Cricket Valley Energy

Cricket Valley Transmission Line

and Re-conductoring Project

Attachment A

Pre-Filed Direct Testimony

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of the

Application by Cricket Valley Energy Center, LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law For Approval of a New 345 kV Line From the Pleasant Valley Substation to the Cricket Valley Energy Center, LLC, and the Re-conductoring of An Existing 345 kV Line

Case No. _____

THE WITNESSES NAMED BELOW ARE SITTING ON THE FOLLOWING PANELS:

ENVIRONMENTAL / ENGINEERING:

Robert De Meyere, Andrew Degon, Paul Cass, David Klinch, Michael Guski,

Robert O'Neal, Ted Barten, Peter Valberg, John Guariglia

ENGINEERING JUSTIFICATION:

Robert De Meyere, John Marczewski, Manos (Emmanouil) Obessis

APPENDIX A PRE-FILED DIRECT TESTIMONY

Testimony in support of the Article VII Application for the Cricket Valley Transmission Line Project will be supplied by a panel of witnesses, with different witnesses responsible for different exhibits or parts thereof, as indicated below. Below is a list of exhibits that indicates the witness or witnesses whose testimony will support each exhibit.

Exhibit	Witnesses
Exhibit 1: General Information Regarding Application	Robert De Meyere
Exhibit 2: Location of Facilities	Michael Guski Andrew Degon
Exhibit 3: Alternatives	Michael Guski Theodore Barten Andrew Degon
Exhibit 4: Environmental Impact	Michael Guski David Klinch Peter Valberg Robert O'Neal Timothy Lloyd John Guariglia Andrew Degon Paul Cass, PE
Exhibit 5: Design Drawings	Andrew Degon Paul Cass, PE
Exhibit 6: Economic Effects of Proposed Facility	Robert De Meyere Andrew Degon
Exhibit 7: Local Ordinances	Michael Guski David Klinch
Exhibit 8: Other Pending Filings	Michael Guski David Klinch
Exhibit 9: Cost of Proposed Facility	Robert De Meyere Andrew Degon Paul Cass, PE
Exhibit E-1: Description of Proposed Transmission Line	Andrew Degon Paul Cass, PE
Exhibit E-2: Other Facilities	Andrew Degon Paul Cass, PE
Exhibit E-3: Underground Construction	Andrew Degon Paul Cass, PE Theodore Barten
Exhibit E-4: Engineering Justification	Andrew Degon Robert De Meyere Manos (Emmanouil) Obessis John J. Marczewski
Exhibit E-5: Effect on Communications	Andrew Degon Paul Cass, PE
Exhibit E-6: Effect on Transportation	Andrew Degon Paul Cass, PE

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Case No. _____

DIRECT TESTIMONY OF

ROBERT DE MEYERE

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

Q. Please state your full name, employer, and business address.

A. My name is Robert De Meyere. I am employed by Advanced Power Services NA LLC. My business address is 31 Milk Street Suite 1001, Boston, MA 02109.

Q. In what capacity are you employed?

A. I am the Vice President of Development in the Advanced Power Services Boston office and serve as Project Manager for the Cricket Valley Energy Center, LLC project.

Q. Please summarize your education and professional background.

A. I received a Bachelor of Science in Civil Engineering from Northeastern University, Boston, MA in 1989, and a Bachelor of Science in Biology from the State University of New York, Stony Brook, NY in 1976. I have more than 30 years of professional experience in the U.S, and international power industry with expertise in project management, business development and strategic planning. My green-field development and project acquisition experience includes over 4700 MW of operating plants totaling over $4.0 billion. My responsibilities ranged from initiating independent power and cogeneration projects to the acquisition and divestment of projects in North America, Asia, Africa and the Middle East. I have materially participated in both coal and natural gas fired projects throughout these regions. I have lived and worked both in the Middle East and Southeast Asia. I have been in my present position since January 2008. My work has involved project feasibility and development of electric generation projects. Prior to Advanced Power From 2007 to 2008, I was Director of Acquisitions and Project Financing at Burns and Roe Enterprises, Inc. Prior to Burns and Roe from 2004 to 2007, I was a principal at Trinexus Energy Partners. Prior to Trinexus from 2002 to 2004, I

was Director of Development at BTU Ventures, establishing and investing a $290 million private equity fund and successfully led the effort to form the first regional O&M joint venture by an American company with a German power utility. Prior to joining BTU from 2000 to 2002, I was the Manager of Project Development at PG&E National Energy Group the unregulated subsidiary of PG&E Corp., one of the largest utilities in the US. At PG&E, I had primary responsibility for leading a multi-discipline team in the development of a 1,200 MW gas-fired combined-cycle plant. Prior to PG&E NEG from 1997 to 1998, I was Business Development Manager Asia-Pacific for KLT Power Inc. From 1993-1996, I provided consulting services to Trigen Boston Energy, ARS Group and Global Petroleum. From 1991 to 1993, I was Manager and Senior Advisor for Gas Ventures Advisors Southeast Asia. From 1989 to 1991, I was Project Manager for Meridian Power, from 1988 to 1989, I was project Engineer for Alpine American Corporation from 1983 to 1988, I was a design engineer for Wormser Engineering and from 1981 to 1983 I was at Stone and Webster Inc.

Q. Please describe your role in the Cricket Valley Transmission Line Project.

A. I served as Advanced Power's Project Manager for the development of the Cricket Valley project, responsible for the supervision of the internal and external members of the Cricket Valley project team with regard to all aspects of development including the preparation of the Application.

Q. What portion(s) of the Application are you sponsoring?

A. I am helping to sponsor all the exhibits which were prepared for the application.

Q. Does this conclude your testimony?

A. Yes.

ROBERT E. DE MEYERE
137 Stock Farm Road
Sudbury, MA 01776
(978) 443-5478

SUMMARY

Power sector professional with over thirty years of experience in the global IPP market. Expertise includes; business development, project development, project management and strategic planning. Demonstrated success in the identification, evaluation, development and acquisition of power generation projects. Opened new markets in emerging economies. Initiated and managed combined cycle and coal projects from concept through financial close. Demonstrated leadership of cross-functional teams; evaluating, negotiating and finalizing complex project structures and agreements. Multicultural background and a proven ability to successfully negotiate with culturally diverse joint venture parties, commercial entities and governments. Language studies include French, Indonesian and Chinese. Worked, lived and traveled extensively in Europe, The Middle East, and Asia.

PROFESSIONAL EXPERIENCE

Advanced Power NA Inc., Boston, MA January 2008 – Present
Vice President, Development
Advanced Power develops and invests in power generation and related infrastructure projects in Europe and North America.

- Responsible for all activities and resources necessary to site, initiate, develop, permit, license and finance power projects.
- Negotiate long-term contracts with partners, vendors, and customers, working with the Operations and Legal Departments.
- Project Manager for the 1000 MW Cricket Valley Energy project
- Responsibilities include oversight of project teams on existing and new development projects including; feasibility investigations, permitting, conceptual design, capital cost, public and government relations, coordination of electrical interconnection, permitting, and preparation of RFP responses.
- Analyze acquisition opportunities, respond to public bids, and identify potential bid opportunities.
- Responsible for marketing Advanced Power NA projects to power industry, banking and private equity sectors.

Burns and Roe Enterprises Inc., Oradell, NJ January 2007 – January 2008
Director Acquisitions and Projects Finance, Power Consulting Division
The consulting group provides Independent Engineering Due Diligence and owners engineering services to banks, lending institutions, private equity funds, financial advisors, independent power producers, Cogenerators, Utilities and Municipal Authorities.

- Project Manager on due diligence reviews for merchant plants, tolling projects, refinancing of operating plants, bond offerings, 144A financing, appraisal valuations and fatal flaw reviews.
- Led project teams providing consulting services for feasibility investigations, design review, capital cost studies, coordination of electrical interconnection, preparation of RFP responses.
- Responsible for marketing Burns and Roe services to banking and private equity sector

TriNexus Energy Partners LLC, Lexington, MA 2004 - 2007
Principal and Founder, Project Acquisition, Development and Consulting
TriNexus Energy offers a complete range of advisory and transactional services in connection with mid and downstream energy projects, with a specific focus on power generation.

- Negotiated Letter of Intent and Memorandum of Understanding with United Arab Emirates (UAE) based, Investment Company to originate energy related opportunities on a global basis.
- Arranged financing for a newly formed US-based Transmission & Distribution holding company.
- Seven negotiated opportunities totaling 2500MW presented to the investment committee for approval.
- Project agreement with US based Fund to invest in 970MW wind Power Company in Mid-West.

BTU Ventures Inc., Burlington, MA 2002 - 2004

Lead Developer

BTU Ventures and was established in 2001 to capitalize on the deregulation and privatization of the energy and energy-related industries in select Middle Eastern and North African countries. BTU Ventures is a private equity group focused on the midstream and downstream segments of the energy value chain.

- Key Contributor to the creation of $290 million, United Arab Emirates (UAE) based, BTU Power fund and within 18 months fully committed the fund's capital.
- Responsible for deal origination, due diligence, and selection of third party advisors.
- Acquisition of of the 471 MW Rades II project in Tunisia, appointed to Steering Committee.
- Established the first of its kind, regional Operating & Maintenance joint venture with a German utility to manage IPP assets acquired by BTU Power.
- Selected as preferred bidder on the acquisition of a government owned power utility in Jordan.

PG&E National Energy Group, Boston, MA 2000 - 2002

Manager, Project Development

PG&E NEG, an integrated energy company with a strategic focus on power generation, greenfield development, natural gas transmission and wholesale energy marketing and trading in North America.

- Responsible for all activities and resources necessary to site, initiate and develop power projects, specific responsibility for creating a portfolio of investments in the Mid-West and Eastern Canada.
- Managed development and led all negotiations for 1200 MW combined cycle project in the Mid-West and gained site control for five projects in the Mid-west portfolio.
- Built necessary teams of third-party experts including legal, environmental and engineering firms.
- Successfully sited and bid 600 MW combined cycle project to Canadian Utility in twelve week schedule.
- Supervised multi-disciplinary team of internal personnel and external consultants from initiation through development, permitting and construction of combined cycle gas fired power projects.

Power Development, Sudbury, MA 1998 - 2000

Consultant

Consulting services to several companies to take advantage of merchant power opportunities in the United States and to establish a strategy and approach for projects internationally.

- Directed internal and external resources for a start-up company successfully bringing two Midwest projects from proposals into advanced development.
- Created value for 1800 MW of projects for successful sale to third parties.
- Formulated regional strategies and ownership structures for several international projects.

KLT Power Inc., Kansas City, MO 1996 - 1998

Business Development Manager Asia - Pacific

KLT Power was established as part of the strategy to diversify Kansas City Power & Light into unregulated businesses. The objective was to identify development and acquisition opportunities and establish KLT's presence in assigned regions.

- Developed and implemented strategy establishing KLT Power's presence in Southeast Asia.
- Identified and lead due diligence on over 2500 MW of coal and natural gas fired private power projects.
- Successfully initiated and negotiated agreements for over 800 MW of new development opportunities.
- Assigned region expanded to include South Asian projects for KLT.

Independent Power Consultant, Sudbury, MA 1993 - 1996

Consultant

Consulting services and assistance to private sector, foreign government and utility clients sponsoring development of power projects in Asia, Africa, The Middle East and the Americas.

- Financial and technical due diligence and evaluation of projects in Asia and the United States.
- Arranged strategic partnership for a 300 MW combined cycle project in the Middle East.
- Business development strategies for district heating, district cooling and cogeneration projects in the Northeast USA.

Gas Ventures Advisors, Boston, MA 1991 - 1993

Manager

GVA was an international development company formed as an affiliate to British Gas plc. (BG). The objective was to seek opportunities in power generation capable of utilizing or expanding BG's natural gas expertise and resources.

- Formulated and successfully executed strategy to pursue cogeneration opportunities in Malaysia.
- Conceived and originated development of the 720 MW Genting Sanyen Power Project.
- Formulated and proved feasibility of a phased approach to generation for low cost power at an expanding industrial estate on Java, Indonesia.

Meridian Power Corp., Boston, MA 1989 - 1991

Project Manager

Meridian Power was a Boston based independent power development company, with several cogeneration projects in New England.

- Project management of multiple cogeneration projects.
- Prepared EPC, O&M and vendor, selection criteria, term sheets, contract specifications and schedules.
- Participated in successful negotiations of Energy Services, Fuel Supply and Power Purchase agreements.
- Oversight of all technical and permitting related issues.

Alpine American Corp., Natick, MA 1988 - 1989

Project Engineer

- Multiple project responsibility for management, design, fabrication and installation of process systems
- Supervised several Engineers, Designers and Fabricators.

Wormser Engineering, Burlington, MA 1983 - 1988

Designer

- Responsible for conceptual designs and detail plant design for coal fired cogeneration projects.
- Developed computer programs to aid in technical design and financial analysis.

Stone & Webster Engineering, Boston, MA 1981 - 1983

Draftsman

- Assigned to several fossil fuel, fluidized bed and nuclear power generation projects.
- Prepared drawings and design studies during construction for problem resolution.

EDUCATION

Northeastern University Post graduate, MBA studies
Northeastern University - BS Civil Engineering (Cum Laude)
SUNY Stony Brook - BS Biology

PAPERS

Co-authored white paper for UAE client for the design of an integrated utility solution for a major real estate development project - 2005
"Project Development from the Developers Prospective", Seminar program for Pakistan - 1995
"Opening Remarks" as Chairman for Conference on Cogeneration, Jakarta, Indonesia December - 1992
"Cogeneration Revisited" Banker and Tradesman, November - 1992

AFFILIATIONS

Who's Who in Science and Engineering
Member, Chi Epsilon, national honor society for Civil Engineers

PROJECT DESCRIPTION LIST

Project – Cricket Valley Energy, (New York)
MW - 1200
FUEL - Nat. Gas
Development
Development Manager

Project - Carthage Power (Tunisia)
MW - 471
FUEL - Nat. Gas
Operating
Acquisition due diligence, created JV with Steag of Germany to provide O&M

Project - Project Trinity (Turkey)
MW - 3800
FUEL - Nat. Gas
Operating
Lead acquisition effort for three (3) power plants in Turkey – executed purchase agreement

Project - Taweelah B/C (UAE)
MW - 2000
FUEL - Nat. Gas
Operating
Created Bidding consortium successful bid for acquisition of and expansion

Project – Sadaf (Saudi Arabia)
MW - 200
FUEL - Nat Gas
Operating
Bid for acquisition

Project – CEGCO (Jordan)
MW - 1636
FUEL - Oil, Gas,
Operating
Created bidding consortium, and successfully bid to acquire Jordanian Utility.

Project - Goose Lake, (Illinois)
MW - 1200
FUEL - Nat. Gas
Development
Development Manager

Project – Redbud (Oklahoma)
MW - 1000
FUEL - Nat Gas
Operating
Managed Development and Sale

Project – Thunderbird (Oklahoma)
MW - 600
FUEL - Nat. Gas
Development
Managed Development and Sale

Project - Salalah Power (Oman)
MW - 200
FUEL - Nat Gas
Operating
Bid for acquisition

Project - Uch Power Co. (Pakistan)
MW - 500
FUEL - Nat Gas
Operating
Bid for acquisition

Project - Jorf Lasfar Power Co. (Morocco)
MW - 1800
FUEL - Nat Gas
Operating
Preferred bidder on acquisition

Project - Azito Power (Cote d'Ivoire)
MW - 250
FUEL - Nat Gas
Operating
Bid for acquisition

Project - Kiowa Power Partners (Oklahoma)
MW - 500
FUEL - Nat. Gas
Operating
Bid for Acquisition

Project - Bawana II (India)
MW - 300
FUEL - Nat. Gas
Development
Development Manager

Project – Bijapur (India)
MW - 350
FUEL - Coal
Development
Development Manager

Project - Pontianac B (Indonesia)
MW - 110
FUEL - Coal
Development
Development Manager

Project - South Sumatra (Indonesia)
MW - 250
FUEL - Coal bed, methane
Development
Development Manager
Methane

Project – Bentu (Indonesia)
MW - 135
FUEL - Nat Gas
Development
Development Manager

Project – Philnico (Philippines)
MW - 150
FUEL - Coal
Development
Development Manager

Project - Genting Sanyen Power (Kuala Langat, Malaysia)
MW - 720
FUEL - Nat. Gas
Operating
Country Manager, Identified and initiated project development, obtained agreement with Genting Sanyen Paper Mill, determined conceptual design, developed proposal. for TNB, resulting in PPA.

Project - Bumi Serpong Damai (Indonesia)
MW - 400
FUEL - Nat. Gas
Development
Technical support, Established Indonesia conceptual design, and on hold preliminary feasibility study.

Project - Combined Cycle Plant (Penang, Malaysia)
MW - 300
FUEL - Nat. Gas
Operating
Country Manager, Identified and, initiated project developed proposal leading to a JV with Local partner.

Project - Ma Ta Phut (Thailand)
MW - 250
FUEL - Nat. Gas
Operating
Provided development technical support

Project - Romat Hovav (Romat Hovav, Israel)
MW - 300
FUEL - **Oil/Nat Gas**
Awarded
Arranged strategic partnership and structured Joint Venture

Project - Fauji Kabirwala (Kabirwala, Pakistan)
MW - 157
FUEL - Nat. Gas
Operating
Provided financial analysis.

Project - Ocean Spray Cranberry (Middleborough, MA)
MW - 45
FUEL - Nat. Gas
PPA buyout
Project Manager, Identified and selected consultants, coordinated Government agencies, consultants, utility, fuel supply, and engineer. Bid power to utility resulting in PPA. Participated in negotiations for fuel supply and other key agreements.

Project - Stratton Energy Associates (Stratton, ME)
MW - 40
FUEL - Waste Wood
Operating
Financial Analysis for utility buyout of PPA.

Project - University of Rhode Island (Rhode Island)
MW - 60
FUEL - Nat. Gas
Cancelled
Project Manager, Identified and selected South Kingston, RI consultants Coordinated Government agencies, consultants, utility, fuel supply, and Owners Engineer.

Project - Cogeneration Project (Toronto, Canada)
MW - 120
FUEL - Nat. Gas
Operating
Lead Due diligence in Toronto Canada, to audit and identify contractual flaws and project feasibility

Project - Anderson Clayton Foods (Jacksonville, IL))
FUEL - Coal
Operating
Developed conceptual plant layout, Prepared schedules and cost estimates,Wrote Specs and selected vendors, participated in facility start up.

Project - Southeast Missouri University (Cape Gerardeau, MO)
FUEL - Coal
Operating
Developed conceptual plant layout, Prepared schedules and cost estimates

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Case No. _____

DIRECT TESTIMONY OF

THEODORE A. BARTEN, P.E.

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

CRICKET VALLEY ENERGY CENTER, LLC

ARTICLE VII APPLICATION (ELECTRIC FACILITY)

Theodore A. Barten, PE

Q. Please state your full name, employer and business address.

A. My name is Theodore A. Barten. I am employed by Epsilon Associates, Inc. My business address is 3 Clock Tower Place, Suite 250, Maynard, Massachusetts, 01754.

Q. In what capacity are you employed?

A. I am co-Managing Principal of the firm. I work with several of my partners to lead the firm's energy practice. As environmental engineers and consultants, we provide site selection, route selection, environmental analyses, licensing and permitting for energy generation, electric transmission, gas pipeline and other energy infrastructure projects in the Northeast. I have served as the firm's Project Manager for a number of these projects over the past 17 years.

Q. Please summarize your educational and professional background.

A. I received a Bachelor of Science degree in Environmental Engineering from Rensselaer Polytechnic Institute in Troy, New York in 1973. I completed a year of full-time graduate study in environmental engineering at the same institution in 1974, and earned a Masters Degree in Business Administration from Northeastern University in 1980. I am a Registered Professional Engineer in seven states, including my home state of Massachusetts. I have nearly 40 years of experience in engineering and environmental consulting, primarily in the energy field, and have been in my current position since

1997.

In 1997, I joined six of my senior colleagues from the former HMM Associates to co-found Epsilon Associates ("Epsilon"), a privately held engineering and environmental consulting firm, based in Maynard, Massachusetts. My practice at Epsilon is focused on site selection, route selection, environmental analysis, licensing, permitting and compliance for energy and utility projects. Over the past seventeen years, I have been responsible for Epsilon's environmental analysis and permitting efforts for the 525 MW FPL/IDC Bellingham project, the 270 MW Brockton Power project, the 750 MW Constellation Nickel Hill project, the Weaver's Cove LNG terminal and associated pipelines in Fall River, Massachusetts the Braintree Electric Light Department's 116 megawatt ("MW") dual fuel, simple-cycle electric generating facility in Braintree, Massachusetts; (3) Montgomery Energy Billerica Power Partners' ("Montgomery Energy") proposal for a 348 MW dual-fuel, simple-cycle generating facility in Billerica, Massachusetts; and Brockton Power's proposal for a 350 MW combined cycle generating facility in Brockton, MA. My pipeline and transmission line projects have included the Key Span Energy Delivery New England Bourne pipeline, project, Epsilon's route selection and environmental data collection efforts on TransEnergie's 650 MW HVDC Harbor Cable project, a subsurface/submarine cable link between PJM and the Con Ed system in New York City; NSTAR Electric's 345 kilovolt ("kV") underground transmission project running from the Town of Stoughton into NSTAR Electric's South Boston substation, National Grid's Sagamore Pipeline Reinforcement Project, and National Grid's 115 kV underground Worcester Cable project.

More recently, I was Epsilon's Project Manager for routing, licensing and permitting for NSTAR's 18 mile 345 kV Lower SEMA project.

Prior to co-founding Epsilon Associates in 1997, I was responsible for Earth Tech's multi-office Commercial Consulting Division from 1994-1996. Earlier, I was employed by HMM Associates of Concord, MA and its' successor firms, Summit Environmental and Earth Tech. I joined HMM Associates in 1986 and spent the next three years focused on the firm's environmental engineering and permitting practice. My group was responsible for the environmental licensing of several of New England's early independent power projects including Altresco-Pittsfield, Dartmouth Power, and MASSPOWER. In 1989, I became President of HMM and continued to play an active role in the firm's energy practice.

I began my career with United Engineers & Constructors ("UE&C"). From 1974 to 1982, I was employed by UE&C's Boston Office Power Division with responsibility for site selection studies, route selection studies, environmental analysis and environmental licensing for major utility power projects, primarily in New York State. From 1982 to 1985, I was Assistant Chief Engineer, Environmental, with UE&C's General Engineering Division. In this capacity, I was responsible for environmental engineering and permitting on a variety of industrial power and industrial pollution control projects.

Q. Please describe your role in the Cricket Valley Transmission Line Project.

A. Working with the Project team, I provided technical input to several parts of the Article VII application.

Q. What portions of the Application are you sponsoring?

A. I am sponsoring exhibit 3 (Alternatives).

Q. Were the materials referenced above prepared by you or under your supervision

and control?

A. Yes, they were.

Q. Does this complete your testimony?

A. Yes, it does.

THEODORE A. BARTEN, P.E.

MANAGING PRINCIPAL

EDUCATION

Masters, Business Administration, Northeastern University, Boston, MA, 1980
Graduate Study, Environmental Engineering, Rensselaer Polytechnic Institute, 1973-74
B.S. Environmental Engineering, Rensselaer Polytechnic Institute, Troy, NY, 1973

PROFESSIONAL REGISTRATIONS

Registered Professional Engineer in Massachusetts, New Hampshire, Maine, Vermont, Connecticut, Rhode Island, Pennsylvania, and Illinois
National Council of Engineering Examiners Certificate, 1984

PROFESSIONAL SUMMARY

Mr. Barten has more than three decades of experience in engineering and environmental consulting. His principal technical focus is siting, environmental analyses, licensing, permitting and compliance work for electric utility, independent power and industrial clients. A Registered Professional Engineer in eight states, Mr. Barten has been responsible for projects ranging from the routine to the extraordinarily complex and controversial. His projects have typically involved route selection or site selection studies, adjudicatory level environmental review, a full array of Federal, state and local level permits, extensive regulatory agency interface and public presentations. Mr. Barten's extensive expert testimony experience includes twelve successful Massachusetts Energy Facility Siting Board proceedings. Throughout his career Mr. Barten has been able to combine sound technical analysis, credible agency interface and effective client advocacy to secure timely approvals for a wide array of well conceived projects.

Mr. Barten spent the first 12 years of his career with United Engineers & Constructors, a major designer and builder of utility power projects. In 1986, he joined HMM Associates and was responsible for building a respected energy facilities permitting practice. Mr. Barten became President of HMM Associates in 1989. Following the 1994 acquisition of HMM, Mr. Barten was Executive Vice President responsible for Earth Tech's 700 person commercial consulting operation.

In early 1997, Mr. Barten and six senior colleagues from the former HMM Associates co-founded Epsilon Associates. In the firm's early years, he was Project Manager for Epsilon's licensing and permitting efforts for several major merchant power projects. Later, Mr. Barten was responsible for the route selection study, the routing and environmental portions of the EFSB petition and expert testimony for NSTAR's 18 mile underground 345 kV Boston area reliability project and the routing and EFSB elements of KeySpan's 13 mile Sagamore Pipeline Reinforcement project.

He is currently Epsilon's Project Manager for the NSTAR Lower SEMA project, 18 miles of new above ground 345 kV line and associated station work across several southeastern MA towns. The project licensing and permitting effort includes a full EFSB review, MEPA review, Cape Cod Commission review and a number of Federal, Massachusetts and local permits.

On the energy infrastructure and generation front, Mr. Barten was Epsilon's Project Manager for a comprehensive, multi year environmental licensing and permitting effort for the proposed Weaver's Cove Energy LNG import terminal/Offshore Berth Project in Fall River, MA. In 2008, he completed the successful licensing and permitting effort for Braintree Electric's 116 MW Watson Station. In the same time frame, Mr. Barten served as Epsilon's Principal-in-Charge for permitting efforts for a proposed 350 MW combined cycle project in Brockton, MA and a 348 MW simple cycle project in Billerica, MA.

PROJECT EXPERIENCE

Transmission and Pipeline Projects

- *NSTAR Lower SEMA 345 kV Project, Carver, Plymouth, Bourne, Sandwich and Barnstable, MA:* Project Manager for Epsilon's route selection, environmental analysis, licensing and permitting effort for NSTAR's proposed Lower SEMA 345 kV project. Project elements include 18 miles of new above ground 345 kV line (on existing ROWs), a new crossing of the Cape Cod Canal, a new 345 kV/115 kV substation in Barnstable and station work at Carver. The licensing work will include reviews by EFSB, MEPA and the Cape Cod Commission; Federal, Massachusetts and local permits will also be sought.

- *National Grid, Worcester Cable Project, Worcester, MA:* Principal-in-charge for Epsilon's route selection, environmental analysis and EFSB process work for this 3.6 mile 115 kV underground transmission project. The Project included significant substation work at two in City substation as well as work at two outlying stations. EFSB approval is expected in the fall of 2010.

- *KeySpan Energy, Sagamore Line Reinforcement Project, Sandwich, Barnstable, Yarmouth, Dennis and Harwich, MA:* Responsible for the route selection study, routing and environment elements of the EFSB Petition, discovery responses and expert testimony. The Project includes 13 miles of 20"/12" pipe to be constructed in three segments; construction of the initial segment was completed in 2006/2007.

- *NSTAR 345 kV Transmission Reliability Project, Stoughton, Canton, Milton, Boston, MA*: Responsible for route selection study and associated elements of the EFSB and MEPA filings for this proposed 18 mile multi-circuit underground 345 kV project. The $210,000,000 project will connect the NSTAR 345 kV grid south of Boston to existing substations in Hyde Park and South Boston. The project was constructed in two phases; the first phase (2 of 3 circuits and substaitons) was placed in service in 2007.

- *KeySpan Energy, Cape Cod Pipeline Reinforcement Project*: Route selection, environmental analysis, MA EFSB Petition, MEPA ENF and permitting for KeySpan's Cape Cod Pipeline Reinforcement project. Approximately eight miles of new 12" diameter 200 psi pipeline will strengthen the KEYSPAN gas delivery system in the Bourne/Sandwich/Falmouth area. The project was built and is in commercial operation.

- *TransEnergieUS Harbor Cable Project*: Route selection study, regulatory interface, licensing and permitting strategy for a 20+ mile, 650 MW HVDC underground/submarine merchant cable to connect PJM and NYPOOL.

Energy Infrastructure Projects

- *Weaver's Cove Energy, Fall River, MA*: Responsible for regulatory interface, environmental studies, analysis, licensing and permitting for a proposed LNG import terminal on the Taunton River in Fall River, MA. The new terminal will be located at the former Shell Oil marine terminal and will include a 200,000 cubic meter storage facility, a vaporization system, a truck loading area and two pipeline connections to the Duke/AGT "G" lateral.

  The FERC jurisdictional project will also include a new pier and berthing area, expansion of an existing turning basin and dredging in portions of the existing seven mile long Federal channel. Dredge volumes are expected to be approximately 2,500,000 cubic yards; the dredge material has been determined to be suitable for offshore disposal. In addition to the FERC Resource Reports, permit applications were filed with the US Army Corps, MA DEP, MCZM, RI DEM, RI CRMC and four local Conservation Commissions. FERC approval was granted in July 2005; permitting continued into 2006 and 2007.

  In March of 2008, Hess/Weaver's Cove announced the Offshore Berth Project. This potential modification includes a berth/unloading platform in Mount Hope Bay and a 4.25 mile submarine "pipe in pipe" LNG transfer line to connect the unloading platform to the terminal in Fall River. An updated FERC filing was made in early 2009 together with a full suite of permit applications.

- *Confidential Client, LNG Peak Shaving Facility*: Site selection, evaluation and technical analyses for a proposed 220,000 gallon LNG peak shaving facility in Southeastern Massachusetts.

Utility Site Selection/Route Selection Studies

- Site selection efforts for AES Enterprise Inc. in Connecticut and New York. Sizeable areas were examined to identify suitable sites for 500 MW CTCC merchant plants.

- Study Manager for a major site selection study conducted for the Allegheny Power System; APS is the holding company for West Penn Power, Monongahela Power, and Potomac Edison. A 50,000 square mile region of interest in Pennsylvania, West Virginia, Ohio, Maryland, and Virginia was examined. Site engineering and environmental characteristics, together with off-site waste disposal, water augmentation reservoirs, and transmission requirements were evaluated for 2000 MW and 600 MW coal-fired power stations. Approximately 60 sites were identified and evaluated; six sites were recommended to APS.

- Study Manager for a follow-up study to the initial study conducted for Allegheny Power System. The follow-up study was a detailed comparison of five preferred 2000 MW sites. The study included preparation of refined site layouts, sizing of off-site water augmentation reservoirs, preparation of differential capital and operating cost estimates, an assessment of licensing schedules, and air quality modeling. The results of these analyses were used to rank and compare the sites. The recommended site was expected to be the location of APS's next major generation project.

- Environmental supervisor for a study to identify and evaluate ten potential New York State locations for a 25 MW wood-fired cogeneration facility. The study was commissioned by the Power Authority of the State of New York. The statewide siting effort included analyses of wood fuel supply and cogeneration economics. Two preferred locations were identified and accepted by PASNY.

- Transmission Line Route Selection - Responsible for a route selection and subsequent preparation of an environmental analysis for 160 miles of 115 and 345kV transmission lines associated with East Kentucky Power Cooperative's J.K. Smith Power Station (1200 MW). Developed the route selection methodology, estimated costs of various alternatives, and analyzed constructability considerations. Provided expert testimony on route selection and environmental effects at Kentucky Energy Regulatory Commission public hearings.

Merchant Power and Cogeneration Projects

- *Brockton Clean Power, LLC, Brockton, MA*: Principal-in-charge for the licensing and permitting effort for a 350 MW combined cycle plant sited on a 13 acre site adjacent to the Brockton Advanced Water Reclamation Facility. The dual fuel facility includes wet mechanical cooling towers, duct firing and black start capability. Cooling tower makeup will be treated effluent from the AWRF. Licensing elements include MEPA review, a full EFSB review including a local zoning exemption, USEPA PSD review, and a number of DEP and local approvals. The project completed its EFSB and MEPA review; a 2010 Project Change Filing is currently before the EFSB.

- *Montgomery Energy Billerica Power Partners, LLP, Billerica Energy Center, Billerica, MA:* Principal-in-charge for the licensing and environmental permitting for a proposed 348 MW generation facility in Billerica, MA. The peaking facility includes six dual fuel quick start Rolls Royce Trent 60 gas turbines and ancillary equipment on a 14 acre industrial site. Project licensing includes MEPA review, the EFSB process, a DEP Non-Major Comprehensive Air permit and local approvals.

- *Braintree Electric Light Department, Braintree, MA*: Project Manager for the environmental analysis and licensing effort for the 116 MW simple cycle Thomas A. Watson Generating Station. The facility includes two dual fuel quick start Rolls Royce Trent 60 gas turbines and ancillary equipment. Project licensing includes MEPA review, a full EFSB process, an EPA PSD permit and a DEP Major Source Air Plan review. The facility was placed in commercial operation in mid 2009.

- *Constellation Power Development, Dracut, MA:* Project Manager for the environmental analyses and licensing effort for a proposed 750 MW Nickel Hill Energy project. The combined cycle merchant plant will employ wet mechanical cooling towers; cooling tower makeup will be withdrawn from the nearby Merrimack River. In addition to MEPA, EFSB and DEP approvals, provided extensive testimony at seven evenings of hearings leading to issuance of the Town of Dracut Special permit.

- *Brockton Power LLC, Brockton, MA:* Project Manager for the environmental analyses and licensing effort for the 270 MW project. This ABB based CTCC unit will use evaporative cooling; make-up water will be provided by the adjacent City of Brockton treatment plant. In addition to MEPA, EFSB and DEP approvals, participated in hearings for zoning variances (granted).

- *Sithe Energies, Weymouth, MA:* Strategy and senior level review for the environmental analysis and licensing effort for a 750 MW Fore River project. The project is located at the former Boston Edison Edgar Station site in Weymouth, MA. Provided input to the analysis of alternatives to the proposed once through cooling system, safety issues, and engineering issues.

- *Florida Power and Light IDC, Bellingham, MA:* Principal-in-Charge, responsible for alternative site evaluation, and elements of the EFSB petition and MEPA documents for a 525 MW CTCC merchant plant. Worked closely with IDC to secure Town of Bellingham approvals.

- *CH Resources/Central Hudson Gas & Electric, MA/CT:* Environmental consultant to for generation acquisition due diligence efforts.

- *Various Clients:* Officer-in-charge for the licensing of several gas turbine-based power projects: All of these projects were built and placed in commercial operation.

  - *MassPower (Makowski/GE/Bechtel), Monsanto, Springfield, MA:* 240 MW cogeneration facility

  - *Energy Management, Inc., Dartmouth, MA:* 60 MW independent power project

  - *Energy Management, Pawtucket, RI:* 60 MW cogeneration unit

  - *Indeck Energy at Hammermill Paper, Oswego, NY:* 60 MW cogeneration unit

- *General Electric, Pittsfield, MA:* Project Manager for the licensing of ALTRESCO's 166 MW gas turbine combined cycle power plant. Responsible for MEPA, Energy Facilities Siting Council, and DEQE submittals. A waiver of the mandatory MEPA EIR was secured. The project was fully permitted in less than one year and began commercial operation in the fall of 1990.

- *Pepperell Power Corporation (Energy Management, Inc.), Pepperell, MA:* Project Manager for the licensing of a 40 MW gas turbine combined cycle unit. Located at the James River paper mill in Pepperell, MA, this plant began commercial operation in 1989. Wastewater was discharged via the mill's treatment works to the Nashua River, modifications to the mill's NPDES permit were secured to implement this cost effective solution.

- *Corps of Engineers, Rantoul, IL:* Directed the licensing effort for a 270,000 lb/hr Coal-Fired Central Heating Plant, Chanute Air Force Base. Work included a NEPA Environmental Assessment, a solid waste disposal evaluation, and complete State of Illinois PSD, air, wastewater, and solid waste permitting. A Finding of No Significant Impact was granted based on the NEPA Environmental Assessment.

- *Uniroyal Chemical's, Geismar, LA:* Directed a comprehensive air quality modeling effort, BACT analysis and PSD demonstration for a 460,000 lb/hr coal-fired cogeneration facility.

Utility Power Projects

- Supervising Licensing Engineer for the New York State PSC Article VIII/NRC Environmental Review process for a 2400 MW nuclear power station proposed by New York State Electric & Gas. The project included comprehensive site data collection programs and complete analysis of two sites as well as an assessment of a 2400 MW coal alternative. The preferred site was located on the southeastern shoreline of Lake Ontario while the alternate site was located on the Hudson River south of Albany. Extensive hydrologic field studies and mathematical modeling were conducted to support 316(b) discharge demonstrations. A 32 volume, 20,000 page joint Nuclear Regulatory Commission, NYS Public Service Commission Environmental Report was prepared and accepted.

- Completed a series of assignments for the Nantucket Electric Company (NEC). Projects included permitting of supplemental diesel generator installations at the Nantucket Airport and an air quality modeling study for NEC's 20 MW downtown facility. The latter was conducted in response to a MA DEQE Consent Order; facility stacks were raised to bring the plant into full compliance.

Waste-to-Energy Projects

- Project Manager for the Independent Engineers review of the 1500 TPD Wheelabrator Milbury, MA resource recovery facility. This work was completed for John Hancock Insurance in support of a $300,000,000 debt financing. Also conducted follow-on monitoring of plant availability, heat rate, waste through-put and residue generation rates.

- Advisor to the Town of Lancaster, MA Board of Health on a proposed 800 TPD resource recovery facility. Assisted the Town in reviewing competitive proposals, provided technical review throughout the Site Assignment process, and presented recommendations at public forums.

- Officer-in-Charge for site evaluation, environmental assessment, and permitting for Energy Initiatives proposed 20 MW New England Wood Energy facility, Brockton, MA. The project was to be fueled with a mix of whole tree chips and demolition debris.

- Project Manager responsible for licensing and permitting support for American Ref-Fuel's proposed 1500 TPD-40 MW refuse energy facility in Lowell, MA. Air quality, truck traffic, and noise analyses were provided under subcontract to ARI, Concord, MA.

- Conducted a feasibility study for a mass burn refuse energy facility at Chanute AFB, Rantoul, IL. Refuse availability and environmental requirements were determined. Conceptual designs and life cycle cost analyses were prepared for 60 TPD and 25 TPD modular controlled air incineration units and presented to the U.S. Army Corps of Engineers.

- Directed the licensing and community relations effort for Dartmouth College's 90,000 lb/hr wood-fired boiler project in Hanover, NH. The boiler was to be housed in an on-campus central heating plant; the project also included a remote wood-fired storage facility. Licensing activities included a DOE Fuel Use Exemption petition, a New Hampshire Air Permit, and a PSD exemption from the Governor of New Hampshire. While the project has successfully permitted, changing project economics led to installation of an oil-fired boiler.

Pulp & Paper Projects

- Project Manager responsible for a water quality modeling effort to assess the waste assimilative capacity of the Alabama River under extreme low flow conditions. The analysis was conducted for MacMillan Bloedel's 2000 TPD Pine Hill, Alabama kraft pulp and paper mill. Represented MBI in negotiations with the Alabama DEM, secured discharge permit waiver.

- Conducted an assessment and analysis of long-standing clarifier/lagoon NPDES discharge permit violations for 600 TPD mill in Georgia. Examined production rates, pulp wastage, lagoon residence times, precipitation patterns, and other parameters. Recommended low cost improvements and presented them to the Georgia DNR.

- Project Manager for an environmental regulatory analysis of a proposed 300 TPD bleachery at Interstate Paper, Riceboro, GA.

- Appraisal and Economic Analysis for Hammermill Paper Company's Lock Haven, PA 460,000 lb/hr coal-fired boiler plant. Components of the appraisal included site inspections, inventory of existing equipment, determination of remaining useful life for major equipment, and estimates of replacement cost and current fair market value. The report was compiled to support a $40,000,000 leveraged lease transaction. Financing was successfully concluded.

Environmental Engineering Projects

- Environmental engineering support for the reuse of a 60 acre marine petroleum terminal in Southeastern Massachusetts. A variety of alternative uses were explored as part of a comprehensive master planning effort.

- Analysis of water supply and sewer requirements and available infrastructure for the proposed reuse of the South Weymouth Naval Air Station. The reuse plan includes up to 4,000,000 sf of commercial/business space on the 1400 acre base.

- Engineering input for Bluestone Energy's proposed 5 MGD Taunton River Desalinization Project. This first of its kind project will treat brackish water from the lower reaches of the Taunton River; drinking water will be conveyed north to Brockton via a new 15 mile pipeline.

- Project Engineering Manager for design of a 90,000 cfm forge hammer exhaust and air pollution control system for Wyman-Gordon, Worcester, MA. The $2,000,000 system included moveable exhaust hoods at four hammers, ductwork, high efficiency air filtration systems, mist eliminators, stacks, an elevated equipment enclosure, and a 1500 kVA substation. The design effort was preceded by an extensive on-site pilot testing program.

- Project Engineering Manager for design of a 9,000 cfm welding fume exhaust and control system for Wyman-Gordon, Grafton, MA. The $250,000 system included three separate exhaust trains, special high temperature hoods, baghouses, and all necessary ductwork.

- Project Engineering Manager for Boiler Efficiency and Control Study for Shenango, Inc., a Pittsburgh area pig iron, coke, and ingot mold producer. The study objective was to develop a particulate control upgrade for two existing 75,000 lb/hr multi-fuel boilers (coal, blast furnace gas, coke oven gas). At the time of the study, the boilers were not able to fire coal because of particulate emissions violations.

- Project Engineer for an assessment of water supply requirements, sewage and leachate discharges from a 1,500,000 SF commercial development in Framingham, MA. The 150-acre project site included the 32-acre former Town of Framingham landfill.

EXPERT TESTIMONY EXPERIENCE

Expert Testimony, Massachusetts Energy Facilities Siting Board, Environmental Analysis, Brockton Power Project Change Filing, 350 MW combined cycle power project, 2010

Expert Testimony, Massachusetts Energy Facilities Siting Board, Environmental analysis, Advanced Power Brockton Clean Energy, 350 MW combined cycle power project; 2008-2009.

Expert Testimony, Massachusetts Energy Facilities Siting Board, Site selection, and environmental analysis, Montgomery Energy Billerica Power Partners, LLP, 348 MW peaking power project; 2008.

Expert Testimony, Massachusetts Energy Facilities Siting Board, Project alternatives, site selection, and environmental analysis, Braintree Electric Light Department, 116 MW Thomas A. Watson Generating Station; 2007-2008.

Expert Testimony, Massachusetts Energy Facilities Siting Board, justification for EFSB override of a Cape Cod Commission denial, KeySpan Energy Delivery, Sagamore Line Reinforcement Project (Cape Cod, MA), 2006-2007.

Expert Testimony, Massachusetts Energy Facilities Siting Board, Project alternatives, route selection, cost estimates and environmental analysis, KeySpan Energy Delivery, Sagamore Line Reinforcement Project (Cape Cod, MA); 2005-2006

Expert Testimony, Massachusetts Energy Facilities Siting Board, Project alternatives, route selection, environmental analysis and mitigation, construction methodology; NSTAR Electric 345 kV Transmission Reliability Project (Stoughton to Boston); 2004-2005.

Expert Testimony, Massachusetts Energy Facilities Siting Board, site conditions and justification for an extension of the March 2000 EFSB approval, 270 MW Brockton Power Project; 2003.

Expert Testimony, Massachusetts Energy Facilities Siting Board, Project alternatives, route selection, cost estimates and environmental issues, KeySpan Energy Delivery Cape Cod Pipeline Reinforcement Project; 2003.

Expert Testimony, Massachusetts Energy Facilities Siting Board, Site selection, engineering, environmental and safety issues, 750 MW Constellation Power Nickel Hill Energy Project; 1999-2000.

Expert Testimony, Massachusetts Energy Facilities Siting Board, Engineering, environmental and safety issues, 270 MW Brockton Power Project, 1999.

Expert Testimony, Massachusetts Energy Facilities Siting Board, Safety and water/wastewater issues, Sithe Energies 750 MW Fore River Station; 1999.

Expert Testimony, Massachusetts Energy Facilities Siting Board, Site selection, environmental and safety issues for the 525 MW FP&L IDC Bellingham project; original Petition and subsequent Compliance filing; 1998, 1999, 2000.

Expert Testimony, Massachusetts Energy Facilities Siting Council, Environmental issues and mitigation measures for the 166 MW ALTRESCO cogeneration facility, Pittsfield, MA; 1988.

Testimony, Massachusetts Legislature, Joint House Senate Energy Committee, "Comparative environmental effects of coal-fired power generation".

Expert Testimony, Kentucky Energy Regulatory Commission, Route selection and environmental effects of 160 miles of 115 and 345kV transmission lines, East Kentucky Power Cooperative.

PROFESSIONAL AFFILIATIONS AND HONORS

National Society of Professional Engineers
Massachusetts Society of Professional Engineers
Northeast Energy and Commerce Association (NECA), Board of Directors, 2003-2008
MADOER Bio-mass Energy Working Group; Technology Committee Chair
Chi Epsilon (National Civil Engineering Honorary)
Beta Gamma Sigma (National Management Scholastic Honorary)
Rensselaer Mathematics and Science Medal
Bausch & Lomb Science Medal

PREVIOUS EMPLOYERS

Earth Tech/Summit, Executive Vice President, Commercial Division - 1994-96
Summit Environmental/WW Engineering & Science, President - 1994
Summit Environmental/HMM Associates, President - 1990 - 94
HMM Associates, President - 1989
HMM Associates, Vice President, Division Manager, Environmental Engineering & Permitting - 1986 - 88
United Engineers & Constructors Inc., General Engineering Division, Assistant Chief Engineer - 1982 - 85
United Engineers & Constructors Inc., Power Division, Supervising Licensing Engineer, Project Engineer - 1974 - 82

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of the

Application by Cricket Valley Energy Center, LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law For Approval of a New 345 kV Line From the Pleasant Valley Substation to the Cricket Valley Energy Center, LLC, and the Re-conductoring of An Existing 345 kV Line

Case No. _____

DIRECT TESTIMONY OF

PAUL G. CASS, PE

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

Q. Please state your full name, employer, and business address.

A. My name is Paul G. Cass. I am employed by DiGioia Gray and Associates, LLC. My business address is 570 Beatty Road, Monroeville, Pa 15146.

Q. In what capacity are you employed?

A. I am an Associate at the firm. DiGioia Gray and Associates is an Engineering Consulting firm. Over 90 percent of the firms business is in the electric power delivery market which includes engineering services for transmission lines and substations. I serve as a technical consultant as well as Project Manager for various electric transmission projects.

Q. Please summarize your education and professional background.

A. I received a Bachelor of Science in Civil Engineering from the University of Pittsburgh in 1972 and a Master of Science in Civil Engineering from the University of Pittsburgh in 1975. I have over 40 years' experience in Civil Engineering specializing in transmission line engineering, structural engineering and geotechnical engineering. I've been directly involved with most aspects of transmission lines and transmission projects from inception to removal for about 34 years. I have served in my present position since July 2007. Prior to joining DiGioia Gray, from 1981 to 2007 I held various engineering positions at Duquesne Light Co. From 1975 to 1981 and from 1972 to 1973 I was a geotechnical engineer for GAI Consultants in Monroeville, Pa.

I am a licensed professional engineer in Pennsylvania, New York and five other states.

Q. Please describe your role in the Cricket Valley Transmission Line Project.

A. I served as DiGioia Gray's Lead Engineer for the Article VII Application, responsible for a preliminary detailed design of the transmission lines including conductor selection, structure design, assessment of constructability issues, cost estimation, EMF analysis and line performance assessment. I was the Project Manager and Lead Engineer for the preparation of two System Deliverability Upgrade studies prepared for Consolidated Edison and the New York Independent System Operator (NYISO) for this project.

Q. What portion(s) of the Application are you sponsoring?

A. I am sponsoring the following exhibits, which were prepared by me or under my supervision and direction: Exhibit 4 (Environmental Impact – EMF Analysis), Exhibit 5 (Design Drawings), Exhibit 9 (Cost of Proposed Facilities), Exhibit E-1 (Description of the Proposed Line), Exhibit E-2 (Other Facilities), Exhibit E-5 (Effect on Communications), and Exhibit E-6 (Effect on Transportation).

Q. Does this conclude your testimony?

A. Yes.

Paul G. Cass, P.E.

Associate – Sr. Consultant – Transmission Line Engineering Group

Education

B.S. Civil Engineering, 1972
University of Pittsburgh

M.S. Civil Engineering, 1975
University of Pittsburgh

Registrations/Certifications

Professional Engineer
Pennsylvania, New York, Virginia, New Jersey, Ohio, Indiana & Texas

Professional Affiliations

American Society of Civil Engineers, 1972 to present
IEEE, 2009 to present

Employment History

2007-present
DiGioia, Gray & Associates, LLC
Associate

1994-2007
Duquesne Light Company
Principal Engineer

1981-1994
Duquesne Light Company
Sr. Engineer

1975-1981
GAI Consultants, Inc.
Geotechnical Engineer

1972-1973
GAI Consultants, Inc.
Geotechnical Engineer

Honors

Chi Epsilon (Civil Engineering

Honorary Society)

Summary

Transmission engineering including transmission line analysis and design; analysis and design of foundations for transmission and substation structures; transmission line siting and routing; electrical performance of transmission lines; inspection, maintenance and repair of transmission line and substation structures and foundations; analysis, design and modifications of microwave and antenna structures. Structural engineering for buildings and general type structures. Geotechnical engineering associated with landslide evaluation and stabilization, foundations, and various retaining structures.

Professional Experience

Sr. Consultant and Group Mgr. of Transmission Line Engr.

As Group Manager of Transmission Line Engineering from June 2007 to July 2011 and as Sr. Consultant from July 2011 to present. Responsible for transmission line & structure design, from inception through construction phases. Evaluations and assessments of existing lines and structures, including structural modeling and analysis, clearance studies, NESC Code conformance, electrical performance and design criteria evaluations.

Project Manager and Lead Engineer to evaluate feasibility, constructability and cost for a potential transmission line to connect a natural gas power plant to the transmission grid. The project is located in New York and involved the design of a 15 mile 345kV line and a reconductoring and reinforcement of an existing 3 mile 345kv lattice tower line. The project included constructability assessment, environmental assessment, an addition to 345kV substation, evaluation of permit requirements, structure and foundation designs, insulator assembly designs, design for energized work methods, material and equipment requirements, detailed cost estimation, schedules, EMF analysis, lightning performance, property identification and protection of underground gas facilities.

Project Manager and Consultant for the inspection, evaluation and design of modifications and reinforcement of an 11.2 mile transmission line for PPL which was being upgraded to improve electrical performance and replacement of a shield wire with an OPGW. Responsible for the inspection of all structures; grounding evaluation of all structures; lightning performance analysis and improvement recommendations; structure analysis based upon changed loads and loading criteria; structure reinforcement recommendations, erection details and fabrication details; plan and profile drawings, stringing and construction details for the installation of the OPGW.

Lead a study sponsored by EPRI to develop a guide for the design of transmission structures to facilitate and improve the constructability and maintainability of future transmission lines. The study investigates and makes recommendations regarding the design and placement of ladders, platforms, vangs and other appurtenances used during operations, construction and maintenance. Structure design to enable hot-line maintenance is also addressed. In 2014 the topics of "Good Design/Construction Practices" and "Design for Safe Construction Practices" will be addressed.

Paul G. Cass, P.E.

Associate – Sr. Consultant Transmission Line Engineering Group

Responsible and transmission line engineering expert for various peer review projects. Conducted peer reviews for Duquesne Light Co, Consolidated Edison, Orange and Rockland Utilities and URS. These peer reviews entailed tower modeling and reinforcement recommendations; PLS-Cadd modeling; line upgrading; construction plans and specification; and constructability issues. Almost all peer reviews have resulted in identifying crucial design or construction errors or missing information prior to construction and or structure reinforcement.

Lead a study sponsored by CEATI International to develop deflection criteria for steel poles and drilled shaft foundations. Modeling and parametric studies were conducted to ascertain the effects of pole flexibility on sag, clearances, appearance and stringing procedures. Recommendations for structure and foundation deflection criteria to be used in design specifications were developed for industry use.

Developed and implemented a process to evaluate and resolve NERC clearance violations. This process was utilized to resolve various 345kV clearance violations for an eastern US utility. The process allowed the engineer to determine the solution which provided the greatest value.

Project Manager and Lead Engineer for the construction, structure rehab or relocation of twenty 138kv transmission lines for Duquesne Light Co. The work included, inspections, line layout, line design, structure (towers, poles and steel h-frames) design, structure reinforcement and repairs, foundation design, letters of notification, permitting, material management, cost estimation and all construction documentation.

Project Manager and Lead Engineer of the analysis and recommendations of Allegheny Energy's 138 kV Whiteley Substation subsidence. In February, 2010, this 138 kV substation dropped 5 feet due to longwall mining underneath the substation. DGA predicted the types and area of overstress and also provided detailed recommendations to mitigate the problems. DGA monitored the station during the subsidence event and recommended adjustments and various schemes to be used to stabilize the structures. The substation successfully withstood the subsidence event and stayed energized during the event. This project was awarded the ESWP Industrial Project of the Year for 2011.

Project Manager and technical support for the evaluation and improvement of the lightning performance of an 18 mile double circuit 138kV transmission line for PPL. Using the EPRI program TFLASH, the line performance was evaluated at its existing condition and under various insulator, grounding, and lightning arrester improvements. Construction cost for each option was determined.

Authored a Manual on "Transmission Line Inspections, Recommendations, Maintenance and Work Management" for Duquesne Light Co. This comprehensive Reference Manual covers all aspects of inspecting and maintaining a transmission line system.

Project Manager for the Structural Evaluation and Modifications of Two 500 Ft Tall 345 kV Transmission Towers owned by ConEdison. This included addition of elevator platforms and tower reinforcement for pendulums to prevent conductor galloping.

Prepare and Instruct a Continuing Education Course in Transmission Line Design, Siting, Maintenance and Inspection for DGA engineers and engineers from outside utilities, such as Duquesne Light and Allegheny Power.

Project Manager for the design, permitting and construction documents for the relocation or construction of 14 transmission lines for Duquesne Light Company.

Project Manager and lead engineer on the development of a process and associated software which utilizes life cycle costing methods to optimize the design of transmission lines. This is a research project for the Electric Power Research Institute (EPRI). Project tasks included: Developed methodology to determine initial capital, operation, energy losses, transmission outage, maintenance and failure costs; prepared a spreadsheet program to determine costs during planning, line siting and final engineering phases; calculated present value costs for all cost items; integrated dependability concepts in the design of transmission lines; and prepared presentations

and reports to EPRI on the project.

Project Manager for a study and recommendations to improve lightning performance for approximately 20 miles of 138kV transmission lines in north eastern Pennsylvania using the EPRI program TFLASH. Evaluated options of improved grounding, lightning arresters, increased insulation and un-balanced insulation. Made recommendations and cost estimate based upon performance and cost.

Engineer of record for the design of three new types of electric transmission lattice towers. The towers are for American Electric Power (AEP) with design by Brametal of Brazil. Responsibilities include checking and validation that the structures meet NESC Code, ASCE 10 for lattice transmission structures and AEP's Design specification.

Responsible for the analysis, evaluation of distress and recommendations for A-frame structure foundations for Florida Power & Light, St. Lucie-Midland transmission lines. DGA inspected, assessed, modeled and prepared repair recommendations to ascertain the cause and impact of cracking of foundations and anchor bolt section loss on hybrid concrete pile foundations used to support critical structures

Responsible for the inspection, assessment and recommendations of approximately 400 miles of 230kV and 69kV transmission lines for PPL. The purpose of this inspection/assessment process is to determine if the lines should be repaired (maintained), rehabilitated (reinforcement and/or upgraded) or rebuilt. This incorporated consideration of life cycle costs, structure reliability and deterioration.

As Principal Engineer for Duquesne Light Company:

Project Engineer for the engineering, design and project management for construction and maintenance of transmission line, substation and underground facilities.

Developed and responsible for a periodic inspection program of all transmission line structures which is a comprehensive ground and aerial inspection program. Evaluation and analysis of the inspection data.

Development of maintenance/replacement recommendations and work management associated with the implementation of these recommendations.

Resident Geotechnical Engineer for foundation designs, construction issues and landslide evaluations

Performed engineering and investigative studies for the T&D Operating Departments

Preliminary engineering and siting support for a eight mile tap 138kV transmission line to Wildwood Substation near Pittsburgh Pa. Responsibilities included a complete transmission line design of single circuit wood structure line; Duquesne Light representative during several public input hearings; Duquesne Light representative for transmission line design and construction during PUC evidentiary hearings. Successful in presenting arguments that public and contractor safety, line reliability, line constructability and cost in addition to environmental concerns were factors in determining the line location.

Project Engineer for the design of 138/345-kV Emergency Restoration Structures (11) utilizing a common pole and standard transmission hardware. Project Manager for the development process of designing and building a temporary replacement 138-kV or 345-kV line in the event of a catastrophic structural failure. Duquesne Light representative for the PJM 345-765kV transmission line restoration guidelines. Lead transmission/structural engineer assigned to the DLC transmission restoration team.

Project Engineer for the designed "Controlled Failure" transmission structures modifications to suspension H-frame structures allowing the wire to fall to the ground just prior to a complete structure failure. This process was critical for tree "fall-in" areas.

Served as, "Expert Witness" for various lawsuits against Duquesne Light Company.

Paul G. Cass, P.E.

Associate – Sr. Consultant Transmission Line Engineering Group

Manager for the development and utilization of the Transmission Line Structures (TLS) program for Duquesne Light Company consisting of:

A comprehensive database program covering transmission structure and transmission line design, references (drawings, etc.), inspection, materials, maintenance recommendations, and work management

Project Engineer for the analysis, strengthening and modification of microwave towers and other structures for the addition of antennas or microwave equipment and other associated appurtenances.

Supervisor of various technicians preparing construction drawings and the inspections for the transmission line engineering program.

Expert in the use of the Flip7 program and PLS-Cadd, PLS-Pole, and PLS-Tower programs

Integrated Lidar data into PLS-Cadd

Developed "Standards" and "Materials Management" documents using the PLS series programs

Developed and conducted a program to inspect, analyze and prepare recommendations for bowed, laminated wood cross-arms:

Video taped visual inspection of all cross-arms

Detailed inspections (coring) of over 500 cross-arms

All inspections and recommendations were conducted through a series of linked database programs.

Developed Standards for transmission line loadings; vault, manhole and ductbank construction; vault and precast manhole design; and the implementation of AutoCAD for transmission line and structural-type drawings.

Wrote several engineering type computer programs utilizing QuickBasic and Autolisp. One program BIAXCOL3 (analysis of rectangular reinforced concrete columns under biaxial loads) was marketed very successfully by the American Concrete Institute for over eight years.

As Engineer for GAI Consultants, Inc.:

Inspected and evaluated 25 dams in Ohio

From 1979 thru 1981, contributed to the Drilled Pier Research Study for EPRI which included the development of a theoretical model for drilled pier behavior (evolved into the PADLL and MFAD computer programs), and the data reduction of all instrumentation and laboratory testing.

Publications and Presentations.

2012 Cass P.G., Horn M., Bazan-Zurita, E.B., Mitigation and Monitoring of Structural Distress in the Whitely Electrical Substation Due to Mine Subsidence. Presented at the 2012 Electrical transmission and Substation Structures Conference, Columbus, Ohio, November 2012

2010 Cass P.G., DiGioia A. M., Jr., and Chan J., Life-Cycle Cost and Performance of Electric Transmission Line Systems. Presented at the Second International Symposium on Life-Cycle of Civil Engineering Systems, Taipei, Taiwan, October 27-31.

2009 Cass P.G, Wood Transmission Pole Foundation Depth ≠ 10% + 2 Ft. Presented at the Southeastern Electric Exchange Annual Conference and Trade Show, Atlanta, Georgia, June 8-10.

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of the

Application by Cricket Valley Energy Center, LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law For Approval of a New 345 kV Line From the Pleasant Valley Substation to the Cricket Valley Energy Center, LLC, and the Re-conductoring of An Existing 345 kV Line

Case No. _____

DIRECT TESTIMONY OF

ANDREW DEGON

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

Andrew Degon

Q. Please state your full name, employer, and business address.

A. My name is Andrew Degon. I am employed by Advanced Power (NA), Inc... My business address is 31 Milk Street, Suite 1001, Boston, MA 02109.

Q. In what capacity are you employed?

A. I am the Director of Engineering and Construction for Advanced Power (NA) and serve as the Project Engineer for the Cricket Valley Energy Center project.

Q. Please summarize your education and professional background.

A. I received a Bachelor of Science in Mechanical Engineering from Rutgers University in 2000. I have over 13 years of professional experience in the power industry as a project engineer and project manager for the development, construction and operation of over 5,000 MW of power projects including related fuel, electric and water infrastructure. My work has involved the direction of all technical aspects of power plant development, including management of technical consultants, technical support for permitting and siting activities, development of RFPs and solicitation of proposals from equipment vendors and construction contractors, negotiation of commercial contracts, capital and operating cost estimating, and technology assessments.

Prior to joining Advanced Power, I was a Senior Development Engineer with Capital Power Corporation from 2011 to 2013, and from 2008-2011 I was a Project Manager with GenPower Services. From 2004-2008, I was a Project Engineer with L.S. Power Development, from 2001-2004 I was a Project Engineer with R.W. Beck, and from 2000-2001 I was a Project Engineer with Joseph Technology Corporation.

Q. Please describe your role in the Cricket Valley Transmission Line Project.

A. I served as the engineering lead for the Applicant on all technical aspects of the Article VII Application.

Q. What portion(s) of the Application are you sponsoring?

A. I am sponsoring the following exhibits, which were prepared by me or under my supervision and direction: Exhibit 2 (Location of Facilities), Exhibit 3 (Alternatives), Exhibit 4 (Environmental Impact), Exhibit 5 (Design Drawings), Exhibit 9 (Cost of Proposed Facility), Exhibit E-1 (Description of Proposed Transmission Line), Exhibit e-2 (Other Facilities), Exhibit E-3 (Underground Construction), Exhibit E-4 (Engineering Justification), Exhibit E-5 (Effect on Communications), Exhibit E-6 (Effect on Transportation).

Q. Does this conclude your testimony?

A. Yes.

ANDREW S. DEGON

DIRECTOR, ENGINEERING & CONSTRUCTION

RELEVANT EXPERIENCE

ADVANCED POWER (NA) **JULY 2013 - PRESENT**
Director, Engineering & Construction

- Currently serving as Director of Engineering and Construction for all domestic power projects.
    - o *Cricket Valley Energy Center – A three unit 1,000 MW combined cycle facility with air-cooled condensers, zero liquid discharge system, gas insulated switchgear, and 14.5 mile 345 kV overhead transmission line, sited on an abandoned industrial magnesium refining facility in Dover, NY.*
    - o *Carroll County Energy – A two unit 700 MW combined cycle facility with air-cooled condensers, sited in Carroll County, OH.*
    - o *Brockton Power – A one unit 350 MW combined cycle facility sited in Brockton, MA.*
- Overall responsibilities include management and oversight of all technical development and construction activities, including: management of all technical consultants, technical support for permitting and siting activities, development of RFPs and solicitation of proposals from OEMs and EPC contractors, capital and operating cost estimating, technology assessments, contract negotiation and development, permit compliance, budget tracking and forecasting, change order evaluation and processing, negotiated claims settlement, schedule analysis, invoice evaluation and acceptance, and preparation of monthly reports.

CAPITAL POWER CORPORATION **NOVEMBER 2011 – JULY 2013**
Senior Development Engineer

- Served as the technical lead for all Northeast (ISONE, NYISO, PJM) business development activities including development engineering for greenfield projects, technical due diligence for asset acquisitions, and engineering evaluations for optimizing revenues from the operating fleet.
- Specific responsibilities included: management of all technical consultants, technical support for permitting and siting activities, developing RFPs and soliciting proposals from OEMs and EPC contractors, capital and operating cost estimating, technology assessments, feasibility studies for plant upgrades and improvements, optimization of operating asset's annual and capital expenses, and technical support for merchant asset dispatch strategies.

GENPOWER SERVICES, LLC **DECEMBER 2008 – OCTOBER 2011**
Project Manager

- Served as the owner's Project Manager for the construction of the 700 MW, coal-fired Longview Power Plant in Maidsville, WV, consisting of a supercritical PC boiler, an SCR catalyst, wet scrubber, baghouse and over $180 million of associated infrastructure projects.
- Responsibilities included overall commercial and technical management of each infrastructure EPC contract, including: contract negotiation and development, permit compliance, budget tracking and forecasting, change order evaluation and processing, negotiated claims settlement, schedule analysis, invoice evaluation and acceptance, and preparation of monthly reports.
- Power plant infrastructure projects included:

    Water Pipelines & Intake Structure ($40MM) - 9,500 GPM intake facility and over 13 miles of water supply and wastewater piping.

Water Treatment Facility ($36MM) - 10 MGD water treatment facility incorporating Actiflo clarification, multimedia and micro filtration, and reverse osmosis treatment processes that serve as the sole pre-treatment source of supply water to Longview.

Overland Conveyor ($46MM) – 4.5-mile overland conveyor bringing coal directly from the mine mouth to the Longview Blending Yard, including three transfer stations and a stackout and reclaim terminal.

Coal Blending Yard ($11MM) - Blends coal with secondary sources and transfers the blended product to Longview's on-site coal handling system.

On-Site Coal Handling System ($36MM) – 750 TPH system consisting of receiving, stackout, reclaim and transfer conveyor systems.

Natural Gas Pipeline ($9MM) - A 4-mile natural gas pipeline for the supply of startup and auxiliary boiler fuel at the Longview facility.

L.S. POWER DEVELOPMENT, LLC OCTOBER 2004 – NOVEMBER 2008
Senior Engineer

- Project Development Support - Provided technical support for permitting and general development activities for coal, combined-cycle and peaking power projects. Specific activities include development of technical parameters for air and water permits, providing testimony to local zoning, siting council and regulatory departments, and management of owner's engineers and consultants used to prepare site layouts, geotechnical investigations, noise studies, etc.
- Project Execution - Managed the solicitation of proposals and negotiated both commercial and technical portions of equipment supply contracts with major equipment OEMs for a dual-fueled power project in Connecticut, including two combustion turbines and hot SCR systems. Developed technical specifications for EPC related scope associated with several coal, combined cycle and simple cycle projects.
- Financing Support - Supported financing of several power projects by managing the independent engineer's review and providing technical inputs to pro formas, including startup and commissioning costs, operating expenses, capital costs, sales tax estimates and EPC drawdown projections.
- Due Diligence – Supported due diligence activities associated with the acquisition of large portfolios of domestic power plant assets, including the $1.5 billion, 6,300 MW Duke Energy North America transaction in 2006, and the $1.3 billion, 3,619 MW Mirant transaction in 2007.
- Construction Management – Project Engineer for an expansion project of an existing simple cycle power plant to a 2x1 combined cycle in Bosque County, Texas. Responsibilities included commercial review of the requested change orders and technical review of contract submittals.

R. W. BECK, INC. MAY 2001 – SEPTEMBER 2004
Project Engineer

- Owner's Engineering - Provided project development consulting to developers and municipalities, including composing bid solicitations, negotiating turbine purchase and EPC contracts, developing project heat balances and cost estimates. Assisted developers in the production of alternate site arrangements and plant configurations, and provided technical expertise on the performance impacts of alternate site locations. Developed performance and emissions related information for air permit applications.
- Independent Engineering - Conducted reviews of the performance related contractual terms of Power Purchase Agreements, provided independent validation of performance testing result calculations and corrections to design conditions, and reviewed performance testing protocol and witnessed performance testing on behalf of lender.

JOSEPH TECHNOLOGY CORPORATION, INC. MAY 2000 – MAY 2001
Project Engineer

- Conducted district energy technology assessments, including retrofits of existing power plants to accommodate supplying district heating systems, and feasibility studies of the cost benefits to potential offtakers.

EDUCATION: Bachelor of Science, Mechanical Engineering, Rutgers University, May 2000

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of the

Application by Cricket Valley Energy Center, LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law For Approval of a New 345 kV Line From the Pleasant Valley Substation to the Cricket Valley Energy Center, LLC, and the Re-conductoring of An Existing 345 kV Line

Case No. _____

DIRECT TESTIMONY OF

JOHN W. GUARIGLIA

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

Q. Please state your full name, employer, and business address.

A. My name is John W. Guariglia. I am employed by Saratoga Associates Landscape Architects, Architects, Engineers, and Planners, P.C. (Saratoga Associates). My business address is 109 South Warren Street, Suite 400, Syracuse, New York, 13202.

Q. In what capacity are you employed?

A. I am an Associate Principal at Saratoga Associates and oversee the completion of many visual impact assessments on behalf of our clients.

Q. Please summarize your education and professional background.

A. I received a Bachelors degree in Landscape Architecture from the State University of New York College of Environmental Science and Forestry. I have more than ten years experience in conducting visual assessments for energy generation and transmission Projects. My work has been focused on overseeing visual assessments of proposed electric generation and transmission projects.

Q. Please describe your role in the Cricket Valley Transmission Line Project.

A. I served as Saratoga Associates Principal-in-Charge, responsible for overseeing the Saratoga Associates project team in the preparation of the projects visual assessment, as required by the Article VII regulations.

Q. What portion(s) of the Application are you sponsoring?

A. I am sponsoring the visual assessment.

Q. Does this conclude your testimony?

A. Yes.

John W. Guariglia, RLA
Associate Principal

Project Role
Principal-in-Charge

Education
Bachelor of Landscape Architecture, State University of New York, College of Environmental Science & Forestry, 1994

Associate in Science, Monroe Community College, 1991

Registration /Certification
New York – License # 0017651

Speaking Engagements/Publications
"Use of GIS Technology and Landscape Visualization Software to Predict Visual Impact", American Cultural Resources Association Annual Conference, Providence, RI, September 2009

Allen, M. W., and Guariglia, J. W., "Development of Advanced Viewshed Analysis to Facilitate Project Siting Community Decision-Making" presented at America Wind Energy Association National Conference, May 2009

Allen, M. W., and Guariglia, J. W., "Cumulative Visual Analysis to Facilitate Project Permitting" presented at America Wind Energy Association National Conference, May 2010

Guariglia, J. W., and Perkins, G. W., "Nighttime Visual Impact Analysis to Facilitate Project Permitting" presented at America Wind Energy Association Offshore National Conference, October 2010

Guariglia, J. W., "Assessing Visual Impact and Shadow-Flicker for Site Permitting" presented at America Wind Energy Association National Conference, June 2012

Professional Experience

Mr. Guariglia, a Registered Landscape Architect, brings close to twenty years experience in the field of Landscape Architecture. During his career he has worked on a variety of energy, site development, planning, and aesthetic projects across the Country. Specifically, over the past thirteen years, Mr. Guariglia has become a recognized expert in the specialized discipline of visual impact assessments. In addition to his many years of project management, Mr. Guariglia is skilled in a variety of software programs and has served as an expert witness. With Mr. Guariglia's unique experience, Saratoga Associates is able to assist project sponsors in the permitting of high profile projects.

Representative Experience

Select Wind Energy Projects

> **Ball Hill Wind Energy Project, Duke Energy Villenova/Hanover, NY**
Principal-in-Charge of visual resource assessment and shadow analysis for a 42-turbine windpark. An analysis of the projects 115 KV transmission line and a cumulative analysis including an adjacent wind project were also completed.

> **Beech Ridge Wind Farm, Invenergy LLC, Greenbrier, WV**
Principal-in-Charge/Project Manager of visual resource assessment for a 124-turbine wind farm located along several ridgelines in the mountains of West Virginia. Project is in close proximity to State, National and local resources. Provided expert testimony.

> **Beech Ridge Energy - Phase II Expansion/Modification, Invenergy LLC, Greenbrier, WV**
Principal-in-Charge of visual resource assessment for a 33-turbine wind farm located along several ridgelines in the mountains of West Virginia. Project is in close proximity to State, National and local resources.

> **Antrim Wind Farm, Eolian Wind, Antrim, NH**
Principal-in-Charge of the visual resource assessment and shadow-flicker analysis for a 10-turbine wind farm along a mountainous ridgeline.

> **Stony Creek Wind Farm, Invenergy LLC, Orangeville, NY**
Principal-in-Charge of the visual resource assessment and shadow-flicker analysis for a 59-turbine wind farm. VRA included calibrated panorama simulations from select locations.

> **Tuscola-Bay Wind Energy Project, NextEra Energy Resources, Blumfield/Gilford/Merritt, MI**
Principal-in-Charge of the visual resource assessment for a 75-turbine wind farm. Represented developer at public hearings.

Speaking Engagements/Publications
- continued

Guariglia, J. W., "Visual and Shadow Flicker Impacts Pose Double Threat" cover article in North American Windpower, January 2013

Guariglia, J. W., "Visual Impact Assessment Requirements for Permitting of Wind Energy Facility" presented at America Wind Energy Association National Conference, May 2013

> **Tuscola Wind II, NextEra Energy Resources, Akron/Fairgrove/Gilford, MI**
Principal-in-Charge of the visual resource assessment for a 59-turbine wind farm and associated substation. Represented developer at public hearings.

> **Arkwright Wind Farm, Horizon Wind Energy, Arkwright, NY**
Principal-in-Charge/Project Manager of visual resource assessment and shadow-flicker analysis for a 47-turbine wind farm.

> **Ripley-Westfield Wind Farm, Pattern Energy, Ripley/Westfield, NY**
Principal-in-Charge of the visual resource assessment and shadow-flicker analysis for a 61-turbine wind farm. VRA included nighttime simulations and animations of both daytime and nighttime conditions.

> **Ball Hill Windpark, Noble Environmental Power, Villenova/Hanover, NY**
Principal-in-Charge/Project Manager of visual resource assessment and shadow analysis for a 60-turbine windpark. An analysis of the projects 115 KV transmission line and a cumulative analysis including an adjacent wind project were also completed.

> **High Sheldon Wind Farm, Invenergy LLC, Sheldon, NY**
Principal-in-Charge of visual resource assessment and shadow-flicker analysis for an 86-turbine wind farm.

> **Perrin Ranch Wind Farm, NextEra Energy Resources, Coconino County, Arizona**
Principal-in-Charge of daytime and nighttime photo renderings, viewshed analysis, and guidance to the developer on matters pertaining to potential visual impact for a 66-turbine wind farm. An animated video of the projects 3.5 mile 138 kV tie-in line was also completed.

> **Moresville Energy Center, Invenergy LLC, Stamford, NY**
Principal-in-Charge/Project Manager of visual resource assessment and shadow-flicker analysis for a 33-turbine wind farm located along the Moresville Range in the scenic Catskill Mountain region.

> **Jericho Rise Wind Farm, Horizon Wind Energy Chateaugay/Bellmont, NY**
Principal-in-Charge of photo simulations for a 53-turbine wind farm.

> **Wethersfield Windpark, Noble Environmental Power, Wethersfield/Eagle, NY**
Principal-in-Charge/Project Manager of visual resource assessment and shadow-flicker analysis for an 86-turbine windpark. A cumulative analysis, including six proposed/existing windparks, and the projects 115 KV transmission line, was also completed.

> **Ridgeline Wind Farm, Clipper Windpower, Hampshire, WV**
Principal-in-Charge of photo simulations and viewshed maps of a 19-turbine wind farm along a mountainous ridgeline.

- **Allegany Windpark, Noble Environmental Power, Centerville/Rushford, NY**
  Principal-in-Charge/Project Manager of visual resource assessment and shadow-flicker analysis for a 67-turbine windpark. A cumulative analysis, including six proposed/existing windparks, was also contained in the VRA.
- **Chateaugay/Bellmont Windparks, Noble Environmental Power Chateaugay/Bellmont, NY**
  Project-in-Charge/Project Manager of visual resource assessment and shadow-flicker analysis for an 86-turbine windpark located along the northern boundary of the Adirondack Park. A cumulative analysis, including seven proposed windparks, was also completed.
- **Blissfield Wind Energy Project, Exelon Wind, Lanawee County, MI**
  Principal-in-Charge of simulations and presentation animation for a 45-turbine wind farm.
- **Wildcat Wind Farm, Exelon Wind, Lea County, NM**
  Principal-in-Charge of simulations and presentation posters for a 19-turbine wind farm.
- **Hounsfield Wind Farm, Upstate Power Corp., Hounsfield, NY**
  Principal-in-Charge of visual resource assessment for an 84-turbine wind farm located on Galloo Island within Lake Ontario.
- **Windfarm Prattsburgh, First Wind, Prattsburgh/Italy, NY**
  Project Manager/Visual Analyst of visual resource assessment and shadow-flicker analysis for a 50-turbine windfarm. A cumulative analysis of an adjacent wind project was also completed.
- **Victory II Wind Farm, Clipper Windpower Carroll/Crawford Counties, Iowa**
  Principal-in-Charge of shadow-flicker analysis for an 80-turbine wind farm.
- **Shooting Star Wind Farm, Infinity Wind Power, Kiowa County, KS**
  Principal-in-Charge of shadow-flicker analysis for a 66-turbine wind farm.
- **Eclipse Wind Farm, Clipper Windpower Guthrie/Audubon Counties, Iowa**
  Principal-in-Charge of shadow-flicker analysis for a 20-turbine wind farm.
- **Golden West Wind Project, El Paso County, CO**
  Principal-in-Charge of shadow-flicker analysis for a 100-turbine wind farm.
- **Fair Wind Energy Project, Clipper Windpower, Oakland, MD**
  Principal-in-Charge of shadow-flicker analysis for a 19-turbine wind farm.
- **Green City Growers Wind Power Project, Green City Growers, LLC Cleveland, OH**
  Principal-in-Charge of shadow-flicker analysis for community scale wind project.
- **City of El Dorado Wind Power Project, City of El Dorado El Dorado, KS**
  Principal-in-Charge of shadow-flicker analysis for community scale wind project

- **Georgia Mountain Community Wind, State of Vermont, Georgia, VT**
  Principal-in-Charge of photo simulations for a 5-turbine wind farm.
- **Block Island Offshore Wind Farm, Deepwater Wind Block Island, RI**
  Principal-in-Charge of simulations and viewshed map for an 8-turbine offshore wind farm.
- **Rhode Island Offshore Wind Farm, Deepwater Wind Block Island, RI**
  Principal-in-Charge of simulations for an offshore wind farm. Simulations were used in the developers' pursuit of development rights.
- **New Jersey Offshore Wind Farm, Deepwater Wind Asbury Park, NJ**
  Principal-in-Charge of simulations for an offshore wind farm. Simulations were used in the developers' pursuit of development rights.
- **Varian Semiconductor Wind Power, Boreal Renewable Energy Development, Gloucester, MA**
  Principal-in-Charge/Project Manager of simulations and viewshed analysis for a community scale wind project overlooking the City of Gloucester. Analysis addressed concerns of Massachusetts Historical Commission.
- **Massachusetts Water Resources Authority DeLauri Pump Station Wind Project, Boreal Renewable Energy Development, Boston, MA**
  Principal-in-Charge of simulations for a community scale wind project in the City of Boston.
- **Passadumkeag Windpark, Noble Environmental Power Penobscot, ME**
  Principal-in-Charge/Project Manager of viewshed map development for a 28-turbine windpark. The maps were created to assist the project sponsor during its fatal flaw analysis.
- **Confidential Ohio Wind Farm**
  Principal-in-Charge of photo simulations for a 62-turbine wind farm.
- **Confidential Indiana Wind Farm**
  Principal-in-Charge of photo simulations for a 63-turbine wind farm.
- **Confidential Pennsylvania Offshore Wind Farm**
  Principal-in-Charge of calibrated panorama simulations for an offshore wind farm.
- **Confidential Kansas Wind Farm**
  Principal-in-Charge of shadow-flicker analysis for a 42-turbine wind farm.
- **Confidential Arizona Wind Farm**
  Principal-in-Charge of photo renderings, viewshed analysis, and guidance to the developer on matters pertaining to potential visual impact for an 81-turbine wind farm. An animated video of the project was also completed.

Select Solar Energy Projects

- **Tufts University Solar Project, SunEdison, Grafton, MA**
  Principal-in-Charge of simulations for a 3.5 MW solar installation. Simulations of two project sites under consideration were completed.
- **Roswell Solar Energy Facility, GCL-SR Solar Energy Chaves County, NM**
  Principal-in-Charge of simulations and presentation boards for a solar installation of up to 30 MW.

Select Transmission Line Projects

- **Ball Hill Wind Energy Project, Duke Energy Villenova/Hanover, NY**
  Principal-in-Charge of visual resource assessment that included an analysis of the 115 KV transmission line. As part of the analysis a series of simulations, viewshed maps, and associated analysis was provided.
- **Perrin Ranch Wind Farm, NextEra Energy, Coconino County, Arizona**
  Principal-in-Charge of an animated video of the projects 3.5 mile 138 kV tie-in line was completed for use in permitting the project.
- **Wethersfield 230 KV Transmission Line (Art. VII Application), Noble Environmental Power, Wethersfield, NY**
  Principal-in-Charge/Project Manager of visual resource assessment for a 5.5 mile above ground 230 KV transmission line.
- **Upstate NY Power 230 KV Transmission Line (Art. VII Application), Upstate Power Corp., Hounsfield to Mexico, NY**
  Principal-in-Charge of visual resource assessment for a 51 mile above ground and sub-aquatic 230 KV transmission line.
- **Centerville-Yorkshire 115 KV Transmission Line (Art. VII Application), Noble Environmental Power Centerville to Yorkshire, NY**
  Principal-in-Charge/Project Manager of visual resource assessment for a 14 mile above ground 115 KV transmission line. Also completed a cumulative analysis of the transmission line and the proposed Allegany windpark.
- **345 KV Electrical Transmission Line (Art. VII Application), Besicorp Development LLC, Rensselaer County, NY***
  Project Manager of visual resource assessment for an 8.1 mile above ground. Provided expert testimony.

Select LNG, Biomass, and Traditional Energy Projects

- **North Springfield Sustainable Energy Project, Winstanley Enterprises and Weston Solutions, Inc., North Springfield, VT**
  Principal-in-Charge of simulations and structure color study for a 35 MW wood-fired cogeneration plant.

- **Safe Harbor Offshore LNG Facility, Atlantic Sea Island Group, Long Beach, NY**
  Principal-in-Charge/Project Manager of visual resource assessment for a Deepwater port application of a proposed LNG facility on a man-made island off the coast of Queens, NY.
- **Confidential Offshore LNG Terminal #1, Eastern Seaboard, United States**
  Principal-in-Charge of visual resource assessment for a major offshore floating LNG terminal.
- **Confidential Offshore LNG Terminal #2, Eastern Seaboard United States**
  Principal-in-Charge of visual resource assessment for a major offshore floating LNG terminal.
- **Brayton Point Station Cooling Tower & Unit 3 DS/FF Projects Somerset, MA**
  Principal-in-Charge of simulations illustrating facility improvements and two 500-foot tall natural draft cooling towers.
- **AES Cayuga Generation Plant, AES Cayuga LLC, Lansing, NY**
  Principal-in-Charge of photo simulations for a proposed landfill expansion.
- **Empire Newsprint Recycling and Power Plant (Art X Application), Besicorp Development LLC, Rensselaer, NY***
  Project Manager/Visual Analyst of visual impact assessment for a 505 MW co-gen power plant (including water vapor plumes) and recycling facility. Provided expert testimony.

** Prior to association with Saratoga Associates.*

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of the

Application by Cricket Valley Energy Center, LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law For Approval of a New 345 kV Line From the Pleasant Valley Substation to the Cricket Valley Energy Center, LLC, and the Re-conductoring of An Existing 345 kV Line

Case No. _____

DIRECT TESTIMONY OF

MICHAEL GUSKI

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

Q. Please state your full name, employer, and business address.

A. My name is Michael Guski. I am employed by Epsilon Associates, Inc. My business address is 3 Clock Tower Place, Suite 250, Maynard, Massachusetts, 01754.

Q. In what capacity are you employed?

A. I am a Partner at Epsilon Associates and the market lead for energy transmission projects, and serve as Project Manager for various electric transmission projects.

Q. Please summarize your education and professional background.

A. I received a Master of Science in Atmospheric Sciences from the State University of New York at Albany in 1975, and a Bachelor of Science in Atmospheric Sciences from the State University of New York at Albany in 1970. I have more than 30 years of professional experience as a Project Manager for energy generation and transmission Projects. I have served in my present position since 1997. My work has involved overseeing the permitting and licensing of proposed electric generation and transmission projects and providing regulatory compliance services for industrial and energy facilities. Prior to joining Epsilon Associates, from 1995 to 1997 I was an Associate Principal for GZA Geo Environmental, and from 1987 to 1995, I was a manager at Earth Tech/HMM Associates. From 1980 to 1987, I was a Senior Scientist at International Paper Company, and from 1976 to 1980 I was employed by United Engineers & Constructors. From 1974 to 1976, I was an Air Pollution Meteorologist at Westinghouse Environmental.

Q. Please describe your role in the Cricket Valley Transmission Line Project.

A. I served as Epsilon Associate's Project Manager for the Article VII Application, responsible for the supervision of the Epsilon project team and subcontractors with regard

to environmental studies and the preparation of the environmental analyses required as part of the Application.

Q. What portion(s) of the Application are you sponsoring?

A. I am sponsoring the following exhibits, which were prepared by me or under my supervision and direction: Exhibit 2 (Location of Facility), Exhibit 3 (Alternatives), Exhibit 4 (Environmental Impact), and Exhibit 8 (Other Pending Filings).

Q. Does this conclude your testimony?

A. Yes.

MICHAEL E. GUSKI, CCM

PRINCIPAL

EDUCATION

B.S., Atmospheric Science, State University of New York at Albany, 1970
M.S, Atmospheric Science, State University of New York at Albany, 1975

PROFESSIONAL REGISTRATIONS

Certified Consulting Meteorologist (No. 303, 1981)

PROFESSIONAL SUMMARY

Mr. Guski is a project manager and air pollution meteorologist with more than three decades of professional experience. His work has focused on industrial and power project impact assessment, permitting, and compliance. Mr. Guski has managed the full scope of environmental permitting required for numerous new energy projects. He has provided expert witness testimony, prepared air permit applications, prepared Title V operating permit applications, conducted air quality impact assessments, and provided due diligence services in support of facility acquisitions. Mr. Guski has also conducted ambient air monitoring, performed permitting feasibility studies, undertaken air compliance assessments, negotiated with regulatory agencies, and supported clients in enforcement actions. Mr. Guski directs Epsilon's permitting efforts for gas pipeline and electric transmission line projects. Mr. Guski also manages Epsilon projects involving wind energy facilities.

PROFESSIONAL EXPERIENCE

Independent Power, Linear, and Cogeneration Projects

- *Veolia Energy Boston, Lechmere Viaduct Waste Heat Pipeline, Cambridge and Boston, MA.* Project Manager for the permitting of an 18 inch high pressure steam pipeline from the GenOn Kendall Station in Cambridge to the Veolia Boston distribution system in Boston. Permitting involves MEPA, Article 97, Army Corps of Engineer, Cambridge and Boston Conservation Commissions, Mass Historic Commission, and Massachusetts Chapter 91.

- *Village of Hamilton, Creation of Gas Utility, Hamilton, NY.* Project Manager for the permitting associated with creation of a distribution gas utility for the Village. Permitting involves New York State Environmental Quality Review Act (SEQRA) and allowed segmentation. Project will include a 10 inch distribution pipeline.

- *National Grid, 115 kV Overhead Transmission Line, Winchendon, MA.* Principal-In-Charge for the permitting of five and half miles of overhead 115 kV transmission line. Project involved route analysis and selection, environmental analysis of alternatives, Energy Facility Siting Board (EFSB), MEPA ENF, cultural resource assessments, Mass Historic Commission, and Army Corps of Engineers.

- *Noble Environmental Power, 230 kV Transmission Line, Wyoming County, NY.* Project Manager for the Article VII permitting of a 5.5-mile 230 kV transmission line from a windpark to a connection with existing New York State transmission facilities. Coordinated engineering, environmental and regulatory requirements for the preparation of an Application for the facility under Article VII of the New York State Public Service Law. Prepared project presentations for discussion with Public Service Commission officials and participated in the negotiation of project elements consistent with local, state and federal permitting requirements.

- *Noble Environmental Power, 230 kV Transmission Line, Wyoming County, NY.* Project Manager for preparation of the Environmental Management and Construction Plan for the 5.5-mile 230 kV transmission line approved under Article VII of the New York State Public Service Law.

- *Noble Environmental Power, Bliss 115 kV Transmission Line, Wyoming County, NY.* Project Manager for the preparation of a vegetation clearing and disposal plan, and preparation of a long-term vegetation management plan for a 115 kV transmission line from a windpark to a connection with existing New York State transmission facilities in western New York.

- *Noble Environmental Power, Windpark SPCC Plans, NY.* Project Manager for the preparation of a Spill Prevention Countermeasure and Control (SPCC) plans several Noble windparks in New York.

- *Besicorp Empire Development Company, Rensselaer, NY.* Project Manager for permitting for a 505 MW cogeneration facility and recycled newsprint mill. Responsible for obtaining permits related to siting the facilities, including New York State Article X approval, New York DEC air permits and Army Corps of Engineer approvals. Provided managerial oversight of associated Niagara Mohawk Power Corporation Article VII applications for 8.1 mile electric transmission line and 4.5 mile gas pipeline requiring Article VII applications.

- *Arcade Transmission Line Project, NY.* Project Manager for evaluation of primary and alternative routes for a proposed 115 kV transmission line in western New York State. Evaluation included potential impacts on wetland and other environmental resources, land use, visual resources, evaluation of transmission structures, and permitting feasibility and strategy.

- *Indeck Energy Services, Elwood, IL.* Project Manager for CALPUFF modeling and risk assessment for a proposed 700 MW coal-fired power plant. Analysis included assessment of deposition of nitrogen and sulfur on sensitive prairie flora, including a rare clover. Project involved reconciliation of protocols with the U.S. EPA, U.S Fish and Wildlife, Illinois EPA and the Midewin National Prairie.

- *FPL Energy, Far Rockaway, Queens, NYC.* Project Manager for air quality modeling, air permitting, and noise impact assessment for FPL Energy's proposed 55 MW Bayswater and Jamaica Bay Peaking Plants in Far Rockaway, Queens, New York City. Conducted air quality analysis, including cumulative impact assessment, noise impact assessment, and prepared state and city air permit applications.

- *Confidential Project, NY.* Project Manager for air quality modeling, air permitting, noise impact assessment, and Article X support for proposed 500 MW combined cycle gas turbine power plant in the New York City metropolitan area.

- *Indeck Energy Services, North Smithfield, RI.* Environmental analysis, licensing and permitting of Indeck's proposed 350 MW gas turbine combined cycle power plant in North Smithfield, Rhode Island. Conducted environmental studies, including air quality modeling, water supply evaluation, noise assessment, and wetlands evaluation. Prepared application to the Rhode Island Energy Facility Siting Board (EFSB), and air and wetlands permit applications to the Rhode Island Department of Environmental Management (RIDEM). Provided expert witness testimony at EFSB hearings.

- *Sithe Energies of New England, MA.* Responsible for air quality analysis and air permitting of a 750 MW gas turbine combined cycle power plant (Fore River Station) in Weymouth, Ma. Provided expert witness testimony at EFSB hearings. Assisted Sithe in reviewing and negotiating the Title V operating permit for the Framingham combustion turbine plant. Managing project involving technical support to Sithe on emissions monitoring system for the Mystic Station in Everett, Ma.

- *Central Hudson/CH Resources, NY.* Managed projects involving environmental due diligence and compliance support for power plants in New York State, Massachusetts and Connecticut. Provided assistance to CH Resources in evaluating the purchase of former cogeneration plants in Syracuse, Niagara Falls and Beaver Falls, New York. Managed environmental compliance and permitting projects for these facilities, including preparation of NO_x Budget monitoring plans and modification of air permits to allow more flexible operation.

- *Indeck Energy Services, Six Power Plants in Up-state NY.* Provided environmental compliance support to Indeck for six (6) operating power plants in New York State. Managed the preparation of NO_x Budget Monitoring Plans for Indeck's Olean, Corinth, Illion, Oswego, Yerkes and Silver Springs power generating plants in up-state New York.

- *Sithe Energies USA, Inc., Ogdensburg, NY.* Managed environmental studies and permitting of an 80-MW combustion turbine combined-cycle cogeneration facility, including preparation of an Environmental Analysis/Environmental Assessment Form (EA/EAF), Air Permit to Construct, SPDES permit, and Army Corps of Engineers Section 10/404 permit.

- *Indeck Energy Services, Oswego, NY.* Responsible for permitting a 50-MW gas turbine cogeneration project at IP/Hammermill's Oswego paper mill. The project included a stack height modeling assessment for the existing paper mill boilers.

- *Indeck Energy Services, Olean, NY.* Managed permitting of a 79-MW cogeneration facility, including preparation of the SEQR EA/EAF, Air Permit to Construct, and Army Corps of Engineers Section 404 wetland permit. Project issues included air quality impacts, wastewater discharge, and cooling tower impacts.

- *Indeck Energy Services, Yonkers, NY.* Managed air permitting of a proposed 135-MW, combined-cycle cogeneration facility in Yonkers, New York, a "severe" ozone non-attainment area adjacent to New York City. The permitting involved securing offsets and assessment of LAER for NO_x emissions.

- *Cogeneration Partners of America, Binghamton, NY.* Responsible for permitting a 55-MW cogeneration facility at the Anitec Image Corporation, including preparation of the SEQR EA/EAF and PSD/Air Permit to Construct. Major project issues involved site contamination, noise impacts, and impacts on air quality. The project was placed in service in 1980.

- *Indeck Energy Services, Corinth, NY.* Managed permitting of a 117-MW cogeneration facility at International Paper's Corinth Mill. Project included preparation of an Environmental Impact Statement (EIS) and Air Permit to Construct, wetlands evaluations, and various environmental studies required by SEQRA.

- *Southbridge Steam Limited Partnership, Southbridge, MA.* Managed permitting of the proposed American Optical Cogeneration Project, including preparation of a MEPA Environmental Impact Report (EIR), Air Plans Application, Wetlands NOI, and NPDES permit. Major permitting issues involved wetlands, site contamination, assessment of impacts on historic resources, and visual plume impacts.

- *Thermo Energy Systems, New York, NY.* Managed the preparation of a SEQR EA/EAF and a New York State wetland permit for a proposed 55-MW cogeneration facility in Staten Island. Major project issues involved potential site contamination, visual plume impacts, and impacts on historic resources.

- *Thermo Energy Systems, GA.* Managed environmental feasibility study for proposed gas turbine facility in Georgia in support of Oglethrope power procurement. Project involved determining air permitting requirements, wetlands delineation, wastewater discharge permitting requirements and other environmental issues.

- *Thermo Energy Systems, MD.* Managed environmental feasibility study and preliminary impact assessment for proposed gas turbine facility in Maryland in support of BG&E power procurement. Project involved evaluation of air permitting requirements, wetland impacts, aesthetics and other issues.

- *Owl Energy Resources, New York, NY.* Managed air permitting and preparation of a Draft EIS for a proposed urban waste, wood-fired power generating facility in Staten Island. Project issues included evaluation of air toxic emissions, air pollution control technologies, regulatory analyses and agency negotiations.

- *Megan Raccine, Canton, NY.* Evaluated air compliance of existing cogeneration plant and modification of air permit. Project involved CO non-compliance and control issues, agency negotiations and permit modifications.

Utility Power Projects

- *Boston Edison Company, Boston, MA*. Managed the preparation of Title V operating permits for the company's power generating facilities, including the Mystic Station, New Boston Station, and Pilgrim Nuclear Plant. The project involved substantial regulatory analysis, agency negotiations, emission inventories, analysis of hazardous air pollutant emissions due to No. 6 oil burning, determination of insignificant activities, and assistance in implementing emissions and fuel monitoring systems in response to Title IV acid rain and Title I NO_x ACT requirements. Assisted BECO in negotiating final Title V operating permit for the Pilgrim Nuclear Plant.

- *Bangor Hydro-Electric Company, Bangor, ME*. Managed air compliance assessment and licensing of three diesel electric generating facilities in Maine. Issues involve PSD impacts in a Class I areas (Acadia NP, Moosehorn NWR) and assessment of visibility impairment.

- *Commonwealth Electric Company, Wareham, MA*. Prepared Title V operating permit applications for five power generating facilities in eastern Massachusetts including the Canal Station, the Kendall Street Station, the Blackstone Station, and two diesel generating stations on Martha's Vineyard.

- *Bangor Hydro Electric Company, Veazie, ME*. Managed air licensing of a 60-MW, oil-fired steam electric generating facility. Project involved air quality modeling of various fuel oil sulfur limits and assessment of various operating scenarios.

- *Holyoke Gas & Electric, Holyoke, MA*. Managed air permitting of a new 150-MMBtu/hr boiler at the Holyoke Gas & Electric steam-generating plant. The project involved preparation of a Non-Major Comprehensive Air Plans application including evaluation of BACT and air quality impacts.

- *East Kentucky Power, Winchester, KY*. Designed and managed the air quality and meteorology program for a PSD permit for J.K. Smith Power Station, two 600-MW coal-fired units. The design aspect involved computer modeling to determine monitoring locations, negotiations with state air officials on monitoring requirements and selection of monitoring equipment. Conducted air modeling analysis and prepared air quality sections for the PSD permit and EIS.

- *Proposed Nuclear or Coal-fired Power Plant, NY*. Conducted ambient air monitoring and modeling for the New Site Generation Project for New York State Electric and Gas Corporation. Project involved evaluation of air quality impacts for an Article VIII application for two 1,200-MW nuclear units or three 850-MW coal-fired units.

- *Proposed Coal-fired Power Plant, UT*. Conducted ambient air monitoring and modeling for the Intermountain Power Project for Los Angeles Board of Power and Light. The project involved assessment of air quality impacts for a federal EIS under NEPA for a proposed 3,000-MW fossil-fueled power plant near Hanksville, Utah.

Industrial and Institutional Projects

- *Tyrolit (Bay State/Sterling), Westborough, MA.* Managed air compliance assessment and permitting project for an abrasive wheel manufacturing facility. The project involved development of emission control plans, including a VOC RACT plan, and permitting of a modification to convert the vitrified wheel manufacturing process from the use of para-dichlorobenzene to naphthalene. Assisted in negotiating a consent agreement with the Massachusetts Department of Environmental Protection (MADEP) and the Office of the Attorney General. Conducted air quality modeling in support of a health risk assessment, assisted in evaluating air pollution control systems, prepared odor study plan, and negotiated final air permit.

- *Boston University, Boston, MA.* Provided air compliance and permitting support to Boston University (BU). Conducted compliance assessments and prepared Air Plan and Title V Operating Permit Applications for various air emissions sources at BU. Assisted in the negotiation of consent agreement and air permit conditions.

- *Chemprene, Beacon, NY.* Managed air compliance assessment of a conveyor belt manufacturing plant in support of due diligence for the acquisition of the facility. The facility is subject to New York State Department of Environmental Conservation surface coating regulations (6 NYCRR Part 228), VOC Reasonably Available Control Technology (RACT), and future Maximum Achievable Control Technology (MACT) standards for the control of hazardous air pollutants (HAP).

- *Rhinehold Industries, Pottsville, IA.* Conducted air compliance assessment of a composite laminate manufacturing plant in support of due diligence of acquisition of the facility. The facility is subject to Iowa State air pollution control regulations, federal New Source Performance Standards (NSPS) for the control of VOC (40 CFR Part 60, Subpart VVV), and future MACT standards for "Paper and Other Webs - Surface Coating".

- *Eastman Gelatine, Peabody, MA.* Managed air quality dispersion modeling study for the purpose of eliminating existing ambient air $S0_2$ monitoring program at photographic gelatin manufacturing plant. The facility maintains the capability to burn relatively high sulfur No. 6 oil.

- *Textron Specialty Materials, Lowell, MA.* Managed air toxics modeling study of specialty materials manufacturing plant. Modeling involved evaluating bypass stack release of hydrogen cyanide (HCN).

Pulp & Paper Projects

- *Rock-Tenn Company, Norcross, GA.* Managed Title V operating permit applicability study for a recycled fiber company. The project involved evaluating potential Title V regulatory requirements in over a dozen states, estimating potential emissions including HAPs from approximately 50 facilities of various types and sizes, and determining potential Title V applicability.

- *International Paper, Androscoggin Mill, Jay, ME*. Conducted dispersion modeling of SO_2 and particulate matter (PM) emissions using the EPA Complex I and ISCST models for renewal of an air license for a large kraft pulp mill. Conducted evaluation and validation of an alternate complex terrain model using ambient SO_2 monitoring data and EPA statistical procedures.

- *International Paper, Ticonderoga, NY and Androscoggin, ME*. Mills. Conducted air toxics dispersion modeling of chlorine emissions from bleach plants at two Kraft pulp mills to assess compliance with state AAL's in support of air permitting.

- *International Paper, Mobile Mill, AL*. Conducted dispersion modeling and preparation of impacts analysis sections of a PSD permit for a coal conversion at the Mobile Mill. The air quality impact analysis involved modeling over 100 sources in the Mobile area using the EPA RAM model.

- *International Paper, Various Sites*. Designed and supervised installation of ambient air and meteorology monitoring programs at three large Kraft pulp mills in Arkansas, Texas and Maine.

- *International Paper, TX*. Conducted dispersion modeling and prepared impact analysis report for a Texas Air Control Board (TACB) permit to construct a new oriented strand board plant in Nacogdoches, Texas.

Specialized Air Quality and Modeling Projects

- *Casella Landfills, ME.* Supervised air quality modeling of toxics and H_2S for an air monitoring program and risk assessment. Managed the installation of an H_2S ambient air monitoring program, including real time alert for potential offsite odor.

- *Clean Harbors of Braintree, Inc., Braintree, MA*. Responsible for air quality impact assessment of a proposed rotary kiln hazardous waste incinerator. Responsibilities involved management of air dispersion modeling, deposition modeling, and preparation of the air baseline and impact sections of the project impact report. Major project issues involved assessment of hazardous air pollutant emission impacts, measurement of ambient levels of air toxics, and community relations. Responsible for air dispersion modeling and meteorological analysis in support of an air toxics study for modifications to a pathological waste incinerator at the same site.

- *Boliden Resources, Inc., Ashland, ME*. Managed air quality studies for the proposed Bald Mountain open pit copper mining project. Project included assessment of air quality impacts from fugitive mining sources, determination of air permitting requirements, and specification of ambient air and meteorology monitoring program.

EXPERT TESTIMONY EXPERIENCE

Expert Testimony, Rhode Island Energy Facilities Siting Board, air pollution control, air quality impact assessment, general environmental issues, 350 MW Indeck-North Smithfield Energy Project.

Expert Testimony, Massachusetts Energy Facilities Siting Board, air quality impact assessment, Sithe Energies 750 MW Fore River Station.

Expert Testimony, North Smithfield, Rhode Island Zoning Board, stack height variance, 350 MW Indeck-North Smithfield Energy Project.

PUBLICATIONS

"An Application of the CALPUFF Model in an Ecological Risk Assessment," Elizabeth M. Hendrick and Michael E. Guski, Epsilon Associates, Inc., Stephen G. Zemba, Cambridge Environmental, Inc., and James Schneider, Indeck Energy Services; Guideline on Air Quality Models: Applications and FLAG Developments – An Air & Waste Management Specialty Conference, Denver, CO, April 2006.

"Title V Operating Permit Issues for a Diverse Power Generating System in Massachusetts," Michael E. Guski, GZA, Jacob J. Scheffer, Boston Edison Company, Bernard Laseke, EARTH TECH; 89th Annual Meeting and Exhibition of Air and Waste Management Association, Nashville, Tennessee, June 1996.

"Evaluation of Air Toxics Emissions and Impacts from Urban Wood Waste to Energy Facility," Michael E. Guski and Dale T. Raczynski, HMM Associates, Inc., Concord, Massachusetts; 87th Annual Meeting and Exhibition of Air and Waste Management Association, Cincinnati, Ohio, June 1994.

"Analysis of Inhalable Particulate Data Collected Near Three Major Pulp Mills," Michael E. Guski and Nehl Aldridge, Environmental Sciences Group, International Paper Company, Northeast Regional Meeting of NCASI, Boston, Massachusetts, October 1983.

"A Study of the Lake Breeze Circulation in the Proximity of Lake Ontario," M.E. Guski and P.L. Miller, Proceedings Second Conference on Coastal Meteorology, American Meteorological Society, Los Angeles, California 1980.

PROFESSIONAL AFFILIATIONS

American Meteorological Society
Air and Water Management Association

PREVIOUS EMPLOYERS

GZA Geo Environmental, Newton Upper Falls, MA, Associate Principal, 1996
Earth Tech, Concord, MA, Manager, Regulatory Modeling and Permitting, 1993-1995
HMM Associates, Concord, MA, Section Manager, Air Quality, 1987-1993
International Paper Co., Purchase, NY, Senior Scientist, 1980-1987
United Engineers & Constructors, Boston, MA, Power Division, 1976-1980
Westinghouse Environmental, Pittsburg, PA, Air Pollution Meteorologist, 1974-1976

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

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Case No. _____

DIRECT TESTIMONY OF

DAVID KLINCH

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

Q. Please state your full name, employer, and business address.

A. My name is David Klinch. I am employed by Epsilon Associates, Inc. My business address is 3 Clock Tower Place, Suite 250, Maynard, Massachusetts, 01754.

Q. In what capacity are you employed?

A. I am a Senior Consultant at Epsilon Associates, and serve as a project scientist and/or project manager for electric generation and transmission projects as well as other capital development projects.

Q. Please summarize your education and professional background.

A. I received a Master of Science in Environmental Studies from the University of Massachusetts at Lowell in 2002, and a Bachelor of Science in Environmental Science from the University of Massachusetts at Lowell in 1993. I have more than 20 years of professional experience as a Project Manager for energy generation, transmission, natural gas and oil pipeline, and railroad projects. I have served in my present position since 2013. My work has involved the permitting and licensing of proposed electric generation and transmission projects, gas and oil pipeline and refinery projects, and commercial development projects.

Prior to joining Epsilon Associates, from 2007 to 2013, I was employed by UniStar Nuclear Energy, Inc., as an Environmental Permitting and Licensing Manager. From 2003 to 2007, I was employed by ENSR/AECOM as a Wetland Program Manager, and from 1998 to 2003, I was employed by Environmental Science Services (ESSGroup) as an Environmental Project Manager. From 1993 to 1998, I was employed by ENSR/AECOM as a Wetland and Soil Scientist.

Q. Please describe your role in the Cricket Valley Transmission Line Project.

A. I served as Epsilon's Assistant Project Manager for the Article VII Application, responsible for the supervision of the Epsilon project team and subcontractors with regard to environmental studies and the preparation of the environmental analyses required as part of the Application.

Q. What portion(s) of the Application are you sponsoring?

A. I am sponsoring the following exhibits, which were prepared by me or under my supervision and direction: Exhibit 4 (Environmental Impact) and Exhibit 8 (Other Pending Filings).

Q. Does this conclude your testimony?

A. Yes.

David C. Klinch, PWS, PMP

EDUCATION

M.S., Environmental Studies-Water Resources, University of Massachusetts, 2002

B.S., Environmental Science, University of Massachusetts, 1993

PROFESSIONAL REGISTRATION & MEMBERSHIPS

Society of Wetland Scientists, Certified Professional Wetland Scientist (PWS) (Cert. #1221)

Project Management Professional #1438136 - Project Management Institute

American Nuclear Society, Full Member #2048818

Associate Soil Scientist, Society of Soil Scientists of Southern New England

Mr. Klinch is a Senior Consultant at Epsilon. He has over 20 years' experience in environmental regulatory analysis, impact statement preparation and environmental permitting with a strong focus on the energy sector. More specifically, Mr. Klinch has provided environmental permitting, consulting, regulatory compliance and due diligence services for utility and merchant electric generation projects, transmission projects and natural gas pipeline projects. His technical responsibilities have included regulatory agency coordination and negotiation, wetland delineations, wildlife habitat evaluations, wetlands and waterway assessments, waste site characterization, and construction management and oversight services.

Mr. Klinch has strong working relationships across the northeast with lead agency staff in New England and the Mid-Atlantic states. This includes work with the U.S. Army Corps of Engineers, and U.S. Fish & Wildlife Service across numerous districts as well as the Massachusetts Department of Environmental Protection, Pennsylvania Department of Environmental Protection, Susquehanna River Basin Commission, Delaware River Basin Commission, and New York State Department of Environmental Conservation.

Mr. Klinch is also a Certified Project Management Professional and has provided full time Environmental Project Management services for new nuclear power plant projects in New York, Maryland, Pennsylvania, and Missouri. This work involved the development of project scopes, schedules and budget estimates for technical analyses, including engagement and management of environmental consultants, and negotiations with local, state and federal regulatory agencies.

Mr. Klinch is a certified as a Professional Wetlands Scientist by the Society of Wetland Scientists and is an Associate Soil Scientist with the Society of Soil Scientists of Southern New England. Prior to joining Epsilon, Mr. Klinch served on the Hubbardston Conservation Commission where he was responsible for implementing and administering the Wetlands Protection Act. He was also a member of the Town of Hubbardston Low Impact Development Committee.

PROFESSIONAL EXPERIENCE

Transmission Projects

- *National Grid USA, North Andover Commons, New 13kV Duct Bank Installation, North Andover, MA*. Mr. Klinch served as the Project Manager for environmental permitting and due diligence services in support of the construction of 10 miles of new subsurface duct bank in downtown North Andover. Services included subsurface hazardous materials investigation along the project route, coordination with other utilities (Bay State Gas, AT&T), coordination with the town relative to the placement of aboveground structures within the historic Town Commons, and representation of the project at municipal meetings and hearings.

- *National Grid USA, Tewksbury Substation Expansion, Tewksbury, MA*. Mr. Klinch served as the Project Manager for the in-field environmental assessment and environmental permitting of the footprint expansion of the existing Tewksbury substation to support the installation of two new 115–13kV #2 transformers. Work included wetland delineation, habitat assessment, GPS survey of wetland boundaries, and preparation of a Notice of Intent filing to the Tewksbury Conservation Commission and MassDEP, and representation of National Grid's expansion plans before the Commission at public hearings.

- *National Grid USA, Wetland and Wildlife Habitat Analyses and Wetland Protection Act Regulatory Filings, 1993-2008, Various Locations, Massachusetts*. Mr. Klinch completed or managed wetland delineation and protected species habitat analyses in support of regulatory filings at various National Grid facilities and rights-of-way in Westford, Worcester, Ayer, Tewksbury, Amesbury, Beverly, Barre, Chelmsford, Gloucester, Haverhill, Salem, Lawrence, Marlborough, Topsfield, and Haverhill (Ward Hill). Work included wetland delineation and boundary survey, wildlife habitat analyses, wetland mitigation planning and annual monitoring, management of specialty subcontractors, and representation of projects at municipal conservation commissions, planning boards, and the Massachusetts Energy Facilities Siting Board. Previous to National Grid's acquisition of infrastructure in Massachusetts, Mr. Klinch provided similar services as well as 24 hour on-call emergency spill response services for the Massachusetts Electric Company (MECo).

- *Northeast Utilities/Connecticut Light and Power, Cross Sound Cable Project, New Haven, CT to Brookhaven, NY*. Mr. Klinch was the lead scientist responsible for the analysis and environmental permitting of a submarine cable installation and landfalls in Connecticut and New York. He performed resource area analysis and mapping, project siting analysis, regulatory permit review and application preparation supporting New York Public Service Commission review of the project, and assisted in assessment of subsurface contamination investigations in Long Island Sound and at proposed landing locations in support of the installation of two 138 kV DC circuits providing 328 MW of capacity.

- *FPL Energy - Offshore Wind Park Technical Investigations and Regulatory Permitting, Long Island Sound, NY*. Mr. Klinch provided technical management

of avian and water quality studies, regulatory strategy and permit application preparation services, and coordination with USACE, NYSDEC, and USFWS in developing the scope of environmental investigations proposed to support wind farm siting and environmental impact avoidance.

♦ *TransEnergie U.S. Ltd., Electric Cable and Transmission Line Siting and Feasibility Study, Pennsylvania, Ontario, and Ohio*. Mr. Klinch completed remote and in-field siting assessment and regulatory permitting feasibility study for the routing of two 325 MW electric cables from Ontario to Ohio and Pennsylvania. He provided siting services for subsurface and overhead lines, analysis of potential hazards and fatal flaws among the routes, and characterized regulatory permitting requirements affecting the project.

Generation Projects

♦ *National Grid USA, Hoosac Wind Project Interconnection Support, Florida and Monroe, MA*. Mr. Klinch served as National Grid's environmental assessment and permitting liaison with eneXco (now Iberdrola Renewables) for the Bakke Mountain Wind farm, and managed in-field assessment of wetlands and rare species habitats along the proposed 5.5 mile 34.5 kV transmission line interconnection route. Mr. Klinch also represented National Grid as an expert witness before the Massachusetts Energy Facilities Siting Board (EFSB), providing testimony regarding the nature of environmental impacts associated with the transmission facilities serving the proposed wind farm, which was constructed in 2012.

♦ *PG&E National Energy Group, Lead Environmental Compliance Director, Athens, NY*. Mr. Klinch provided 18 months of full-time onsite permitting and inspection services to ensure compliance with permit requirements from the New York State Department of Public Service, NYSDEC, USACE, New York State Historic Preservation Office, and other local authorities as required for the construction of a new 1,080 megawatt (MW) power plant, natural gas pipeline, and 0.6 mile 345 kV transmission line in eastern New York. He managed a multidisciplinary team of scientists to ensure environmental compliance and good construction practice associated with the completion of water and gas line construction and restoration, BMP and stormwater management systems, onsite earthworks and blasting, and ecological restoration and mitigation programs.

♦ *American National Power Company, Ramapo Power Project, Ramapo, NY*. Mr. Klinch performed Article X and Clean Water Act regulatory permit preparation, wetland delineation and functional analysis, wildlife habitat assessment, and facility/transmission line siting studies in support of a proposed 1,100 MW natural gas power plant. His work included rare species surveys, permit application preparation, regulatory agency negotiation, and soils analyses.

♦ *Public Service Electric & Gas – Wetland Mitigation Area Design, Bethlehem, NY*. Mr. Klinch provided design, permitting/regulatory compliance support, and subsequent monitoring of a wetland mitigation area associated with the repowering of the 757 mW Bethlehem Energy Facility. Mitigation area

design and work products were prepared to meet NYSDEC and USACE specifications and New York State Article X compliance filing needs.

♦ *Dominion Energy, Peaker Project Feasibility Analysis. Brayton Point and Salem Harbor Station, Somerset and Salem, MA*. Mr. Klinch served as water and natural resource task leader for analysis of two existing power generation facilities to assess the viability of new peaking units. He conducted site review and analysis of permitting needs and strategy for all potential water, tidelands, wetland, and habitat impact-related regulatory permits.

EXPERT TESTIMONY

♦ National Grid USA, Expert Testimony, Massachusetts Energy Facilities Siting Board, Environmental analysis, National Grid USA Transmission Interconnection to the Bakke Mountain Wind Farm, Hoosac Wind Project, 2005.

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Case No. _____

DIRECT TESTIMONY OF

JOHN MARCZEWSKI

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

Q. Please state your full name, employer, and business address.

A. My name is John J. Marczewski. I am a Principal at Energy Initiatives Group, LLC ("EIG"). My business address is 176 Worcester-Providence Turnpike, Suite 102, Sutton, Massachusetts 01590.

Q. In what capacity are you employed?

A. EIG has been retained by the Cricket Valley Energy Center project and provides consulting and owner's engineering services related to the transmission interconnection, New York Independent System Operator, Inc. ("NYISO") processes, and interfaces with transmission owners such as Con Edison, LIPA, and Northeast Utilities as well as entities such as ISO-NE.

Q. Please summarize your education and professional background.

A. I received a Bachelor of Science degree in Electrical Engineering from Worcester Polytechnic Institute and a Master of Engineering degree in Electric Power Engineering from Rensselaer Polytechnic Institute. I am a Registered Professional Engineer in several states. I am a member of the National Society of Professional Engineers, a member of the Institute of Electrical and Electronics Engineers and its Power Engineering Society. I have over 25 years of work experience including having held positions at electric utilities and engineering/consulting firms serving the electric power industry. My past work includes assignments in development, engineering/design, construction, and operation of distribution, transmission, and generation projects, as well as assisting generation and transmission developers with their interconnections and the interconnection study process. I am a past Chair of the NYISO Operating Committee

(2009-10), and the Transmission Planning Advisory Sub-committee (2007-08). I have presented testimony previously to the Commission in the Article X proceedings for the Ramapo Energy Project (Case 98-F-1968) and the Brookhaven Energy Project (Case 00-F-0566), as well as proceedings related to Con Edison's recent rate case (Case 13-E-0030, Case 13-G-0031, and Case 13-S-0032).

Q. Please describe your role in the Cricket Valley Transmission Line Project.

A. I have advised the Project on the NYISO interconnection process (including representation in the Interconnection Projects Facilities Study Working Group ("IPFSWG") for each Class Year in which the Project has participated), engineering and design related to its interconnecting switchyard with Con Edison, engineering and design concepts and issues related to the proposed transmission line and reconductoring projects, and other related transmission and interconnection technical and process matters.

Q. What portion(s) of the Application are you sponsoring?

A. I am sponsoring the following exhibits, which were prepared by me or under my supervision and direction: Exhibit E-4 (Engineering Justification).

Q. Does this conclude your testimony?

A. Yes.

John J. Marczewski

Principal

Expertise

- Large Scale Project Conceptualization and Development
- Utility and ISO/RTO Interconnection Process Management
- NYISO, ISO-NE, and PJM Processes and Transmission Systems
- Merchant Transmission Development, Interconnection, Commissioning, Market Integration
- Substation Engineering and Design; Electrical Equipment
- Traction Power, Railroad Electrification
- System Operations and Special Technical Issues
- Renewable Energy Project Development and Interconnection
- Expert Testimony

Experience

- Massachusetts Electric (now National Grid), Distribution Field Engineer
- New England Electric (now National Grid), Electrical Stations Engineer
- PLM, Inc. (electric power consultancy), Principal Engineer
- JMEnergy, Inc., President and Founder
- Energy Initiatives Group, Principal and Founding Partner

Assignments

Linden VFT Merchant Transmission Project: Key technical consultant , **i**nterconnection management, and owner's engineer for development, design, construction, commissioning, market integration, and operation of a 315 MW controllable AC transmission tie between the northern New Jersey 230 kV and New York City 345 kV transmission networks.

Linden Cogeneration Plant – Hurricane Sandy Restoration: Managed restoration of 345 kV Gas Insulated Switchgear and HPFF pipe-type cable transmission facilities, and engineered installation of temporary 4.16 kV auxiliary power facilities to allow restart of an 800 MW combined cycle generating plant following flooding from Hurricane Sandy in October, 2012.

Renewable Energy Project Interconnections: John has or is assisting with the evaluation, site assessment, commissioning, and interconnection process management for many renewable generation projects.

Amtrak Northend Electrification Project: Technical lead and interconnection study process manager for Amtrak's New Haven, CT – Boston, MA mainline railroad electrification project to prepare for high-speed Acela Express service. Coordinated four 115 kV supply point interconnections with three host utility companies to provide power for the 2 x 25 kV AC traction power system.

Large Generating Plant Interconnection Management: Managed and coordinated the interconnection study process for many large generating plants planned or built in various ISO/RTO areas. Examples include:

- Brookhaven, LI Energy Project: 580 MW
- Newark, NJ Energy Center, 700 MW
- Bayonne Energy Center, 500 MW (NYC connection)

Merchant Transmission Interconnection Development: Developed and managed interconnections and the interconnection study process for various planned merchant transmission projects.

Professional Affiliations and Leadership

- Professional Engineer: Registered in Massachusetts, Rhode Island, and Connecticut
- Institute of Electrical and Electronic Engineers, Member
- National Association of Professional Engineers, Member
- Chair, NYISO Operating Committee, 2009-2010
- Chair, NYISO Transmission Planning Advisory Subcommittee, 2007-2008
- First Congregational Church of Holliston, MA – Co-Chairperson of Capital Campaign Advance Gift Committee; Member, Board of Deacons; Chair, Property Committee.

Education

- **Rensselaer Polytechnic Institute:** Master of Engineering in Electric Power Engineering, 1987
- **Worcester Polytechnic Institute:** Bachelor of Science in Electrical Engineering, 1985

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Case No. _____

DIRECT TESTIMONY OF

Manos (Emmanouil) Obessis

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

Q. Please state your full name, employer, and business address.

A. My name is Manos (Emmanouil) Obessis. I am employed by PowerGEM, LLC. My business address is 632 Plank Road, Suite 101, Clifton Park, NY 12065.

Q. In what capacity are you employed?

A. I am a Vice President at PowerGEM. I am also the Director of Consulting.

Q. Please summarize your education and professional background.

A. I received a Diploma of Engineering, with specialization in Power Systems, from the Aristotelian University of Thessaloniki, in Greece, in 1990. I also have a Master of Science in Electrical Engineering and a Master of Science in Economics, from Iowa State University. I have also received a Philosophy Doctorate (Ph.D.) in Electrical Engineering, also from Iowa State University. I have over 15 years of professional experience in the power industry as a consulting engineer and project manager, advising clients on system congestion management, interconnection requirements and procedures, and market operations. My technical expertise includes network evaluation, deliverability assessment, market monitoring and investigation, and steady state analysis. I have undertaken numerous feasibility and interconnection studies for new generation and merchant transmission projects that include steady state, stability and short circuit analysis. Further, I have been leading major market and planning studies involving fossil and renewable generation, as well as congestion analysis and flowgate identification efforts.

Prior to joining PowerGEM, I was with Power Technologies, Inc. (PTI) (now, Siemens PTI) as a Manager-Senior Consultant, where I was involved in studies in transmission

planning, generation siting, steady state and dynamic analysis, and economic behavior of power systems.

Q. Please describe your role in the Cricket Valley Transmission Line Project.

A. I serve as a technical consultant and advise the Applicant on matters regarding the NYISO Class Year Interconnection studies and deliverability procedures. I was also the lead engineer of the team that conducted the Project's System Reliability Impact study on behalf of the NYISO.

Q. What portion(s) of the Application are you sponsoring?

A. I am sponsoring portions of exhibit Exhibit E-4 (Engineering Justification).

Q. Does this conclude your testimony?

A. Yes.

PowerGEM

Power Grid Engineering & Markets

Manos V. Obessis
Vice President
PowerGEM (Power Grid Engineering & Markets)

Education:

Ph.D., Electrical Engineering, Iowa State University, 1997
M.S., Economics, Iowa State University, 1997
M.S., Electrical Engineering, Iowa State University, 1992
Engineering Diploma, Electrical Engineering, University of Thessaloniki, Greece, 1990

Experience Summary

Manos Obessis joined PowerGEM in 2001 as Partner and Vice President to work on the development, testing, implementation and consulting use of analysis methods and software models used in support of power networks and market analysis. Dr. Obessis is actively involved in the company's software, educational and consulting activities, as well as business development and strategic marketing efforts. He participates in PowerGEM research efforts to develop, implement, and strategically position proprietary software and analytical models. He has advised clients on system congestion management, interconnection requirements and procedures, and market operations. Project experience includes network evaluation, deliverability analysis, market monitoring and investigation, and load flow analysis.

A sample of technical assignments includes:

- Transmission needs-analysis studies in Connecticut, in cooperation with transmission providers and the ISONE, to identify short and long term transmission system upgrades and reinforcements to ensure system reliability.
- Estimation of congestion costs in New York. The study estimated systemwide transmission congestion costs in New York State and allocated such costs to underlying system constraints. Study results have been included in NYISO regulatory filings.
- Assessment of bottled generation resulting from increased wind generation in New York. The study identified congestion points that may bottle renewable generation as increased wind generation resources become available. Study results have been filed with the NYS DPS.
- Identification of must-run generating units in ERCOT. The study evaluated transmission congestion in Texas and developed the analytical and computational framework to identify generating resources necessary to relieve local congestion and ensure system reliability.
- Planning and system interconnection studies for multiple projects proposed for development in New York and New England, including major generation and merchant transmission projects.
- Siting/fatal flaw studies for existing and proposed generating stations in multiple reliability regions, which provide assessment of project interconnectibility from technical and economic perspectives.

Prior to joining PowerGEM, Dr. Obessis was with Power Technologies, Inc. (PTI) as a Manager-Senior Consultant. He was involved in studies in transmission planning, generation siting, steady state and dynamic analysis, and economic behavior of power systems, as well as in efforts leading to development of market models and simulation methods for spot price prediction in the New England region.

Affiliations & Publications

Dr. Obessis has authored several technical publications on the topics of generation dispatch, transmission planning, and transfer analysis. He is a Senior Member of IEEE and a Member of Sigma Xi Scientific Research Society.

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PUBLIC SERVICE COMMISSION

In the Matter of the

Application by Cricket Valley Energy Center, LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law For Approval of a New 345 kV Line From the Pleasant Valley Substation to the Cricket Valley Energy Center, LLC, and the Re-conductoring of An Existing 345 kV Line

Case No. _____

DIRECT TESTIMONY OF

ROBERT O'NEAL

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

Q. Please state your full name, employer, and business address.

A. My name is Robert O'Neal. I am employed by Epsilon Associates, Inc. My business address is 3 Clock Tower Place, Suite 250, Maynard, Massachusetts, 01754.

Q. In what capacity are you employed?

A. I am a Principal at Epsilon Associates, and serve as project manager for noise assessments and air quality modeling projects for wind energy and fossil fuel power generation facilities as well as hard rock quarries, aggregate handling, asphalt and concrete plants, C&D processing facilities, landfills, real estate development, and mobile sources.

Q. Please summarize your education and professional background.

A. I received a Master of Science in Atmospheric Science from Colorado State University in 1987, and a Bachelor of Arts in Engineering Science from Dartmouth College in 1983. I have more than 25 years of professional experience as a Project Manager in the areas of community noise impact assessments, meteorological data collection and analyses, and air quality modeling projects. I have served in my present position since 2000. My work has involved design and implementation of sound level measurement programs, modeling of future impacts, conceptual mitigation analyses, and compliance testing for wind energy and fossil fuel generation facilities.

Prior to joining Epsilon Associates, from 1987 until 1997, I was employed by Tech Environmental, Inc. where I was a Project Manager responsible for noise impact assessments and air quality modeling studies. In 1997, I joined Earth Tech, Inc. as a Program Director. In that capacity, I was responsible for community noise studies for

electric generating stations, as well as meteorological analyses, and air quality modeling. In 2000, I joined Epsilon Associates, Inc. as a Senior Consultant. In 2004, I was made a Principal of the firm.

Q. Please describe your role in the Cricket Valley Transmission Line Project.

A. I served as Epsilon's technical expert in the area of noise for the Article VII Application, responsible for the supervision of the Epsilon project staff with regard to noise-related analyses and the preparation of the noise assessment part of the Application included in Exhibit 4.

Q. What portion(s) of the Application are you sponsoring?

A. I am sponsoring the following exhibits, which were prepared by me or under my supervision and direction: Exhibit 4 (Environmental Impact).

Q. Does this conclude your testimony?

A. Yes.

ROBERT D. O'NEAL, CCM, INCE

PRINCIPAL

EDUCATION

M.S., Atmospheric Science, Colorado State University, 1987
B.A., Engineering Science, Dartmouth College, 1983

REGISTRATIONS

Certified Consulting Meteorologist, #578

PROFESSIONAL SUMMARY

A Principal of the firm, Mr. O'Neal is a Certified Consulting Meteorologist with over 25 years of experience in the areas of community noise impact assessments, meteorological data collection and analyses, and air quality modeling. Mr. O'Neal's noise impact evaluation experience includes design and implementation of sound level measurement programs, modeling of future impacts, conceptual mitigation analyses, and compliance testing. Rob has performed noise measurement and modeling assessments for wind energy and fossil-fuel power generation facilities in the Northeast, the Mid-Atlantic region, the Midwest, and the Southwestern U.S. Other industries served include hard rock quarries, aggregate handling, asphalt and concrete plants, C&D processing facilities, landfills, real estate development, and mobile sources. He has also provided expert witness testimony on noise impact studies and air pollution modeling in front of local boards, courts of law, and adjudicatory hearings. His air quality background involves applying air quality dispersion models for regulatory permitting applications, as well as for general air quality impact evaluations. He has experience with the CALMET/CALPUFF modeling system used to evaluate visibility and acid deposition impacts in Class I areas.

PROFESSIONAL EXPERIENCE

Wind Energy Projects

- *Iberdrola Renewables – Groton Wind, Groton, NH.* Developed an extensive sound level measurement and modeling program for a proposed 48 MW wind farm near Plymouth, NH. Concurrent sound level data and meteorological data were collected and analyzed. The results were presented as expert witness testimony at community open houses and during the Site Evaluation Committee public hearings.

- *Massachusetts Clean Energy Center – Research Study on Wind Turbine Acoustics*. The study includes measuring sound emissions from a variety of operating wind turbines in the Commonwealth of Massachusetts. Fieldwork includes measuring both the level and quality of sound emissions from operating wind turbines under various wind regimes and topography. To better understand how wind speed and wind direction vary over the turbine height, meteorological data are collected using on-site meteorological towers and LiDAR systems. Acoustical data are measured at various distances from the wind turbines and include

broadband, one-third octave band, low frequency and infrasound, and interior/exterior sound levels.

- *Eolian Renewable Energy -- Antrim Wind, Antrim, NH.* Developed an extensive sound level measurement and modeling program for a proposed 30 MW wind farm in Antrim, NH. Concurrent sound level data and meteorological data were collected and analyzed. The results were presented as expert witness testimony at community open houses and during the NH Site Evaluation Committee public hearings.

- *FPL Energy – Horse Hollow Wind Energy Center, Taylor County, TX*. Developed and executed an extensive sound level measurement program for a 735 MW wind farm in Taylor County, TX. Concurrent sound level data, meteorological data, and wind turbine power output data were collected and analyzed. The results were used in legal proceedings as part of expert witness testimony in the case.

- *Pioneer Green Energy – Great Bay Wind, Somerset County, MD.* Developed an extensive sound level measurement and modeling program for a proposed 99 MW wind farm on the eastern shore of Maryland. Concurrent sound level data and meteorological data were collected and analyzed. The results were used in the state-level permit applications.

- *FPL Energy – Wolf Ridge Wind Farm, Cooke County, TX*. Developed and executed an extensive sound level measurement and modeling program for a proposed wind farm in Cooke County, TX. Concurrent sound level data and meteorological data were collected and analyzed. The results were used in legal proceedings as part of expert witness testimony in the case.

- *John Deere Renewables –Michigan Thumb I Wind Farm, Huron County, MI*. Developed and executed a long-term sound level measurement program for an existing 69 MW wind farm in Michigan to determine compliance with the local noise ordinance. Concurrent sound level data and meteorological data were collected and analyzed.

- *NextEra Energy Resources (formerly FPL Energy) – Low Frequency & Infrasound Study, TX*. Developed and executed a sound level measurement program as part of a scientific study to determine low frequency and infrasound levels from two types of wind turbines. Both interior and exterior data were compared to independent impact criteria for audibility, vibration, rattle, and annoyance. The study results were published in the peer-reviewed Noise Control Engineering Journal.

- *NextEra Energy Resources (formerly FPL Energy) – Ashtabula Wind Farm, Barnes County, ND*. Developed and executed a sound level measurement program for an existing wind farm in North Dakota in response to noise complaints. Concurrent sound level data and meteorological data were collected and analyzed.

- *Gamesa Energy – Barton Chapel Wind Farm, Jack County, TX.* Developed an extensive sound level measurement and modeling program for a proposed 120 MW wind farm in Jack County, TX. Concurrent sound level data and meteorological data were collected and analyzed. The results were used in legal proceedings as part of expert witness testimony in the case.

- *TCI Renewables – Crown City Wind Farm, Cortland County, NY.* Developed an extensive sound level measurement and modeling program for a proposed 80 MW wind farm in central NY. Concurrent sound level data and meteorological data were collected and analyzed. The results were used in the state-level permit applications.

- *Babcock & Brown – Allegheny Ridge Wind Farm, Portage, PA.* Developed and executed a sound level measurement program for an 80 MW wind farm in Cambria and Blair Counties, PA. Concurrent sound level data, meteorological data, and wind turbine power output data were collected and analyzed. The results were used to demonstrate compliance with the noise standard of the Development Agreement with the local Township.

- *FPL Energy – Waymart Wind Farm L.P., Waymart, PA.* Managed the post-construction community noise study for a 65 MW wind turbine facility utilizing 43 GE 1.5 MW turbines. A compliance demonstration with the local noise ordinance was done utilizing the pre-construction ambient sound level data and the on-site meteorological data.

- *State of New Hampshire, Office of the Attorney General -- Lempster Mountain Wind Power Project, Lempster, NH.* Performed an independent review of a proposed 24 MW wind turbine farm. The applicant's noise impact analysis was evaluated and comments provided to the State of NH.

- *Varian Semiconductor Equipment Associates, Inc. – Wind Farm, Gloucester, MA.* Two 2.5 MW wind turbines are proposed at a facility which manufacturers the machinery used in computer chip making. Managed the sound level impact study including existing condition measurements and future modeling using the WindPro model. The results were presented at a series of city council public hearings resulting in approval of the project.

Independent Power Projects

- *Braintree Electric Light Department – Thomas A. Watson Generating Station, Braintree, MA.* Conducted long-term continuous ambient sound level measurement program for a proposed 105 MW natural gas and oil-fired simple-cycle electric power generation facility. Acoustical modeling, including several rounds of mitigation, was performed to demonstrate compliance with the State noise policy.

- *Montgomery Energy Billerica Power Partners -- Billerica Energy Center, Billerica, MA.* Worked on noise aspects for a proposed 350 MW natural gas and oil-fired simple-cycle electric power generation facility. Acoustical modeling, including several rounds of mitigation, was performed to demonstrate compliance with the State noise policy. Expert testimony on noise issues was presented to the Energy Facilities Siting Board.

- *Advanced Power Services – Brockton Power, Brockton, MA.* Conducted a 168-hour continuous ambient sound level measurement program at multiple sites for a proposed 350 MW natural gas-fired combined-cycle electric power generation facility. Acoustical modeling, including mitigation, was performed to demonstrate compliance with the State noise policy. Expert testimony on noise issues was presented to the Energy Facilities Siting Board.

- *Besicorp-Empire Development Company – Rensselaer, NY.* Prepared interrogatory responses, and testimony for the Noise section of the Article X application for this proposed 505 MW combined-cycle gas-fired electric power generation facility, recycled newsprint manufacturing plant, and waste water treatment plant. Additional testimony was provided for Technical Conference hearings before a NYS DEC Administrative Law Judge.

- *Cornell University, Ithaca, NY.* Prepared a sound level impact assessment report for the NY SEQRA process and Article VII natural gas pipeline application for this proposed 30 MW combined heat and power generation facility.

- *Milford Power Co., LLC – Milford, CT.* Conducted post-construction ambient sound level measurements for a 544 MW combined-cycle gas-fired electric generating facility. The project utilizes two Alstom GT-24 combustion turbines, one steam turbine, and an 8-cell wet mechanical cooling tower. High-pressure steam blows and transformer noise were also measured during construction and assessed for community impacts.

- *FPL Energy – Jamaica Bay Peaking Facility, Far Rockaway, NY.* Managed the noise impact study as part of an Environmental Assessment for a 50 MW natural gas-fired peaking plant utilizing two P&W combustion turbines. A compliance demonstration with the local noise ordinance was done utilizing the ambient background data and acoustical modeling. Follow-up noise monitoring was done to evaluate vendor performance specifications.

- *FPL Energy – Bayswater Peaking Facility, Far Rockaway, NY.* Managed the noise impact study as part of an Environmental Assessment for a 55 MW natural gas-fired peaking plant utilizing two P&W combustion turbines. A compliance demonstration with the local noise ordinance was done utilizing the ambient background data and acoustical modeling.

- *Sithe Energies – Heritage Station, Oswego, NY.* Conducted ambient sound level measurements and performed sound level modeling at the 1000 MW Independence Station power plant in support of permitting a proposed 800 MW combined-cycle electric generation facility adjacent to the existing station in Oswego. The proposed project will utilize General Electric's new "H" System combustion turbine technology, and a 16-cell wet mechanical cooling tower. A compliance demonstration with the local noise ordinance was done utilizing the ambient background data and acoustical modeling. Mr. O'Neal prepared the Noise section of the Article X Application in conjunction with the New York State Public Service Law as well as expert testimony on noise for the Article X public hearings.

- *PG&E – Mantua Creek, West Deptford, NJ.* Conducted single-station CALPUFF modeling for impacts at the nearest Class I area for a proposed 800 MW natural gas-fired combined-cycle electric power generation facility. The latest IWAQM Phase 2 guidance was followed for calculating ambient concentration, wet and dry deposition, and regional haze impacts at the Brigantine National Wildlife Refuge.

- *Duke Energy Power Services, LLC – OH, IN, IL, MO.* Conducted ambient sound level measurement programs and performed acoustical modeling for six proposed simple-cycle electric power generation facilities in the Midwest for Duke Energy. These 640 MW peaking

stations were permitted for 8 GE 7EA combustion gas turbines. The results of the noise impact assessment were used to secure site plan approval from the local community.

- *Calpine Corporation – Ontelaunee Energy Center, Ontelaunee, PA*. Conducted 24-hour ambient sound level measurements at multiple sites for a proposed 543 MW natural gas-fired combined-cycle electric power generation facility utilizing two Westinghouse 501F combustion turbines. A compliance demonstration with the local noise ordinance was done utilizing the ambient background data and acoustical modeling. Post-construction sound level measurements were done on the turbines to confirm they met the vendor guaranteed noise limits.

Linear Siting and Transmission Projects

- *NSTAR 345 kV Transmission Reliability Project, Stoughton, Canton, Milton, Boston, MA*: Responsible for noise impact assessment for this proposed 18 mile multi-circuit underground 345 kV project. Construction noise impacts along the route and operational noise from substations in Hyde Park and South Boston were analyzed. Expert testimony before the EFSB was provided.

- *Weaver's Cove Energy, Fall River, MA*. Managed the implementation of an extensive existing condition sound level measurement program. Long-term continuous and short-term measurements were taken at multiple locations around a proposed liquefied natural gas (LNG) import terminal. Expected future sound level impacts from operation of the LNG import terminal were calculated. In addition, community sound level impacts from an associated 2.5 million yd^3 dredging project in the adjacent channel were evaluated. The FERC Resource Report 9 section on noise impacts was prepared.

- *BP/Amoco – Continental Divide EIS, WY and CO*. Performed meteorological and air quality dispersion modeling for a proposed natural gas field development project in Wyoming using the CALMET and CALPUFF models. Extensive emission inventories were developed within a large domain (200,000 km^2) using state air agency records and permit file reviews. Ambient pollutant concentrations, wet and dry deposition, and visibility impacts at eight Class I areas from long-range transport were evaluated as a result of the project and the cumulative inventory.

Industrial/Commercial Projects

- *General Electric Company, Hudson River PCBs Superfund Site, Hudson River, NY*. Prepared the Noise Impact Assessment for dredging, processing, and construction activities associated with Phase 1 of the Final Design Report. Source-specific sound level measurements of key sources were also made. Sound level monitoring was done during Phase 1 dredging and processing of the sediment to determine compliance with the Quality of Life Performance Standards.

- *Former Coal Tar Gasification Facility, Island End River, Everett, MA*. Managed an extensive sound level measurement program prior to and during a dredging operation. An existing condition measurement program over multiple seasons was conducted for one-week intensive

periods. A measurement program during a 10-day pilot study was carried out to determine key sources of dredge noise within the community. Sound level monitoring was also conducted throughout the remediation work program itself. This work was coordinated with the land-based and water-based parties on the remediation team.

- *Environmental Soil Management, Inc., Loudon, NH*. An extensive sound level measurement program was conducted for a thermal soil treatment plant in response to community noise complaints. Simultaneous overnight measurements were made at multiple locations with and without the plant operating to identify the possible sources of area noise. Digital audio tape recordings were collected and presented at the local zoning board meeting to demonstrate the low noise levels. Follow-up measurements were made to satisfy decibel limits imposed by the board in order to allow 24-hour per day operations.

- *Gordon Food Service, Brighton, MI*. Noise impacts from loading dock activity, truck traffic, yard dogs, and rooftop mechanical equipment were analyzed as part of the local approval process for a 170,000 square foot regional distribution center in Michigan. Detailed existing condition sound level measurements were made and future operational impacts modeled.

- *Eastman Gelatine Corp., Peabody, MA*. A detailed sound level measurement program was performed to identify sources of community noise concerns around an existing manufacturing facility. Long-term continuous broadband and short-term narrow band sound level measurements were collected around the site. The narrow-band measurements allowed the annoying sources of noise to be identified and a mitigation program to be established.

- *Wingra Engineering, Inc., TN*. Performed meteorological and air quality dispersion modeling in support of a multi-site evaluation for a proposed gray and ductile iron foundry project in Tennessee using the CALMET and CALPUFF models. Ambient pollutant concentrations, wet and dry deposition, and visibility impacts at four Class I areas from long-range transport were evaluated as a result of the project and background sources.

- *Dartmouth-Hitchcock Medical Center, Lebanon, NH*. As part of the state air quality permitting process, applied the ISC and VALLEY models to demonstrate compliance with the NAAQS for the new construction of a major New England hospital's boilers, incinerator, and diesel generators. Interactive modeling was required within the area of significant impact. Prepared original and renewal Title V Operating Permits for the hospital complex.

- *The Home Depot, Sutton, MA*. Ambient sound level measurements, noise modeling, and air quality modeling were conducted to evaluate the potential noise impacts from the operation of a new 24-hour per day 200-dock regional distribution center. The primary sources included the delivery trucks and yard dogs. Expert testimony on air quality and noise impacts were presented in Massachusetts Land Court.

- *The Stop & Shop Supermarket Company, Freetown, MA*. Noise impacts from loading dock activity, truck traffic, and rooftop mechanical equipment were analyzed as part of the local approval process for a 1,500,000 square foot regional distribution center in Freetown. The results of the study were presented to the neighborhood in a series of meetings.

Rock Quarries

- *A. Colarusso & Son., Inc., Hudson, NY.* A sound level impact analysis was performed for a proposed rock quarry expansion at a site in Columbia County in support of the NYS DEC Mined Land Reclamation Permit and SEQRA process. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at an existing excavation site and were used to calculate future sound level impacts.

- *Aggregate Industries, Peabody, MA.* A Noise Management Plan was developed as part of the Special Permit requirements at this site. A method of correlating noise complaints with meteorological conditions were set-up. In addition, a series of Best Management Practices for noise reduction were implemented. An extensive community sound level monitoring program was developed and implemented. Mitigation measures to reduce noise from the quarry were designed and presented to city officials and the neighborhood.

- *Sour Mountain Realty, Inc., Fishkill, NY.* A sound level impact analysis was performed at the site of a proposed hard rock quarry in support of a NYS DEC Mined Land Reclamation Permit application in Dutchess County. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and processing equipment were measured at existing rock quarries and used to calculate future sound level impacts. Expert testimony on noise impacts was provided before a NYS Administrative Law Judge.

- *Paquette Pit, Center Harbor, NH.* A sound level impact analysis on rock-crushing and processing equipment, and electrical generators was conducted for a proposed quarry. The results were submitted to the Planning Board.

- *A.A. Wills Materials, Inc., Freetown, MA.* Ambient sound level measurements were conducted at residential locations around an existing 105-acre hard rock quarry along Route 140. Four days of continuous measurements were made with and without the quarry operating to determine the impact of the operations on ambient sound levels in the neighborhood.

Sand & Gravel Operations

- *Okemo Mountain Resort, Ludlow, VT.* A sound level impact analysis was performed for a proposed sand and gravel excavation site in Ludlow. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were used to model future sound levels from operation of gravel extraction. Expert testimony on noise impacts was presented before the Act 250 District Environmental Commission and the local review board.

- *Dalrymple Gravel & Contracting Co., Inc., Erwin, NY.* A sound level impact analysis was performed for a proposed sand and gravel excavation site ("Scudder Mine") at a site in Steuben County in support of the NYS DEC Mined Land Reclamation Permit and SEQRA process. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at an existing excavation

site and were used to calculate future sound level impacts. Expert testimony on noise impacts was presented before a NYS Administrative Law Judge.

- *Palumbo Block Co., Inc., Ancram, NY.* A sound level impact analysis was performed for a proposed sand and gravel excavation site ("Neer Mine") in Columbia County in support of the NYS DEC Mined Land Reclamation Permit process. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at existing excavation sites and used to calculate future sound level impacts. Expert testimony on noise impacts was presented before a NYS Administrative Law Judge.

- *Newport Sand & Gravel, Goshen, NH.* A sound level impact analysis was performed for a proposed 68-acre sand and gravel excavation site along Route 10 in Goshen. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at existing excavation sites and used to calculate future sound level impacts. The results of this work were presented to the local Zoning Board of Appeals.

- *Morse Sand & Gravel, Lakeville, MA.* A sound level impact analysis was performed for an existing concrete batch plant. Ambient background and operational sound level measurements were collected around the site. A mitigation program was designed and the effectiveness of various noise control options were tested. The results of this work were presented as expert witness testimony in Massachusetts Land Court in Boston.

- *Ambrose Brothers, Inc., Sandwich, NH.* A sound level measurement program was performed for an existing sand and gravel excavation site in Sandwich. A future sound level measurement program will be conducted upon the opening of a new phase of the operation to determine the sound level change due to equipment relocation.

- *Granite State Concrete, Inc., Lyndeborough/New Boston/Mont Vernon, NH.* A sound level impact analysis was performed for a proposed 39-acre expansion of an existing sand and gravel excavation site in Lyndeborough. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at the existing excavation site and used to calculate future sound level impacts. The results of this work were presented to the local Zoning Board of Appeals.

- *P.J. Keating Co., Townsend, MA.* A sound level impact analysis was performed for a proposed sand and gravel excavation site. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at existing excavation sites and used to calculate future sound level impacts. The results of this work were presented as expert witness testimony in Massachusetts Land Court in Boston.

Asphalt Plants

- *Massachusetts Broken Stone Company, Berlin, MA.* Performed an ambient hydrogen sulfide (H_2S) and meteorological monitoring program at an existing hot mix asphalt plant. Continuous

measurements were made of H_2S, wind speed, and wind direction to determine if the facility may be a source of odor in the area.

- *Tilcon Capaldi, Inc., Watertown and Weymouth, MA*. Air quality impacts from two asphalt-batching plants were evaluated based on best management practices and dispersion modeling. Both fugitive sources from materials handling and ducted combustion sources were reviewed and mitigation measures were recommended. Expert testimony was provided on matters before the MA DEP and abutters of the plants.

- *Pike Industries, Inc., Henniker, NH*. Air quality dispersion modeling, control technology evaluation, best management practice review, and meteorological data analysis were conducted for an asphalt batch plant in order to address a local odor issue. The results of this work were presented in meetings with the NH ARD and the neighbors.

- *Pike Industries, Inc., Ossipee and Madison, NH*. Air quality dispersion modeling was conducted for two asphalt batch plants in order to revise the State air pollution permit to allow the burning of specification used oil.

Transfer Stations/Landfills

- *Confidential Client, ME*. Project manager for an ambient air quality monitoring plan submitted to ME DEP for two existing landfills as part of the landfill gas and odor management system. CALMET meteorological modeling and CALPUFF dispersion modeling were used to specify the continuous hydrogen sulfide (H_2S) monitoring locations and appropriate H_2S Action Levels.

- *Wood Recycling, Inc., Southbridge, MA*. Prepared an ambient air quality monitoring plan for the existing Southbridge Landfill as part of the landfill gas and odor management requirements. MA DEP approval was obtained for the sampling locations and equipment specifications of three fixed hydrogen sulfide (H_2S) monitoring systems and an on-site meteorological station. Dispersion modeling was used to specify the appropriate detection limits for the H_2S equipment.

- *Pine Tree Waste, Inc., Westbrook, ME*. Prepared a noise impact assessment for a proposed construction & demolition transfer station and processing facility. This project involved calculation of expected operational noise impacts from the processing equipment, a compliance evaluation with State and local noise regulations, and testimony before the local Planning Board.

- *Holliston Transfer Station, Holliston, MA*. Prepared a noise impact assessment for an existing C&D and MSW transfer station in Holliston, MA. This project involved ambient background noise monitoring at sensitive receptors around the site, a compliance evaluation with State and local noise regulations, and expert testimony before the Board of Health during the site assignment hearings.

- *Resource Recovery of Cape Cod, Sandwich, MA*. Prepared a noise impact and mitigation assessment for an existing 600-ton/day construction & demolition transfer station on Cape Cod. This project involved extensive ambient background noise monitoring at sensitive receptors

around the site, calculation of expected operational noise impacts from the processing equipment, a compliance evaluation with State noise regulations, and mitigation calculations.

- *Valley Mill Corp., Pittsfield, MA*. Prepared a noise impact assessment for a proposed 250-ton/day C&D transfer station in Pittsfield. This project involved ambient background noise monitoring at sensitive receptors around the site, calculation of expected operational noise impacts from the processing equipment, and a compliance evaluation with State noise regulations.

- *WSI, Oxford, MA*. Prepared a noise impact assessment for a proposed 750-ton/day C&D and MSW transfer station in Oxford, MA. This project involved ambient background noise monitoring at sensitive receptors around the site, calculation of expected operational noise impacts from the processing equipment, a compliance evaluation with State noise regulations, and expert testimony before the Board of Health during the site assignment hearings.

EXPERT TESTIMONY EXPERIENCE

Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for Dufferin Wind Power [Case ERT 13-070 to 13-075, Bovaird v. Director, Ministry of the Environment].

Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for K2 Wind Ontario, Inc. [Case ERT 13-097 to 13-098, Drennan v. Director, Ministry of the Environment].

Expert witness before the NH Site Evaluation Committee on noise issues for the 30 MW Antrim Wind Project (2012); 48 MW Groton Wind project (2010).

Expert witness before the MA Energy Facilities Siting Board on noise issues for: 18-mile underground electric transmission line and substation project in the Boston Metropolitan area (2004-2005); Billerica Energy Center power plant (2007); Brockton Clean Energy (2008-2009).

Expert witness in Vermont Act 250 Land Use proceedings on noise issues for a proposed sand and gravel excavation site at Okemo Mountain (2007).

Expert witness in the 42nd District Court of Texas on noise issues for a 735 MW wind turbine farm (2006).

Expert witness before NY DEC Administrative Law Judge on noise issues for a hard rock quarry facility (1997), two sand and gravel excavation sites (2001; 2003), and a cogeneration power plant (2003).

Expert witness for site assignment hearings on noise issues from solid waste transfer stations in Lowell, MA (1998); Marshfield, MA (1999); Holliston, MA (2004); Oxford, MA (2006).

Expert witness in Massachusetts Land Court on noise issues for a proposed sand and gravel pit (1991), a proposed cross-dock distribution center (2002), and an existing concrete batch plant (2005).

Expert witness in Vermont Act 250 Land Use process for air quality impacts at ski areas (1991; 1992; 1997).

Expert witness before MA DEP Administrative Law Judge for an asphalt plant in Boston (1996).

Expert witness before municipal boards on issues of air pollution and noise impacts from local industries (many years).

Invited specialty speaker on noise impact assessments for Boston University's Masters of Urban Planning degree program (1994; 1996).

PROFESSIONAL ORGANIZATIONS

American Meteorological Society - Certified Consulting Meteorologist #578
Air and Waste Management Association
Institute of Noise Control Engineers (INCE)
Acoustical Society of America

PUBLICATIONS

O'Neal, R.D., Hellweg, Jr., R.D. and R. M. Lampeter, 2011. Low frequency sound and infrasound from wind turbines. Noise Control Engineering Journal, **59** (2), 135-157.

O'Neal, R.D., and R.M. Lampeter, 2007: Sound Defense for a Wind Turbine Farm. North American Windpower, Zackin Publications, Volume 4, Number 4, May 2007.

O'Neal, R.D., 1991: Predicting potential sound levels: A case study in an urban area. Journal of the Air & Waste Management Association, **41**, 1355-1359.

McKee, T.B. and R.D. O'Neal, 1989: The role of valley geometry and energy budget in the formation of nocturnal valley winds. Journal of Applied Meteorology, **28**, 445-456.

CONFERENCE PRESENTATIONS

O'Neal, R.D. Lampeter, R.M., Emil, C.B. and B.A. Gallant. Evaluating and controlling noise from a metal shredder system. Presented at INTER-NOISE 2012, NY, NY, August 19-22, 2012.

O'Neal, R.D., 2011. Wind Turbine sound Levels: The Michigan I, Huron County, MI Study. Presented at Great Lakes Wind Collaborative 4th Annual Meeting, Ypsilanti, MI.

O'Neal, R.D., Hellweg, Jr., R.D. and R. M. Lampeter, 2011. Low frequency sound and infrasound from wind turbines. Presented at WINDPOWER 2011, Anaheim, CA.

O'Neal, R.D., Hellweg, Jr., R.D. and R. M. Lampeter, 2010. Low frequency sound and infrasound from wind turbines – a status update. NOISE-CON 2010, Baltimore, MD.

O'Neal, R.D., 2010. Noise control evaluation for a concrete batch plant. NOISE-CON 2010, Baltimore, MD.

O'Neal, R.D., and R.M. Lampeter, 2009: Nuisance noise and the defense of a wind farm. INTER-NOISE 2009, Ottawa, Canada, August 23-26, 2009.

O'Neal, R.D., and R.M. Lampeter, 2009: Sound from Wind Turbines: A Key Factor in Siting a Wind Farm. 12th Annual Energy & Environment Conference – EUEC 2009, Phoenix, AZ, February 2, 2009.

O'Neal, R.D., 2001: The Impact of Ambient Sound Level Measurements on Power Plant Noise Control in Massachusetts: A Case Study. Proceedings of the Air & Waste Management Association 94th Annual Meeting and Exhibition, Orlando, FL, June 24-28.

Hendrick, E.M., and R.D. O'Neal, 2001: A Case Study of Class I Impacts Using CALPUFF Screen. Proceedings of the Air & Waste Management Association Guideline On Air Quality Models: A New Beginning, Newport, RI, April 2001.

O'Neal, R.D., 1994: Indoor air sampling techniques used to meet workplace and ambient air toxic detection requirements. Proceedings of the Air & Waste Management Association 87th Annual Meeting and Exhibition, Cincinnati, OH, June 19-24.

O'Neal, R.D., 1992: Estimating future noise levels from industrial noise sources. Acoustical Society of America 124th Meeting, New Orleans, LA, October 31 - November 4.

O'Neal, R.D., 1991: Temporal traffic fluctuations and their impact on modeled peak eight-hour carbon monoxide concentrations. Proceedings of the Air & Waste Management Association 84th Annual Meeting and Exhibition, Vancouver, B.C., June 16-21.

O'Neal, R.D., 1990: Noise barrier insertion loss: A case study in an urban area. Proceedings of the Air & Waste Management Association 83rd Annual Meeting and Exhibition, Pittsburgh, PA, June 24-29.

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

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Case No. _____

DIRECT TESTIMONY OF

PETER A. VALBERG, Ph.D.

ON BEHALF OF

CRICKET VALLEY ENERGY CENTER, LLC

Q. Please state your name, position and business address.

A. My name is Peter A. Valberg, Ph.D. My position is a Principal and Senior Health Scientist at Gradient, and environmental health consulting company. My business address is Gradient at 20 University Road, Cambridge, Massachusetts 02138.

Q. On whose behalf are you testifying in these proceedings?

A. With regard to this proceeding, I am testifying on behalf of Cricket Valley Energy Center, LLC.

Q. Please summarize your educational and professional background.

A. I hold an A.B. degree, *summa cum laude*, in Physics and Mathematics from Taylor University, both M.A. and Ph.D. degrees in Physics from Harvard University, and an M.S. degree in Human Physiology from the Harvard University School of Public Health ("HSPH"). A copy of my resume is attached hereto as Exhibit PAV-1.

I specialize in the areas of exposure to and toxicology of environmental agents, and ionizing / non-ionizing radiation. I have extensively researched and studied the links between human health and specific agents such as air pollutants, groundwater contaminants, radio wave frequencies ("RF"), and electric and magnetic fields ("EMF"). For 25 years, I served as a faculty member in the Department of Environmental Health at HSPH, where I researched and taught toxicology, cell biology, environmental health, and public health. One of the research grants I directed at HSPH was funded by the National Cancer Institute, and was on the topic of "Magnetic Field Effects on Macrophages." I

have served on advisory panels for the National Institutes of Health ("NIH"), the Health Effects Institute, and the Environmental Protection Agency ("EPA"). I am a member of the International Society for Environmental Epidemiology, the Health Physics Society, the Bioelectromagnetics Society, and the Committee on Man and Radiation ("COMAR"). I have served on the Board of Directors of the Bioelectromagnetics Society, and on the "Harvard Advisory Committee on EMF and Human Health" and the "Peer Review Board on Cellular Technology and Human Health," both located at the Harvard University Center for Risk Analysis. I have assisted the Health Effects Institute (Boston, MA) in determining the feasibility of launching an EMF research program, and I have published a summary document on "EMF Mechanisms" in the journal Radiation Research. In 2006, I was asked to present lectures on how EMF interacts with living organisms by the Cyprus International Institute for the Environment and Public Health in a symposium on "Electromagnetic Fields: Sources, Health Effects, and Regulations," which took place in Nicosia, Cyprus. For the Harvard School of Public Health, I helped organize a conference in the Boston area on "Childhood Leukemia: Electric and Magnetic Fields as Possible Risk Factors." A summary of this workshop was published (2003) in the journal Environmental Health Perspectives. I have worked with the World Health Organization ("WHO") on analyzing the EMF that occur in the context of cellular telephones, and with the State of Connecticut (Connecticut Siting Council) on how EMF health-based exposure limits relate to siting policies for electric-power transmission lines.

Q. Have you presented testimony in utility, regulatory or other proceedings?

A. Yes. Please see the accompanying table, Exhibit PAV-2, for details.

Q. What is your involvement and responsibility with respect to Cricket Valley Energy Center, LLC's proposed transmission facilities?

A. Gradient was asked by Epsilon Associates to independently review the EMF analysis of DiGioia Gray & Associates as to the EMF impacts of the 345-kV lines serving the Cricket Valley Energy Center. I provided edits and suggestions to the EMF report, which were incorporated in the finalized version.

Q. What is the purpose of your testimony?

A. In conjunction with other witnesses, I am responsible for testifying as to the EMF impacts of the Electric Transmission Line part of the project, which extends from the Cricket Valley Energy Center to the Pleasant Valley Substation, specifically as the the analysis presented in Appendix C, "Transmission Line EMF Study."

Q. Were the materials referenced above reviewed by you?

A. Yes.

Q. Are there any updates as to those matters for which you are responsible?

A. Generally, it should be noted that the ICNIRP 1998 EMF guidelines have been replaced by 2010 EMF guidelines. As of November 2010, the International Commission for Non-Ionizing Radiation Protection ("ICNIRP") revised its EMF "guidelines for protection against adverse health effects" from continuous public exposure to magnetic fields from 833 mG to 2,000 mG; the electric-field guidelines were not changed ("Guidelines for Limiting Exposure to Time-Varying Electric and Magnetic Fields (1 Hz–100 kHz)

Published in *Health Physics* 99(6): 818-836; 2010"). The ICNIRP stated that the new guidelines were based on (a) new computational simulations (of EMF interaction with the body) based on anatomically detailed human body models, (b) new scientific research that provides a better understanding of biological actions of EMF than what was available in 1998, and (c) basing the health risk assessment on induced electric fields rather than induced electric currents, as was done in 1998. On this latter point, ICNIRP states that it is now clear that the induced electric field is the physical quantity that determines biological effect, instead of induced current density.

Q. Does this conclude your testimony?

A. Yes.

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PETER A. VALBERG, Ph.D.
Principal

AREAS OF EXPERTISE

Public health, inhalation toxicology, epidemiology, human health risk assessment, indoor / outdoor air quality, comparative toxicology, modeling of human exposure and retained dose, health effects of ionizing and non-ionizing radiation, biophysics of power-line fields and cell telephone radio waves, risk communication.

EDUCATION

M.S., Human Physiology and Inhalation Toxicology, Harvard University, 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

1990 – 98 2001 - present	GRADIENT CORPORATION, Cambridge, MA Principal and Senior Scientist in 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.
1985 - 2000	HARVARD SCHOOL OF PUBLIC HEALTH, Boston, MA Associate Professor of Physiology. (Adjunct, after 1990) Research areas: (1) human health effects of air toxics, (2) lung macrophage function measured with magnetic particles, (3) lung deposition and clearance of radioactive tracer particles.
1998 - 2000	CAMBRIDGE ENVIRONMENTAL, INC., Cambridge, MA Senior Scientist
1989	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.
1982	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

- Physical and Biological Sciences Study Committee, Town of Needham Planning Board
- National Academy of Sciences and National Research Council, Evaluating Health-Risk-Reduction Benefits of USEPA Regulations (2001 – present)
- Harvard School of Public Health: Research Advisory Committee Member for NIH-Sponsored Research on "Mechanisms of mortality/morbidity due to air particulate" (1997 – present)
- Member of the Committee on Man and Radiation (COMAR) (1999 – present)
- Health Effects Institute, Cambridge, MA, *ad hoc* reviewer (1984 – 94)
- National Research Council, Commission on Life Sciences: Committee on Passive Smoking (1986-88)
- 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: Cardiovascular and Pulmonary Study Section, and Radiation Study Section, reviewer
- DOE: Office of Health and Environmental Research, reviewer
- Harvard Center for Risk Analysis: Peer Review Board on Cellular Telephones (1994 – 1999)

PROFESSIONAL ASSOCIATIONS

International Society for Environmental Epidemiology • Society for Risk Analysis • Health Physics Society • International Society for Aerosols in Medicine • Sigma Xi • American Association for the Advancement of Science

PROJECT LIST (abbreviated)

Mining Company: Evaluated the scientific and epidemiological basis for the toxicity of arsenic in soils. Evaluated metals toxicity factors and site-specific bioavailability of metals. Recalculated the cancer potency factor for arsenic, using the original cancer prevalence data in combination with a modified water intake.

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 emissions estimates, exposure modeling, and multiple-pathway (ingestion, inhalation, dermal, mothers' milk) health risk assessment.

Confidential Client: Prepared a risk assessment for a Massachusetts landfill containing both chemical and radioactive waste. Multiple pathways of contaminant uptake were assessed for a potential trespasser scenario.

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

Confidential Client: 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.

Confidential Clients: Prepared human toxicology profiles for a range of chemical substances, including beryllium, carbon black, chlorine, coke oven emissions, copper, ferrocene, Freon, manganese, *n*-butylamine, and thorium.

Electric Power Research Institute: Reviewed and analyzed the various possible mechanisms by which biological systems may be affected by environmental electric and magnetic fields (EMFs). Organized a leukemia workshop.

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

Environmental Health Association for the Carbon Black Industry: Evaluated the toxicology and epidemiology of carbon black (CB) inhalation and ingestion. Reviewed IARC document on the carcinogenicity of CB.

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. Presented case studies on health risks of electric and magnetic fields and cellular telephones.

Health Effects Institute: Prepared a state-of-the-art document on inhaled ozone dosimetry: "Ozone Molecular Dosimetry and Interaction with Biological Macromolecules." Reviewed *in vivo* and *in vitro* O_3 uptake and mechanisms of toxicity..

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.

California Manufacturing Company: Prepared a multi-pathway human health risk assessment for a site contaminated with polychlorinated biphenyls (PCBs) and chlorinated organic solvents (PCE, TCE, DCE, VC). Analyzed experimental data to derive a fraction of PCBs that are picked up from contaminated surfaces by dermal contact.

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

Utility: Prepared an in-depth critique of the risk assessment prepared for a coal-fired power plant. Risk assessment included multi-pathway exposure plus evaluation of both normal and upset operating considerations. Dioxins and metals were most important chemicals.

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

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

National Institute of Environmental Health Sciences -- Division of Research Grants: Participated in the Radiation Study Section Peer-Review Panel of grant applications in response to a RFA on EMF 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 the health effects of electric and magnetic fields (EMFs).

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

A Renewable Fuels, Electric Generating Company: Prepared and delivered public testimony on the potential health effects of airborne emissions from a wood-fired electric power generating plant.

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 with radioisotopes (primarily tritium); the groundwater had the potential to reach off-site farms and ranches at some time in the future.

U.S. Department of Justice: Prepared an analysis of the health hazards of the Love Canal Superfund site (Niagara Falls, NY) as they were known at the time of the emergency declarations in 1978 and in 1981.

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: 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: Helped EPA prepare a database of non-cancer health effects for 189 Hazardous Air Pollutants designated in the 1990 Clean Air Act Amendments.

U.S. Environmental Protection Agency, Environmental Criteria and Assessment Office: Participated in peer review group that evaluated research proposals on "Indoor and Ambient Air Risk Assessment Methodologies."

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.

Western Uranium Mill: Evaluated the implications of radioactive substance migration as predicted by different EPA and DOE models. Assessed the health impact of radioisotopes, and uptake of radioactivity into food.

World Health Organization: Helped prepare a WHO research report on electric and magnetic field 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."

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Valberg, P.A. 1976. Thevenin's theorem with controlled sources. *American Journal of Physics* 44:577-580.

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Brain, J.D., and P.A. Valberg, S. Sorokin, and W. Hinds. 1974. An iron oxide aerosol suitable of animal exposures. *Environ. Res*. 7:13-26.

ABSTRACTS AND REPORTS (list available on request)

INVITED LECTURES (past 8 years only)

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, July 18-23, 1999.

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, North Carolina, June 6–8, 1999.

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.

3/1/98 "Practical Experiences with Risk Communication: What works and What Doesn't?" Society of Toxicology, 37th Annual Mtg., Continuing Education Course on *Risk Communication: Avoiding the Pitfalls*. Seattle, WA.

10/14/97 "Physics, Dosimetry, and Mechanisms of Interaction of EMF with Living Organisms," Harvard School of Public Health Continuing Education Course on *Electric and Magnetic Field Health Research: Assessing the Science*, Boston, MA.

10/6/97 "Pathways of Exposure for Occupational Chemicals", Harvard School of Public Health Continuing Education Course on *Fundamentals of Industrial Hygiene*, Boston, MA.

9/30/97 "Particulate Matter and the Proposed NAAQS," *Air Pollution CEE/CHE 193.L* course, Tufts University, Department of Public Safety, Somerville, MA.

9/23/97 "Principles of Toxicology," Harvard School of Public Health Continuing Professional Education Course: *Analyzing Risk: Science, Assessment, and Management*, Boston, MA

10/7/96 "Issues in Inhalation Exposure in the Workplace," Harvard School of Public Health Continuing Professional Education Course: *Fundamentals of Industrial Hygiene*, Boston, MA.

7/22/96 "Magnetic Particles in Cells and Tissues: Characteristics of Their Interactions with Magnetic Fields", *Gordon Research Conference on Bioelectrochemistry*. Newport, RI.

5/2/96 "A Confounding Role for Indoor Air Pollutants in PM Associations with Daily Morbidity & Mortality", *Second Colloquium on Particulate Air Pollution*. Park City, UT.

3/27/96 "Pulmonary Deposition and Clearance of Particles", Harvard School of Public Health Continuing Education Course on *Fundamentals of Industrial Hygiene*, Boston, MA.

3/1/96 "Underground Diesel Emissions: Regulatory Approaches to Health Impacts", *Salt Institute Annual Meeting*, Dana Point, CA.

2/3/96 "Comments on the ACGIH Development of a Diesel-Exhaust TLV", Meeting of the *ACGIH Subcommittee on Dust and Inorganics*, Ft. Lauderdale, FL.

1/29/96 "Exposure-Response Analysis of the Diesel-Exhaust-Exposed Railroad-Worker Cohort", California EPA Symposium on *Considerations in the Use of Epidemiologic Data for Quantitative Cancer Risk Assessment.* Public Utilities Commission Auditorium, San Francisco, CA.

12/95 "Relationship Between Indoor/Outdoor PM Exposures", *Clean Air Science Advisory Committee*, EPA Science Advisory Board Meeting, Chapel Hill, NC.

10/95 "Overview and Assessment of EMF from a Public Risk Perspective", Forum on *Electric and Magnetic Fields: Science and Policy Update.* Northwestern University, Chicago, IL.

9/95 "Electric and Magnetic Fields: An Update", *MEDICHEM 1995, International Commission on Occupational Health, 23rd Annual Congress*. Massachusetts Institute of Technology, Cambridge, MA.

8/95 "EMF Biophysics: Magnetic Particles as a Paradigm Example", Harvard School of Public Health Symposium on *EMF Bioeffects: Linking Biophysics with Biology.* Boston, MA.

8/95 "Overview of Proposed EMF Mechanisms", Harvard School of Public Health Continuing Education Course on *Electric and Magnetic Field Health Research: State of the Science.* Boston, MA.

6/95 "Fields of Fear," Participant in *WGBH Frontline* Public Broadcasting Service television presentation on EMF Hazards, Boston, MA.

5/95 "Flaws in EPA's Health Assessment of Diesel Exhaust Emissions," Presentation before the *Clean Air Science Advisory Committee*, Science Advisory Board Meeting, Alexandria, VA.

3/95 "Lung Tumors Induced by Inhaled Particles: Generalizable Across Species?", *Massachusetts Institute of Technology Toxicology Symposium*, Cambridge, MA.

3/95 "Biophysical Models in Relation to EMF Health Risks", *Electric Power Research Institute EMF Seminar*, Santa Clara, CA.

3/95 "Pitfalls of Using Epidemiological Data to Estimate Cancer Risk Due to Diesel-Exhaust Exposure", Annual Meeting of the *Society of Toxicology*, Baltimore, MD.

2/95 "What do Animal and Mechanistic Data Tell us about EMF Health Hazards?", *6th Annual Public Health Rounds*, Harvard School of Public Health, Boston, MA.

7/94 "How methylation assumptions modify the arsenic cancer slope factor," *Rocky Mountain Regional Conference on Lead and Arsenic Exposure*, Salt Lake City, UT.

6/94 "Risk Assessment in Occupational Medicine", *Michigan Occupational and Environmental Medicine Association*, Dearborn, MI.

5/94 "The EMF Metric: What's Required to Characterize Exposure", National Institutes of Health (National Institute of Environmental Health Sciences), Study Section Meeting, Portland, OR.

4/94 "EMF: Controversies in Health Risk Evaluation", Electric Council of New England, Boxborough, MA.

3/94 "Evaluating the Health Impacts of Incinerator Emissions", Society of Toxicology special *Public Communications Workshop*, Annual Meeting of the Society of Toxicology, Dallas, TX.

3/94 "Communicating a Public-Health Perspective on EMF Health Risks", Society of Toxicology Symposium on *The Toxicology of Electromagnetic Fields: Issues and Uncertainties*, Annual Meeting, Dallas, TX.

3/94 "Citizen's Perception of Electromagnetic Health Risks", *34th Navy Occupational Health and Preventive Medicine Workshop*, Norfolk, VA.

2/94 "Perceived Potential Health Risks from VDTs and other Electrical Equipment in the Work Environment: A Framework for Addressing Worker Concerns", *35th Navy Occupational Health and Preventive Medicine Workshop*, Virginia Beach, VA.

2/94 "Environmental Health and Inhalation of Particulates: Diesel Exhaust as a Case Study," *Association of State and Territorial Health Officials* (ASTHO), Electronic Seminar.

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, Bioelectromagnetics, Biophysical Journal, Biorheology, Cell Biophysics, Environmental Geochemistry and Health, Environmental Health Perspectives, Epidemiology, Experimental Lung Research, Fundamental and Applied Toxicology, Hepatology, IEEE Biomedical Engineering, Journal of Aerosol Medicine, Journal of Applied Physiology, Journal of Applied Toxicology, Journal of Occupational and Environmental Medicine, Nature, Radiation Research, Risk Analysis: An International Journal, Regulatory Toxicology & Pharmacology, Science, Tissue & Cell, USGS Environmental Geochemistry of Mineral Deposits (Reviews in Economic Geology series).