and worked closely with the New York State Department of Environmental Conservation and New York State Department of State to assess impacts and develop certificate conditions and a monitoring plan that was acceptable to the client and to the agencies.

  Other responsibilities included managing and coordinating the following regulatory permit applications and reviews: Application for Article VII Certificate of Environmental Compatibility and Public Need to the New York State Department of Public Service, Application for Coastal Zone Management Federal Consistency Certification to the New York State Department of State Coastal Management Program, and Individual Permit to the New York District of the Army Corps of Engineers (including an Essential Fish Habitat Assessment). Also coordinated and managed supporting reports, responses to comments to the regulatory agencies, and development of draft certificate and permit conditions.

- **Cape Wind Associates, LLC - Renewable Energy Project, Nantucket Sound, MA.** Served as Senior Scientist and reviewer of environmental assessments and regulatory permitting for a proposed renewable electric generating facility involving installation of 130 offshore wind turbine generators with a potential to generate 454 MW in Nantucket Sound, Massachusetts. The proposed wind park is sited on Horseshoe Shoal, and will interconnect with the regional power grid through an AC submarine cable system between the wind park and the southern shore of Cape Cod.

  Task manager for completion of fisheries, marine protected species, underwater acoustics, underwater EMF, and socioeconomic environmental resource assessments. Supervised and coordinated the preparation of the Final Environmental Impact Report (FEIR) for Massachusetts Environmental Policy Act (MEPA) review for these topics. Responsible for coordination and review of data acquisition and development of technical reports on these topics in support of the National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) under development by the Minerals Management Service (MMS). Also responsible

for providing technical support to respond to MMS data requests necessary for completion of the EIS.

- **TransEnergie U.S. Ltd. – Cross Sound Cable Project, New Haven, CT to Brookhaven, NY.** Served as co-Project Manager for completion of regulatory permitting requirements for the installation of an approximately 24-mile electric transmission line and fiber optic underground and submarine cable system and associated land-based facilities in New York and Connecticut. Responsible for the completion of environmental resource evaluations including managing field efforts and preparing supporting documentation on existing resources, impact assessments, and mitigation measures related to aquatic resources (fisheries, benthos, shellfish), avian resources, endangered and threatened species, water and marine sediment quality, and coastal wetlands. Coordinated and managed the preparation of the following regulatory permits and reviews: Application for Certificate of Environmental Compatibility and Public Need to the Connecticut Siting Council, Permits to the Connecticut Department of Environmental Protection (CTDEP) Office of Long Island Sounds Program, Application for Article VII Certificate of Environmental Compatibility and Public Need to the New York State Department of Public Service, Coastal Zone Management Federal Consistency Certification to the New York State Department of State Coastal Management Program, Joint application and review by the New England and New York Districts of the Army Corps of Engineers.

- **TransÉnergie U.S., Ltd. – Various Merchant Overland and Submarine Multi-State Cable Route Evaluations, Northeastern and Mid Western United States and Canada.** Evaluated the regulatory requirements and performed initial environmental assessments for the evaluation of several potential merchant HVDC cable transmission projects located in the United States and Canada.

Charles J. Natale, Jr.
President and CEO

Principal Scientist and Senior Project Manager

ESS Group, Inc., 888 Worcester Street, Wellesley, MA 02482

EXPERIENCE

- ESS Group, Inc., Wellesley, MA: *President and CEO, Principal Scientist and Senior Project Manager* - December 1995 to Present

EDUCATION

- MS, Marine Science (Coastal Geology and Physical Oceanography), College of William & Mary, Virginia Institute of Marine Science, 1982
- BS, Environmental Sciences and Biology, Boston College, 1979
- SEA Program Graduate, Marine and Nautical Sciences, Boston University Marine Program and Woods Hole Oceanographic Institute, 1978

SUMMARY OF RESPONSIBILITIES AND PROJECT EXPERIENCE

Charles J. Natale, Jr. has over 27 years of national and international consulting experience. He manages large-scale multi-disciplinary environmental consulting and engineering projects in a variety of environmental settings, with particular focus on coastal ocean environments. Mr. Natale has educational training and professional experience in both geological sciences and engineering with a focus on marine, coastal, and estuarine environments. His particular areas of expertise are in the evaluation of marine and estuarine geological conditions, evaluation of remote sensing data to interpret marine and coastal sedimentary conditions, and evaluation of physical oceanographic data related to tide, current and wave, and sediment transport conditions. Mr. Natale also has extensive experience in evaluating the bulk physical, chemical, and thermal characteristics of marine and coastal sediments, particularly associated with linear routing evaluations for submarine cable or pipeline projects. He also has significant experience in evaluating aquatic resource habitat impacts as a result of seabed disturbances and associated sediment transport and deposition.

In addition to his areas of technical expertise, Mr. Natale has extensive experience in planning, design, and permitting of submarine cable or pipeline projects in coastal environments. He has successfully completed project design and permitting of several submarine cable projects located in various marine and coastal geological conditions, using both AC and HVDC cable technologies. Mr. Natale has extensive experience in marine dredging, jet-plow, and directional drilling construction/installation methodologies for submarine cable installation evaluations. He has experience in evaluating the physical and environmental conditions for cable or pipeline landfall and substation/converter yard installations. Mr. Natale's expertise also includes extensive experience in marine navigation and global positioning systems associated with cable route planning, design, and construction. He combines his expertise in route planning, installation feasibility, and environmental impact evaluations to facilitate project permitting and construction. Mr. Natale has worked on several submarine cable and pipeline projects either as an independent consultant, project team leader, or specialized consultant for geological or geotechnical conditions evaluations.

Mr. Natale has conducted marine and coastal geological evaluations associated with submarine cable or pipeline projects in the Northeastern, Mid-Western, and Mid-Atlantic Regions of the United States. His geographic experience is primarily concentrated in the Northeastern United States; however, he has

conducted coastal geologic investigations for a variety of projects located in Bermuda, the Upper Caribbean Islands and the Dutch Lesser Antilles. Representative project experience includes:

- **Hudson Transmission Partners, LLC – The Hudson Project, Lower Hudson River between New Jersey and Manhattan, NYC.** – Mr. Natale is serving as Prinicipal-In-Charge and Senior Scientist overseeing technical studies and environmental regulatory review and approvals for a Point-to Point High Voltage electric transmission project that includes a new overland and submarine electric transmission project between New Jersey (PJM) and New York City (Zone J). The Hudson Project involves the construction of a High Voltage Converter Station (AC/DC) in a back-to-back configuration and interconnecting 345kV underground and submarine cable systems to transmit up to 660 MW of new electric transmission capacity from PJM to the NYC Zone J load center in the NYISO regional grid.

  Mr. Natale is responsible for managing and directing a multi-disciplinary technical project team to plan, design, permit, and construct this new high voltage transmission facility that will interconnect PJM at Ridgewood NJ, cross the Hudson River and then connect with NYISO – Zone J via the ConEd Wst 49th Street Substation in Mid-town Manhattan. The project involves extensive linear routing assessments (upland and marine), marine biological and geological studies, water quality impact evaluations, a full spectrum of environmental impact assessments ,project constructability assessments, and project permitting review and approvals in both New Jersey and New York states as well as the ACOE. The Hudson Project also requires NYS- Department of Public Service approvals under Article VII of the Public Service Code and is a project supported by NYPA and the NYCEDC through a commercial Power Purchase Agreement.

- **Cape Wind Associates LLC – Cape Wind Offshore Renewable Electric Generation and Submarine Cable Project, Nantucket Sound.** Mr. Natale is serving as the Principal-in-Charge and leading the technical studies, environmental impact assessments, and regulatory permitting for the first offshore wind energy project in the United States. The Cape Wind energy project is a proposed commercial-scale renewable electric generating facility involving installation of 138 offshore wind turbine generators in Nantucket Sound, Massachusetts, with a potential to generate 478 MW of renewable energy serving the New England regional transmission system. This project involves the siting and construction of offshore wind turbine generators as well as a 12-mile long high voltage submarine cable system servicing the wind farm facility.

  Mr. Natale also served as a key technical expert on project siting and environmental impact issues before the Massachusetts Energy Facilities Siting Board, the US Army Corp of Engineers, and other agencies related to project design and permitting. This first of its kind renewable energy project is presently completing its Environmental Impact Statements and regulatory permitting for a planned commencement of construction in 2008.

- **PSEG Power LLC – Cross-Hudson Project, Lower Hudson River between New Jersey and Manhattan, NYC.** Mr. Natale served as the Principal-In-Charge and Senior Project Manager overseeing a generator lead high voltage AC submarine cable transmission project from Bergen New Jersey to Mid-town Manhattan, New York City. His team was responsible for evaluating and permitting transmission cable installation methods, land and marine routing feasibility assessments, environmental impact assessments and regulatory permitting for the construction of an approximately eight (8) linear mile, 500 MW 345 kV alternating current (AC) electric generator lead. The project involves upland cable installation in New York City and New Jersey, installation of the submarine cable system beneath the riverbed of the Hudson River using jet plow techniques, complex cable landfall transitions at the New Jersey and New York landfalls using horizontal directional drilling techniques, and overland transmission cable routing through densely developed urban environments. Mr. Natale was a lead negotiator with state and federal regulatory agencies and completed several agreements which led to final project approval in 2003.

- **Northeast Utilities/LIPA – Long Island Cable Replacement Project.** Mr. Natale served as the Principal-In-Charge for marine geophysical and geological investigations and associate environmental impact assessments and permitting for the Long Island Cable Replacement Project in the States of Connecticut and New York. This project assignment involves the removal and replacement of an existing 138kV fluid-filled AC submarine cable system presently providing electric transmission capacity transfer from the CL&P – Norwalk, CT Substation to the LIPA- Northport, NY Substation with a new solid di-electric AC sub-cable system. The project has successfully completed all necessary local state and federal regulatory permitting in both Connecticut and New York states. Mr. Natale and ESS are currently providing construction oversight and environmental management and monitoring services for the full project construction activities and compliance reporting for both LIPA and Northeast Utilities/CL&P. Construction commenced in the Fall of 2007 and will continue into 2008.is currently completing regulatory permitting reviews in both states and is expected to go to construction in 2007/2008.

- **TransÉnergie U.S., Ltd. – Cross Sound Cable Project, Long Island Sound, Connecticut and New York States.** Mr. Natale serves as Principal Scientist-In-Charge for the planning, design, and permitting of the first submarine cable project using HVDC technology in the United States. The Cross Sound Cable Project is a merchant energy transmission project in response to deregulated energy initiatives in the Northeastern U.S. The submarine cable will be installed along a selected coastal and offshore route originating in New Haven Harbor, Connecticut, across Long Island Sound, and then interconnecting with the Long Island energy transmission system at the decommissioned Shoreham generating facility in Brookhaven, New York. The cable will be approximately 24 miles long and will transmit approximately 300MW of DC-transmitted energy. The DC cable energy will be transformed to AC energy for local service distribution at DC/AC Converter Stations located near each of the planned cable landfalls. Mr. Natale was Principal Scientist responsible for planning and conducting extensive geophysical and geotechnical surveys of seabed conditions within Long Island Sound to evaluate several potential submarine cable routes. He also assisted in evaluating and selecting preferred cable routes and landfall locations. He managed a multi-disciplinary technical team to conduct remote sensing surveys of marine seabed conditions, geotechnical borings, and sediment thermal profiles to evaluate potential cable routing and installation and methodologies. Mr. Natale also directed comprehensive environmental impact evaluations associated with selected cable routes and landfall locations. These evaluations included impact assessments of shellfish and finfish resources, water quality protection, prevailing tides and currents, and navigational and marine hazards. He has also managed and directed regulatory permitting and Energy Siting Council reviews for the project.

- **TransÉnergie U.S., Ltd. – Various Merchant Overland and Submarine Cable Route Evaluations, Northeastern and Mid Western United States and Canada.** Mr. Natale presently serves as Principal-In-Charge for completion of technical studies, field assessments, and reports of findings and recommendations for evaluating several potential merchant HVDC cable transmission projects for TransÉnergie U.S., Ltd. located in the United States and Canada. Mr. Natale is responsible for directing a technical team to complete initial route planning investigations and selection of preferred overland and submarine cable routes for each project under consideration. The terrestrial and marine geologic conditions along selected routes, and the feasibility of submarine cable installation in varied marine environmental conditions along each prospective route are evaluated. Review of potential environmental, navigational, and operational impacts of the submarine cable are also conducted to assess potential installation impacts to marine environmental resources.

  Mr. Natale also conducts regulatory permit reviews and EIS requirements for both national and international projects. He participates on technical review teams involving the client, cable installers and environmental specialists to evaluate project feasibility and potential fatal flaw analyses.

- **New England Electric System/National Grid - Nantucket Cable Project, 45 kV AC Submarine and Telecommunications Cable Project Linking Cape Code (Harwich), Massachusetts with Nantucket Island.** Mr. Natale was Project Manager for completion of technical studies and regulatory permitting for this 45 kV AC submarine cable transmission project. The objective of this project was to provide a submarine cable energy transmission connection from Cape Cod to the Island of Nantucket to improve system transmission capacity and reliability. Mr. Natale was responsible for the completion of all cable linear routing and siting evaluations; completion of comprehensive marine geological and geophysical studies; development of regulatory permitting strategies; completion of environmental impact evaluations; and completion of local, state, and federal permitting reviews. Mr. Natale also conducted aquatic resource evaluations, navigational impact studies, wetlands impact studies, and shoreline erosion evaluations for cable landfalls. The project was successfully designed and permitted and is presently in operation.

- **Commonwealth Electric Company – Martha's Vineyard Cable Project, 26 kV AC Submarine Cable and Telecommunications Cable Project Linking Cape Cod (Falmouth) with the Island of Martha's Vineyard.** Mr. Natale was Project Manager for this submarine cable energy transmission project. The objective of this project was to provide a replacement submarine cable from Cape Cod to the Island of Martha's Vineyard to improve system transmission capacity and reliability. Mr. Natale was responsible for conducting extensive marine geologic and geophysical surveys of existing seabed conditions to evaluate cable burial feasibility. He conducted navigational impact and marine archeological impact investigations. He was also responsible for development of regulatory permitting strategies, completion of environmental impact evaluations, completion of marine geological and geophysical surveys, and completion of local, state, and federal permitting. Mr. Natale also provided expert witness testimony during court proceedings. The submarine cable project was successfully installed and is presently in operation.

- **Commonwealth Electric Company/NStar – Acushnet River Submarine Cable Project, New Bedford, Massachusetts.** Mr. Natale served as Principal-In-Charge for the planning, design, and regulatory permitting of two (2) new 42" diameter submarine cable conduits installed in marine bedrock across the Acushnet River in New Bedford, Massachusetts. The objective of this project was to provide a cable conduit under the riverbed for new AC submarine cables and consolidation of existing submarine cables to remove them from contaminated surface sediments within this EPA-designated Superfund Site. The conduits would house one (1) new 115 kV submarine electric transmission line, and the relocation of fourteen (14) existing submarine cables. Conduit construction was performed via micro-tunneling technology. Mr. Natale directed the subsurface geological exploration program and associated geologic analyses to evaluate installation feasibility. Environmental impact assessments were conducted, and the project was successfully permitted and constructed.

- **PG&E Generating (Formerly U.S. Generating Company) – 1080 MW Gas-Fired, Combined Cycle Independent Power Plant Located in Athens, New York.** Mr. Natale served as Principal-In-Charge for the site planning, design, and permitting of the largest merchant energy development project in the Northeastern United States. This project also included the planning, design, and permitting of a new submarine pipeline and river water intake/discharge structure in the Hudson River in Athens, New York. Mr. Natale was responsible for technical oversight and project team management for facilities siting design, utility interconnection studies, water intake structure siting and design, and associated impact evaluations and permitting. Mr. Natale was responsible for managing completion of required site surveys and technical studies, including geophysical remote sensing surveys of river sediments, hydrological data gathering and analysis and geological condition evaluations. The energy development project was the first project to be approved under the New York State Article X licensing process. The proposed river water pipelines and intake/discharge structures were also approved for construction.

PROFESSIONAL CERTIFICATIONS, AFFILIATIONS, AND AWARDS

- Member, VIMS Council of Directors: College of William & Mary, Virginia Institute of Marine Science – School of Marine Science and VIMS Foundation. 2003-present.
- Member – Board of Directors – New England Environmental Business Council.
- Guest Lecturer – Marine environmental and regulatory issues related to offshore energy projects – Boston College School of Law, University of Massachusetts-Boston.

RELEVANT PUBLICATIONS/PRESENTATIONS

- *Use of Marine Remote Sensing Data for Submarine Cable Route Planning and Siting*, 2000, Whitney, P. R., Natale, C.J., and Nash, J.P. Marine Technological Society, Oceans 2000 Conference.
- *CITGO Marine Terminal Dredging Project*, 1994, Natale, C.J., Dredging '94, American Society of Civil Engineers. Conference Proceedings.
- *Seismic Survey Considerations in the Planning and Design of Dredging Projects for Marine Terminal Facilities*, 1992, Natale, C.J. and Nowak, T.A. and Adams, B.A., Ports '92, American Society of Civil Engineers. Conference Proceedings

Howard R. Quin, PhD, INCE

Senior Scientist
Group Manager, Land Development and Engineering

Tech Environmental, Inc., 1601 Trapelo Road, Waltham, MA 02451

EXPERIENCE

- Tech Environmental, Inc., Waltham, MA: *Senior Scientist* – July 2007 to Present.
- Epsilon Associates, Inc., Maynard, MA: *Senior Consultant* – 2005 to 2007.
- KM Chng Environmental, Inc., Burlington, MA: Senior Consultant – 2000-2005.

EDUCATION

- PhD., Geophysics, Columbia University, 1990
- M.S., Geophysics, Stanford University, 1982
- B.S. Physics, Stanford University, 1982

SUMMARY OF RESPONSIBILITIES AND PROJECT EXPERIENCE

Dr. Quin is a sound and vibration expert with over 20 years of professional experience in energy, industrial and transportation noise and vibration studies. He has worked on several complex projects in New York City and New York State that required noise monitoring, modeling and design modifications for mitigation. Dr. Quin's expertise includes impact evaluation, data collection, computer modeling, software development, mitigation design and subsurface environmental geophysics. Dr. Quin has performed noise measurement and acoustic modeling impact assessments for transit, power plant, wind turbine, highway, airport, harbor, construction, and industrial facility projects in the Northeast, Mid-Atlantic and Midwest. Mr. Quin's representative project experience includes:

UTILITY SITING, ENGINEERING, AND PERMITTING

- **General Electric - Hudson Dredging Project, Fort Edward, N.Y.** General Electric was required by EPA to dredge the Hudson River and remove deposits of polychlorinated biphenyls (PCBs). As part of this environmental remediation project, GE proposed to create a dredge materials processing facility in Fort Edward, New York. Dr. Quin studied expected noise levels from construction, truck traffic, barge operations, future facility operations, train noise, and highway noise. Complex noise modeling was undertaken that considered noise from a combination of sources, including a trammel screen, tug operations, cranes, trucks, and additional stationary sources. Modeling was performed using the Cadna/A software package for stationary sources and the TNM traffic noise model for impacts from truck operations at the proposed facility. Dr. Quin developed design modifications that would keep potential noise below project-specific limits, thereby streamlining the noise permitting process.
- **Access to Region's Core (ARC), New York, N.Y.** A project to build a new Trans-Hudson Tunnel from New Jersey to Penn Station in New York City required an environmental impact assessment. As part of this assessment, Dr. Quin performed a comprehensive noise and vibration analysis for both the New York and New Jersey sides of the tunnel, to prove compliance with applicable NYCDEP CEQR and NJDEP regulations. Noise monitoring was performed, consisting of 24-hour and hourly background sound level measurements along the Northeast corridor from New York's Penn Station to Newark's Penn Station. Transit operational noise and vibration data for the project were calculated and modeled using software developed by Dr. Quin. He also used the SoundPlan software to model potential construction noise for a variety of construction scenarios. Based on the modeling results, Dr.

Quin designed procedures and structures to minimize operational and construction noise so that the tunnel could be constructed with acceptable noise and vibration levels.

- **HVAC and Station Equipment Vibration Assessment, New York, N.Y.** The introduction of HVAC and backup generator equipment at a vent building for Grand Central Station raised nearby commercial vibration concerns. Dr. Quin estimated vibration potential from the project and compared it to vibration annoyance thresholds. By studying and recommending appropriate vibration platforms for several large pieces of equipment, Dr. Quin determined appropriate design features to ensure that equipment vibration levels would not be high enough to annoy adjacent workers and occupants.
- **Cornell University - Cornell Cogeneration Unit, Ithaca, N.Y.** Cornell University added a new cogeneration unit to supplement their existing power station. During project development, Dr. Quin performed a noise analysis to assess the potential impacts of the new unit. The detailed noise analysis took into account the complex terrain surrounding the proposed site, which included coal piles, sloping cliffs, and valley topography. Noise sources such as cooling towers and vents, and associated equipment enclosures, were monitored and modeled. Dr. Quin developed a package of design recommendations that assisted Cornell in proceeding with the optimal equipment and enclosures to maintain acceptable noise levels.
- **Grand Central Station, New York, N.Y.** The East Side access project at Grand Central Station entailed the construction of new platforms and associated structures adjacent to a heavily trafficked shopping plaza. Dr. Quin performed a complex rail sound and vibration analysis that examined both construction and operational impacts. The project included the projection of rail sound and vibration-induced noise on interior spaces. Potential noise impacts of the proposed ventilation system, fans, and generator equipment were examined. Dr. Quin's report specified appropriate equipment to maintain acceptable levels of noise at nearby commercial enterprises.
- **Industrial/Municipal/Commercial/Energy Noise Services.** Dr. Quin has performed noise measurement and acoustic modeling impact assessments for a wide range of projects. He has worked on high-profile commercial projects such as the South Station Development and the Bullfinch Triangle Redevelopment in Boston; impacts from a municipal wastewater facility, the MWRA Union Park facility in Boston; a major dredging operation, the Island End Marina in Chelsea, MA; a harbor configured for offloading liquefied natural gas, the Weaver's Cove LNG Facility in Fall River, MA; blast monitoring projects at mines in Reading, PA and Hazleton, PA; and on energy facilities including the Brayton Point Power Plant in Swansea, MA, the Braintree Electric Plant in Braintree, MA, and the Brockton Power Plant in Brockton, MA. Dr. Quin's work on these projects included measurement, analysis, modeling, design recommendations, detailed reports, and in some cases, public testimony.

PROFESSIONAL CERTIFICATIONS AND AFFILIATIONS

- Institute of Noise Control Engineers, Full Member
- Seismological Society of America, Past Member
- Environmental And Engineering Geophysical Society, Past Member

RELEVANT PUBLICATIONS/PRESENTATIONS

- "Noise Issues from Truck and Building Related Activities for Proposed Sears and Circuit City Facilities", presented to Covington Zoning Board, Covington, PA, June 2007
- "Community Noise Monitoring of Quarry Activities", presented to New England Society of Explosive Engineers, Marlborough, MA, October 2006
- "Wind Turbine Noise and Potential Community Effects", presented to Gloucester Public Meeting, City of Gloucester, MA, March 2006

- "Noise Levels and Potential Barrier Locations for Route 3 South between Weymouth and Duxbury", presented to MassHighway Environmental Group, Boston, MA, March 2003.

- "Catalog of Locations of Nuclear Explosions at Balapan, Kazakhstan" with C. H. Thurber and R. Saleh, Bulletin of Seismological Society of America, Vol. 84, No. 2, pp. 458-461, (1994).

- "Accurate Locations of Nuclear Explosions in Balapan, Kazakhstan" with C. H. Thurber and P.G. Richards, Geophysical Research Letters, Vol. No. 5, Pages 399-402, (1993).

- "Regional Seismic Structure in the Region Surrounding Kazakhstan" with C.H. Thurber, Air Force Final Report (Chapter 4, PL-T92-2304, 1993).

- "Seismic Velocity Structure and Event Relocation in Kazakhstan from Secondary P Phases", with C.H. Thurber, Bulletin of Seismological Society of America, Vol. 82, No.6, pp. 2494-2510, (1992).

- "Dynamic Stress Drop and Rupture Dynamics of the October 15, 1979 Imperial Valley Earthquake", Tectonophysics, Vol. 175, pp.163-177, (1990).

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Peter A. Valberg, Ph.D., FATS
Principal

Areas of Expertise

Public health, inhalation toxicology, epidemiology, human health risk assessment, risk communication, indoor / outdoor air quality, comparative toxicology, modeling of human exposure and retained dose, health effects of ionizing and non-ionizing radiation.

Education

M.S., Human Physiology and Inhalation Toxicology, Harvard School of Public Health.

Ph.D., Physics, Harvard University, Graduate School of Arts and Sciences.

M.A., Physics, Harvard University.

A.B., Physics and Mathematics, *summa cum laude*, Taylor University.

Professional Experience

2001 – Present (and 1990 – 1998) GRADIENT CORPORATION, Cambridge, MA
Principal. Environmental consulting practice includes inhalation toxicology; environmental health; human health risk assessment; use of epidemiology in public health decisions; health effects of airborne gases and particles; health effects of ionizing and non-ionizing radiation.

1998 – 2000 CAMBRIDGE ENVIRONMENTAL, INC., Cambridge, MA
Senior Scientist.

1985 – 2000 HARVARD SCHOOL OF PUBLIC HEALTH, Boston, MA
Associate Professor of Human Physiology. (Adjunct, after 1990) Research work included: (1) human health effects of air toxics, (2) lung macrophage function measured with magnetic particles, (3) lung deposition and clearance of radioactive tracer particles.

1987 INSTITUTE OF OCCUPATIONAL HEALTH, Helsinki, Finland
Visiting Researcher. Developed a magnetometric assay to be used for studying pulmonary macrophage function for lung cells lavaged from human subjects.

1984 INHALATION TOXICOLOGY RESEARCH INSTITUTE, Albuquerque, NM
Visiting Scientist. Examined the effect of exercise and hypercapnia on deposition, lung clearance, and lung distribution of inhaled radioactive aerosol.

1976 – 1985 HARVARD SCHOOL OF PUBLIC HEALTH, Boston, MA
Assistant Professor of Respiratory Physiology.

1970 – 1976 AMHERST COLLEGE, Amherst, MA
Assistant Professor of Physics.

Professional Activities

- National Academy of Sciences and National Research Council, Evaluating Health-Risk-Reduction Benefits of USEPA Regulations (2001 – 2003)
- Harvard School of Public Health: Research Advisory Committee Member for NIH-Sponsored Research on "Mechanisms of mortality/morbidity due to air particulate" (1997 – 2005)
- Member of the Committee on Man and Radiation (COMAR) (1999 – 2006)
- Health Effects Institute, Cambridge, MA, *ad hoc* reviewer (1984 – 1994)
- National Research Council, Commission on Life Sciences: Committee on Passive Smoking (1986-1988)
- Editorial Board, *Journal of Aerosol Medicine* (1987– 2000)
- Center for Indoor Air Research, grant-application reviewer (1989 – present)
- NIOSH: Environmental Center Grants, Site Visit Delegation (1990)
- NIH Reviewer: Cardiovascular and Pulmonary Study Section, Radiation Study Section, and Health of the Population Study Section
- DOE: Office of Health and Environmental Research, reviewer
- Harvard Center for Risk Analysis: Review of Cellular Telephones (1994 – 1999)
- Physical and Biological Sciences Study Committee, Town of Needham Planning Board

Professional Affiliations

Fellow of the Academy of Toxicological Sciences • Society of Toxicology (full member) • International Society for Environmental Epidemiology • Society for Risk Analysis • Health Physics Society (full member) • Sigma Xi • American Association for the Advancement of Science • American Conference of Governmental Industrial Hygienists (associate member)

Projects *(abbreviated)*

Carbon Black Manufacturers: Evaluated the toxicology and epidemiology of carbon black inhalation and ingestion.

Charter School in Washington DC: Prepared a health risk assessment for the school board on the health risks of handling asbestos-containing materials that might release fibers.

City of Newton Health Department: Measured RF levels from a local transmitting antenna, reviewed RF field calculations, and provided scientific literature critique on RF health effects.

Confidential Client: Prepared a risk assessment for a Massachusetts landfill containing both chemical and radioactive waste and including multiple pathways of contaminant uptake by a trespasser.

Confidential Client: Prepared a model predictive of asbestos fiber drift and inhalation health hazard applicable to industrial processes where asbestos-containing materials are used.

Confidential Clients: Prepared an analysis of relative risks of TCE in drinking water *versus* health hazards from background levels of chemicals in air, water, and soil, as well as other routine risks to life and health.

Electric-Power Generating Companies: Prepared and delivered expert reports and public testimony on the potential health effects of airborne emissions from coal fired, gas fired, oil fired, and wood-fired electric utility power generating plants.

Electric Power Research Institute: Reviewed and analyzed the mechanisms by which biological systems may be affected by environmental electric and magnetic fields (EMFs). Organized a public workshop on the causes and characteristics of childhood leukemia.

Engine Manufacturers Association: Prepared critiques of the U.S. EPA and California EPA health assessment documents on the potential carcinogenicity of diesel exhaust and ambient air particulate matter.

Harvard School of Public Health: Continuing Education for Professionals: Prepared material on special topics on inhalation toxicology for graduate students and health professionals: Presented lectures on risk assessment and risk communication.

Health Effects Institute: Prepared an analysis entitled "Ozone Molecular Dosimetry and Interaction with Biological Macromolecules."

Health Effects Institute: Organized, supervised, and documented a feasibility study for the Health Effects Institute initiating a national research program on the health effects of electric and magnetic fields.

Manufacturing Company: Analyzed multi-pathway human health risk for a site contaminated with polychlorinated biphenyls (PCBs) and chlorinated organic solvents. Analyzed experimental data to derive a fraction of PCBs that are picked up from concrete by dermal contact.

Manufacturing Company/FUSRAP Site: Prepared a radionuclide health risk assessment and site management plan for site contaminated by nearby storage of uranium ore.

Massachusetts Department of Public Health: Prepared a public communications essays on what citizens can do to support improved air quality.

Medical Product Manufacturer: Prepared a risk assessment for air toxics produced during malfunction of a medical device used to assist breathing.

Michigan Occupational and Environmental Medical Association (MOEMA): Prepared and delivered a risk assessment tutorial for MOEMA's Continuing Education program.

Mining Company: Evaluated the epidemiological basis for the toxicity of arsenic in soils. Evaluated metals toxicity factors and site-specific bioavailability of metals.

National Institute of Environmental Health Sciences -- Division of Research Grants: Revised grant applications for the Radiation Study Section Panel on Health-Effects Research.

Navy Occupational Health and Preventive Medicine Program: Prepared and delivered seminars and workshops to U.S. Navy medical personnel on the current research on electric and magnetic fields (EMFs).

New Mexico Environmental Department: Prepared a health risk assessment for measured and modeled concentrations of 80 airborne chemicals in Albuquerque, NM.

Refinery: Prepared a multipathway human health risk assessment for air emissions from a petroleum refinery. Our risk assessment preparation process was monitored by a Multi-Agency Task Force composed of regulators, educators, union members, and local officials.

School District on Long Island: Assessed possible environmental, occupational, and lifestyle risk factors for early-term miscarriage.

University of Denver: Analyzed the potential health impact of uranium disposal from munitions testing ("depleted uranium") as it was practiced in the 1960's and 1970's.

Uranium Mill: Evaluated the health implications of radioactive substance migration as predicted by different EPA and DOE models.

U.S. Department of Energy: Prepared a risk communication strategy for a nuclear test site where detonation of underground atomic devices had the potential to contaminate groundwater.

U.S. Department of Justice: Prepared an analysis of the health hazards of the Love Canal Superfund site (Niagara Falls, NY)

U.S. Department of Justice: Prepared a report and provided expert testimony on human toxicology with regard to soil contamination at a RCRA site.

U.S. Department of Justice: Prepared reports and provided expert testimony on asbestos, sulfuric acid, and airborne particulate inhalation toxicology.

U.S. Environmental Protection Agency: Provided USEPA with a peer review (scientific critique) of the Agency's draft reference concentration (RfC) methodology for risk assessment.

U.S. Environmental Protection Agency: Analyzed the health risks of a remediation alternative at the Bloody Run Creek section of the Hyde Park Landfill superfund site (Niagara Falls, NY).

U.S. Environmental Protection Agency, Health Effects Research Laboratory: Assisted in preparing a database of non-cancer health effects for 189 Hazardous Air Pollutants.

U.S. Environmental Protection Agency, Environmental Criteria and Assessment Office: Evaluated research proposals on "Indoor and Ambient Air Risk Assessment Methodologies."

Utility: Analyzed the relationship between inhaled carbon monoxide concentration and blood carboxyhemoglobin. Performed sensitivity analysis on all the variables involved.

Waste Management Company: Evaluated health risks for a medical waste incinerator, including a multiple-pathway (ingestion, inhalation, dermal, mothers' milk) health risk assessment.

World Health Organization: Helped prepare a WHO research report on electric and magnetic field (EMF) health effects. Presented a lecture on EMF health effects at a WHO workshop in Geneva, Switzerland. Published review article on RF health effects.

Academic Research Projects *(abbreviated)*

National Heart, Lung, and Blood Inst.:	"Physical Determinants of Lung Function and Dysfunction."
National Heart, Lung, and Blood Inst.:	"Pulmonary SCOR: Chronic Diseases of the Airways."
National Cancer Institute:	"Magnetic Field Effects on Macrophages."
National Inst. of Environ. Health Sci.:	"Inhaled Particle Retention in Normal and Diseased Lungs."
National Heart, Lung, and Blood Inst.:	"Particle Location and Ingestion by Lung Macrophages."

National Inst. of Environ. Health Sci.: "Factors Influencing Deposition of Inhaled Aerosols."

Publications – *Articles*

Valberg, PA; Long, CM; Hesterberg, TW. 2008. "Comment on the Nanoparticle Conclusions in Cruts *et al*. (2008), 'Exposure to diesel exhaust induces changes in EEG in human volunteers.'" *Part Fibre Toxicol*. 5(1):10.

Hesterberg, TW; Long, CM; Bunn, WB; Sax, SN; Lapin, CA; Valberg, PA. 2008. "Non-Cancer Health Effects of Diesel Exhaust (DE): A Critical Assessment of Recent Human and Animal Toxicological Literature." *Critical Reviews in Toxicology* (in press).

Valberg, PA. 2007. "Modulated RF Energy: Mechanistic Viewpoint on the Health Implications." *Base stations and wireless networks: exposures and health consequences: Proceedings of International Workshop on Base Stations and Wireless Networks: Exposures and Health Consequences. Switzerland, Geneva, June 15-16, 2005*. World Health Organization. WHO Library ISBN 978 92 4 159561 2. (NLM: QT 162.U4) http://www.who.int/peh-emf/meetings/archive/valberg_bsw.pdf.

Long, CM; Valberg, PA. 2007. "Comment on 'An Assessment of Risk from Particulate Released from Outdoor Wood Boilers' by Brown et al." *Human and Ecological Risk Assessment* 13:681-685.

Valberg, PA; Van Deventer, TE; Repacholi, MH. 2007. "Base stations and wireless networks: Radiofrequency (RF) exposures and health consequences." *Environ. Health Perspect*. 115: 416-424.

Hesterberg, TW; Bunn, W; Chase, GR; Valberg, PA; Slavin, TJ; Lapin, CA; Hart, GA. 2006. "A critical assessment of studies on the carcinogenic potential of diesel exhaust." *Critical Reviews in Toxicology*. 36(9):727-76.

Valberg, PA; Long, CM. 2006. "Comment on 'Vehicle self-pollution intake fraction: children's exposure to school bus emissions.' " *Environmental Science & Technology* 40(9):3123-3132.

Valberg, PA; Long, CM, and Sax, SN. 2006. "Integrating studies on carcinogenic risk of carbon black: epidemiology, animal exposures, and mechanism of action." *Journal of Environmental and Occupational Medicine* 48:1291-1307.

Stout, N; Valberg, PA. 2005. "Bayes' Law, Sequential Uncertainties, and Evidence of Causation in Toxic Tort Cases." *Michigan Journal of Law Reform* 38(4):781-910.

Bunn, W; Hesterberg, T; Valberg, PA; Slavin, T; Hart, G; Lapin, C. 2004. "A reevaluation of the literature regarding the health assessment of diesel engine exhaust." *Inhal. Toxicol.* 16:889-900.

Valberg, PA. 2004. "Is PM more toxic than the sum of its parts? Risk-assessment toxicity factors versus PM-mortality 'effect functions'." *Inhal. Toxicol.* 16(Supplement 1):19-29.

Valberg, PA. 2003. "Possible non-causal bases for correlations between low concentrations of ambient particulate matter (PM) and daily mortality." *Non-Linearity in Biology, Toxicology, and Medicine* 1:521-530.

Valberg, PA. 2003. "Ambient particulates and health effects." *A Practical Approach to Occupational and Environmental Medicine* (Ed: Robert J. McCunney), Lippincott Williams & Wilkins, Philadelphia, pp. 835-850.

Brain, JD; Kavet, R; McCormick, DL; Poole, C; Silverman, LB; Smith, TJ; Valberg, PA; Van Etten, RA; Weaver, JC. 2003. "Childhood leukemia: Electric and magnetic fields (EMF) as possible risk factors." *Environ. Health Perspect.* 111:962-970.

Multi-author Report. 2002. "Estimating the Public Health Benefits of Proposed Air Pollution Regulations." NAS Committee on Estimating the Health-Risk-Reduction Benefits of Proposed Air Pollution Regulations, Board on Environmental Studies and Toxicology, National Research Council. *The National Academies Press*, Washington, DC. 192 pp.

Bunn III, WB; Valberg, PA; Slavin, TJ; Lapin, CA. 2002. "What is New in Diesel." *Int. Arch. Occup. Environ. Health* Jul:75 (Supplement 1):122-132.

Ames, MR; Zemba, SG; Yamartino, RJ; Valberg, PA. 2002. "Letter to the editor, Comments on: Using CALPUFF to evaluate the impacts of power plant emissions in Illinois: model sensitivity and implications." *Atmos. Environ.* 36:2263-2265.

McCunney R; Muranko, H; Valberg, PA. 2001. "Patty's Toxicology, 5th Edition" (Edited by E. Bingham) Volume 8, Chapter 111 - Carbon Black, John Wiley & Sons, New York.

Watson, AY; Valberg, PA. 2001. "Carbon black and soot: Two different compounds." *Am. Ind. Hyg. Assoc. J.* 62:218-228.

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Abstracts & Reports *(list available on request)*

Invited Lectures *(past 10 years)*

6/23/08 "Routes of Entry into the Body: Pulmonary Deposition and Clearance of Particles." Presented in the course "Comprehensive Industrial Hygiene: Practical Applications of Basic Principles," Harvard School of Public Health, Boston, MA.

6/25/07 "Routes of Entry into the Body: Pulmonary Deposition and Clearance of Particles." Presented in the course "Comprehensive Industrial Hygiene: Practical Applications of Basic Principles," Harvard School of Public Health, Boston, MA.

3/29/07 "Non-linear exposure-response relationships between ambient PM_{10} and daily mortality" Presentation with Dr. T. Bowers at the Society of Toxicology Annual Meeting, Charlotte, NC. This presentation was selected as one of the "*Top 12 Risk Assessment Abstracts at the SOT Meeting.*"

11/7/06 "What is EMF? How EMF Interacts with Organisms." Presented at the *Cyprus International Institute for the Environment and Public Health symposium on "Electromagnetic Fields: Sources, Health Effects, and Regulations,"* Nicosia, Cyprus.

6/19/06 "Pulmonary Deposition and Clearance of Particles." Presented in the course *"Comprehensive Industrial Hygiene: Practical Applications of Basic Principles,"* Harvard School of Public Health, Boston, MA.

5/18/06 "Health Hazards of Nanoparticles." Presented at *"A Mock Hearing: Environment, Health & Safety" at the NanoBusiness Alliance Meeting*, New York City, NY.

4/25/06 "Inhalation Risk Assessment: Extrapolating from Macro-materials to Nano-materials." *Overcoming Obstacles to Effective Research Design in Nanotoxicology*, Cambridge, MA.

10/6/05 Panelist for: "A Reevaluation of the Association Between Diesel Exhaust Exposure and Lung Cancer." *Air & Waste Management Association (AWMA) Specialty Workshop on "Diesel Exhaust,"* Chicago, IL.

6/20/05 "The Respiratory Tract as a Portal of Entry for Airborne Chemicals in the Work Environment." Lecture at the *Harvard School of Public Health course on "Comprehensive Industrial Hygiene,"* Boston, MA.

6/16/05 "Electromagnetic Fields, Base Stations, and Wireless Networks: Exposures & Health Consequences." *WHO Workshop, 15-16 June 2005, at the World Health Organization,* Geneva, Switzerland.

2/11/05 "Generation of Charged Aerosols by High-Voltage Electric-Power Lines." *American Association for Aerosol Research, Specialty Conference on Particulate Matter,* Atlanta, GA.

2/4/05 "Magnetic Microparticles Detect and Probe Cytoplasmic Motions." *Bioelectromagnetics Society Winter Workshop,* Phoenix, AZ.

6/21/04 "Pulmonary Deposition and Clearance of Particles." Harvard School of Public Health Continuing Education Course on *Fundamentals of Industrial Hygiene*, Boston, MA.

1/27/04 "Quantitative and Qualitative Factors that Determine Health Risk: Explaining Risk to Judges, Juries, and Communities." *Mealey's Water Contamination Conference*, Pasadena, CA.

9/14/02 "Health Effects of Air Pollutants." Annual Scientific Meeting of the Michigan Occupational and Environmental Medicine Association *Current Topics in Occupational and Environmental Medicine,* Frankenmuth, MI.

6/18/01 "Pulmonary Physiology, and Lung Deposition and Clearance of Particles." Harvard School of Public Health Continuing Education Course on *Fundamentals of Industrial Hygiene*, Boston, MA.

11/14/00 "Effects of Air Pollution on the Human Lung." Lecture in Tufts University course CEE 136, *Air Pollution*, Medford, MA.

7/26/00 "Review of Ambient Air Quality as it Relates to Proposed Emission Standards for Massachusetts Power Plants." *Testimony before the Massachusetts Department of Environmental Protection*, Boston, MA.

1/10/00 "Useful Concepts in the Physics of RF." *RF Safety: Science, Compliance and Communication*, Electromagnetic Energy Association and the University of Texas Health Science Center, San Antonio, TX.

12/16/99 "Exposure to inhaled pesticides and human health risks." *51st Annual Crop Protection School.* Office of Continuing Professional Education, North Carolina State University, Raleigh, NC.

7/21/99 "How do Endogenous Forces Compare to EM Forces and Torques on Electrical Charges and Magnetite?" *11th International Congress of Radiation Research,* Dublin Inst. of Technology, Dublin, Ireland.

6/7/99 "Lack of Concordance between Reported Lung Cancer Risk Levels and the Occupation-Specific Potential for Diesel Exhaust Exposure." *Third Colloquium on Particulate Matter and Human Health,* Durham, NC..

3/8/99 "Relative Risk Issues in Urban Pesticide Exposure and Children's Health." *Association of American Pesticide Control Officials,* AAPCO States/Industries Forum, Washington, DC.

1/13/99 "Panel Discussion on Health Effects of Wireless Technology." *Cape Cod Commission,* Deliberations at Cape Cod Community College, Barnstable, MA.

12/8/98 "Review of Health Issues in a Proposed Antenna Upgrade." *City of Newton Health Department*, Land Use Committee Deliberations, Newton, MA.

11/30/98 "Overview of radio wave health effects." Wayland, MA, Cellular Telephone Committee, Wayland Town Meeting Warrant.

8/3/98 "Exposure assessment in power-line-EMF and radio-wave epidemiologic studies." *EPE.215T Environmental and Occupational Epidemiology,* Harvard School of Public Health, Boston, MA.

4/22/98 "Health risks from electrical power lines and cellular telephones." *EH.202D Principles of Environmental Health*, Harvard School of Public Health, Boston, MA.

3/23/98 "Inhalation and Dermal Exposure to Occupational Chemicals." Harvard School of Public Health, Continuing Education Course on *Fundamentals of Industrial Hygiene*, Boston, MA.

Manuscript Peer Reviewer for the Following Research Journals

American Industrial Hygiene Journal; American Journal of Physics; American Journal of Respiratory Cell and Molecular Biology; American Review of Respiratory Disease; Atmospheric Environment; Bioelectromagnetics; Biophysical Journal; Biorheology; Cell Biophysics; Critical Reviews in Toxicology; Environmental Geochemistry and Health; Environmental Health Perspectives; Environmental Science & Technology; Epidemiology; Experimental Lung Research; Fundamental and Applied Toxicology; Hepatology; Human and Ecological Risk Assessment; Human and Experimental Toxicology; IEEE Biomedical Engineering; IEEE Transactions on Plasma Science; Journal of Aerosol Medicine and Pulmonary Drug Delivery; Journal of Applied Physiology; Journal of Applied Toxicology; Journal of Occupational and Environmental Hygiene; Journal of Occupational and Environmental Medicine; Journal of Occupational Medicine and Toxicology; Journal of Toxicology and Environmental Health; Nature; Nonlinearity in Biology, Toxicology, and Medicine; Radiation Research; Risk Analysis: An International Journal; Regulatory Toxicology & Pharmacology; Science; Tissue & Cell; Toxicology and Applied Pharmacology; USGS Environmental Geochemistry of Mineral Deposits (Reviews in Economic Geology series).

Payson R. Whitney, III, PE

Senior Civil/Coastal Engineer and Project Manager
Group Manager, Land Development and Engineering

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EXPERIENCE

- ESS Group, Inc., Wellesley, MA: *Senior Civil/Coastal Engineer and Project Manager* – October 1998 to Present.
- Earth Tech, Inc., Concord, MA: *Civil Engineer* – 1994 to 1998.

EDUCATION

- BS, Civil Engineering, Lehigh University, 1994

SUMMARY OF RESPONSIBILITIES AND PROJECT EXPERIENCE

As a civil engineer, Mr. Whitney has more than 12 years of experience in a wide range of public and private sector projects, including project activities in both civil/site engineering and coastal permitting/shoreline assessment. His experience includes linear project planning and siting, facility siting, recreational facility planning and design, dredging design, roadway design, site layout and design, site drainage analysis, transportation analysis, analyzing required design review changes to project specifications and plans, reviewing third party plan sets, reviewing contractor bid packages and shop drawings, construction consultation, preparation of construction budget estimates, and preparation of AutoCAD plans. Mr. Whitney has extensive experience in the planning and permitting of linear transmission projects. He also has extensive experience in the planning and execution of marine geophysical and geotechnical surveys for coastal and offshore projects such as submarine electric cables, offshore generating facilities, marinas, and dredging. Mr. Whitney has also managed the preparation of various environmental regulatory permit applications, including Chapter 91 Waterways License applications, MCZM Federal Consistency Statements, 401 Water Quality Certifications, U.S. Army Corps of Engineers Permit applications, Notices of Intent, FEMA Conditional Letter of Map Revision applications, MEPA submittals, and New York Article VII submittals. Mr. Whitney's representative project experience includes:

UTILITY SITING, ENGINEERING, AND PERMITTING

- **Confidential Client – Submarine Electric Cable System, New York City Area.** Project Manager responsible for preparation of a Desktop Routing Study to identify possible submarine cable routes and landfalls for a confidential New York City area energy project.
- **PSEG Power LLC – Cross Hudson Project, Ridgefield, New Jersey to New York City (Manhattan).** Served as project manager for environmental consulting and engineering services related to the PSEG's proposed Cross Hudson Project. The project entailed the construction of a submarine electric cable system between New Jersey and New York City. The proposed cable system was planned to transmit power from the PSEG Bergen Station in Ridgefield, NJ to the ConEd West 49th Street substation in New York City. The cable system was to be approximately 7 miles long (including upland and submarine portions), and would transmit approximately 500 MW of AC energy as well as fiber optic communications. Mr. Whitney was responsible for day-to-day coordination of ESS services, coordination with PSEG, coordination with the project engineers, providing technical

services related to submarine cable route design and construction, and for planning, directing, and overseeing multiple marine geophysical and geotechnical field investigations. Mr. Whitney was responsible for developing the proposed submarine cable route from project survey and constraints information. Responsible for overseeing preparation of New York Article VII filing and US Army Corps of Engineers permit application, as well as various separate supporting reports and responses to comments.

- **Cape Wind Associates, LLC – Cape Wind Project, Nantucket Sound.** Providing services related to the siting and design of a proposed renewable electric generating facility involving installation of 130 offshore wind turbine generators with a potential to generate 454 MW in Nantucket Sound, Massachusetts. The proposed wind park is sited on Horseshoe Shoal, and will interconnect with the regional power grid through an AC submarine cable system between the wind park and the southern shore of Cape Cod. Responsible for preparing conceptual facility layouts and evaluating geologic conditions for a project baseline environmental impact and feasibility study. Responsible for planning, directing, and overseeing extensive marine geophysical and geotechnical field investigation programs, included hydrographic, sub-bottom profiling, side-scan sonar, and magnetometer surveys; as well as advancing vibracores and surface sediment grabs, to evaluate surface and shallow/deep subsurface sediment/geologic conditions in the area of the proposed offshore renewable electric generating facility and the submarine electric cable links to the mainland electric grid. Mr. Whitney prepared a detailed Navigational Risk Assessment for the proposed wind park. This Navigational Risk Assessment was the first such assessment submitted to the US Coast Guard's First District, and assessed the possibility for project impacts to marine vessel traffic and USCG search and rescue operations.

- **Connecticut Light & Power Company and its Project Partners – Submarine Replacement Cable Project, Norwalk, Connecticut to Northport, New York.** Responsible for planning, directing, and overseeing an extensive marine geophysical and geotechnical field investigation program for an 11-mile, 300 MW Alternating Current (AC) submarine cable system that will replace an existing series of electric transmission cables connecting existing power stations in Connecticut and Long Island. The seven existing fluid-filled submarine cables will be taken out of service and replaced with three new solid dielectric AC cables within the existing cable corridor. Two survey vessels conducted geophysical and geotechnical surveys simultaneously. The field investigation program included bathymetric, sub-bottom profiling, side-scan sonar, and magnetometer surveys; as well as advancing vibracores and surface sediment grabs, to evaluate surface and shallow subsurface sediment/geologic conditions along the proposed alternative routes. The program consisted of over 400 miles of geophysical survey tracklines, over 30 vibracores, and approximately 100 surface sediment grabs.

- **TransEnergieUS, Ltd. – Cross Sound Cable Project, New Haven, Connecticut to Brookhaven (Shoreham), New York.** Responsible for planning, directing, and overseeing geophysical and geotechnical field investigation programs; developing proposed cable route alignments, and dredging design/construction oversight for the Cross Sound Cable Project that crosses Long Island Sound between New Haven, Connecticut and Brookhaven, New York. The cable system is approximately 24 miles long, and will transmit approximately 300 MW of DC energy as well as fiber optic communications upon energization. The DC cable energy is transformed to AC energy for power grid distribution at DC/AC Converter Stations located near each of the planned cable landfalls. The field investigation programs included hydrographic, sub-bottom profiling, side-scan sonar, and magnetometer surveys; as well as advancing jet probes and vibracores, to evaluate surface and shallow subsuface sediment/geologic conditions along the proposed alternative routes and in problematic areas encountered during cable installation. Responsible for developing the final proposed cable route from project survey and constraints information, and coordinating development of project plan sets. Provided engineering support for proposed construction methodologies and regulatory permitting application preparation. Served as an expert witness during Connecticut Siting Council proceedings. Responsible for designing and managing a 12,000 cubic yard hydraulic dredging operation at the Shoreham landfall to facilitate cable embedment. Responsible for planning

and executing a post-installation cable and obstruction survey to field locate the cable and to identify and characterize obstructions encountered during installation. Responsible for determining proposed remedial cable burial means and methods.

- **American National Power – Preliminary Engineering and NYS Article X Preparation**, **Ramapo, New York.** Responsible for preliminary civil/site engineering for a proposed 1,100 MW natural gas-fired power plant in Ramapo, New York. Design elements included lot and easement layout, site access/egress, storm water management, and site grading. Also provided project support for the preparation and submittal of the project's Article X Pre-Application Report and the Article X submission to the New York State Department of Public Service.

PROFESSIONAL CERTIFICATIONS AND AFFILIATIONS

- Professional Engineer Registration, Commonwealth of Massachusetts, No. 41706, 2001
- Professional Engineer Registration, State of Rhode Island, No. 8551, 2006
- Engineer-In-Training, Commonwealth of Pennsylvania, 1994
- Master Design Certificate for Low Impact Development, State of Rhode Island, No. 1106011, 2006
- American Society of Civil Engineers (ASCE)
- Boston Society of Civil Engineers Section - ASCE (BSCES)—Board of Government Member (1999-2000)
- BSCES Waterways, Ports, Coastal & Ocean Technical Group—Chairman (1999-2000); Executive Committee Member

RELEVANT PUBLICATIONS/PRESENTATIONS

- *Use of Marine Remote Sensing Data for Submarine Cable Route Planning and Siting*, Whitney, P.R.; Natale, C.J.; and Nash, J.P., Marine Technology Society/IEEE Oceans 2000 Conference, Providence, Rhode Island, September 2000.