EXHIBIT 1

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Alan M. Wironen, PE

TRC Engineers

249 Western Avenue

Augusta, ME 04330

- 1 Q: Please state your name, employer, and business address.
- 2 A: Alan M. Wironen PE, TRC Engineers (TRC), 249 Western Ave, Augusta, ME 04330
- 3 Q: What is your position at TRC Engineers?
- 4 A: Principal Civil Engineer.
- 5 Q: How long have you been employed with TRC Engineers?
- 6 A: I have employed at TRC since February 2007.

7 Q: Please describe your educational background and professional experience.

A: I have a BSCE degree from Lowell University and an MSCE from Georgia Tech. I am a
retired Navy Civil Engineer Corps Officer. My experience includes construction
management, contract administration, public works management, design engineering
and consulting. Design engineering includes all aspects of design and construction
management for roads, sewers, water systems, airports, aircraft fueling, substations,
high voltage transmission, building repair and various other projects. In addition I have
worked as a private contractor.

15 Q: Please describe your current responsibilities with TRC Engineers.

- A: I am the lead engineer for multiple projects. This position requires me to coordinate the
 effort for other assigned engineers and designers, communicate with clients, perform
 design reviews, develop estimates and provide quality control for on-going design and
 consulting work.
- Q: Have you previously testified before the New York State Public Service
 Commission or Siting Board on Electric Generation?
- 22 A: I provided testimony for the Champlain-Hudson Power Express Transmission system.
- Q: Have you previously served as an expert witness before any other court, agency,
 or other body on the subject you plan to offer testimony on today?
- A: Yes, for the Champlain-Hudson Power Express Transmission project and a similar
 project in Vermont.

Wironen

	27	Q:	What is the purpose and scope of your testimony in this proceeding?
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- A: I am the Engineer of Record for the Civil Design included as part of the Article 10 permitsubmission.
- 30 Q: What portion(s) of the Application is your testimony sponsoring?
- 31 A: Primarily Exhibit 11, Preliminary Design Drawings.
- 32 Q: Were these Exhibits, Application sections, or studies prepared by you or under
 33 your direction and supervision?
- A: The drawings of Exhibit 11 were prepared under my supervision and direction.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies,
 publications, data or documents produced by persons other than yourself/your

37 company? If so, please cite these sources. [These are independent studies, etc.]

A: My testimony relies upon information prepared by S. E Sargent (Substation,
 Transmission, and Collector System design); Survey data collected and topographic
 information supplied by Bergman; General Electric (Wind tower and wind tower
 foundations)



ALAN M. WIRONEN, PE

EDUCATION

M.S., Civil Engineering, Georgia Institute of Technology, 1988 B.S., Civil Engineering, University of Lowell, 1981 Transmission Engineering Certificate, Gonzaga University, (December 2012)

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Professional Engineer, Maine, (#8817), 2001 Professional Engineer, Massachusetts, (#33067 C), 1985 Professional Engineer, Connecticut, (#25655), 2004 Professional Engineer, New York, (# 090671)

AREAS OF EXPERTISE

Mr. Alan M. Wironen, PE, has management and technical experience in the following general areas:

- Engineering Management
- Project Management and Project Scheduling
- Construction Management
- Preliminary & Conceptual Design
- Engineering Studies
- Construction Specifications
- Construction Cost Estimating
- Detailed Engineering Design
- Coating Inspection and Forensic Evaluation
- Tank and Piping Inspection
- Underground Electric Transmission Design

REPRESENTATIVE EXPERIENCE

Mr. Wironen has over 37 years of experience and progressive responsibility in construction management and engineering consulting. His qualifications include extensive hands-on planning, field investigation and construction management, design, permitting, cost estimating, and project management. Mr. Wironen's background includes extensive service to public and private-sector clientele including the U.S. Department of Defense, Exxon-Mobil Oil Company, State of Maine, Public Service of New Hampshire, Northeast Utility Services Company, National Grid, New York Power Authority, and various small private and municipal clients. He currently serves in the capacity of Principal Civil Engineer in the Augusta, Maine office.

New York Power Authority, 765 kV Transformer Replacement and Upgrades (Project Engineer 2011-2014)

Mr. Wironen was the lead engineer for the project to replace the seven single phase 765 kV transformers. The work was accomplished in phases coordinated to permit the 765 kV yard to remain in operation during the transformer replacement



and facility upgrades. The project scope included the replacement of the existing transformers, transformer containment upgrades, foundation modifications, replacement of underground tertiary cable and conduit, replace protection and control cabling with a new system housed within a new underground cable trench. The protection and control system was designed to duplicate the current control sequence, using modern relays, fiber optics and controls, including new local control cabinets. All of the new system controls and cabling were designed to meet very demanding control system separation criteria.

Confidential Client, DC Transmission Feasibility Study (Transmission Engineer 2010)

Mr. Wironen provided technical support and cost estimating services for the project feasibility study. The project evaluated multiple routes and scenarios for construction of a 1000 MW High Voltage Direct Current transmission cable originating in Northern Maine and terminating in the metro-Boston area. The study included evaluation of marine routes, new transmission corridors, parallel to existing high pressure gas lines, along railroad right-of-way, and parallel to existing interstate highways. Key to the feasibility study was the project cost estimates which Mr. Wironen developed from commercial cost estimating databases and historical project information.

Transmission Developers Inc. TDI, Champlain-Hudson Power Express (Transmission Engineer 2010-2013)

This project conducted a feasibility study to construct a 1000 MW High Voltage Direct Current Transmission line from the U.S. Canadian border into New York City and southern Connecticut. The project was found to be feasible and has continued through preliminary design and is currently nearing completion of the permitting process. The current scope has been reduced to just the 330 miles of transmission system from Canada to New York City, including 101 miles through Lake Champlain, 134 miles of underground cable installation along railroad right-of-way, state roads and parklands, and 98 miles along the Hudson River.

Mr. Wironen's role during this process was to serve as technical consultant to the system developer, assist with preliminary design and permitting. Mr. Wironen has provided permitting narratives used in the permit applications, developed typical design exhibits and provided testimony in the permitting hearings.

Mr. Wironen developed various route alternatives, preliminary designs and associated cost estimates for alternative evaluation and selection. He also participated in Engineer-Procure-Construct (EPC) bid evaluations and developed an independent detailed cost estimate for the terrestrial portion of the project construction.



Transmission Developers Inc. TDI, New England Clean Power/Champlain-VT Power Express (Transmission Engineer 2013-Present)

This project conducted a feasibility study to construct a 1000 MW High Voltage Direct Current Transmission line from the U.S. Canadian border to various substations in South Central Vermont. The feasibility study eventually resulted in the current project scope; approximately 100 miles of transmission system within Lake Champlain and an additional 55 miles along local and state roads from Benson, VT to a HVDC - AC converter station located in Ludlow, VT. In Ludlow, a 345 kV underground transmission line will connect the converter station to the existing Coolidge Substation where the power will be available to all of southern New England via the existing transmission grid. The project is currently in the permitting phase. Mr. Wironen's is the technical consultant to the system developer during the system feasibility study, project siting, preliminary design, and permitting. Mr. Wironen has worked directly with the Vermont regulators and Vermont Transportation to develop the project route and associated details. Early, direct involvement by the regulators and Vermont Transportation has assured support of the project at the state level. He has also participated in public outreach meetings, met with local land owners and provided testimony in support of the project. Mr. Wironen and his team have developed all of the project permit drawings and associated details including those for the converter station site. He has also participated in the permitting process by assisting with environmental impact estimates, impact mitigation measures, exhibit review and various other tasks.

Public Service of New Hampshire, White Mountain Projects-Manchester, NH (Project Manager 2007-2010)

Upon joining TRC in January, Mr. Wironen was assigned as the Project Manager for the White Mountain Projects, a group of 5 large high voltage substation construction, repair, upgrades and modification projects. The project includes Protection and Control Relay upgrades at the Littleton and Whitefield, NH substations; separation of the distribution and transmission systems at the Beebe River Substation; Construction of a new substation at White Lake, NH; and modification of the Saco Valley substation to include additional capacitor banks and a 290 MVA phase shifting transformer.

Enterprise Engineering Inc, Principal- Freeport Maine (Chief Engineer: 1997-2007)

As the Principal-in-Charge of Enterprise Engineering's Freeport, Maine office, Mr. Wironen supervised a consulting engineering staff of 43 individuals including 12 engineers of various disciplines. Personally developed, reviewed, supervised, and acted on all management initiatives including budgeting, contributing to the office's annual business, marketing, and operations plans, reviewed contract terms and conditions, established standard billing rates and monitored business benchmarks. Other duties included establishing project management guidelines, review of engineering proposals, approval of negotiated agreements, management of the office safety program, and direct design of both mechanical and civil engineering projects.



Naval Air Station, Resident Officer in Charge of Construction- Brunswick, ME (Contract Manager: 1988-1993)

As the senior contract manager and Warranted Contracting Officer for the Brunswick, Naval Air Station, Mr. Wironen managed the contracts office and its 14 personnel. Responsibilities included budgeting, staffing, office workload planning and project assignments. Project responsibilities included project planning, contract negotiations, and management of an average of ten design contracts and \$30 million in construction contracts per year.

Trust Territory of the Pacific Islands, Resident Officer in Charge of Construction- Colonia, Yap, Federated States of Micronesia (Contract Manager: 1984-1985)

While on active duty, Mr. Wironen was assigned to manage and administer infrastructure construction contracts for the United Nation's Trust Territory Government and served as the US Government's local envoy. Specific work requirements included running the construction administration office and managing its six employees. Contract workload included more than \$24 million in construction including the new airport, roadways, sewer, water and electric systems. Personal responsibilities included performing material testing, evaluating proposed materials, reviewing submittals, and detailed design, estimating and negotiating changes, inspecting the construction and resolving conflicts.

U. S. Navy, Naval Mobile Construction Battalion 74- Gulfport, MS (1981-1983)

Mr. Wironen served as the Engineering Officer for the deployments to Puerto Rico and Okinawa. This position required management of the Battalion's material testing laboratory, its engineering and surveying staff. Following the Okinawa deployment was assigned as the Detachment Guantanimo Bay, Cuba Assistant Officer In Charge. This position required overseeing the technical and military training of the 89 assigned personnel, managing the construction projects and the detachment's construction equipment maintenance.

NY Air National Guard, Aircraft Fueling Facility

Construction Administrator on a government project at the International Airport in Niagara Falls, NY. The project included design and construction of the ready-issue fuel tanks, containment system, truck receipt and issue system, Philips Type II fuel hydrant system, fuel laboratory and de-icing fluid storage. The projects also included repairs to the existing bulk fuel storage system and a two-mile underground fuel transfer pipeline. Specific project responsibilities included coordination of construction inspection, submittal review, payment request approval, civil inspection, tank construction inspection, pipeline construction inspection, and owner liaison.

NAVFAC Southern Division, Repair Tanks and Dikes - South Carolina

Construction Administrator for the construction of a drainage system and 4500 gpm oil/water separator to handle and treat storm water from a 50 acre government fuel



facility. The work included construction of shotcrete containment dike liners, castin-place containment floors and rebuilding of nine 150,000 Bbl bulk fuel storage tanks, including new foundations and under-floor liners.

NAVFAC Southern Division, Replace Bulk Fuel Storage Facility – Mayport, FL

Project Manager for the design and construction of a new bulk fuel storage facility to be built on the same site as the existing, while the existing facility remains in operation. The work included phased demolition of the existing seven cut-and-cover bulk fuel tanks, temporary piping for temporary operation of the facility during construction, four new 80,000 Bbl bulk above ground tanks and concrete containment dikes, refueler vehicle parking, one-half mile ship refueling pipeline, three mile perimeter road and related tasks.

NAVFAC Southern Division, API 653 Tank Inspection – Jacksonville, FL

Project Manager and API 653 inspector for API 653 in-service, and out-of-service inspection of eleven 188,000 Bbl bulk fuel storage tanks. The project included design of repairs to the out-of-service tanks so they could be placed back in service for 5 years, until replacement tanks could be constructed.

Other Fuel System and Tank Projects

- <u>Repair Tanks 1-4</u> (DFSP Verona, New York): Construction contract administrator and inspector for tank repairs, new concrete ring wall foundations, oil-water separator, and dike modifications for the fuel farm facility.
- <u>Repair Tanks, Dikes, & Dike Drain System</u> (DFSP Searsport, Maine): Project Manager and Construction Administrator for the design and construction of a project that included: dike lining with 650,000 square feet of geosynthetic clay liner, jacking and repair of four storage tanks, secondary containment, environmental permitting, a direct-buried 2,500 GPM oil/water separator, site drainage improvements, design of fire suppression system modifications and related work.
- <u>Replace Fuel Tankage</u> (DFM, FISC Jacksonville, Florida): Construction Administrator for a MILCON facility replacement to receive, store and issue marine diesel (DFM) at FISC Jacksonville. The design provided three new aboveground storage tanks, new secondary containments, and a new pump house as well as a co-located truck loading and receiving station. The design also maintained the existing system in full operation, while construction of the new facility was ongoing.
- <u>Inspect Storage Tanks</u> (Various Locations, ExxonMobil, Motiva Enterprises LLC, Irving Oil, Gulf Oil, J M Huber, Webber Energy, Kahler Oil): Participant and/or lead inspector for API 653 tank inspections, tank evaluations, and report preparation. Various locations in Eastern United States, 1998 – 2007.
- <u>Repair POL Facilities</u> (DFSP Tampa, Florida): Project Manager for the design and construction administration of the complete re-build of three 188,000 bulk fuel tanks, including foundation construction, a dike lining system, a drainage system, and an oil/water separator for the seven-acre



fuel facility. The project included the design of a 750,000 square foot geomembrane liner system, a 2,000-foot drainage system, and twin 1,250 GPM precast concrete aboveground oil/water separators. The work also included design of a new pump facility, pipeline repairs, new ready-issue filtration system, truck rack and related controls.

 Jet Fuel Off-Load Facility (Barksdale AFB, Louisiana): Construction Administrator and inspector for the construction of a five acre JP-8 petroleum logistics facility to support jet fuel receipt requirements at Barksdale Air Force Base (AFB), Louisiana. The design provided the capability to receive 100% of the Base's daily jet fuel requirement by tank truck, operating storage for receipt/issue of JP-8, aircraft refueler fillstands, and connection into the existing petroleum logistics infrastructure. Ancillary facilities include a system pumphouse, operations facility, secondary containment systems, and a 2,000 GPM oil/water separator capable of treating contained stormwater during the sites "first flush."

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Benjamin M. Doyle

Capitol Airspace Group

5400 Shawnee Road, Suite 304

Alexandria, VA 22312

1	Q:	Please state your name, employer, and business address.
2	A:	Benjamin M. Doyle
3		Capitol Airspace Group
4		5400 Shawnee Road Suite 304
5		Alexandria, Virginia 22312
6	Q:	What is your position at Capitol Airspace Group?
7	A:	President and Owner.
8	Q:	How long have you been employed with Capitol Airspace Group?
9	A:	I established the company in March, 2010.
10	Q:	Please describe your educational background and professional experience.
11		I hold an Associate's Degree in History from Cochise College, Sierra Vista, Arizona. I am
12		a graduate of the US Army Air Traffic Control Specialist Course and held a Control Tower
13		Operator Certificate. As an air traffic controller, I was responsible for providing air traffic
14		control services to VFR and IFR flight operations in controlled airspace. As a shift
15		supervisor, I was responsible for all air traffic control tower operations and the training of
16		developmental controllers on my shift. As a training supervisor, I was responsible for initial
17		and recurring training for all air traffic control tower personnel. As tower chief, I was
18		responsible for all aspects of air traffic control associated with the tower. This included
19		coordination with airfield management and the establishment and maintenance of air
20		traffic procedures. I held ratings and positions at Libby Army Airfield, Ft. Huachuca, AZ,
21		Wiesbaden Air Base, Wiesbaden, Germany and Camp Colt, Bosnia-Herzegovina.
22		
23		Over the last 18 years I have worked in Obstacle Evaluation and Terminal Instrument
24		Procedures (TERPS). In that time, I have been responsible for the development of

25 obstacle evaluation studies conducted for companies in the energy, communications and

- real estate industries. I developed a set of processes through which I could predict FAA
 decision making in airspace cases. This led to the creation of Capitol Airspace Group,
 LLC. Capitol Airspace and its staff provide Obstacle Evaluation studies and advocacy to
 hundreds of clients on thousands of projects.
- 30 Q: Please describe your current responsibilities with Capitol Airspace Group.
- As President and Owner, I have direct responsibility for the overall management of Capitol
 Airspace Group. I manage a group of technicians and project managers that provide
 technical and advocacy services to our clients.

34 Q: Have you previously testified before the New York State Public Service Commission
 35 or Siting Board on Electric Generation?

- 36 A: No.
- Q: Have you previously served as an expert witness before any other court, agency,
 or other body on the subject you plan to offer testimony on today?
- A: Yes, I have provided testimony in front of the Oregon Energy Commission regarding the impact of a proposed wind farm in relation to military training flight routes. I have also provided expert testimony at an administrative hearing convened by the Ohio Department of Transportation regarding the impact of a wind energy facility on airport air traffic operations. Lastly, I provided expert testimony regarding federal safety standards associated with tall structures for a litigation case in Louisiana.
- 45 Q: What is the purpose and scope of your testimony in this proceeding?
- 46 A: To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
 47 or the Exhibits thereto.
- 48 Q: What portion(s) of the Application is your testimony sponsoring?
- 49 A: Exhibit 25 and Exhibit 26.

50Q:Were these Exhibits, Application sections, or studies prepared by you or under your51direction and supervision?

52 A: Yes, they were prepared by my staff and under my supervision.

- Q: In your testimony, will you refer to, or otherwise rely upon, any studies,
 publications, data or documents produced by persons other than yourself/your
- 55 company? If so, please cite these sources. [These are independent studies, etc.]
- 56 A: I may site regulatory guidelines established by the Federal Aviation Administration and
- 57 the United States Congress. These may include excerpts from United States Code, Code
- 58 of Federal Regulations, FAA Orders, Handbooks and Advisory Circulars.

Benjamin M. Doyle President Capitol Airspace Group

Capabilities Summary

Twenty-three years of Aviation Experience includes eighteen years of airspace analysis focused on obstruction analysis and terminal instrument procedures. Five years experience supervising and conducting aircraft operations in fixed and tactical military air traffic control facilities in the United States, Germany and Bosnia-Herzegovina. Experience includes tower operations as an active tower controller, training supervisor and Tower Chief at the Wiesbaden Army Airfield Air Traffic Control Tower. Certified as FAA Control Tower Operator (certificate last awarded in 1997).

<u>Experience</u>

2010 to Present

President and Owner, Capitol Airspace Group

Responsible for the overall management of Capitol Airspace Group, an aviation consulting firm focused on providing airspace, obstacle evaluation and instrument procedures design services to airports and private companies.

2009 to 2010

Vice President, Airspace and Obstacle Evaluation

Responsible for JDA Aviation's Airspace and Obstacle Evaluation line of business. Responsibilities included the management of all client projects, technical analysis and airspace mitigation development. Duties included the overall business and fiscal management of the Airspace and Obstacle Evaluation line of business, supporting staff and contractors.

1999 to 2009, Aviation Management Associates, Inc., Alexandria, VA

Director, Airspace Analysis

Responsible for supervising the completion of airspace obstruction studies for client developers, attorneys and architects. Responsibilities include managing all technical and programmatic aspects of Aviation Management's airspace business. These duties require an in-depth knowledge of and experience in air traffic control procedures and air traffic and airspace management.

Airspace

In accordance with Federal Aviation Regulations, provide extensive obstruction analysis of proposed construction throughout the United States. Based on analyses, advise clients on federal filing requirements and file proposed structures which are deemed "obstructions to navigable airspace". Conduct analyses using a host of FAA databases and proprietary airspace models. Responsible for representing client interests during airspace negotiations and appeals with FAA, state and local aviation authorities.

Airspace Models

Responsible for the development and maintenance of all airspace models and tools to support obstacle evaluation and procedure design.

1996 to 1999, 3-58th Aviation Battalion (ATS), U.S. Army, Wiesbaden, Germany

Tower Chief

Responsible for supervising facility operations to ensure compliance with military and FAA rules and regulations. Responsibilities included supervision of shift supervisors and subordinate controllers while ensuring that all controllers remained at a safe and proficient operational level. Additional responsibilities included setting and enforcing policy dealing with air traffic control operations specific to the airfield and coordinating with associated facilities for standard and non-standard operations.

Training Supervisor

Responsible for planning, scheduling, directing, and supervising facility training for all assigned ATC personnel. Responsibilities included developing local course material, training aids and control scenarios to supplement U.S. Army and FAA training programs. Supervised and conducted classroom and self –study training while ensuring trainee position qualification and recommending trainees for facility rating.

Air Traffic Controller

Provided terminal air traffic control services for U.S., German and military operations. Provided IFR, SVFR and VFR control for local and international, fixed and rotary wing flights in class D airspace. Coordinated with Frankfurt approach Control for IFR arrivals, departures and overflights. Deployed as Air Traffic Controller during operations in Bosnia-Herzegovina.

1994 to 1996, 304th Military Intelligence Battalion, U.S. Army, Fort Huachuca, AZ

Air Traffic Controller

Provided terminal air traffic control services at Libby Army Airfield in support of U.S. Army, Air Force, commercial air carrier and general aviation aircraft. Controlled Air Force and Army pilot training flights consisting of precision and non-precision approaches as well as closed traffic on crossed runways. Controlled a mixture of manned and unmanned aircraft within Class D and Class E airspace. Provided IFR, SVFR and VFR control of local and transient aircraft.

<u>Education</u>

Associates Degree, History, Cochise College, Sierra Vista, AZ, 1996 Air Traffic Control Course, U.S. Army Air Traffic Control School, Fort Rucker, AL, 1994 Air load Planning Course, U.S. Air Force, Munich, Germany, 1997 Primary Leadership Development Course, Non-Commissioned Officer Academy, Grafenwoehr, Germany, 1997

Schwabenbauer

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Brian J. Schwabenbauer

TRC Environmental Corporation

225 Greenfield Parkway, Suite 115

Liverpool, NY 13088

Schwabenbauer

1 Q: Please state your name, employer, and business address.

A: Brian J. Schwabenbauer, TRC Environmental Corporation (TRC), 225 Greenfield
 Parkway, Suite 115, Liverpool, NY 13088.

4 Q: What is your position at TRC?

5 A: I am the Permitting Program Manager and a Senior Project Manager.

6 Q: How long have you been employed with TRC?

7 A: I have been employed with TRC since 2015.

8 Q: Please describe your educational background and professional experience.

9 A: I hold a Masters of Professional Studies with a focus in Environmental Policy from the 10 State University of New York College of Environmental Science and Forestry (SUNY 11 ESF), and a Bachelor of Arts in Environmental Studies from Hobart College. I have 12 served as a Project Manager or technical resource specialist for dozens of energy infrastructure and renewable energy projects, as well as other development projects. In 13 14 addition to this, my professional expertise includes environmental compliance monitoring during construction, ecological survey, wetland delineation, wetland permitting, wetland 15 16 mitigation design and monitoring, environmental impact avoidance and minimization 17 during the siting of project components, global positioning system (GPS) survey and 18 mapping, and geographic information system (GIS) data analysis. Additional information 19 on my experience is presented in my curriculum vitae, a copy of which is attached.

20 Q: Please describe your current responsibilities with TRC.

A: As the Permitting Program Manager and a Senior Project Manager, I am responsible for
 overseeing TRC's environmental permitting and compliance projects being worked on by
 staff in multiple offices across New York State. My responsibilities include staffing, staff
 development, quality control, project management, and providing technical expertise on
 complex energy projects.

Schwabenbauer

26	Q:	Have you previously testified before the New York State Public Service
27		Commission or Siting Board on Electric Generation?
28	A:	No.
29	Q:	Have you previously served as an expert witness before any other court, agency,

30 or other body on the subject you plan to offer testimony on today?

- A: I have provided expert witness testimony before several municipal Planning Boards,
 Town Boards, and Zoning Boards of Appeal in New York State regarding multiple energy
 projects, with a focus on environmental impact assessment, impact avoidance, and
 impact minimization.
- 35 Q: What is the purpose and scope of your testimony in this proceeding?
- 36 A: To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
 37 or the Exhibits thereto.
- 38 Q: What portion(s) of the Application is your testimony sponsoring?
- A: Exhibit 2, Overview and Public Involvement; Exhibit 3, Location of Facilities; Exhibit 6,
 Wind Power Facilities; Exhibit 9, Alternatives; Exhibit 10, Consistency with Energy
 Planning; Exhibit 13, Real Property; Exhibit 14, Cost of Facilities; Exhibit 18, Safety and
 Security; Exhibit 22, Terrestrial Ecology and Wetlands (primarily wetland and streams);
 Exhibit 23, Water Resources and Aquatic Ecology; Exhibit 28, Environmental Justice;
 Exhibit 31, Local Laws and Ordinances; Exhibit 32, State Laws and Regulation.
- 45 Q: Were these Exhibits, Application sections, or studies prepared by you or under
 46 your direction and supervision?

47 A: Yes.

- Q: In your testimony, will you refer to, or otherwise rely upon, any studies,
 publications, data or documents produced by persons other than yourself/your
 company? If so, please cite these sources. [These are independent studies, etc.]
- 51 A: See Exhibits listed above for references.

52 Q: Does this conclude your testimony?

53 A: Yes.



BRIAN J. SCHWABENBAUER

EDUCATION

M.P.S., Environmental Policy, State University of New York College of Environmental Science and Forestry, *Magna Cum Laude*, 2009 B.A., Environmental Studies, Hobart College, 2001

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

2015: 40-Hour OSHA Hazardous Waste Operations Training (29 CFR 1910.120)
2015: National Safety Council CPR and First Aid Courses
2013: NYSDEC Qualified Erosion and Sediment Control/SWPPP Inspector
2007: ASTM Phase I Environmental Site Assessment
2006: IWEER Certified in Wetland Delineation

AREAS OF EXPERTISE

Mr. Brian Schwabenbauer has project management and technical experience in the following general areas:

- Project Management
- Environmental Permitting / Regulations (Federal, State, and Local)
- Environmental Inspection and Compliance During Construction
- Agency Consultations
- Ecological Risk Assessments
- Wetland Delineation, Permitting and Mitigation
- Environmental Impact Avoidance and Minimization
- Environmental Impact Statements
- Geographic Information Systems (GIS)
- Erosion and Sediment Control
- Stormwater Inspections

REPRESENTATIVE EXPERIENCE

Brian Schwabenbauer is a Permitting Program Manager for TRC's New York offices and a Senior Project Manager with 15 years of experience in environmental consulting. His professional expertise includes project management, environmental compliance monitoring during construction, ecological survey, wetland delineation, wetland permitting, wetland mitigation design and monitoring, environmental impact avoidance and minimization during the siting of project components, global positioning system survey and mapping, and geographic information system data analysis. He is a New York State Qualified Inspector for erosion and sediment control and an IWEER Certified Wetland Delineator.

NextEra Energy Resources, Eight Point Wind Energy Center -

Steuben County, NY (2015 - Present)

TRC is providing Article 10 support services for a 101.8MW Wind Energy Project in Southwestern NY. Mr. Schwabenbauer is serving as a Senior Technical Specialist for this effort and is in charge of assisting the Project Manager, agency consultations, permitting strategy and support study oversight. TRC's scope includes preparation of the PIP, PSS and Article 10 Application as well as other federal permitting requirements and support studies.



Calpine, Multiple Projects in New York State, Local Permitting Support (2015 – Present)

TRC is providing local permitting support on multiple wind energy projects in New York for the installation of meteorlogical (met) towers. Approval for the met tower projects has been achieved through the State Environmental Quality Review Act (SEQRA). Mr. Schwabenbauer is overseeing completion of the applicable permit application (as dictated by the town and county regulations), attending local meetings/hearings, and conducting site visits/associated studies.

Confidential Client, ~150 projects (350+ MW) in New York, State Environmental Quality Review Act and Environmental Due Diligence (2015 – Present)

Oversaw preparation of State Environmental Quality Review Act (SEQRA) Full Environmental Assessment Form (FEAF) and supplemental information attachments to address SEQRA and concerns of town, county and state agencies as part of the siting, permitting and development of proposed solar projects (mostly 2-3 MW). Performed early environmental due diligence of project site to evaluate potential permitting concerns and required approvals.

SolarCity, Multiple Projects, Local Permitting Review (2015 – Present)

Evaluated local, state and county regulations for the development of multiple solar sites throughout New York State. Review included coordination with multiple local, state and county offices and evaluation of codes and regulations pertaining to solar development, as well as desktop review of mapped natural and historic resources.

SolarCity, Multiple Projects, Wetland Delineation Reporting (2015 – Present)

Coordinated field teams for completion of wetland delineations on multiple potential solar development sites throughout New York State. Oversaw completion of wetland delineation reports according to the US Army Corps of Engineers (USACE) the Northcentral and Northeast Regional Supplement to the Wetland Delineation Manual (2012) for use in permitting.

New York Power Authority, SMART Path Moses-Adirondack – St. Lawrence and Lewis Counties, NY (Sr. Environmental Scientist: 2015)

Mr. Schwabenbauer served as the Field Manager for the ecological surveys and wetland/stream delineations for this Project associated with permitting and planning for the replacement of transmission poles along an 85-mile corridor, from the St. Lawrence-FDR hydroelectric plant to a substation in Croghan, NY. The ecological surveys conducted will ultimately support a wetland application pursuant to Article VII and Section 68 of the Public Service Law.

Competitive Power Ventures (CPV), CPV Fairview Energy Center – Cambria County, PA (Sr. Environmental Scientist: 2014 – 2015)

Mr. Schwabenbauer led the ecological review and assisted with the environmental permitting for the construction of a natural gas fired power plant located in Jackson Township, PA. The project comprises two natural gas-fired combustion turbine electric generators to generate approximately 1,000 MW of power. Environmental studies conducted to support federal, state and local permitting included wetland and stream delineations, cultural resource investigations, sound analysis and modelling and geotechnical investigations for Project generation site and the lateral lines needed for natural gas and cooling water supply.

EnSite USA, Vector Pipeline Expansion Project – Oakland, Macomb and St. Clair Counties, MI (Sr.



Environmental Scientist: 2014 – 2015)

Conducted the ecological reviews for federal, state and local permitting of a proposed 48 mile expansion of the existing Vector Pipeline including compressor station expansion. Responsibilities included conducting the wetland and stream delineations for the entirety of the proposed route during project development and contributing to the initial preparation of a FERC Application for Certificate of Public Convenience and Necessity.

National Fuel Gas, Dunkirk Natural Gas Transmission Line – Chautauqua County, NY (Sr. Environmental Scientist: 2014 – 2015)

Mr. Schwabenbauer assisted in the preparation of an application pursuant to Article VII and Section 68 of the Public Service Law, for a 9.7-mile natural gas transmission line. Primary responsibility was leading multiple site walkovers/reviews with New York State Department of Public Service (NYS DPS) and Agriculture & markets (NYSDAM) staff and coordinating the on-site ecological, wetland/stream, and land use studies. Contributed to the completion of the Environmental Management and Construction Standards and Practices, Agricultural Management Plan, Invasive Species Control Plan, and all federal wetland and stream permitting pursuant to Section 404 of the Clean Water Act.

National Fuel Gas Supply Company, RM32, C45, and C49 Pipeline Replacement Projects – Erie County, NY (Sr. Environmental Scientist: 2014 – 2015)

Oversaw the environmental compliance monitoring during construction for three natural gas transmission line replacement projects. Coordinated resolution of SWPPP compliance issues with Construction Site Manager and contractors, and assured compliance with local, state, and federal permits. Prior to the start of construction, provided compliance training to project contractors.

National Grid, 115kV Maintenance and Rebuild Projects – Multiple Counties, NY (Manager, Environmental Inspection: 2011 – 2013)

Managed role as the Environmental Compliance Monitor for all phases of four separate major electric transmission line maintenance/re-build projects in Jefferson, Onondaga, Oswego, Essex, and Washington Counties, New York. Primary responsibility was to assure SWPPP compliance and also monitoring compliance with various environmental protection commitments, including wetland and stream crossings. Prior to the start of construction, provided compliance training to project contractors. During permitting efforts coordinated wetland/stream delineations on over 100 miles of existing right-of-way and assisted with surveys of ecological resources and land use within transmission line easement/right-of-way corridors to support preparation and submittal of Part 102 Reports to the NYS DPS. Assisted with preparation of the Part 102 Reports and associated permit applications submitted to federal, state, and local regulatory agencies.

St. Lawrence Gas Company, Norfolk to Chateauguay Natural Gas Transmission – Franklin & St. Lawrence Counties, NY (Project Manager: 2011 – 2014)

Served as the project manager of a 48-mile natural gas transmission line and 50-miles of gas distribution, and oversaw the project's environmental compliance monitoring during construction. Coordinated resolution of SWPPP compliance issues with Construction Site Manager and contractors, and assured compliance with local, state, and federal permits. Managed internal staff working on the project and conducted billing reviews/budget administration. Assisted with preparation of Article VII application submitted to the New York State Department of Public Service (NYS DPS).



OWNEnergy, Copenhagen Wind Farm – Lewis and Jefferson Counties, NY (Project Manager: 2012 – 2013)

Project manager for the agency coordination, sub-consultant coordination, site planning, environmental impact analysis, and State Environmental Quality Review Act (SEQRA) compliance for a proposed fortynine turbine, ~ 80 MW electric generating facility in Lewis and Jefferson Counties, NY. Managed and conducted the on-site ecological investigations, wetland delineations, and layout of various project components (including turbines, substations, laydown yards, and a 9-mile transmission line) for this proposed project located in the Towns of Denmark, Champion and Rutland, New York.

Iberdrola Renewables, Hoosac Wind Power Project – Towns of Florida and Monroe, MA (Manager, Environmental Compliance: 2012 – 2013)

Managed role as the environmental/construction compliance monitor for a 19-turbine commercial-scale wind power project in the Towns of Florida and Monroe, Massachusetts. Prepared the Environmental Compliance Manual and provided compliance training to the project contractors. Assisted the project owner (client) in the interpretation of (and adherence to) numerous permit conditions (local, state, and federal). Conducted site reviews with agencies with jurisdiction over the site. Managed internal staff working on the project and conduct billing reviews/budget administration. This project began commercial operation in early 2013, and continued involvement following construction included restoration and SWPPP compliance monitoring/reporting.

Iberdrola Renewables, Hardscrabble Wind Farm – Herkimer County, NY (Environmental Scientist, Permitting: 2005 – 2010)

Assisted in SEQRA review for this 37-turbine, 74 MW project, located in the Towns of Fairfield, Norway, and Little Falls, Herkimer County, NY. Helped prepare a Draft, Supplemental, and Final EIS, and worked closely with the Lead Agency's Special Counsel and consultant through the preparation of SEQRA Findings and local Special Use Permits. Also obtained regulatory authorization from the Corps of Engineers and NYSDEC, designed the compensatory wetland mitigation area, obtained permit amendments necessitated by construction-driven project changes.

Iberdrola Renewables, Hardscrabble Wind Farm – Herkimer County, NY (Manager, Environmental Compliance: 2010 – 2012)

Lead on-site environmental monitor for the construction of a 37-turbine commercial wind power project in the Towns of Fairfield, Norway, and Little Falls, New York. Prepared an Environmental Compliance Manual and provided compliance training to the project contractors. Helped client maintain compliance with environmental, agricultural, and archeological protection commitments and environmental permit conditions (including federal, state, and local permits and approvals).

Vermont Electric Power Company (VELCO), Cell Tower Collocations – Multiple Sites In Vermont (Environmental Scientist: 2009)

Served as the primary individual responsible for the completion of NEPA reviews and Phase I ESA's for the collocation of VELCO communications equipment on existing cell towers (13) throughout the state of Vermont. Conducted field investigations and prepared necessary reports.

Airtricity, Munnsville Wind Farm – Madison County, NY (Environmental Monitor: 2007)

Primary environmental and agricultural monitor during the construction of a 24-turbine project, located in Madison County, NY. Efforts included monitoring and reporting on compliance with wetland/stream



avoidance, erosion and sediment control, and agricultural land impact minimization measures. Conducted site visits with agency representatives, and provided consultation/training to contractors aimed toward maintaining compliance with federal, state, and local permit conditions.

Everpower Wind Holdings, Buckeye Wind Farm – Champaign County, NY (Sr. Environmental Scientist: 2011)

Assisted the developer in layout of components (including turbines, access roads, electrical interconnect, substations, and laydown yards) for this project in Champaign County, Ohio so as to avoid and minimize impacts to wetland/stream communities, forestland, and agricultural land. Also assisted with production and submittal of the certification application to the Ohio Power Siting Board. In accordance with the Ohio Administrative Code, the certification application addressed potential project-related impacts to ecological resources, soils and geology, groundwater, air quality, aesthetics, agricultural land use, cultural resources, and socioeconomics.

Everpower Wind Holdings, Howard Wind Farm – Steuben County, NY (Sr. Environmental Scientist: 2009 – 2011)

Conducted SEQRA review for this 25-turbine, 62 MW project, located in the Town of Howard, NY. Prepared a Draft and Final EIS, and worked closely with the Lead Agency (SCIDA) Special Counsel and consultant throughout the SEQRA review process. Also obtained NYSDEC authorization under Section 401 of the Clean Water Act, and Corps authorization under Section 404 of the Clean Water Act.

Black Oak Wind Farm, LLC, Black Oak Wind Farm – Tompkins County, NY (Sr. Environmental Scientist: 2011 – 2013)

Assisted Project Manager with the agency coordination, sub-consultant coordination, site planning, environmental impact analysis, and SEQRA compliance for a proposed seven turbine, ~ 14 MW electric generating facility in Tompkins County. Managed and conducted the on-site ecological investigations, wetland delineations, and layout of various project components (including turbines, substation, laydown yard, and buried electrical interconnect). Assisted with production of a DEIS and FEIS. Fieldwork included wetland delineations and an ecological assessment, and transportation assessment.

Iberdrola Renewables, Roaring Brook Wind Power Project – Lewis County, NY (Environmental Analyst: 2007 – 2009)

Conducted the wetland delineation and prepared the wetland report for a 39 turbine, 78 MW project. Assisted the developer in layout of components (including turbines, access roads, electrical interconnect, substation, and laydown yards) to avoid impacts to wetland/stream communities, forestland, and agricultural land. Assisted in successfully navigating the Project through the SEQRA review process with DEIS and FEIS submittals.

Horizon Wind Energy, Dairy Hills Wind Farm – Wyoming County, NY (Environmental Analyst: 2006 – 2008)

Conducted the wetland delineation and wetland report preparation for a 60-turbine, 120 MW project in the Towns of Perry, Warsaw and Covington Wyoming County, New York. Assisted in successfully navigating the Dairy Hills Wind Project through the SEQRA review process with a DEIS and FEIS submittals.



PG&E National Energy Group, Athens Generation Project – Greene County, NY (Environmental Scientist: 2005)

Conducted the ecological review and post-construction monitoring for a 1,080 MW natural gas-fired power plant proposed by PG&E National Energy Group. Assisted with field data collection, agency liaison, and preparation of a wetland delineation report and functional analysis. Project was the first permitted under New York's Article X power plant siting regulations.

SPECIALIZED TRAINING

- 2014: Federal Energy Regulatory Commission (FERC) Environmental Review and Compliance for Natural Gas Facilities
- 2014: USFWS Endangered Species Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act Training
- 2014: Southern Gas Association (SGA) Environmental Compliance During Pipeline Construction

PROFESSIONAL AFFILIATIONS

- Society of Wetland Scientists
- New York State Wetlands Forum

SELECTED PUBLICATIONS AND PRESENTATIONS

- NYS Wetlands Forum, March 2012 An Overview of the Relationship Between Permit Commitments and Construction Realities.
- SUNY ESF, Renewable Energy class (undergraduate and graduate levels), March 2009 2015. *Modern Wind Industry and Associated Permitting Requirements.*
- SUNY ESF, Natural Resources Policy class (undergraduate and graduate levels), April 2016. Environmental Consulting and Example Projects.
- SUNY ESF, Environmental Law class (undergraduate and graduate levels), April 2016. *State Environmental Quality Review Act (SEQRA) and Example Projects*.

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Christopher Nunalee

WindLogics

700 Universe Blvd.

Juno Beach, FL 33408

- 2 A: Christopher Nunalee
- 3 WindLogics

1

Q:

- 4 700 Universe Blvd
- 5 Juno Beach, FL 33408
- 6 Q: What is your position at WindLogics?
- 7 A: Wind Energy Resource Assessment Supervisor.
- 8 Q: How long have you been employed with WindLogics?
- 9 A: I have been employed since January 2015.

10 Q: Please describe your educational background and professional experience.

Please state your name, employer, and business address.

11 A: I received a Bachelor's of Science degree in Meteorology and a Doctor of Philosophy 12 degree in Atmospheric Science both from North Carolina State University in Raleigh, 13 NC. My research has been published in seven peer-reviewed journals and I have 14 presented at dozens of professional conferences in the fields of wind flow modeling, wind energy, and turbulence. I have served as a fellow at the National Center for 15 16 Atmospheric Research in Boulder Colorado where I studied atmospheric dispersion in 17 areas of complex terrain. I have also worked with multiple consulting firms (e.g., MESO 18 Inc and WindSim AS) on various renewable energy and numerical modeling projects. 19 Since joining WindLogics, I have worked as a Senior Wind Resource Modeling Analyst 20 and in my current role as Supervisor of Wind Energy Resource Assessment.

21 Q: Please describe your current responsibilities with WindLogics.

A: Currently I supervise at team of wind energy resource analysts in the energy assessment and layout design of wind farms across North America. My team supports all of NextEra Energy Resources in the end-to-end development of wind energy projects in the following capacities: wind farm site prospecting, design of measurement campaigns, analysis of on-site meteorological data, wind resource numerical modeling,

	wind turbine technology selection, wind farm layout design, long-term energy
	assessment, investment-grade risk assessment, site suitability, setback assessment,
	and project financing support.
Q:	Have you previously testified before the New York State Public Service
	Commission or Siting Board on Electric Generation?
A:	No.
Q:	Have you previously served as an expert witness before any other court, agency,
	or other body on the subject you plan to offer testimony on today?
A:	No.
Q:	What is the purpose and scope of your testimony in this proceeding?
A:	To Sponsor certain portions of the Eight Point Wind Project Article 10 Application or the
	Exhibits thereto.
Q:	What portion(s) of the Application is your testimony sponsoring?
A:	Exhibit 6.
Q:	Were these Exhibits, Application sections, or studies prepared by you or under
	your direction and supervision?
A:	Yes.
Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
	publications, data or documents produced by persons other than yourself/your
	company? If so, please cite these sources. [These are independent studies, etc.]
	Q: A: Q: A: A: A: Q: A: Q: A: Q:

47 A: References are provided in corresponding Exhibits.

Dr. Christopher G. Nunalee

336 Golfview Rd. 1108 • North Palm Beach, FL, 33408 • Office: (561) 691-2383 • Mobile: (910) 616-0238 • christopher.nunalee@fpl.com

Education

North Carolina State University, Raleigh, NC, U.S.A. Doctor of Philosophy, Atmospheric Science 2015 Dissertation: A Dynamical Characterization of Atmospheric von Kármán Vortex Streets Induced by *Bluff Topography*

North Carolina State University, Raleigh, NC, U.S.A. Bachelor of Science, Meteorology, magna cum laude

Experience

WindLogics, NextEra Energy Inc. – Juno Beach, FL Wind Energy Resource Assessment Supervisor

- Sept 2016 Current Supervised a team of 11 analysts in the energy assessment and wind farm layout design of • approximately 1 - 2 GW of installed wind energy plants per year across North America
- Supported the risk assessment and investment approval of entire NextEra Energy Resource wind • portfolio as it pertains to energy production including greenfield development wind sites, repower opportunities, and acquisition opportunities
- Supported the end-to-end development cycle of new wind projects included RFP responses, • permitting, and project financing

WindLogics, NextEra Energy Inc. – Juno Beach, FL

Senior Resource Modeling Analyst

- Prepared wind resource assessment (WRA) reports and presentations for internal and external • project stakeholders and in support of management investment review
- Designed optimal wind farm layouts to support various phases of project development •
- Performed technical reviews of team deliverables to ensure quality control standards were met
- Independently designed and implemented novel processes to meet unique, time-sensitive customer requests and disseminated processes to peers
- Led a cross-functional project team to achieve a ~60% time savings in standard WRA cycle time

North Carolina State University – Raleigh, NC

Doctoral Research Assistant – Boundary Layer Meteorology May 2011 – Dec 2014 Conducted independent and collaborative technical research with a focus on numerical weather prediction, turbulence modeling, and computer programming (serial and parallel)

- Delivered professional presentations at domestic and international conferences (e.g., AMS, AWEA, EWEA, SPIE) and published multiple peer-reviewed publications
- Taught classes at the undergraduate and graduate level

WindSim AS – Tønsberg, Norway

Intern – CFD Model Development Office

- Developed a streamlined methodology for creating synthetic wind climatology data using MERRA data and WindSim CFD software (currently offered as a consulting service)
- Validated and debugged a new wind park layout optimization module against a geographically diverse suite of existing turbine layouts
- Served as mesoscale modeling expert for RFP responses

National Center for Atmospheric Research – Boulder, CO

Graduate Student Research Fellow – Research Applications Laboratory May 2012 – Dec. 2013

Simulated neutrally and stably stratified turbulent boundary layers over complex terrain using • WRF-LES and validated results against observational data

Jan 2015 – Sept 2016

May - August 2013

2011

- Assisted in debugging and implementing a new surface layer physics Fortran module for WRF
- Identified, documented, and corrected model instabilities induced by steep terrain

MESO Inc. – Atmospheric Research & Modeling – Raleigh, NC Meteorological Contractor

May – November 2010

(01/2011 - 05/2011)

- Identified/validated publicly available solar/wind data archives for energy resource assessment
- Analyzed multiple meteorological events and composed technical reports for management

Teaching Experience

- MEA 582 Wind Power Meteorology (Invited Lecturer) (01/2014 01/2014)
- MEA 213 Introduction to Atmospheric Science I (Lab Instructor) (08/2011 12/2011)
- MEA 135 Weather & Climate (Undergraduate Tutor)

Technical Background

Operating Systems:Microsoft Windows, Unix/LinuxScripting Languages:Fortran-95, HTML, IDV, Java, Matlab, NCL, R, UNIX shell-scriptingSoftware:ArcGIS, MS Office, OpenWind, WAsP, Windographer, WindSim, WRFFamiliar Major Datasets:CFSR, ERA-Interim, MADIS, MERRA, MODIS, NARR

Leadership and Involvement

- **Peer Reviewer** Quarterly Journal of the Royal Meteorological Society
- Member of IEC-61400-16 Mirror Committee Wind Resource Assessment Standardization
- Six Sigma Yellow Belt NextEra Energy Inc. Corporate Operational Excellence
- 1st Annual Recipient of the Warner Internship for Scientific Enrichment National Center for Atmospheric Research – Advanced Study Program

Selected Publications

He, P., Nunalee, C. G., Basu, S., Minet, J., Vorontsov, M. A., and Fiorino, S. T. (2015). <u>Influence of Heterogeneous</u> <u>Refractivity on Optical Wave Propagation in Coastal Environments</u>, Meteorology and Atmospheric Physics, (DOI 10.1007/s00703-015-0391-3).
Nunalee, C. G.; Horváth, Á; and Basu, S. (2015). <u>High-Resolution Numerical Modeling of Mesoscale Island Wakes and</u> Sensitivity to Static Topographic Relief Data, Geoscientific Model Development, DOI: 10.5194/gmd-8-2645-2015

Nunalee, C. G.; He, P.; Basu, S.; Minet, J., Vorontsov, M. A. (2015). <u>Mapping Optical Ray Trajectories through Island Wake</u> <u>Vortices</u>, Meteorology and Atmospheric Physics, DOI: 10.1007/s00703-015-0366-4.

Nunalee, C. G.; Kosovic, B; and Bieringer, P. E. (2014). *Eulerian Dispersion Modeling with WRF-LES of Plume Impingement in Neutrally and Stably Stratified Turbulent Boundary Layers*, Atmospheric Environment, DOI: 10.1016/j.atmosenv.2014.09.070

Nunalee, C. G.; and Basu, S. (2014). <u>On the Periodicity of Atmospheric von Kármán Vortex Streets</u>, Environmental Fluid Mechanics, DOI: 10.1007/s10652-014-9340-9.

Nunalee, C. G.; and Basu, S. (2014). <u>Mesoscale Modeling of Low-Level Jets Over the North Sea</u>. In: M. Hölling, J. Peinke, S. Ivanell (eds.) Wind Energy - Impact of Turbulence, pp. 197-202. Springer.

Nunalee, C. G.; and Basu, S. (2013). <u>Mesoscale Modeling of Coastal Low-Level Jets: Implications for Offshore Wind</u> <u>Resource Estimation</u>, Wind Energy, 17: 1199–1216. DOI: 10.1002/we.1628

Selected Presentations

Nunalee, C. G.; Kosovic, B. (2013). *Evaluation of WRF-LES for Transport & Dispersion Over Complex Terrain*, AMS 21st Symposium on Boundary Layers and Turbulence, 11, June, Leeds, United Kingdom.

Nunalee, C. G.; Basu, S. (2014). <u>Uncertainty of Numerically Simulated Surface Fluxes and Sensitivity to</u> <u>Atmospheric Boundary Layer Parameterization</u>, 14th International Evapotranspiration Symposium, 7, April, Raleigh, NC.

Nunalee, C. G.; Wu, X.; Meissner, C.; Vognaroli, A. (2014). *Downscaling MERRA Mesoscale Data for the Generation of Microscale Wind Fields Using CFD*, AWEA Windpower Annual Conference and Exhibition, 7, May, Las Vegas, NV.

Nunalee, C. G.; Wu, X.; Meissner, C.; Gravdahl, A. (2014). <u>From Reanalysis Data to Park Optimization</u>, AWEA Windpower Annual Conference and Exhibition, 7, May, Las Vegas, NV.

Nunalee, C. G.; Meissner, C; Vognaroli, A. (2014). *Downscaling MERRA Mesoscale Data for the Generation of Microscale Wind Fields Using CFD*, European Wind Energy Association Annual Event, 10, March, Barcelona, Spain.

Nunalee, C. G.; Meissner, C.; Gravdahl, A. (2014). <u>From Reanalysis Data to Park Optimization</u>, European Wind Energy Association Annual Event, 10, March, Barcelona, Spain.

Nunalee, C. G.; Basu, S (2013). <u>On the Periodicity of Atmospheric von Kármán Vortex Streets</u>, 66th meeting of the American Physical Society-Division of Fluid Dynamics, 24-27, November, Pittsburgh, PA.

Nunalee, C. G.; Basu, S.; Minet, J; and Vorontsov, M (2013). <u>Atmospheric Refractivity Anomalies Induced by</u> <u>Mesoscale von Kármán Vortex Streets</u>, OSA, Imaging and Applied Optics: Propagation through and Characterization of Distributed Volume Turbulence, 24-26, June, Arlington, VA.

He, P.; Nunalee, C. G.; Basu, S. (2013). <u>Influence of Turbulence Parameterizations on Atmospheric Refractivity</u> <u>Simulation and Forecasting</u>, OSA, Imaging and Applied Optics: Propagation through and Characterization of Distributed Volume Turbulence, 24-26, June, Arlington, VA.

Nunalee, C. G. (2013). <u>The Use of WindSim Express with MERRA Data</u>, 8th Annual WindSim User's Meeting, 19-20, June, Tønsberg, Norway.

Nunalee, C. G.; and Basu, S. (2012). <u>Estimating the Higher-Order Turbulence Statistics from LES-Generated</u> <u>Atmospheric Boundary Layer Flow Fields</u>, AMS 20th Symposium on Boundary Layers and Turbulence, 9-13, July, Boston, MA.

Nunalee, C. G.; Richardson, H.; and Basu, S. (2012). <u>Mesoscale Modeling of Atmospheric Flow Phenomena in the</u> <u>Coastal and Offshore Regions: Implications for Offshore Wind Resource Assessment</u>, Euromech Colloquim 528, 22-24, February, Oldenburg, Germany

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Christopher Ollson. PhD.

Ollson Environmental Health Management

37 Hepworth Crescent

Ancaster, Ontario, Canada L9K 0C4

1 Q: Please state your name, employer, and business address.

2 A: Christopher Ollson, PhD., Ollson Environmental Health Management (OEHM),

3 37 Hepworth Cres, Ancaster, Ontario, Canada, L9K 0C4

- 4 Q: What is your position at OEHM?
- 5 A: Owner and Senior Environmental Health Scientist.
- 6 Q: How long have you been employed with OEHM?
- 7 A: Two years.

8 Q: Please describe your educational background and professional experience.

A: I hold a Bachelor's degree in Biology from Queen's University (1995). I completed a
Masters (2000) and Doctoral (2003) degree from the Royal Military College of Canada. I
have been an Environmental Health Scientist consultant for 20 years. My expertise is in
environmental health issues related to the energy sector. I have led risk assessments
and provided risk communication support for wind turbine, solar, hydroelectric, energyfrom-waste / waste-to-energy facilities, wind turbine projects, natural gas fired stations,
oil sands environmental assessments, refineries, pipelines, and coal power plants.

16

Over the past decade I have conducted extensive research in potential health and 17 18 environmental issues surrounding wind turbine facilities. I have testified at more than a 19 dozen environmental review tribunals, commissions, hearings and court proceedings 20 with respect to potential health concerns in living in proximity to wind turbines. I have 21 published six peer-reviewed scientific journal articles and given numerous invited 22 conference presentations and invited university lectures on renewable energy health 23 issues. In addition, I was engaged as an expert on behalf of the Vermont Public Service 24 Board to aid them in setting siting rules for renewable energy projects and have 25 appeared before Senate Committee hearings on wind turbine siting in North Dakota and 26 Indiana.

27		In addition to my consulting practice, I maintain an active research program through my
28		Adjunct Assistant Professor appointment at the University of Toronto. I teach graduate
29		level courses in Environmental Risk Assessment and have co-supervised a number of
30		graduate students and Post-Doctoral Fellows. My primary research interests are in
31		potential health issues related to the renewable energy sector, waste-to-energy sector
32		and the emerging field of Health Impact Assessment of major projects.
33	Q:	Please describe your current responsibilities with OEHM.
34	A:	I am the Owner and Senior Environmental Health Scientist at OEHM. Approximately two
35		thirds of my consulting practice currently involves working with wind farm developers in
36		ensuring projects are properly sited to avoid public health impacts.
37	Q:	Have you previously testified before the New York State Public Service
38		Commission or Siting Board on Electric Generation?
39	A:	No.
40	Q:	Have you previously served as an expert witness before any other court, agency,
41		or other body on the subject you plan to offer testimony on today?
42	A:	In the following proceedings I testified and formally qualified as an expert in wind
43		turbines and human health:
44		
45		Ontario Environmental Review Tribunals – Appeal of Renewable Energy Approvals for
46		Wind Projects
47		Erickson v. Ministry of the Environment 2011 Suncor
48		Monture v. Ministry of the Environment 2012 Samsung
49		Moseley v. Ministry of the Environment 2014 Capstone
50		Lambton County v. Ministry of the Environment 2015 Suncor
51		EOCA v Ministry of the Environment 2015 ProWind
52		

53		Queen's Bench of Saskatchewan in McKinnon v. Martin (2010 – also referred to as the
54		Red Lily case)
55		
56		Alberta Utilities Commission (AUC) Proceeding No. 3329, Grizzly Bear Creek Wind
57		Project (March 2016)
58		
59		Alberta Utilities Commission (AUC) Proceeding No. 1955, Bull Creek Wind Project
60		(October 2013)
61		
62		North Dakota Public Services Commission 2015
63		Brady Wind Energy Center NextEra
64		Brady II Wind Energy Center NextEra
65		Oliver III Wind Energy Center NextEra
66		
67		Clinton County Planning and Zoning Commission, MO, County Ordinance Changes
68		(2016) NextEra
69		
70		Chowan County and Perquimins County Board of Commissioners hearings for the
71		Timbermill Wind Project (2016) APEX
72	Q:	What is the purpose and scope of your testimony in this proceeding?
73	A:	To sponsor certain portions of the Eight Point Wind Energy Center Project Application or
74		the Exhibits thereto.
75	Q:	What portion(s) of the Application is your testimony sponsoring?
76	A:	Exhibit 15: Public Health and Safety.
77	Q:	Were these Exhibits, Application sections, or studies prepared by you or under
78		your direction and supervision?
Case No. 16-F-0062

Ollson

Q: In your testimony, will you refer to, or otherwise rely upon, any studies,
 publications, data or documents produced by persons other than yourself/your
 company? If so, please cite these sources. [These are independent studies, etc.]
 A: References are provided in Exhibit 15 and full copies were provided as part of the
 application.

Dr. Christopher G. Nunalee

336 Golfview Rd. 1108 • North Palm Beach, FL, 33408 • Office: (561) 691-2383 • Mobile: (910) 616-0238 • christopher.nunalee@fpl.com

Education

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- Prepared wind resource assessment (WRA) reports and presentations for internal and external • project stakeholders and in support of management investment review
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- Developed a streamlined methodology for creating synthetic wind climatology data using MERRA data and WindSim CFD software (currently offered as a consulting service)
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Simulated neutrally and stably stratified turbulent boundary layers over complex terrain using • WRF-LES and validated results against observational data

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May - August 2013

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- Identified, documented, and corrected model instabilities induced by steep terrain

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May – November 2010

(01/2011 - 05/2011)

- Identified/validated publicly available solar/wind data archives for energy resource assessment
- Analyzed multiple meteorological events and composed technical reports for management

Teaching Experience

- MEA 582 Wind Power Meteorology (Invited Lecturer) (01/2014 01/2014)
- MEA 213 Introduction to Atmospheric Science I (Lab Instructor) (08/2011 12/2011)
- MEA 135 Weather & Climate (Undergraduate Tutor)

Technical Background

Operating Systems:Microsoft Windows, Unix/LinuxScripting Languages:Fortran-95, HTML, IDV, Java, Matlab, NCL, R, UNIX shell-scriptingSoftware:ArcGIS, MS Office, OpenWind, WAsP, Windographer, WindSim, WRFFamiliar Major Datasets:CFSR, ERA-Interim, MADIS, MERRA, MODIS, NARR

Leadership and Involvement

- **Peer Reviewer** Quarterly Journal of the Royal Meteorological Society
- Member of IEC-61400-16 Mirror Committee Wind Resource Assessment Standardization
- Six Sigma Yellow Belt NextEra Energy Inc. Corporate Operational Excellence
- 1st Annual Recipient of the Warner Internship for Scientific Enrichment National Center for Atmospheric Research – Advanced Study Program

Selected Publications

He, P., Nunalee, C. G., Basu, S., Minet, J., Vorontsov, M. A., and Fiorino, S. T. (2015). <u>Influence of Heterogeneous</u> <u>Refractivity on Optical Wave Propagation in Coastal Environments</u>, Meteorology and Atmospheric Physics, (DOI 10.1007/s00703-015-0391-3).
Nunalee, C. G.; Horváth, Á; and Basu, S. (2015). <u>High-Resolution Numerical Modeling of Mesoscale Island Wakes and</u> Sensitivity to Static Topographic Relief Data, Geoscientific Model Development, DOI: 10.5194/gmd-8-2645-2015

Nunalee, C. G.; He, P.; Basu, S.; Minet, J., Vorontsov, M. A. (2015). <u>Mapping Optical Ray Trajectories through Island Wake</u> <u>Vortices</u>, Meteorology and Atmospheric Physics, DOI: 10.1007/s00703-015-0366-4.

Nunalee, C. G.; Kosovic, B; and Bieringer, P. E. (2014). *Eulerian Dispersion Modeling with WRF-LES of Plume Impingement in Neutrally and Stably Stratified Turbulent Boundary Layers*, Atmospheric Environment, DOI: 10.1016/j.atmosenv.2014.09.070

Nunalee, C. G.; and Basu, S. (2014). <u>On the Periodicity of Atmospheric von Kármán Vortex Streets</u>, Environmental Fluid Mechanics, DOI: 10.1007/s10652-014-9340-9.

Nunalee, C. G.; and Basu, S. (2014). <u>Mesoscale Modeling of Low-Level Jets Over the North Sea</u>. In: M. Hölling, J. Peinke, S. Ivanell (eds.) Wind Energy - Impact of Turbulence, pp. 197-202. Springer.

Nunalee, C. G.; and Basu, S. (2013). <u>Mesoscale Modeling of Coastal Low-Level Jets: Implications for Offshore Wind</u> <u>Resource Estimation</u>, Wind Energy, 17: 1199–1216. DOI: 10.1002/we.1628

Selected Presentations

Nunalee, C. G.; Kosovic, B. (2013). *Evaluation of WRF-LES for Transport & Dispersion Over Complex Terrain*, AMS 21st Symposium on Boundary Layers and Turbulence, 11, June, Leeds, United Kingdom.

Nunalee, C. G.; Basu, S. (2014). <u>Uncertainty of Numerically Simulated Surface Fluxes and Sensitivity to</u> <u>Atmospheric Boundary Layer Parameterization</u>, 14th International Evapotranspiration Symposium, 7, April, Raleigh, NC.

Nunalee, C. G.; Wu, X.; Meissner, C.; Vognaroli, A. (2014). *Downscaling MERRA Mesoscale Data for the Generation of Microscale Wind Fields Using CFD*, AWEA Windpower Annual Conference and Exhibition, 7, May, Las Vegas, NV.

Nunalee, C. G.; Wu, X.; Meissner, C.; Gravdahl, A. (2014). <u>From Reanalysis Data to Park Optimization</u>, AWEA Windpower Annual Conference and Exhibition, 7, May, Las Vegas, NV.

Nunalee, C. G.; Meissner, C; Vognaroli, A. (2014). *Downscaling MERRA Mesoscale Data for the Generation of Microscale Wind Fields Using CFD*, European Wind Energy Association Annual Event, 10, March, Barcelona, Spain.

Nunalee, C. G.; Meissner, C.; Gravdahl, A. (2014). <u>From Reanalysis Data to Park Optimization</u>, European Wind Energy Association Annual Event, 10, March, Barcelona, Spain.

Nunalee, C. G.; Basu, S (2013). <u>On the Periodicity of Atmospheric von Kármán Vortex Streets</u>, 66th meeting of the American Physical Society-Division of Fluid Dynamics, 24-27, November, Pittsburgh, PA.

Nunalee, C. G.; Basu, S.; Minet, J; and Vorontsov, M (2013). <u>Atmospheric Refractivity Anomalies Induced by</u> <u>Mesoscale von Kármán Vortex Streets</u>, OSA, Imaging and Applied Optics: Propagation through and Characterization of Distributed Volume Turbulence, 24-26, June, Arlington, VA.

He, P.; Nunalee, C. G.; Basu, S. (2013). <u>Influence of Turbulence Parameterizations on Atmospheric Refractivity</u> <u>Simulation and Forecasting</u>, OSA, Imaging and Applied Optics: Propagation through and Characterization of Distributed Volume Turbulence, 24-26, June, Arlington, VA.

Nunalee, C. G. (2013). <u>The Use of WindSim Express with MERRA Data</u>, 8th Annual WindSim User's Meeting, 19-20, June, Tønsberg, Norway.

Nunalee, C. G.; and Basu, S. (2012). <u>Estimating the Higher-Order Turbulence Statistics from LES-Generated</u> <u>Atmospheric Boundary Layer Flow Fields</u>, AMS 20th Symposium on Boundary Layers and Turbulence, 9-13, July, Boston, MA.

Nunalee, C. G.; Richardson, H.; and Basu, S. (2012). <u>Mesoscale Modeling of Atmospheric Flow Phenomena in the</u> <u>Coastal and Offshore Regions: Implications for Offshore Wind Resource Assessment</u>, Euromech Colloquim 528, 22-24, February, Oldenburg, Germany

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

David G. Gil

NextEra Energy Resources, LLC

700 Universe Blvd.

Juno Beach, FL 33408

1 Q: Please state your name, employer, and business address.

- A: David G. Gil, NextEra Energy Resources, LLC, 700 Universe Boulevard, Juno Beach,
 FL, 33408.
- 4 Q: What is your position at NextEra Energy Resources?
- 5 A: My job title is Director. I lead the development of renewable energy projects.

6 Q: How long have you been employed with NextEra Energy Resources?

7 A: I have been employed with NextEra for eight years.

8 Q: Please describe your educational background and professional experience.

9 A: I have a Bachelor of Arts in Economics from the University of California at Berkeley. 10 Prior to joining NextEra, I spent seven years doing mergers and acquisitions and 11 investment banking, focused first on technology companies, then later on energy 12 companies. Eight years ago, I joined NextEra and have held three primary roles with the 13 company. I started as an analyst for the Chief Executive Officer of NextEra. After two 14 years, I joined NextEra's regulatory and legislative affairs team, focusing on the New York and PJM energy markets. Four years ago I joined NextEra's wind project 15 16 development team. During those four years I have played a lead role in developing and constructing 815 megawatts of new wind projects in Colorado and Kansas. I have also 17 18 worked as the Chief Operating Officer for a health services start-up and as analyst for an 19 economic consulting company.

20 Q: Please describe your current responsibilities with NextEra Energy Resources.

A: I am currently a Director in NextEra's renewables development group and am
 responsible for developing new projects from conception to completion of construction.
 That includes prospecting new potential sites for projects, acquiring leases for sites,
 finding energy customers for projects, permitting projects, and managing the
 development process until construction is complete at which time I handover
 responsibility to NextEra's business management team.

Case No. 16-F-0062

Gil

27	Q:	Have you previously testified before the New York State Public Service
28		Commission or Siting Board on Electric Generation?
29	A:	No.
30	Q:	Have you previously served as an expert witness before any other court, agency,
31		or other body on the subject you plan to offer testimony on today?
32	A:	Yes, I have appeared at several permit hearings for wind energy projects and have
33		appeared at several agency meetings for wind energy projects in Colorado, Kansas,
34		New York and Washington D. C.
35	Q:	What is the purpose and scope of your testimony in this proceeding?
36	A:	I am the lead developer of the Eight Point Wind Energy Center and as such am familiar
37		with nearly all aspects of the Project. I plan to demonstrate that the Applicant has
38		complied with the Article 10 regulations and the Stipulations agreed to by several New
39		York State agencies and the Towns of Greenwood and West Union.
40	Q:	What portion(s) of the Application is your testimony sponsoring?
41	A:	I am sponsoring the entire Application.
42	Q:	Were these Exhibits, Application sections, or studies prepared by you or under
43		your direction and supervision?
44	A:	All the Exhibits were prepared under my direction and supervision.
45	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
46		publications, data or documents produced by persons other than yourself/your
47		company? If so, please cite these sources.
48	A:	Yes, several companies, people and subject matter experts contributed to this Project's
49		Application. As the developer for this Project, I relied upon subject matter experts both
50		from NextEra and from consulting companies to provide studies, data and documents in

51 order to fulfill the requirements of the Article 10 process.

Redactions applied at the request of the company and under the direction of ALJ Sean Mullany, 6/25/18

David G. Gil

Experience NextEra Energy Resources

Director Development / Regulatory Affairs / Analyst

- In current role, as a Director in renewables development, responsible for developing and constructing over 800 MW of new wind projects since 2013 in Colorado and Kansas. Currently developing over nearly 1,500 MW of new renewable projects in New York and Colorado.
- Manage all aspects of project development from customer acquisition, project siting, land lease acquisition and permitting, to construction oversight and project commissioning.
- Previously, as Manager of Regulatory Affairs, responsibilities included monitoring legislative and regulatory affairs in 16 states in addition to all matters in PJM and NYISO.
- In previous role, as Analyst to the CEO; responsibilities included drafting presentations to the Board of Directors, analyzing and drafting project approval presentations and various other research activities.
- Served as Chief of Staff for the CEO's role on the President's Council on Jobs and Competitiveness. Wrote recommendations and policy for the President's Council relating to national energy policy which was implemented by the President of the United States.

Callisto Partners LLC

Mergers & Acquisitions and investment Banking, Senior Associate

- Successfully closed over a dozen complex transactions (mergers, acquisitions, capital and debt offerings, and restructurings) for a combined value of approximately \$1 billion.
- Participated in all aspects of transaction execution including research, due diligence, production of information memoranda, financial modeling and contract negotiations.
- Constructed financial models to predict companies' results and valuation models and analyses, such as DCF models, leverage buy-out models, comparable company analyses and M&A transactions analyses.
- Developed presentations for company executives and board members on strategic relationships, acquisition ideas and valuation strategies.

Palm Beach Meditox, LLC

Chief Operating Officer

- National behavioral healthcare company focused on treating patients with substance abuse issues.
- Increased revenue by more than 200% to \$3.7 million and patient count by almost 300% to 757 patients.
- Opened four new offices and restructured existing offices throughout the United States. Expertise in restructuring and business development led to significant cost reductions throughout the organization.
- Additional responsibilities included analyzing financial oversight, regulatory and legal requirements, negotiating contracts, managing doctor relationships, and overseeing 5 offices and twelve employees.

Prudential Securities

Mergers & Acquisitions and investment Banking Analyst

- Research, analysis and preparation of deal materials directly contributed to the completion of M&A and corporate finance transactions with a combined value of nearly \$1 billion.
- Researched technology companies across industries to provide value-added input to pitches and valuations that helped win deals and educated colleagues for meetings and conferences.
- Conducted due diligence, wrote fairness opinions, prepared SEC filings and created pitch books.

Law & Economics Consulting Group

Research Analyst

- Contributions to research, testimonies and reports led to positive outcomes that saved telecommunications companies over \$3 billion in nine regulatory proceedings.
- Researched and analyzed competition and regulation within the telecommunications industry.
- Modeled telecom companies network expenses utilizing cost models, statistical and econometric analyses.

Education University of California, Berkeley

Bachelor of Arts, Economics, May 1997

West Palm Beach, FL 8/06 - 1/09

West Palm Beach, FL

6/03 - 8/06 and 3/09 - 12/09

8/06 - 1/09 e abuse issues.

> San Francisco, CA 8/99 - 3/02

> > Emeryville, CA

4/98 - 8/99

Juno Beach, FL 12/09 – present

GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Dennis Jimeno

Comsearch

19700 Janelia Farm Boulevard

Ashburn, VA 20147

Jimeno

- 1 Q: Please state your name, employer, and business address.
- 2 A: Dennis Jimeno, Comsearch (A CommScope Company), 19700 Janelia Farm Boulevard,

3 Ashburn, VA 20147.

- 4 Q: What is your position at Comsearch?
- 5 A: I am a Telecommunications Engineer III.

6 Q: How long have you been employed with Comsearch?

7 A: I have been employed with Comsearch for about 14 years.

8 Q: Please describe your educational background and professional experience.

9 A: I hold a Bachelor of Science degree in Electrical Engineering from Virginia Tech and a 10 Master of Science degree in Electrical Engineering from George Washington University. 11 My entire professional experience has been focused in the field of wireless network 12 communications and microwave engineering. From 1995 to 1998, I was employed by 13 MLJ, Inc. as a Design Engineer. From 1998 to 2000, I worked as an RF Engineering Consultant for Nextel. I was employed as an RF Planning Engineer for Winstar from 2000 14 15 to 2001. From 2001 to 2004 I worked as an RF Engineering Contractor for AT&T / 16 Cingular Wireless. Since then, I have been with Comsearch.

17 Q: Please describe your current responsibilities with Comsearch.

My current responsibilities include the planning, analysis, and optimization of wireless 18 A: 19 communication and microwave networks. I have also supervised countless studies to 20 assess the impact of wind farm facilities on various communication systems including 21 microwave links, broadcast radio, over-the-air television, mobile phone, land mobile radio, 22 and radar. I am experienced in RF site planning of mobile and fixed wireless networks for 23 ground and aerial coverage and in analyzing drive test data to validate RF signal 24 propagation models and optimize network performance. I have post-graduate training in 25 wireless networks, satellite communications, and signal propagation.

Case No. 16-F-0062

Jimeno

26	Q:	Have you previously testified before the New York State Public Service
27		Commission or Siting Board on Electric Generation?
28	A:	Yes.
29	Q:	Have you previously served as an expert witness before any other court, agency,
30		or other body on the subject you plan to offer testimony on today?
31	A:	Yes.
32	Q:	What is the purpose and scope of your testimony in this proceeding?
33	A:	To sponsor certain portions of Eight Point Wind's Article 10 Application or the Exhibits
34		thereto.
35	Q:	What portion(s) of the Application is your testimony sponsoring?
36	A:	I am sponsoring various sections of Exhibit 26.
37	Q:	Were these Exhibits, Application sections, or studies prepared by you or under
38		your direction and supervision?
39	A:	Yes.
40	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
		publications, data or documents produced by persons other than yourself/your
41		······································
41 42		company? If so, please cite these sources. [These are independent studies, etc.]



Dennis Jimeno Telecommunications Engineer III

QUALIFICATIONS

- Master of Science in Electrical Engineering
- Experienced in contract negotiations and managed multiple agreements between major wireless service provider and power utilities, municipalities and various communication companies in support of microwave relocation and wireless small-cell site deployment projects
- Experienced in Microwave Path Engineering
- Experienced in RF Planning of wireless networks for ground, maritime, and aerial applications
- Managed wind energy services group tasked with providing engineering studies to assess impact caused by wind energy facilities to surrounding communication systems including: microwave paths, mobile wireless, television, AM/FM radio, radar, and land mobile & emergency services
- Experienced in evaluating compliance with FCC guidelines for human exposure to RF emissions
- Experienced in Network Optimization of mobile wireless networks
- Experienced in analyzing drive test data to validate propagation model and optimize network performance
- Formally trained in wireless networks, satellite communications, and signal propagation
- Experienced in engineering software tools: Matlab, Atoll, CelPlan, Actix RPS, Mentum Planet, and MapInfo®
- U.S. Citizen

PROFESSIONAL EXPERIENCE

Telecommunications Engineer III, Comsearch

2004 - Present

Ashburn, VA

- Performed RF Coverage and Frequency Planning for 900 MHz Point-to-Multipoint SCADA system
- Designed nationwide sensor network as part of spectrum access system (SAS) for sharing frequency band between commercial and naval radio communications while minimizing interference
- Engaged in discussions with various power utilities and municipalities to negotiate terms and conditions on behalf of AT&T to attach small cell equipment and antennas on utility poles nationwide
- Reviewed, edited, and approved impact assessment studies of wind turbines with respect to microwave, radar, TV broadcast, AM/FM radio, and land mobile & emergency services
- Designed ADS-B (Automatic Dependent Surveillance Broadcast) service volume coverage throughout U.S. airspace for FAA as part of NextGen program to modernize air transportation system using GPS satellite technology
- Generated ADS-B coverage predictions for ground-to-air and air-to-ground communications with primary objective of matching or exceeding Secondary Surveillance Radar (SSR) coverage from ground level up to 60,000 ft MSL
- Performed link budget analyses to verify coverage for at least 98% of a given service volume in various interference conditions and scenarios using 1090ES and UAT links
- Designed airport surface coverage using 3D ray-tracing model with task of covering 100% of surface movement area including glide approach path from five (5) nautical miles to touchdown threshold
- Identified potential site locations using commercial towers, oil platforms, and public-use airport facilities that satisfied coverage objectives while minimizing interference to active radars
- Performed power-flux density calculations from ADS-B stations to predict interference and satisfy conditional requirements to co-exist with surveillance radars and multi-lateration systems
- Designed coverage layout for Automated Weather Observing System (AWOS) in Gulf of Mexico using oil platform locations
- Reviewed and approved antenna configuration drawings prior to installation
- Attended zoning hearings to seek board approval of permit to construct new cell sites
- Performed RF hazard analysis per OET Bulletin 65 guidelines regarding safe RF exposure limits
- Evaluated and approved site candidates for implementation

Dennis Jimeno, Telecommunications Engineer III Page 2

- Designed E-911 networks for Tier I and Tier II Public Safety Access Points (PSAPs) using U-TDOA and AOA geo-location technology
- Analyzed PCS and cellular network performance data to evaluate location accuracy performance and verify compliance with E-911 requirements
- Defined drive-test routes for location accuracy testing and optimization

RF Engineering Contractor, AT&T / Cingular Wireless

Various locations

- Designed expansion sites for dual-band GSM network in NY/NJ market (Paramus, NJ)
 - o Evaluated potential site candidates and performed site visits
 - o Attended zoning hearings to seek board approval to install new antennas on existing towers
 - Tuned RF propagation model using drive test data
 - Analyzed drive test data to identify coverage-limited areas
- Generated RF design for GSM network in south Florida market consisting of 400 sites (Lake Mary, FL)
 - o Implemented overlay/underlay site designs using micro-cell solutions
 - o Predicted FER performance for BCCH and TCH channels using Monte Carlo simulations
 - Performed link budget analyses and verified design ERP levels
 - o Performed HSN and MAIO planning for frequency hopping algorithm
 - o Managed network parameters using Nokia OSS/CM Tools and checked daily alarm reports
 - Performed on-air cell verification tests
 - Planned MSC, BSC and LAC boundaries
- Generated GSM overlay design for existing TDMA network (Bothell, WA)
 - o Optimized antenna configuration based on required number of TRXs per sector
 - Generated cell neighbor lists for optimized handoffs
 - Dimensioned BSCs according to current and projected traffic load
- Designed WCS Fixed Wireless Network in 2.3 GHz band using OFDM technology (Dublin, OH)
 - o Generated coverage predictions based on tuned propagation models using dB Planner tool
 - o Processed drive test data and validated propagation models for 50 planned hubs
 - Analyzed drive test data to optimize coverage and minimize interference across network
 - Managed drive test team and coordinated daily activities to meet project milestones

RF Planning Engineer, Winstar

Herndon, VA

- Designed Point-to-Multipoint (PMP) fixed broadband wireless networks in 39 and 28 GHz bands
- Predicted and analyzed interference between hub and subscriber locations
- Performed coverage and capacity design trade-offs for PMP hubs for 64QAM, 16QAM, and QPSK modulation schemes
- Performed link reliability and rain fade analyses using Crane model
- Performed frequency planning
- Evaluated RF software tools and recommended technical enhancements for site coverage planning
- Performed field surveys to evaluate proposed site locations and verify radio line-of-sight (RLOS) conditions

RF Engineering Consultant, Nextel

Reston, VA

- Managed RF Engineering group in local market to design and optimize iDEN network (Mexico City)
- Responsible for planning, roll-out optimization, and setting schedules milestones for project
- Supervised frequency planning, capacity planning, and interference analysis
- Approved search rings and site candidates
- Optimized network parameters to meet key performance objectives for interconnect and dispatch services
- Planned new cell sites to meet target expansion coverage and increase traffic capacity
- Provided basic training on iDEN network optimization, design, and frequency planning
- Led RF Engineering team to optimize iDEN network (White Plains, NY)
- Performed frequency planning and interference analysis for 500+ sites for NY/NJ market
- Optimized Interconnect Location Area (ILA) & Dispatch Location Area (DLA) boundaries

1998 - 2000

2001 - 2004

2000 - 2001

Dennis Jimeno, Telecommunications Engineer III Page 3



1995 - 1998

- Analyzed drive test data and tuned RF propagation models
- Performed capacity analysis to project required number of base radios (BRs) per site

Design Engineer, MLJ Inc.

Arlington, VA

- Provided spectrum sharing engineering services for PCS service providers and incumbent microwave systems in 1.9 GHz band in support of microwave relocation efforts across U.S.
- Performed interference analyses between PCS and microwave point-to-point systems to predict, rank, and mitigate co-channel and adjacent channel interference
- Generated Prior Coordination Notices (PCNs)
- Designed microwave point-to-point systems
- Conducted field test measurements to calibrate RF propagation models
- Performed CDMA optimization for cellular network (Phoenix, AZ)
- Adjusted pilot channel powers to force dominant servers in areas with pilot pollution
- Created neighbor lists for efficient handover
- Performed idle-mode coverage and origination test drives to verify synch and paging channel operation
- Adjusted and tuned search windows (e.g., active, candidate, neighbor, and remaining set) to utilize all good multipath components for optimal pilot selection
- Analyzed drive test and post-test data including FER, Ec/Io, and variable Rx/Tx Power
- Derived cell edge and area service reliability
- Adjusted hand-off parameters including T-Comp, T-Add, Tt-Drop, and T-Drop
- · Performed troubleshooting test drives to analyze and resolve performance problems

EDUCATION

M.S., Electrical Engineering

The George Washington University, Washington, DC

B.S., Electrical Engineering

Virginia Polytechnic Institute & State University, Blacksburg, VA

SOFTWARE

- RF Engineering: Atoll, Mentum Planet, Actix RPS, CelPlan, ATDI, Agilent Wizard
- GIS Mapping: MapInfo, Esri ArcView
- Programming: Matlab
- Microwave Engineering: Pathloss, iQlinkXG

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Diane E. Reilly

TRC Companies, Inc.

14 Gabriel Drive

Augusta, ME 04330

- 1 Q: Please state your name, employer, and business address.
- 2 A: Diane E. Reilly, TRC Companies, Inc. (TRC), 14 Gabriel Drive, Augusta, ME 04330
- 3 Q: What is your position at TRC?
- 4 A: Economist.
- 5 Q: How long have you been employed with TRC?
- 6 A: I have been directly employed with TRC since 2012. For several years prior to that time,
- 7 I provided sub-consulting services to TRC.
- 8 Q: Please describe your educational background and professional experience.
- 9 A: I received a Bachelor of Arts degree in Economics and in Spanish from Furman
 10 University in Greenville, SC. I have a Master's of Arts degree in Economics from the
- 11 University of Georgia in Athens, GA (1993) and completed additional studies specializing
- 12 in Finance and Public Finance. I have over 20 years of experience in environmental
- 13 consulting, evaluating socioeconomic and recreation issues. My resume is attached.
- 14 Q: Please describe your current responsibilities with TRC.
- A: As an economist for TRC, I provide socioeconomic and recreation analysis for a variety
 of energy projects.
- 17 Q: Have you previously testified before the New York State Public Service
 18 Commission or Siting Board on Electric Generation?
- 19 A: No.
- 20 Q: Have you previously served as an expert witness before any other court, agency,
- 21 or other body on the subject you plan to offer testimony on today?
- 22 A: No.
- 23 Q: What is the purpose and scope of your testimony in this proceeding?
- A: To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
 or the Exhibits thereto.
- 26 Q: What portion(s) of the Application is your testimony sponsoring?

Case No. 16-F-0062

Reilly

- 27 A: Exhibit 27: Socioeconomic Effects.
- Q: Were these Exhibits, Application sections, or studies prepared by you or under
 your direction and supervision?
- 30 A: Yes.
- 31 Q: In your testimony, will you refer to, or otherwise rely upon, any studies,
- 32 publications, data or documents produced by persons other than yourself/your

33 company? If so, please cite these sources. [These are independent studies, etc.]

- 34 A: American Wind Energy Association (2017). Wind Energy Reduces Greenhouse Gas
- 35 Emissions. Retrieved from: www.awea.or/reducing-greenhouse-gas-emissions.
- 36 Accessed August 9, 2017.
- 37 ICF (2017). Draft Assessment of Proposed Eight Point Wind Energy Center in New York.
 38 August 10, 2017.
- National Renewable Energy Laboratory (NREL). (2016). Jobs and Economic
 Development Impact (JEDI) Models. https://www.nrel.gov/analysis/jedi/ Accessed April
 13, 2017.
- 42 New York Department of Environmental Conservation (2017). Climate Smart
 43 Communities Guide to Local Action: Taking Steps to Combat Climate Change. Retrieved
 44 from: http://www.dec.ny.gov/energy/50845.html. Accessed April 13, 2017.
- 45 New York State Energy Planning Board (2015). New York State Energy Plan. Retrieved
- 46 from: https://energyplan.ny.gov/Plans/2015.aspx. Accessed April 13, 2017.



Diane E. Reilly

EDUCATION

M.A., Economics, University of Georgia, 1993 B.A., Economics and Spanish, Furman University, 1991

AREAS OF EXPERTISE

Ms. Diane Reilly has technical experience in the following general areas:

- Economic/Socioeconomic Studies
- Recreation Use Studies
- FERC Hydroelectric Licensing & Compliance
- National Renewable Energy Lab's Jobs and Economic Development Impact (JEDI) Modeling
- Environmental Impact Statements and Environmental Assessments

REPRESENTATIVE EXPERIENCE

Ms. Reilly has over 20 years of environmental consulting. She has extensive experience evaluating socioeconomic and recreation issues for the Federal Energy Regulatory Commission (FERC) in the areas of hydropower licensing and license compliance. She is experienced in providing socioeconomic and recreation analyses for wind and solar power projects. Ms. Reilly provides analyses of socioeconomic, recreational, and land use impacts for Environmental Assessments (EAs) and Environmental Impact Statements (EISs).

New York Power Authority, Blenheim-Gilboa Pumped Storage Project

Technical lead for the socioeconomic issues related to the relicensing of NYPA's 1,160 MW Blenheim-Gilboa Pumped Storage Power Project. Authored the socioeconomic portion of the Pre-Application Document, the Socioeconomic Study, and portions of the Draft License Application. Managed the REMI analysis and participated in public meetings. Recreation efforts include analyzing recreation use, activity data, and recreation user survey data.

NextEra Energy Resources, Eight Point Wind Energy Center—New York

Evaluating the economic effects of a proposed wind energy center though the use of the National Renewable Energy Laboratory's Jobs and Economic Development Impact (JEDI) models. Calculating economic impacts in terms of jobs, earnings, and output for the construction phase and for the operation and maintenance phase. Providing demographic, housing, and employment analyses for the county and each of the municipalities in the project area.

Apex Clean Energy Management, Inc., Great Heath Recreation Study/Downeast Wind Energy Project—Maine

Developed annual recreational use, recreation use by activity type, and future demands. Use estimates also were developed that appropriately characterized



seasonal usage at each recreation site. Analyzed the capacity use at each recreation site.

Consumers Energy, Ludington Pumped Storage Project—Michigan

Developed annual recreational use, recreation use by activity type, and future demands. Use estimates also were developed that appropriately characterized seasonal usage at each recreation site. Analyzed the capacity use at each recreation site. Future recreation demands were also forecast.

FirstLight, Turners Falls and Northfield Mountain Hydropower Projects— Massachusetts

Developed annual recreational use, recreation use by activity type, and future demands. Use estimates also were developed that appropriately characterized seasonal usage at each recreation site. Future recreation demands were also forecast. Analyzed the capacity use at each recreation site. Supported the development of the license application and FERC Form 80s.

Exelon Power, Conowingo Hydropower Project and Muddy Run Pumped Storage Project—Pennsylvania and Maryland

Provided recreation analysis to support FERC Form 80 filings and the relicensing process for the 573 MW Conowingo Project and the 800 MW Muddy Run Pumped Storage Project, with a total of 21 formal recreation sites. Estimated specific use level, activity types, capacity, and future demands for each of the projects' recreation facilities included in the study.

Kaukauna Utilities, Kimberly Hydropower Project-Wisconsin

Authored the socioeconomic portion of the Pre-Application Document (PAD) for the relicensing of the 2.7 MW project on the Fox River in Wisconsin. Addressed land use, demographics, housing, and economic activity.

TransCanada, Kibby Mountain Wind Power Project—Maine

Determined recreational usage within the Kibby Wind Power Project Study Area for the proposed 132-megawatt wind power generating facility in the Boundary Mountains of Western Maine. The recreation study involved determining recreational usage levels, activity types, and user-perceived impacts of the proposed project on recreation. The Project, which has now been completed, is the largest wind power project in New England.

Georgia Power, Morgan Falls Hydropower Project—Georgia

Technical lead for recreation and socioeconomics during the FERC relicensing of Georgia Power's 16.8 MW Morgan Falls Project located in metropolitan Atlanta. This project was one of the first to use the Integrated Licensing Process (ILP). Developed the recreational use characterization for the project and the



population and recreation demand projections. Addressed future capacity issues, evaluating the need for additional facilities.

New York Power Authority, Niagara Power Hydropower Project—New York Senior economic reviewer for the socioeconomic report, supporting the New York Power Authority (NYPA) in obtaining a new license for the Niagara Power Project from FERC. Assisted in the development of the Scope of Services, participated in stakeholder meetings, managed the REMI modeling, and authored sections of the socioeconomic report. The Niagara Power Plant is New York State's largest electric generating facility and one of the largest in the United States, generating, on average, 14.0 billion kWh per year. The project required the development of a new license application and a settlement structure to meet the needs of NYPA and the more than 100 interested parties.

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Francis Wang

NextEra Energy Resources, LLC

700 Universe Blvd.

Juno Beach, FL 33408

1	Q:	Please state your name, employer, and business address.
2	A:	My name is Hui Fung Francis Wang.
3		My employer is NextEra Energy Resources, LLC
4		My business address is 700 Universe Boulevard, Juno Beach, FL, 33408.
5	Q:	What is your position at NextEra Energy Resources?
6	A:	My job title is Executive Director. I lead the generation interconnection processes and
7		Transmission Analytics functions of renewable energy projects.
8	Q:	How long have you been employed with NextEra Energy Resources?
9	A:	I have been employed with NextEra for more three (3) years.
10	Q:	Please describe your educational background and professional experience.
11	A:	Francis graduated from University of New Orleans with Bachelor of Science in Civil
12		Engineering, Master of Science in Electrical Engineering, and Master of Science in
13		Mathematics in 1988. After his graduation, Francis was employed by Louisiana State
14		University Medical Center as a Program Analyst in Biometric Research in 1989 and
15		Litton Data System as an Engineer in naval fiber optics and free space laser
16		communication applications in 1990. Prior to NextEra, he joined Entergy Service
17		Incorporation in late 1990 starting as an Engineer in SCADA engineering, Transmission
18		Operation Planning, to Senior Staff Engineer in Transmission Planning. He became
19		Manager, Energy Management System, was responsible for the software system for
20		transmission and generation dispatch of Entergy's 22,000 MW system, Open Access
21		Same Time Information System, and energy accounting. In 2001, Francis became
22		Director, Commercial Analytics, and was responsible energy market and engineering
23		analyses for the investment decisions of Entergy's commercial activities in North East
24		markets and regulated electric services in the middle south region. Francis completed a
25		Master of Business Administration from University of New Orleans in 1996 and Ph.D.
26		degree in Electrical Engineering from Tulane University in 2004.

Case No. 16-F-0062

Wang

27	Q:	Please describe your current responsibilities with NextEra Energy Resources.
28	A:	Francis joined NextEra Energy Resources, LLC in 2014 as Director, Transmission
29		Services. I am currently an Executive Director, Transmission Services, supporting new
30		renewables development and optimizing existing renewable assets performance. As
31		Executive Director, I am responsible for Generation Interconnection, Transmission
32		Services, and Transmission Analytics activities for life cycle of a renewable asset: from
33		project conception, to Generation Interconnection Agreement execution, to completion of
34		construction, and to asset operations.
35	Q:	Have you previously testified before the New York State Public Service
36		Commission or Siting Board on Electric Generation?
37	A:	No.
38	Q:	Have you previously served as an expert witness before any other court, agency,
39		or other body on the subject you plan to offer testimony on today?
40	A:	No. But, I was the company witness and provided the technical transmission system loss
41		testimonies on behalf of Entergy Texas Inc. in its Fuel Factor case and Base Rate Case
42		in 1998.
43	Q:	What is the purpose and scope of your testimony in this proceeding?
44	A:	I am familiar with nearly all aspects of interconnection, generation tie-line, and project
45		substation of the Eight Point Wind Energy Center. I plan to demonstrate that the
46		Applicant has complied with the Article 10 regulations and reliability standards and utility
47		practices for the Project.
48	Q:	What portion(s) of the Application is your testimony sponsoring?
49	A:	I am sponsoring Exhibit 5 and Exhibit 34.

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Jim T. Shea, PE, PTOE

TRC Engineers, Inc.

1382 West 9th Street, Suite 400

Cleveland, OH 44113

- 1 Q: Please state your name, employer, and business address.
 - 2 A: Jim T. Shea, PE, PTOE; TRC Engineers, Inc.;1382 West 9th Street, Suite 400,

3 Cleveland, OH 44113

- 4 Q: What is your position at TRC?
- 5 A: Transportation Engineer.
- 6 Q: How long have you been employed with TRC?

7 A: Hire Date: March 1, 2016.

8 Q: Please describe your educational background and professional experience.

9 A: I graduated from Cleveland State University with a Bachelor of Science in Civil 10 Engineering in 2007 and in 2013 earned a Master of Science in Civil Engineering. Since 11 graduating in 2007, I has worked in the engineering consulting field where I brings 12 experience in transportation planning, roadway design, and traffic operations and design 13 on various transportation projects for county, state, and local government agencies. 14 Throughout my career, I have provided design services on numerous urban roadway reconstruction, resurfacing, and reconfiguration projects where I bring extensive 15 16 experience in pavement resurfacing and repair methodologies in urban areas. In addition 17 to my design experience. I have experience in a variety of preliminary engineering 18 studies, including traffic impact studies, corridor alternative studies, interchange 19 modification studies and safety studies. I earned his Professional Engineer license in 20 2011 and my Professional Traffic Operations Engineer certification in 2013.

20

Q: Please describe your current responsibilities with TRC.

A: I have led various traffic-related projects including traffic impact studies and corridor
 timing studies, traffic signal design, traffic signal system design, and signing and marking
 design. I have considerable experience in traffic analysis using HCS and corridor
 modeling and simulation using Synchro. In addition to my traffic study experience, I have
 served as project engineer on numerous roadway reconstruction, resurfacing, and

27		reconfiguration projects with design experience, including horizontal and vertical
28		alignments, drainage, waterworks, traffic control, and signal design.
29	Q:	Have you previously testified before the New York State Public Service
30		Commission or Siting Board on Electric Generation?
31	A:	No.
32	Q:	Have you previously served as an expert witness before any other court, agency,
33		or other body on the subject you plan to offer testimony on today?
34	A:	No.
35	Q:	What is the purpose and scope of your testimony in this proceeding?
36	A:	To document expected traffic impacts due to the construction and maintenance of the
37		proposed turbines. My scope included traffic analysis, safety analysis, trip generation
38		and distribution, safety analysis, expected routing, mitigation recommendations.
39	Q:	What portion(s) of the Application is your testimony sponsoring?
40	A:	Exhibit 25 – Effects on Transportation.
41	Q:	Were these Exhibits, Application sections, or studies prepared by you or under
42		your direction and supervision?
43	A:	Yes.
44	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
45		publications, data or documents produced by persons other than yourself/your
46		company? If so, please cite these sources. [These are independent studies, etc.]
47	A:	Yes.
48		San Diego County Wind Energy Ordinance
49		(http://www.sandiegocounty.gov/pds/advance/POD10007DEIR.html)
50		LOGISTICUS Projects Group - Eight Point Wind Feasibility Assessment – Dated
51		12/1/2016



Jim T. Shea, PE, PTOE



Education

- M.S., Civil Engineering, Cleveland State University, 2013
- B.S., Civil Engineering, Cleveland State University, 2007

Professional Registrations/ Certifications/Training

- Professional Engineer, Ohio (#76165)
- Professional Traffic Operations Engineer (#3431)
- IMSA Traffic Signal Technician Level II
- NHI Designing for Pedestrian Safety
- NHI Bicycle Facility Design
- NHI Alternative Intersections and Interchanges
- NHI Intersection Safety
 ODOT Safety Studies
- ODOT Safety Studies
 Training
- ODOT Traffic Academy Traffic Signals
- ODOT Traffic Academy Signing and Pavement Markings
- ODOT Traffic Academy Maintenance of Traffic
- ODOT Traffic Academy Interchange Studies
- ODOT Traffic Academy Highway Lighting
- ODOT Highway Safety Manual Focused Training

Project Manager/Transportation Engineer

Jim T. Shea, PE, PTOE serves as Project Manager and Transportation Engineer and brings experience in planning, design, and traffic operations on various transportation projects for county, state, and local government agencies. Throughout his career, Jim has led various traffic-related projects including traffic impact studies and corridor timing studies, traffic signal design, traffic signal system design, and signing and marking design. He is a Professional Traffic Operations Engineer and has considerable experience in traffic analysis using HCS and corridor modeling and simulation using Synchro. In addition to his traffic study experience, Mr. Shea has served as project engineer on numerous roadway reconstruction, resurfacing, and reconfiguration projects with design experience, including horizontal and vertical alignments, drainage, waterworks, traffic control, and signal design.

EXPERIENCE

- Considerable urban corridor roadway design experience.
- Considerable traffic modeling and analysis experience.

PROJECT REFERENCES

Brian Blayney, PE – ODOT District 12 Traffic Planning Engineer Phone: 216-584-2102 Email: <u>Brian.Blayney@dot.ohio.gov</u> Projects: Lakefront West – West 25th Street Analysis, CUY-77-13.80 CCG6B Analysis

Mary Hoy, PE – ODOT District 7 Traffic Planning Engineer Phone: 937-497-6838 Email: <u>mary.hoy@dot.ohio.gov</u> Projects: CLA-72-6.70, SHE-75-8.53

Andrew R. Cross, PE, PTOE – City of Cleveland Division of Traffic Engineering Phone: 216-664-3197 Email: <u>across@city.cleveland.oh.us</u> Projects: East 22nd Street, Fleet Avenue, Scranton Road

KEY PROJECT EXPERIENCE

Ohio Department of Transportation, CLA-72-6.70/SHE-75-8.53 – Clark and Shelby Counties, OH (Project Engineer: 2017) – Provided traffic engineering and related services to ODOT District 7 for traffic control upgrades at two interstate interchanges. Located in Shelby County, the recently reconstructed IR 75/SR 29 interchange required the installation of traffic signals at both the northbound and southbound ramp intersections to accommodate additional turning lanes. Located in Clark County, the IR 70/SR 72 interchange was identified within ODOT's Safety Program for improvements to reduce crashes and improve mobility. Improvements included signal installation at the westbound exit ramp and pavement marking revisions along SR 72 to provide an add lane for the existing eastbound loop exit ramp.

Ohio Department of Transportation, Lakefront West Corridor (West 25th Street Traffic Analysis) - Cleveland, OH (Project Engineer: 2016) - Provided traffic engineering services to evaluate the existing and proposed traffic operations in the vicinity of the West 25th Street and Washington Avenue/Main Avenue intersection within the City of Cleveland. This task is in conjunction with the improvements associated with the CUY-6-12.20 (PID No. 86482) project. A total of six (6) intersections were included within the scope of work for various types of traffic analysis. The study focused on evaluating traffic operations under various types of control at the West 25th Street & Washington Avenue/Main Avenue intersection.

Ohio Department of Transportation, CUY-77-13.80 Cleveland Innerbelt CCG6B Bridge Reconstruction and Interchange Improvements - Cleveland, OH (Project Engineer: 2014-2016) - Performed preliminary engineering for modifications to I-77 southbound near the I-490, Broadway Avenue, and Pershing Avenue interchanges. Mr. Shea was responsible for the signal warrant and removal analysis along the Broadway Avenue corridor. Work tasks also included freeway operational analysis along I-77 to determine if the capacity of the I-490 eastbound system interchange ramp to I-77 southbound should be increased. Various No-build and Build certified traffic volumes were evaluated for discrepancies.



Jim T. Shea, PE, PTOE

Project Manager/Transportation Engineer

Richland Engineering Limited, CUY-90-14.90 EB Owner Support (Project Engineer: 2013-2015) - Provided owner support services to ODOT on various traffic engineering services through various task order agreements. Tasks included signal timing recommendations and modifications at the I-490 and East 55th Street intersection and the Broadway Avenue corridor at the I-490 interchange. Timing modifications were coordinated through the City of Cleveland.

City of Independence, Rockside Road Corridor Study - Independence, OH (Traffic Engineer: 2012-2013) - Responsible for the development and analysis of alternatives to alleviate congestion along the corridor consisting of 10 signalized intersections and the Rockside Road/I-77 Interchange with an ADT of approximately 30,000. The corridor study successfully developed and analyzed short, medium and long term solutions that were recommended for implementation along the corridor. Each of the alternatives along the corridor was analyzed and simulated using Synchro to determine optimal signal timing and offset. Recommended improvements included timing adjustments to the 10 signal closed loop traffic signal system which were made at the controllers and at the City's TMC, signal head upgrades and adjustments, signal pole design and coordination, and overhead sign adjustments.

City of Independence, West Creek Road Traffic Study - Independence, OH (Traffic Engineer: 2012-2013) – West Creek Road Traffic Study was developed in conjunction with the Rockside Road Alternatives Study to evaluate alternatives that could be implemented to help alleviate congestion along the Rockside Road Corridor. The study examined the feasibility of adjusting lane use at the West Creek Road/ Rockside Road intersection, evaluated access control to the Crown Centre site, analyzed the need for additional signalization at various drives access along West Creek and developed alternative routing of traffic flow from West Creek, using Patriots Way, to Oak Tree in order to balance traffic volumes between closely spaced intersections.

City of Independence, Hillside Road Intersection Improvements - Independence, OH (**Project Engineer: 2012-2013**) - Developed design and construction documents for the widening and signal replacement at the intersection of Hillside and Brecksville Road (SR-21). The project also included upgrading drainage, new pavement and curbs, driveways and parking lot grading, and the extension of sidewalks along Hillside to improve access to the nearby school. Construction documents also included the design and installation of wireless interconnect and updated signal timing coordination plans for 10 signals along Brecksville and Pleasant Valley Roads that create a closed loop traffic signal system. Existing signal equipment was evaluated and updated on an as-needed basis.

City of Cleveland, East 22nd Street Rehabilitation - Cleveland, OH (Project Engineer: 2014) - Assigned for the rehabilitation of 0.67 miles of East 22nd Street in the Campus District neighborhood of Cleveland. The project implemented recommendations from the East 22nd Street Corridor/Campus District Redevelopment Plan including the narrowing of the road from Orange Avenue to Central Avenue from three lanes in each direction to two lanes in each direction with bike lanes. Mr. Shea was responsible for the development and analysis of the traffic study to determine the feasibility of the lane reduction. Mr. Shea was also responsible for the design that included the reconstruction of 6 signals. Signal plans included mast arm design, loop detection, RRFB design, interconnect plans, and a corridor timing plan.

City of Cleveland, Fleet Avenue Rehabilitation - Cleveland, OH (Project Engineer: 2012-2013) - Roadway reconstruction project along Fleet Avenue from Independence Avenue (I-77) to Broadway Avenue in the Slavic Village neighborhood of Cleveland. The approximately 1.04-mile long project is broken into two sections, the westernmost 0.66 miles, through the central business district, entailed the total replacement and minor widening of the pavement, including profile adjustments, green infrastructure and streetscape enhancements. Mr. Shea was responsible for the design that included the complete reconstruction of 5 signals and interconnect plans for an additional 2 signals outside of the project limits. Design included signals, RRFB, interconnect and traffic control.

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Joshua S. Brown

TRC Environmental Corporation

10 Maxwell Drive, Suite 200

Clifton Park, NY 12065

Case No. 16-F-0062

Brown

- 1 Q: Please state your name, employer, and business address.
- A: Joshua S. Brown, TRC Environmental Corporation (TRC), 10 Maxwell Drive, Suite
 200, Clifton Park, NY 12065
- 4 Q: What is your position at TRC?
- 5 A: I am the Permitting Planning and Licensing, Office Practice Leader for New York.

6 Q: How long have you been employed with TRC?

7 A: I have been employed with TRC since 2009.

8 Q: Please describe your educational background and professional experience.

9 A: I hold a Dual Bachelor's Degree in Environmental Forest Biology and Forest and Natural 10 Resources Management from the State University of New York College of Environmental 11 Science and Forestry (SUNY ESF). I have served as permitting manager for numerous 12 energy infrastructure and renewable energy projects throughout NY and the northeast. My experience is managing multi-disciplinary teams through project development from site 13 14 prospecting, through siting, permitting, construction and post construction compliance. I have served in this role both as a consultant and wind project developer. Additional 15 16 information on my experience is presented in my curriculum vitae, a copy of which is 17 attached.

18 Q: Please describe your current responsibilities with TRC.

A: As the Office Practice Leader, I am responsible for overseeing TRC's Permitting Planning
 and Licensing staff across NYS. I oversee staff development, quality control and project
 staffing across the region. In addition I serve as a technical expert for complex permitting
 and compliance projects.

Q: Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?

25 A: No.

26	Q:	Have you previously served as an expert witness before any other court, agency,
27		or other body on the subject you plan to offer testimony on today?
28	A:	No.
29	Q:	What is the purpose and scope of your testimony in this proceeding?
30	A:	To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
31		or the Exhibits thereto.
32	Q:	What portion(s) of the Application is your testimony sponsoring?
33	A:	Exhibit 1, General Information; Exhibit 3, Location of Facilities; Exhibit 4, Land Use; Exhibit
34		9, Alternatives; Exhibit 10, Consistency with Energy Planning; Exhibit 13, Real Property;
35		Exhibit 14, Cost of Facilities; Exhibit 18, Safety and Security; Exhibit 22, Terrestrial
36		Ecology and Wetlands (primarily wetland and streams); Exhibit 23, Water Resources and
37		Aquatic Ecology; Exhibit 28, Environmental Justice; Exhibit 31, Local Laws and
38		Ordinances; Exhibit 32, State Laws and Regulations.
39	Q:	Were these Exhibits, Application sections, or studies prepared by you or under your
40		direction and supervision?
41	A:	Yes.
42	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
43		publications, data or documents produced by persons other than yourself/your
44		company? If so, please cite these sources. [These are independent studies, etc.]
45	A:	See Exhibits listed above for references.
46	Q:	Does this conclude your testimony?

47 A: Yes.



JOSHUA S. BROWN

EDUCATION

B.S., Environmental Forest Biology and Forest and Natural Resources Management, SUNY College of Environmental Science and Forestry, 2003

REPRESENTATIVE EXPERIENCE

Mr. Brown is an Environmental Program/Project Manager with over 12 years of experience in renewable energy and transmission permitting. As a Project Manager at TRC, Mr. Brown has been involved with and managed the permitting of numerous wind energy, solar and transmission line projects with a focus on identification and management of critical issues and strategic planning. Mr. Brown manages multi-disciplinary teams through all stages of project development and construction, including site identification, fatal flaw analysis, pre-construction environmental studies, permit applications at local, state and federal levels, regulatory and interested agency involvement, construction monitoring and post construction compliance.

National Grid, Spier Falls – Rotterdam New 115kV Line Project – NY (Project Manager)

TRC is providing environmental permitting and compliance services for Spier Falls/Rotterdam New 115kV Transmission Line Article VII project in upstate NY. Mr. Brown managed overall environmental support for the Project, including permitting and environmental compliance. He was involved in the Article VII Certificate process and led the production of the Environmental Management & Construction Plan (EM&CP). Mr. Brown was involved in settlement negotiations that led to a Joint Proposal of Settlement and an Article VII Certificate hearing to address outstanding landowner concerns.

Transmission Developers, Inc., Champlain Hudson Power Express – NY (Deputy Project Manager)

TRC provided permitting and engineering services for an HVdc transmission line project involving approximately 333 miles of underground and submarine cable with a total transmission capacity of 1,000 MW. The project is designed to deliver energy from Canada into metropolitan New York City. Mr. Brown served as the Deputy Project Manager, managing portions of the Article VII including construction methods and constraints, project layout and compilation of existing utility crossings. Mr. Brown was involved in settlement negotiations with the state agencies and other settlement parties and been involved in developing the Environmental Best Management Practices for the Project.

National Grid, Brown Falls, Taylorville Part 102 Projects – (Project Manager)

TRC supported two-part 102 project involving the Brown Falls – Taylorville #3 and #4 Lines. Mr. Brown is serving as the Project Manager for both of these projects. The first project is part of National Grid's conductor clearance refurbishment program and included the replacement of numerous structures along the 26 mile



line. TRC's scope of work included preparation of a Part 102 Report to the Public Service Commission, APA Major Permit Application, Stormwater Permitting, and construction planning and construction oversight.

National Grid, Various Sub-Transmission and Substation Maintenance Projects – NY (Program Manager)

Mr. Brown is the Program Manager for multiple transmission, sub-transmission and substation maintenance projects. He managed a multi-disciplinary team responsible for preparing and obtaining project required permits including Stormwater Pollution Prevention Plans (SWPPPs), New York Department of Environmental Conservation General Permit Notifications, Public Service Commission Part 102 Applications, Adirondack Park Agency Permitting and Army Corp of Engineer required Permitting. Mr. Brown also manages the agency review and consultation for these projects.

Confidential Solar Client, ~150 projects (350+ MW) in New York, State Environmental Quality Review Act and Environmental Due Diligence

Mr. Brown is the Program Manager coordinating support of over 150 solar project in NY. Support includes initial critical issues analysis, preliminary site due diligence, agency coordination and permitting support.

Noble Clinton Windpark, Noble Ellenburg Windpark, Noble Altona Windpark –Clinton County, NY (Environmental Field Engineer)

Mr. Brown was responsible for coordinating the windparks layout, site specific wetland and cultural resources studies, production of town applications and was involved in the local, state, and federal permitting. Mr. Brown was also involved with the financing, construction monitoring and negotiations of post construction study protocol. The Clinton County Windparks were among the first in New York State and helped form the permitting process for future windparks in the state.

Noble Chateaugay Windpark, Noble Bellmont Windpark and Other Early Development Projects – Franklin County, NY (Environmental Project Manager)

Mr. Brown was the Environmental Project Manager responsible for all permitting efforts and agency contact for Noble Environmental Power's development work in Franklin County, New York. This effort included assisting in development of town laws regulating wind turbines, oversight of all environmental consultants, and compilation of permitting documents for the town, state, and federal agencies.

Western NY Windparks (Environmental Project Manager)

Mr. Brown assisted in the development of the Noble Environmental Power Windparks and was primarily involved in initial windpark layout and coordinating with civil engineers, wetland delineation teams, and wind resource assessment teams to develop optimal layouts for permitting.



Eolian Renewable Energy, Antrim Wind Energy Project – Antrim, NH (Project Manager)

TRC is providing environmental permitting and engineering services for the Antrim Wind Energy Project. Mr. Brown managed the coordinating permitting studies and engineering required for permitting of the Project. TRC performed a Critical Issues Analysis (CIA) early in the development process that identified the likely permitting and development hurdles that required more significant attention during the permitting process. TRC has also been involved in high level project screening of other potential wind sites for Eolian Renewable Energy.

Confidential Client, Wind Energy Project Early Development Support – PA (Project Manager)

TRC is providing feasibility project review and project planning for wind energy projects in Pennsylvania. Mr. Brown manages overall project review and scheduling. TRC provided a comprehensive environmental and permitting review identifying driving permit requirements, required field analysis, associated schedule and risks associated with each project. TRC's support of these early development activities have helped the projects gain development financing and TRC continues to support these projects as the prime environmental, engineering, and permitting contractor.

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Judah Rose

ICF Resources, LLC

9300 Lee Highway

Fairfax, VA 22031

- 1 Q: Please state your name, employer, and business address.
- A: Judah Rose, ICF Resources, LLC, a subsidiary of ICF (ICF), 9300 Lee Highway, Fairfax,
 VA 22031.
- 4 Q: What is your position at ICF?
- 5 A: I am an Executive Director of ICF.
- 6 Q: How long have you been employed with ICF?
- 7 A: I have worked at ICF for over 35 years.

8 Q: Please describe your educational background and professional experience.

9 A: I received a degree in economics from the Massachusetts Institute of Technology and a 10 Master's Degree in Public Policy from the Kennedy School of Government at Harvard 11 University. I have over 35 years of experience in the energy industry including in electricity 12 generation, fuels, power market design, environmental compliance, market mitigation, 13 planning, finance, forecasting and modeling, and transmission. My clients include electric 14 utilities, financial institutions, law firms, government agencies, power consumers, 15 environmental groups, fuel companies, and Independent Power Producers. I am one of 16 ICF's Distinguished Consultants, an honorary title given to three of ICF's 5,000 employees. and I have served on the Board of Directors of ICF as the Management Shareholder 17 18 Representative. I frequently provide expert testimony and litigation support. I have 19 supported the financing of tens of billion dollars of new and existing power plants and I am 20 a frequent counselor to the financial community in restructuring and financing. I have 21 testified in more than 130 instances in scores of state, federal, international, and other 22 legal proceedings. I have also addressed approximately 100 major energy conferences, 23 authored numerous articles published in Public Utilities Fortnightly, the Electricity Journal, 24 Project Finance International, written numerous company studies, and appeared in TV 25 interviews.

26 Q: Please describe your current responsibilities with ICF.
A: I now direct ICF's Wholesale Power Line of Business and I chair ICF's Advisory Services
 Practice.

Q: Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?

31 A: Yes, I have testified before the New York State Public Service Commission.

32 Q: Have you previously served as an expert witness before any other court, agency, or 33 other body on the subject you plan to offer testimony on today?

34 A: I have testified before, filed with, or made presentations to the Federal Energy Regulatory 35 Commission (FERC), an international arbitration tribunal, federal courts, domestic 36 arbitration panels, and state regulators in 24 U.S. states and Canadian provinces, 37 including Arizona, Arkansas, California, Connecticut, Florida, Indiana, Kentucky, 38 Louisiana, Manitoba, Massachusetts, Minnesota, Missouri, Nevada, New Jersey, New 39 York, North Carolina, Ohio, Oklahoma, Pennsylvania, Quebec, South Carolina, and 40 Texas. I have testified extensively on the topics of electric power prices and markets, utility 41 planning, the development of new generation resources and transmission, and generation 42 asset valuation. Many of the testimonies were on subjects similar to the referenced Eight 43 Point Wind Energy Center Project.

44 Q: What is the purpose and scope of your testimony in this proceeding?

- 45 A: To sponsor certain portions of the Eight Point Wind Project Application or the Exhibits46 thereto.
- 47 Q: What portion(s) of the Application is your testimony sponsoring?
- 48 A: Exhibit 8: Electric Systems Production Modeling.
- 49 Q: Were these Exhibits, Application sections, or studies prepared by you or under your
 50 direction and supervision?
- 51 A: Yes.

- 52 Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications,
- 53 data or documents produced by persons other than yourself/your company? If so,
- 54 please cite these sources. [These are independent studies, etc.]
- 55 A: References are listed in Exhibit 8.
- 56 Q: Does this conclude your testimony?
- 57 A: Yes.

Judah L. Rose

Executive Director

EXPERIENCE OVERVIEW

Judah L. Rose joined ICF in 1982 and currently serves as an Executive Director of ICF International. He directs ICF's Wholesale Power practice and co-chairs its Energy Advisory and Solution Line of Business. Mr. Rose has over 35 years of experience in the energy industry including in electricity generation, fuels, power market design, environmental compliance, market mitigation, planning, finance, forecasting and modeling, and transmission. His clients include electric utilities, financial institutions, law firms, government agencies, power consumers, environmental groups, fuel companies, and Independent Power Producers. Mr. Rose is one of ICF's Distinguished Consultants, an honorary title given to three of ICF's 5,000 employees, and has served on the Board of Directors of ICF International as the Management Shareholder Representative.

ICF International

Accomplishment Highlights

- Over 35 years of experience in the energy industry
- Testimony in 130 instances in scores of state, federal, international, and other legal proceedings
- Frequent counselor on restructuring and financing of new and existing power plants

Education

- M.P.P., John F. Kennedy School of Government, Harvard University, 1982
- S.B., Economics, Massachusetts Institute of Technology, 1979

Mr. Rose frequently provides expert testimony and litigation

support. He has provided testimony in 130 instances in scores of state, federal, international, and other legal proceedings. Mr. Rose has testified in over 24 states and provinces, at the Federal Energy Regulatory Commission, in numerous court settings and internationally.

Mr. Rose has supported the financing of tens of billion dollars of new and existing power plants and is a frequent counselor to the financial community in restructuring and financing.

Mr. Rose has also addressed approximately 100 major energy conferences, authored numerous articles published in Public Utilities Fortnightly, the Electricity Journal, Project Finance International, and written numerous company studies. He has also appeared in TV interviews.

SELECTED PRESS INTERVIEWS

- Television"The Most With Allison Stewart," MSNBC, "Blackouts in NY and St. Louis &
ongoing Energy Challenges in the Nation," July 25, 2006
 - CNBC Wake-Up Call, August 15, 2003
 - Wall Street Journal Report, July 25, 1999
 - Back to Business, CNBC, September 7, 1999
- Journals: Electricity Journal
 - Energy Buyer Magazine

- Public Utilities Fortnightly
- Power Markets Week

Magazines: • Business Week

- Power Economics
- Costco Connection

Newspapers: Denver Post

- Rocky Mountain News
- Financial Times Energy
- LA Times
- Arkansas Democratic Gazette
- Galveston Daily News
- The Times-Picayune
- Pittsburgh Post-Gazette
- Power Markets Week
- Wires:
- Bridge News

Associated Press

Dow Jones Newswires

TESTIMONY

- 130. Rebuttal testimony on behalf of Ohio Edison Company, The Cleveland Electric Illuminating Company, The Toledo Edison Company, October 20, 2015.
- 129. Expert testimony on the January 14, 2015 "stopgap" filing at FERC on behalf of The PJM Power Providers Group, Docket No. ER15-852-000, February 13, 2015.
- 128. Damages Testimony on behalf of Duke Energy Indiana, Inc. Plaintiff v. Cause No. 1:13-cv-1984-SEB/TAB, Benton County Wind Farm LLC, January 5, 2015.
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AWARDS AND RECOGNITION

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ICF International	Vice President	1996-1999
ICF International	Project Manager	1993-1996
ICF International	Senior Associate	1986-1993
ICF International	Associate	1982-1986

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Judith A. Bartos

TRC Environmental Corporation

Wannalancit Mills, 650 Suffolk Street

Lowell, MA 01854

Case No. 16-F-0062

- 1 Q: Please state your name, employer, and business address.
- A: Judith Bartos, TRC Environmental Corporation (TRC), Wannalancit Mills, 650 Suffolk
 Street, Lowell, Massachusetts, 01854.
- 4 Q: What is your position at TRC?
- 5 A: Senior Scientist and Senior GIS Analyst.
- 6 Q: How long have you been employed with TRC?
- 7 A: I have been employed at TRC since 1999.

8 Q: Please describe your educational background and professional experience.

9 A: I have a Bachelor of Science and a Masters in Soil Science from the University of
10 Massachusetts at Amherst. I have completed several GIS courses offered by ESRI, the
11 leading vendor for GIS mapping software products. I have also participated in one-on-one
12 training in the use of Autodesk 3DS Max visualization software, specifically for use in
13 photosimulations.

- I have 22 years of experience in the environmental field primarily on energy-related
 projects. At TRC, I have served in the capacity as Senior GIS Analyst for 17 years and
 have provided both the written reports and performed the technical analyses necessary
 for Visual Impact Assessment for numerous projects nationwide.
- 18 Q: Please describe your current responsibilities with TRC.

A: I work with several GIS software packages and 3-dimensional visualization programs to
 provide GIS analysis and visual impact assessments. I am responsible for performing the
 technical and written work of visual assessments and supervise junior staff on other GIS
 projects.

Q: Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?

25 A: No.

Case No. 16-F-0062

26	Q:	Have you previously served as an expert witness before any other court, agency,
27		or other body on the subject you plan to offer testimony on today?
28	A:	Yes. I have testified before the Public Service Commission of West Virginia and the Energy
29		Facility Siting Board in Massachusetts. I have recently provided written testimony to the
30		Vermont Public Service Board.
31	Q:	What is the purpose and scope of your testimony in this proceeding?
32	A:	To sponsor the work performed for Exhibit 24 and accompanying Visual Impact
33		Assessment Report.
34	Q:	What portion(s) of the Application is your testimony sponsoring?
35	A:	Exhibit 24 and accompanying Visual Impact Assessment Report.
36	Q:	Were these Exhibits, Application sections, or studies prepared by you or under your
37		direction and supervision?
38	A:	Yes.
39	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
40		publications, data or documents produced by persons other than yourself/your
41		company? If so, please cite these sources. [These are independent studies, etc.]
42	A:	References are provided in the relevant Exhibit 24 and Visual Impact Report.



JUDITH A. BARTOS

AREAS OF EXPERTISE

Ms. Bartos has 18 years of cumulative experience in the following:

- GIS 10.3 ArcInfo/Spatial Analyst/3D Analyst; ArcServer/sde Geodatabase; 3DS Max 2016; Global Mapper; Visual Nature Studio 3; AutoCad; ArcGISPro
- Three-Dimensional Modeling, Photosimulation, Viewshed Analysis, Lineof-Sights, Advanced Terrain Analysis, Linear Referencing, Shadow Study, Animated Fly-Through, Cut and Fill, Air Modeling and Groundwater Modeling Isopleths, Advanced Geodatabases
- Visual Impact Assessments
- Expert Testimony for Visual Impact Assessments and Photosimulations
- GIS Web Mapping and GIS Mobile App Development
- Wind Farm and Generating Facility siting studies
- Watershed and Hydrologic Modeling using National Hydrography Dataset (NHDPlus), ArcHydro and Time Series Framework
- Soils, Glacial Geology, Hydrology, Landform Interpretation, Ecology, Forest Community Assessment, Stream Characterization, Wildlife Habitat Assessment, Census demographics, Environmental Justice: raster and vector data analysis with occasional use of external relational and nonrelational databases
- Tailoring natural gas pipeline engineering information to state and federal permitting applications. Previously have written Resource Reports for FERC applications as well as final GIS analysis and cartography.
- FGDC-compliant metadata
- Environmental Inspection (FERC Guidelines) Natural Gas Pipeline Construction
- Wetland Assessment and Delineation in CT, DE, MA, MD, ME, NH, NJ, PA, VT, & WV.
- Ecology, Forest Community Assessment, Stream Characterization, Wildlife Habitat Assessment
- Environmental Permitting for Wetland Resource Areas and Hazardous Waste
- Construction Remediation Oversight, Hazardous Waste Management, Site Assessment, Remediation for large-scale infrastructure projects

REPRESENTATIVE EXPERIENCE

Geographic Information Systems (GIS) and Visualization Studies

Ms. Bartos currently works with an integrated collection of GIS and visual/3dimensional software products enabling her to deploy GIS functionality and to provide a full range of computerized visualization services for qualitative and quantitative visual impact assessments. Such elements include complex use of



vector and raster data for geoprocessing, linear referencing, analytical models, and centralizing data by building geodatabases and/or internet web-based mapping services, and utilizing database technology by integrating spatial data with other business data.

Her main area of expertise includes three dimensional modeling skills and photosimulations of proposed facilities in real world coordinates for those projects requiring visual impact studies, as well as viewshed analysis and lines-of-sight. She has provided expert testimony deposition and has assisted in the preparation of pretrial written testimony for visual assessments.

Eversource West Roxbury to Needham Transmission Reliability Project, Massachusetts – (Sr. GIS Systems Analyst: 2016 to present).

Ms. Bartos provided Visualization Services and expert testimony to the EFSB regarding the proposed new build electric transmission line for the West Roxbury to Needham Reliability Project. The project was a new transmission line build traversing through the towns of Needham, Dedham, and Boston (West Roxbury) along an existing above ground transmission. The work provided was in response to an EFSB Information Data Request dated December 8, 2016. Comparative viewshed analyses and photosimulations were provided.

Eversource Sudbury to Hudson Transmission Reliability Project, Massachusetts – (Sr. GIS Systems Analyst: 2016 to present).

Ms. Bartos performed and prepared a Visual Impact Assessment in support for a petition to the EFSB pursuant to G.L. c. 164, § 69J for authority to construct, operate, and maintain an approximately 9-mile 115-kilovolt transmission line from Eversource's Sudbury Substation on Boston Post Road in Sudbury to Hudson Light & Power Department's substation at Forest Avenue in Hudson. Ms. Bartos provided a viewshed analysis to assess impacts at a regional landscape level as well as producing photosimulations.

Eight Point Wind Energy Center, Steuben County, NY – (Sr. GIS Systems Analyst: 2016 to present).

Eight Point Wind expects to install up 34 commercial scale wind turbines in addition to a collection substation and 16-mile overhead 115kv transmission line. Ms. Bartos has produced a combined Visual Impact Assessment for the project that was conducted according to the requirements in 16 NYCRR §1001.24 to be included as Exhibit 24 in an Article X application. The NYSDEC Program Policy "Assessing and Mitigating Visual Impacts was used in order to comply with NYSPSC requirements and Article VII process for the transmission part of the project.

Vermont Green Line, Addison County, VT & Clinton County, NY – (Sr. GIS Systems Analyst: 2015 to present).

The Vermont Green Line Project is a high voltage direct current (HVDC) 400 MW electric power transmission system connecting the New York Power Authority



(NYPA) Plattsburgh Substation in Beekmantown, Clinton County, New York, and the Vermont Electric Power Company (VELCO) New Haven Substation in New Haven, Addison County, Vermont. Ms. Bartos conducted a visual impact assessment and corresponding analyses for the project including viewshed analyses and photosimulations. As part of the deliverable, the NYDEC Visual Policy was used to fulfill Article VII visual requirements for the state of NY and an extensive Quechee Analysis was performed for the VT part of the project to fulfill Section 248(b)(5) of Title 30 Vermont Statutes. In addition, she has submitted pre-trial written testimony for the project.

Lasher Road Substation Project, Saratoga County New York – (Sr. GIS Systems Analyst: 2015 to 2016).

As part of an Article VII application, Ms. Bartos provided visual impact studies and final report writing for a proposed 115kV distribution substation and associated 115 KV tap lines tying into National Grid's existing 115 kV Spier Falls to Rotterdam Transmission Line #2. The Article VII visual assessment used the NYDEC Visual Policy as guidelines for the submittal and included a visual resources inventory, viewshed analyses using existing point cloud LiDAR data and photosimulations.

Shoreham Solar Project, Suffolk County New York – (Sr. GIS Systems Analyst: 2015).

Shoreham Solar Commons, LLC proposed to construct and operate a 24.9MW ground-mounted, stationary/non-tracking solar array installed on mounting racks and associated electric interconnect infrastructure to LIPA's 69 kV power grid. The site is located in Brookhaven, Long Island, NY and subject to SEQRA and 6 NYCRR §617. Ms. Bartos provided technical oversight and analyses for a team providing visual simulations and authored a visual impact assessment following NYSDEC's Visual Program Policy.

Island Park Energy Center LLC, The Island Park Energy Center – A Repowering of the E.F. Barrett Power Station, Town of Hempstead, Nassau County, NY (Sr. GIS Systems Analyst & GIS Coordinator: 2013 – Present). This project is currently on hold. Ms. Bartos served as Sr. GIS Analyst and GIS lead for the repowering of the existing E.F. Barrett Power Station for Island Park Energy Center LLC. Proposed is the development of a new approximately 690 MW combined cycle facility with an additional development of approximately 290 MWs of new peaking (simple cycle) capacity to be known as the Island Park Energy Center (IPEC). The project requires a Certificate of Environmental Compatibility and Public Need from the New York State Board on Electric Generation Siting and the Environment under Article 10 of the New York State Public Service Law. Ms. Bartos is also responsible for conducting a comprehensive Visual Impact Assessment according to 16 NYCRR §1001.24.

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Kunhal V. Parikh

Sargent & Lundy LLC

55 East Monroe Street

Chicago, IL 60603

1	Q:	Please state your name, employer, and business address.
2	A:	Kunhal V. Parikh, Sargent & Lundy LLC, 55 East Monroe St., Chicago IL, 60603
3	Q:	What is your position at Sargent & Lundy LLC?
4	A:	Project Manager.
5	Q:	How long have you been employed with Sargent & Lundy LLC?
6	A:	Five years.
7	Q:	Please describe your educational background and professional experience.
8	A:	Bachelors of Science in Electrical Engineering from Drexel University. I have over 11
9		years of experience in Transmission, Substation and Power Plant design.
10	Q:	Please describe your current responsibilities with Sargent & Lundy LLC.
11	A:	Currently the Project Manager for Sargent & Lundy LLC, overseeing the wind, solar and
12		FERC 1000 projects for Nextera Energy Resources.
13	Q:	Have you previously testified before the New York State Public Service
14		Commission or Siting Board on Electric Generation?
15	A:	No.
16	Q:	Have you previously served as an expert witness before any other court, agency,
17		or other body on the subject you plan to offer testimony on today?
18	A:	No.
19	Q:	What is the purpose and scope of your testimony in this proceeding?
20	A:	Providing expert opinion on transmission line, substation and collection design.
21	Q:	What portion(s) of the Application is your testimony sponsoring?
22	A:	Exhibits 5 and 35.
23	Q:	Were these Exhibits, Application sections, or studies prepared by you or under
24		your direction and supervision?
25	A:	Yes.

Case No. 16-F-0062

Parikh

26	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
27		publications, data or documents produced by persons other than yourself/your
28		company? If so, please cite these sources. [These are independent studies, etc.]
29	A:	New York Power Pool (NYPP) now known as New York ISO, Tie-line rating report.

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Sargent & Lundy
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EDUCATION

Drexel University B.S. Electrical Engineering (Concentration in Power Systems) – 2006

REGISTRATION

Professional License (Delaware, Florida, Minnesota, New York, North Dakota, South Dakota & Wisconsin) IEEE / IEEE PES / Committee Senior Member # 41620409 Cigré Member American Wind Energy Association Transmission Committee Member IEEE Working Group Subcommittee Member on HVDC IEEE Working Group Subcommittee Member on Overhead Transmission Lines

EXPERTISE

Project Management Business Development Transmission Line Design Engineering Substation Design Engineering Graphical Information System (GIS) Interface High Voltage Direct Current (HVDC) **EMF & EMI Studies EMTP Studies Calculation Preparation** Specification Preparation **Relay Settings & Coordination** Arc Flash Calculation Short Circuit / Load Flow Feasibility and Facility Studies **Conceptual Projects** Project Schedules (Primavera and Microsoft Project) **Construction Support**

RESPONSIBILITIES

Kunhal Parikh is responsible for managing the engineering for substation and transmission line projects of the Power Delivery Service group, at Sargent & Lundy. His responsibility includes the oversight of the design of substation and transmission line projects, client interface and project schedules.

Mr. Parikh was elected by senior executives to Sargent & Lundy Leadership Team in 2016 and directly reports to the Senior Vice President of Power Delivery Services. He serves as a liaison between the client and S&L and reports to the client regarding performance and project status.

As a manager, Mr. Parikh is responsible for providing technical direction and technical management for projects. He is also responsible for monitoring and coordinating the activities of the various

KUNHAL V. PARIKH Project Manager Power Delivery Services

disciplines involved in substation and transmission projects with the objective of completing the work on schedule and within the authorized budget, while ensuring that the design is performed in accordance with client requirements and Sargent & Lundy (S&L) standards and QA/QC procedures.

Finally, Mr. Parikh is the process owner of transmission line routing and spotting process, and the HVDC process and subject matter expert in siting of substations and transmission lines.

EXPERIENCE

Mr. Parikh has more than eleven (11) years of experience working in the electric power generation, transmission and substation industry. He has worked on numerous transmission line, substation and fossil plant projects. He has been the transmission line lead engineer for projects ranging from 6.6 kV – 765 kV, and +/- 200 kV to +/- 400 kV HVDC and has prepared and reviewed various project deliverables, including calculations, electrical studies, design criteria, cost estimates, and construction specifications.

Also, Mr. Parikh is actively involved in the IEEE subcommittee of Overhead Transmission Lines, and working groups with HVDC, electrical field effects and optical fiber cables.

In addition, Mr. Parikh has extensive experience in the following areas: preparation of purchase specifications, project proposals, project planning, budget estimates, developing conceptual designs, engineering evaluations, single-line diagrams, transmission line design, system studies, detailed and high level cost estimates, project schedules, budget management, preparation of reports, and field commissioning.

Sargent & Lundy LLC (S&L)

September 2012-Present

• Nextera Energy Resources, LLC

• FERC 1000

- Quebec to Maine HVDC and HVAC Transmission Line (2015)
 - The project consisted of proposing a HVDC transmission lines interconnecting Quebec to Maine for a FERC 1000 submission into NEISO RFP. Utilizing PLS-CADD, PLS-POLE, and Global Mapper to design the new transmission line and spot the structures in accordance to all applicable standards and requirements for the client. Preliminary insulator and hardware selection based on electrical contamination and leakage distances. Structure development of +/- 400 kV HVDC line.
- PJM RTEP Window #1 (2017)
- PJM RTEP Window #3 (2016)
- New York Energy Highway Project
- Western New York Project
 - The transmission line project engineer for the proposed transmission lines interconnecting multiple 345 substations. Utilizing PLS-CADD, PLS-POLE, and Global Mapper to design



the new transmission line and spot the structures in accordance to all applicable standards and requirements for the client.

- Solar
- Eldora 230 kV Transmission Line and 230 kV / 34.5 kV Substation Solar Interconnection
- Heru 230 kV / 34.5 kV Substation Solar Interconnection
- Athens 138 kV / 34.5 kV Substation Solar Interconnection
- Interstate 230 kV / 34.5 kV Substation Solar Interconnection
- Wind
- White Hills 345 kV Substation and Transmission Line Project
- Heartland Divide 161 kV Substation and Transmission Line Project
- Dodge County 345 kV Substation and Transmission Line Project
- Emmons Logan 230 kV and 115 kV Substation and Transmission Line
- Ninnescah 345 kV Transmission Line Project
- Rush Springs 345 kV Transmission Line Project
- Mt. Storm 138 kV Transmission Line Project
- Oliver III 230 kV Transmission Line Project
- Crowned Ridge 230 kV Transmission Line Project
- Huron 345 kV Transmission Line Project
- Eight Point 115 kV Collection, Transmission and Substation Wind Farm Interconnect
- Kramer 220 kV Road Replacement Project
 - The transmission line project manager providing oversight for various new greenfield installation for wind projects between the substation interconnection and collector substation.
- Javelina 345 kV Transmission Line Project
 - The transmission line project engineer for the new 345 kV transmission line between Javelina 345 kV substation and existing 345 kV AEP/ETT Cenizo substation. Utilizing PLS-CADD, PLS-POLE, and Global Mapper to design the new transmission line and spot the structures in accordance to all applicable standards and requirements for the client.
- Mammoth Plains Tatonga 345 kV Transmission Line Project
 - The transmission line project engineer for the new 345 kV transmission line between Mammoth Plains 345 kV substation and existing 345 kV OG&E Tatonga substation.
 Utilizing PLS-CADD, PLS-POLE, and Global Mapper to design the new transmission line and spot the structures in accordance to all applicable standards and requirements for the client. Development of the induction calculation utilizing the SES CDEGS program to



calculate the induced current and voltages on the parallel pipelines along the transmission corridors.

• Westar Energy

- Central Crossing 115 kV Transmission Line Rebuild
 - Developed Westar Energy as a new client for Sargent & Lundy in 2016.
 - Worked with contracts, and procurement agents to develop a new general service agreement (GSA) for five (5) years for engineering services, for engineering, procurement and construction.
 - Project Manager for three (3) phases of the 115 kV Central Crossing rebuild and new greenfield transmission line project interconnecting (3) three new greenfield substations in Topeka, Kansas.

Confidential Client

- Ft. McMurray 500 kV Transmission Line
 - The transmission line project engineer for the new 500 kV 500 km transmission line in Alberta, Canada. Utilizing PLS-CADD, PLS-POLE, and Global Mapper to design the new transmission line and spot the structures in accordance to all applicable standards and requirements for the client. EMF, EMI, AN and RI studies were calculated utilizing EPRI AC/DC program. EMTP calculations were performed to determine the number of transposition structures to mitigate the voltage imbalance utilizing long line parameters.

• American Transmission Company Transmission Line Projects

- Y-311 345 kV Rerate Project
- 8962 138kV Rerate Project
- 9942/9962 138 kV Rebuild Project
- 6853 138 kV Rebuild Project
- 138 kV Zoo Interchange Project
- 345 kV PLP41 Rebuild Project
- Q303 345 kV OPGW Replacement Project
- L121 345 kV OPGW Replacement Project
 - Transmission line projects included the design utilizing PLS-CADD, PLS-POLE, FAD 4.0/5.0 and SAG10. Development of structure loads and drawings for tubular steel poles and laminate poles. Foundation design for poles, h-frames and laminate structures utilizing FAD, and LPILE. Thermal study preparation based on IEEE 738-2006 in accordance to all NERC and FERC requirements. Preparation of the EMF calculation for transmission lines utilizing the EPRI workstation.



• Tucson Electric Power

- DMP Tucson 138 kV Transmission Line Project
 - New 138 kV transmission line between DeMoss Petrie substation and Tucson substation.
 - Utilizing PLS-CADD to design the new transmission line and spot the structures in

accordance to all applicable standards and requirements for the client.

URS Energy and Construction (formally Washington Group) June 2006 – September 2012

- Trans Bay Cable, LLC
 - Transcable HVDC +/- 200 kV 400 MW UG Cable
 - Acted as owner's engineer for the 400 MW +/- 200 kV XLPE submarine cable between San Francisco and Pittsburg, CA. Supporting the environmental siting and constraints of the HVDC UG cable and reviewing construction drawings and terminations.

• Public Service Electric & Gas

- Burlington-Camden 230 kV Conversion Project.
- North Central Reliability Project.
 - Lead engineer in developing the 230 kV transmission line upgrades using PLSCADD, PLS-POLE and Tower software. Developed the construction sequencing schedule and drawings for the 230 kV rebuild, utilizing fall and spring construction outages in the PJM network. Development of the underground technology report for use in the alternative analysis study provided to the Client. Development of the construction package, including the electrical technical package and the demolition package. Developed project design criteria, project cost estimates, project specification, calculations, material lists and primavera schedule.

• Ameren.

- Tie Line Interconnect
 - Lead engineer modeling of the 345 kV transmission tie-line using PLSCADD software.
 Developed project design criteria, project cost estimates, project specification, calculations, material lists and schedule.

• Pennsylvania Power & Light (PPL)

- Carlisle 138 kV Underground Cable Project
 - Development of the 138 kV underground alternative report between Carlisle and West Carlisle substations using, 138 kV EPR cable. Calculated the required ampacity using CymCAP for the cable selected and provided the cost estimate to determine if the underground route was feasible.

• Suncor Energy

- Stage 4 - Pad 116



- Modeling of the 144 kV transmission line using PLS-CADD, and PLS-POLE which were subjected to heavy icing and wind loading conditions. (2011).
- Stage 3 HV System
 - Development of the specifications for the A-frame, CCVT, circuit breaker design and auxiliary components for three substations. Developed the grounding grid analysis for the substations and switchyards using GroundMat program. Development of the battery sizing, line charging current relay setting calculations. Development of the induction calculation utilizing the SES CDEGS program to calculate the induced current and voltages on the parallel pipelines along the transmission corridors.
- PECO
 - Limerick Re-licensing Project
 - Development of the Induced Voltage calculation using EPRI standards and programs for the 500 kV, 230 kV and 138 kV transmission lines interconnecting PECO Limerick station with various substations on their network.
- Next Generation Nuclear Project
 - Development of the system design descriptions (SDD) for medium voltage, low voltage switchgear, circuit breakers, high voltage transformers, and generators in accordance to all applicable standards and requirements.
- Public Service New Hampshire
 - Merrimack Clean Air Project
 - Responsibilities included development of specifications for LV, MV switchgear, MCC, DC & UPS system, and cable bus. Development of the short circuit & load flow / voltage drop, relay coordination, DC & UPS load study, and arc flash protection calculations using SKM PowerTools. Reviewed vendor drawings used for the construction of the LV and MV switchgear, MCC, DC & UPS system, and cable bus. Implementation of the electrical installation package, used to determine the BOP electrical contractor. Development of the Arc Flash Hazard Calculation, utilizing the short circuit and relay coordination study to determine the arc flash incident energy, flash protection boundary and hazard risk category and associated PPE required gear for the 4.16kV medium voltage switchgear and 480 low voltage switchgear and MCCs. This calculation was computed using IEEE 1584, NFPA 90E and SKM PowerTools software program.

• Salt River Project

- Springerville Generating Station



 Developed the grounding grid analysis for the substation and Unit 4 generator using SKM GroundMAT. Developed the Transient Recovery Voltage (TRV) study for proposed dead time breakers to verify if it met the design criteria specified by SRP.

Coakley

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Louis Coakley

NextEra Energy Resources

700 Universe Blvd., JES/JB

Juno Beach, FL 33408

Coakley

- 1 Q: Please state your name, employer, and business address.
- A: Louis Coakley, NextEra Energy Resources, 700 Universe Blvd., JES/JB, Juno Beach,
 FL 33408.
- 4 Q: What is your position at NextEra Energy Resources?
- 5 A: Manager, Environmental Services.
- 6 Q: How long have you been employed with NextEra Energy Resources?
- 7 A: 29 years.
- 8 Q: Please describe your educational background and professional experience.
- 9 A: I have a Bachelor of Arts in Marine Environmental Policy and Geography from
 10 the University of Rhode Island and a Master of Public Administration in Energy
 11 Management and Coastal Zone Management from the University of West Florida. I
 12 have 15 years of experience in the wind energy industry and over 36 years of
 13 experience in the environmental and permitting fields. Please see attached resume for
 14 additional information.
- 15 Q: Please describe your current responsibilities with NextEra Energy Resources.
- A: I am responsible for management of permitting activities for wind, solar, and fossil
 generation; energy storage; and transmission in the Northeast US and Canada. I have
 three direct reports who also support these activities In addition, I am the Environmental
 Natural Resource Protection Unit Leader for the NextEra Energy Corporate Oil Spill
 Response Team.
- Q: Have you previously testified before the New York State Public Service
 Commission or Siting Board on Electric Generation?
- A: Yes, New York State Department of Public Service hearings concerning the New York
 Energy Highway transmission proceedings in 2016.
- 25 Q: Have you previously served as an expert witness before any other court, agency,
- 26 or other body on the subject you plan to offer testimony on today?

27	A:	No.
28	Q:	What is the purpose and scope of your testimony in this proceeding?
29	A:	To sponsor certain portions of the Eight Point Wind Project Application or the Exhibits
30		thereto.
31	Q:	What portion(s) of the Application is your testimony sponsoring?
32	A:	Exhibit 17: Air Emissions; Exhibit 18: Safety and Security; Exhibit 19: Noise and
33		Vibration; Exhibit 20: Cultural Resources; Exhibit 21: Geology, Seismology, and Soils;
34		Exhibit 22: Terrestrial, Ecology and Wetlands; Exhibit 23: Water Resources and Aquatic
35		Ecology; Exhibit 24: Visual Impacts; Exhibit 28: Environmental Justice.
36	Q:	Were these Exhibits, Application sections, or studies prepared by you or under
37		your direction and supervision?
38	A:	Yes, under my direction and supervision.
39	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
40		publications, data or documents produced by persons other than yourself/your

- 41 company? If so, please cite these sources.
- 42 A: References are provided in the corresponding Exhibits and Reports.


Louis "Coke" Coakley

700 Universe Blvd, Juno Beach, FL 33458 (561) 691-7060

1988 to Present:

<u>NextEra Energy Resources & Florida Power & Light, Juno Beach, Florida</u> <u>Manager, Environmental Services</u>

- Conduct environmental and development support necessary for NextEra Energy Resources renewable energy and fossil power generation and transmission projects. Regional project manager for the Northeastern US and Canada. Assist with project financings, acquisitions and divestitures. Manage all environmental development activities and permitting issues, energy facility siting, and report analyses/ conclusions. Participate in agency, stakeholder and public meetings. Involved in over 300 projects throughout the US and Canada.
- **Permitting Manager** for the 101-MW Eight Point Wind Project, 345 kV Empire Transmission Project, New England solar projects (15); 345 kV NY Enterprise Transmission Project, 230 kV Ontario East West Transmission Project; 660 MW Island Park Energy Center combined cycle project. Responsible for expedited development, permitting and post-construction monitoring.
- **Permitting**/ **Development Manager** for the Long Island Offshore Wind Park, a 140-MW offshore wind project off the south shore of Long Island, NY. Previously led project development and coordination with Long Island Power Authority and held over 200 public hearings.
- Environmental Audits Team leader for NextEra Energy facilities. Responsible for scheduling, managing and directing field audits and preparing draft and final audit reports.
- Environmental Resource Protection Unit Leader for NextEra Energy corporate oil spill response team to provide oil spill environmental sensitivity assessments and trajectory/ impact modeling using the SIMAP oil spill model and other resources for all bulk oil storage facilities and pipeline sites.
- Manage corporate process management system for environmental support of wind projects and the Environmental Competitive Utility Database using utility databases and other sources.
- Previous Utilitree Carbon Company Board of Directors, a 42 electric utility non-profit organization providing cost-effectiveness carbon sequestration forestry projects. Developed FPL carbon footprint survey and evaluation program for mitigation activities. Managed FPL submittals for the US Department of Energy Section 1605(b) climate change program.
- Technical environmental licensing lead to the FPL Fort Myers and Sanford repowering projects, Manatee Orimulsion project, Crane-Bridge-Plumosus 230 kV and Levee-Midway 500kV transmission line certifications.
- Established the first Environmental Services Department environmental information management system including the Permit Tracking database, REG Files, Lexis Nexis, environmental alerts notification system, Ventyx database and environmental GIS. Managed Environmental Services responsibilities for the FPL Ten-Year Site Plan.
- Managed federal permitting of the Martin 1,600 megawatt combined cycle/ IGCC power plant, provided primary state licensing support for the Martin Expansion Project, and coordinator of post-certification activities concerning other FPL power plants, including the combined-cycle repowering projects. Created FPL Manatee Island donation to the US Fish & Wildlife Service, largest private land donation to the Service.

1982-1988	Southern States Energy Board Atlanta, Georgia
	Assistant Director Managed energy related environmental projects for the Southern States Energy Board, a 17-state compact organization involved in regional energy and environmental issues. Major projects included electricity policy/ energy facility planning; air and water quality; acid rain; fossil fuel, nuclear and alternative energy development; hazardous waste management and minimization; radioactive materials transportation and storage; biomass; radon; and cogeneration. Organized major regional and national meetings, and directed environmental and energy liaison with government and industry representatives, including governors, Congressmen and leading state legiclators
Pre-1982	 Environmental Affairs Analyst, Southern Natural Gas Company. Coastal Planner, Florida Beach Management Project. Florida Department of Natural Resources. Coastal Energy Analyst, Escambia County Energy Project. Escambia County, Florida. Energy Facility Siting Planner, Coastal Energy Impact Program. Kingston, Rhode Island. Fisheries Biostatistical Specialist, National Marine Fisheries Service. Narragansett, Rhode Island.
Education	Masters of Public Administration: Energy Management and Coastal Zone Management, 1982 University of West Florida BA, Marine Environmental Policy and Geography, 1980 University of Rhode Island
Professional	National Association of Environmental Professionals; National, Florida and Treasure Coast Chapters
Personal	Married; Jupiter Glory Day National Baseball over-35 Champions 2003, 2006, 2014; Chairman, Town of Jupiter Beach Committee, since 1995; FPL MS South Florida Bike Team Captain since 2007.

Publications/ Presentations: Bat Acoustic Monitoring- Bat Movement Forecasting, co-author American Wind Energy Association Annual Conference, Atlanta, GA 2012

Long Island Offshore Wind Park, European Offshore Wind Conference, Copenhagen, Denmark, November 2005

Long Island Offshore Wind Park, Wind Power Conference, Denver, CO, May 2005.

Use of Oil Spill Modeling for Contingency Planning and Impact Assessment, International Oil Spill Conference, Tampa, FL, February 2001.

Benefits and Use of an Oil Spill Response Website, International Oil Spill Conference, Tampa, FL, February 2001.

Display of Site Characteristics via Poster Illustration for Oil Storage Facilities: Florida Power & Light Cases, International Oil Spill Conference, Tampa, FL, February 2001.

Where's the Spill Now? Evaluating the Usefulness of a GIS Oil Spill Trajectory Model During the Initial Stages of an Oil Spill Event. A Case Study of the Florida Power & Light Company, Corporate Oil Spill Drill, Port Manatee, Florida, April 15, 1999, Florida Department of Environmental Protection GIS Conference, Tallahassee, FL, October, 1999.

FPL Mechanical and Vegetative Carbon Sequestration Research and Development Study, Electric Utilities Environmental Conference, Tucson, AZ, January, 1999.

Utility Options and Costs for Mechanical and Vegetative Carbon Sequestration, American Forests Conference, Nebraska City, NE, February, 1996.

FPL Environmental Management Information System, National Association of Environmental Professionals Conference, St Louis, MO, June 1996.

A Growth Utilities' Perspective of Global Climate Change Issues: The Florida Power & Light Experience, Air & Waste Management Conference, San Antonio, TX, March, 1995.

A Public Interaction Program Process for Energy Facility Siting, EEI Public Participation Conference, West Palm Beach, FL, October, 1988.

Legal and Institutional Barriers to OTEC Commercialization, International Conference on Alternative Energy Sources, Miami Beach, FL, December, 1987.

Thompson

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Mark Thompson

NextEra Energy Resources

700 Universe Blvd.

Juno Beach, FL 33408

Thompson

1	Q:	Please state y	/our name, emp	oloyer, and	business address.
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- A: Mark Thompson, Nextera Energy Resources (NEER), 700 Universe Blvd, Juno Beach,
 FL 33408.
- 4 **Q**: What is your position at NEER:
- 5 A: Engineering Manager.
- 6 Q: How long have you been employed with NEER:
- 7 A: 13 years.
- 8 Q: Please describe your educational background and professional experience.
- 9 A: I have a BSc. in Electrical Engineering and a Master's in Business Administration. I have
 10 been involved in, or facilitated the design, construction and operation of over 7 GW of
 11 wind generating facilities. I am vastly experienced in the design, construction,
 12 maintenance of renewable transmission and generating infrastructure.
- 13 Q: Please describe your current responsibilities at NEER:
- A: I currently manage the Wind Engineering Team who provides engineering support to the
 development of wind projects from conceptualization to commercial operation.

16 Q: Have you previously testified before the New York State Public Service
 17 Commission or Siting Board on Electric Generation?

18 A: No.

19 Q: Have you previously served as an expert witness before any other court, agency,

20 or other body on the subject you plan to offer testimony on today?

- 21 A: No.
- 22 Q: What is the purpose and scope of your testimony in this proceeding?
- A: To confirm that NEER has taken all prudent measures to ensure that our generating
 facility exist in harmony with the environment and land owners.
- 25 Q: What portion(s) of the Application is your testimony sponsoring?
- 26 A: Exhibits 5, 11, 12, 14, 34, 35.

Case No. 16-F-0062

- Q: Were these Exhibits, Application sections, or studies prepared by you or under
 your direction and supervision?
- 29 A: Yes.
- Q: In your testimony, will you refer to, or otherwise rely upon, any studies,
 publications, data or documents produced by persons other than yourself/your
 company? If so, please cite these sources.
- 33 A: Yes. Sargent & Lundy Engineering, TRC Engineering, Kenney Geotechnical.

MARK THOMPSON

11075 Watercrest Circle East, Parkland, FL 33076 | (H) 561-691 7350 | (C) 561-289-8216 |

mark.thompson@nee.com

PROFESSIONAL SUMMARY

I have been involved in, or facilitated with the design, construction and operation of 7GW of wind generating facilities. I am vastly experienced in the design, construction, maintenance of renewable generating and transmission infrastructures.

SKILLS

- Project management
- Process implementation
- Risk management processes and analysis
- Team leadership
- Staff development
- Electrical substation components
- Leading technical teams

- Client assessment and analysis
- Engineering design and analysis
- Root cause analysis
- Complex problem solving
- Technical problem solving
- Multidisciplinary exposure
- FMEA
- HVAC system design

WORK HISTORY

JANUARY 2010-CURRENT

Engineering Manager | NextEra Energy Resources | Juno Beach, FL

- Responsible for managing an engineering team that develops wind projects from conceptualization to commercial operations, while remaining cost competitive.
- Worked directly with internal and external stakeholders to ensure that key project requirements and milestones are met.
- Responsible for creative designs that meet external stakeholders' requirements.

• Performed due diligence on projects to determine viability.

NOVEMBER 2007-JANUARY 2010

Senior Buyer for long lead equipment | Florida Power & Light Co | Juno Beach, FL

• Initiated key partnerships with suppliers to reduce equipment cost and improve vendor performance.

NOVEMBER 2004-NOVEMBER 2007

Substation Engineer | Florida Power & Light Co | Juno Beach, FL

- Design and supported construction of 10 distribution substation, ranging in voltages from 69kV to 230kV.
- Design temporary substations to support replacement of aged 13kV metal clad infrastructure
- Design and install up to 300MVAR of capacitor banks in 115kV and 230kV
- substation Supervised storm restoration crews of 100 personnel to restore distribution infrastructure damaged by hurricanes.

SEPTEMBER 2002-NOVEMBER 2004

Distribution Line Engineer | Florida Power & Light Co | Juno Beach, FL

• Responsible for creative distribution line designs at 13kV and 23kV.

JUNE 1992-AUGUST 2002

Maintenance Engineer | Alumina Partners of Jamaica | Nain, St. Elizabeth

- Developed electrical designs and provide technical solutions and feedback.
- Oversaw maintenance, designs and releases for new technologies in the refining of bauxite.
- Maintain an 110MW 13.8kV generation and distribution system

EDUCATION

1999

MBA: Business

Nova Southeastern University, Fort Lauderdale, FL

1992

Bachelor of Science: Electrical Engineering University of Technology, Jamaica, Kingston, St. Andrew

Parish, Jamaica 1st class honors

CERTIFICATIONS

- Certified Six Sigma Green Belt
- Certified Six Sigma Black Belt in progress

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NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Patrick J. Fennell, P.E.

TRC Environmental Corporation

21 Griffin Road North

Windsor, CT 06095

Case No. 16-F-0062

1	Q:	Please state your name, employer, and business address.
2	A:	Patrick J. Fennell, P.E.
3		TRC Environmental Corporation
4		21 Griffin Road North
5		Windsor, CT 06095
6	Q:	What is your position at TRC Environmental Corporation (TRC)?
7	A:	Principal Engineer and Project Manager.
8	Q:	How long have you been employed with TRC?
9	A:	17 years.
10	Q:	Please describe your educational background and professional experience.
11	A:	I have the following degrees:
12		B.S. in Civil Engineering from the University of Missouri at Columbia
13		M.S. in Civil Engineering from the University of Illinois at Urbana-Champaign
14		M.E. in Environmental Engineering from the University of Harford
15		
16		My professional experience includes the following:
17		Combustion Engineering / ABB – 17 years performing seismic analysis, safety analysis,
18		and licensing for commercial nuclear power plants.
19		<u>ABB</u> – 6 years performing environmental compliance functions for ABB facilities.
20		TRC – 17 years performing air quality engineering and permitting.
21		
22		My resume is attached.
23	Q:	Please describe your current responsibilities with TRC Environmental Corporation.
24	A:	I perform air quality engineering and permitting for various projects, including fossil fuel
25		and renewable electric power generation facilities, natural gas pipelines and storage
26		facilities, liquefied natural gas terminals, and industrial and commercial clients. I have

Case No. 16-F-0062

27		prepared air permit applications, environmental assessments, environmental impact
28		statements, and due diligence assessments for projects throughout the country.
29	Q:	Have you previously testified before the New York State Public Service Commission
30		or Siting Board on Electric Generation?
31	A:	No.
32	Q:	Have you previously served as an expert witness before any other court, agency,
33		or other body on the subject you plan to offer testimony on today?
34	A:	No.
35	Q:	What is the purpose and scope of your testimony in this proceeding?
36	A:	To sponsor Exhibit 17 - Air Emissions of the Eight Point Wind Energy Center Application.
37	Q:	What portion(s) of the Application is your testimony sponsoring?
38	A:	Exhibit 17 - Air Emissions.
39	Q:	Were these Exhibits, Application sections, or studies prepared by you or under your
40		direction and supervision?
41	A:	Yes.
42	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
43		publications, data or documents produced by persons other than yourself/your
44		company? If so, please cite these sources.
45	A:	Yes. The other studies, publications, data, and documents are referenced in Exhibit 17.



PATRICK J. FENNELL, P.E., BCEE

EDUCATION

M.E., Environmental Engineering, University of Hartford, 1997

M.S., Civil Engineering, University of Illinois at Urbana, 1977

B.S., Civil Engineering, University of Missouri at Columbia, 1975

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Licensed Professional Engineer, Connecticut (#18763) 1995 Board Certified Environmental Engineer, American Academy of Environmental Engineers, 2008.

AREAS OF EXPERTISE

Patrick J. Fennell, P.E. has demonstrated engineering and project management expertise in:

- Air Pollution Engineering and Permitting
- Oil and Gas Industry Permitting
- Power Plant Permitting
- Liquefied Natural Gas Terminal and Seaport Permitting
- Renewable Energy Permitting
- Surface Mine Permitting
- Odor Assessment and Environmental Compliance

REPRESENTATIVE EXPERIENCE

Mr. Fennell has 39 years of experience and progressive responsibility in Environmental, Civil, and Nuclear Engineering. He currently works in TRC's Planning, Permitting, and Licensing group, and supports Energy and Environmental Services clients on a range of projects.

Air Pollution Engineering and Permitting - Oil and Gas Industry (TRC Environmental Corporation, 2000 - Present)

Mr. Fennell prepares air permit applications and FERC environmental reports for oil and gas industry facilities, including natural gas compressor stations, storage facilities, and pipelines. He prepares emission inventories for facility construction and operation. Mr. Fennell prepares third-party environmental analyses and environmental impact statements under contract to FERC. He has also prepared general conformity submittals. Typical project experience includes the following:

<u>Kemmerer Mine Relocation</u> - The project involved the relocation of a natural gas pipeline in Wyoming to accommodate the ongoing operation of the Kemmerer Mine. Prepared the air emission calculations and the air quality section for the project's environmental assessment for the Bureau of Land Management.



<u>Antelope Creek Oil and Gas Field</u> - The project involved installation and operation of over 500 natural gas and oil wells in Utah. Prepared the air emission calculations and the air quality section for the project's environmental assessment for the Bureau of Indian Affairs.

<u>Dominion Transmission New Market</u> - The project involved construction and operation of two new natural gas compressor stations and modifications to three existing compressor stations and one metering station in New York State. Performed third-party review of resource report submittals and prepared the air quality-related portions of the environmental assessment for the FERC.

<u>Dominion Transmission Allegheny Storage</u> - The project involved the construction of new natural gas compressor stations in Maryland and Ohio, expansion of natural gas compressor stations in West Virginia and Pennsylvania, and construction of pipelines in these states. Prepared the pipeline construction calculations and made extensive revisions to the FERC Resource Report 9 (Air Quality) submittal prepared by another organization. Also prepared responses to numerous public comments submitted to the FERC concerning air quality.

<u>Midcontinent Express Pipeline</u> - The project involved construction and operation of an approximately 500 mile pipeline from Oklahoma to Alabama, including four new compressor stations, one booster station, and numerous meter and regulating stations. Prepared air permit applications in Texas, Louisiana, and Alabama, and the FERC Resource Report 9 (Air Quality).

<u>Sawgrass Storage</u> - The project involved a depleted natural gas reservoir located in Louisiana. Prepared the air permit application for the associated natural gas handling and compression facility.

<u>Florida Gas Transmission Company Phase VIII Expansion</u> - The project involved the construction and acquisition of approximately 500 miles of natural gas pipeline in Alabama and Florida. Prepared detailed air emissions calculations for the project construction for the FERC Resource Report 9 (Air Quality) submittal.

<u>Ruston Compressor Replacement</u> - The project involved replacement of natural gas compressors and ancillary equipment at the Ruston Compressor Station in Louisiana. Prepared the FERC Resource Report 9 (Air Quality) submittal.

<u>Kosciusko Compressor Station</u> - The project involved the replacement of existing natural gas compressors and ancillary equipment at the Kosciusko Compressor Station in Mississippi. Prepared the FERC Resource Report 9 (Air Quality) submittal.



<u>Natural Gas Pipeline Company of America Compressor Station 201</u> - The project involved replacement of existing natural gas compressors and ancillary equipment, and the installation of additional compressors at the NGLP CS 201 in Illinois. Prepared the FERC Resource Report 9 (Air Quality) submittal.</u>

<u>Creole Trail Expansion</u> - The project involved modifying the existing Creole Trail pipeline system to accommodate bi-directional gas flow. This entailed construction of a new compressor station and pipeline. Prepared the FERC Resource Report 9 (Air Quality) submittal.

<u>Daleville Compressor Station</u> - The project involved replacement of existing natural gas compressors and ancillary equipment at the Daleville Compressor Station in Pennsylvania. Prepared the Pennsylvania air plan approval and operating permit applications and the FERC Resource Report 9 (Air Quality) submittal.

<u>Eastern Shore Natural Gas System Reliability Project</u> - The project involved installation of a natural gas compressor and ancillary equipment at the Bridgeville Compressor Station and installation of 10 miles of pipeline Delaware. Prepared the Delaware synthetic minor operating permit application and the FERC Resource Report 9 (Air Quality) submittal.

<u>Eastern Shore Natural Gas White Oak Mainline Expansion Project</u> - The project involved installation of a natural gas compressor and ancillary equipment at the Delaware City Compressor Station and installation of 7 miles of pipeline in Pennsylvania. Prepared the Delaware Synthetic Minor Operating Permit application and the FERC Resource Report 9 (Air Quality) submittal.

<u>Eastern Shore Natural Gas 2017 Expansion Project</u> - The project involved installation of a natural gas compressor and ancillary equipment at the Daleville compressor station in Pennsylvania and installation of 32 miles of pipeline in Pennsylvania, Maryland, and Delaware. Prepared the Pennsylvania air plan approval application, and the FERC Resource Report 9 (Air Quality) submittal, and the applicant-prepared environmental assessment.

Air Pollution Engineering and Permitting - Power Plants (TRC Environmental Corporation, 2000 - Present)

Mr. Fennell conducts engineering evaluations and prepares permit applications for power plants, including simple-cycle and combined-cycle combustion turbines, boilers, reciprocating engines, and integrated gasification combined-cycle facilities. He prepares stationary and mobile source emissions inventories for single-source and multi-source modeling. Mr. Fennell performs air pollution control technology assessments and economic analyses for BACT, LAER, BART, MACT, etc. He helps clients respond to problems that arise during startup and routine operation. Typical project experience includes the following:



Long Island Fast Track Project - The project involved preparing the initial air permit applications for three simple-cycle GE LM6000 combustion turbine facilities (Edgewood, Equus, and Pine Lawn) in Long Island, New York. Also prepare submittals for subsequent power up-rates and compliance activities.

<u>Shoreham Solar Commons</u> - The Project involved preparing the Environmental Assessment for a 24.9 MW solar photovoltaic facility in Brookhaven, New York.

<u>Kleen Energy Systems</u> - The project involved preparation of the NSR air permit application for a 620 MW combined-cycle dual fuel-fired power plant in Middletown, Connecticut.

<u>FirstLight Power Resources</u> - The project involved preparation of the NSR air permit application for the Waterbury Generation Project, a dual-fuel General Electric LMS-100 gas turbine generator in Waterbury, Connecticut.

<u>Connecticut Municipal Electric Energy Cooperative</u> - The project involved preparation of the NSR air permit application for the Alfred L. Pierce Generating Station Repowering Project, a dual-fuel simple-cycle General Electric 7EA gas turbine generator in Wallingford, Connecticut.

<u>Connecticut Municipal Electric Energy Cooperative</u> - The project involved preparation of applications to construct and operate twenty 2.5 MW diesel engines located at 10 sites in 5 Connecticut cities or towns plus another site on Fishers Island, New York.

<u>Beacon Falls Energy Park</u> - The project involved preparation of the air permit application to construct a 63.3 MW fuel cell park in Beacon Falls, Connecticut.

<u>LS Power Wallingford Energy</u> - The project involved preparation of the NSR air permit application for the addition of two GE LM6000 simple-cycle natural gasfired combustion turbines at a power plant in Wallingford, Connecticut.

<u>Lawrence Energy Center</u> - The project involved preparation of the Permit to Install/Prevention of Significant Deterioration air permit application and corresponding sections of the Ohio Power Siting Board application for a combined-cycle natural gas-fired power plant in Lawrence County, Ohio.

<u>Fremont Energy Center</u> - The project involved preparation of the Permit to Install/Prevention of Significant Deterioration air permit application and corresponding sections of the Ohio Power Siting Board application for a combined-cycle natural gas-fired power plant in Fremont, Ohio.

<u>CPV Warren</u> - The project involved preparation of the PSD air permit application for a 580 MW combined-cycle power plant in Front Royal, Virginia.



<u>CPV Fluvanna County</u> - The project involved preparation of the PSD air permit application for a 520 MW combined-cycle power plant in Fluvanna County, Virginia.

Air Pollution Engineering and Permitting - Liquefied Natural Gas Terminals and Seaports (TRC Environmental Corporation, 2000 - Present)

Mr. Fennell prepares air permit applications and FERC environmental reports for liquefied natural gas terminals. He has prepared third-party environmental analyses and environmental impact statements under contract to FERC. He has also prepared general conformity submittals. Mr. Fennell prepares air emissions inventories for seaport facilities on the Gulf of Mexico and Pacific Coasts. The inventories included emissions from stationary facilities, onshore mobile sources, construction, and shipping and tow vessels. Typical project experience includes the following:

<u>Jordan Cove Energy Project</u> - The project involved preparing detailed calculations of the construction air emissions for natural gas liquefaction and export facilities in Oregon.

<u>Sabine Pass LNG Project</u> - The project involved construction of a LNG terminal in Cameron Parish, Louisiana. Revised construction calculations performed by another organization to avoid general conformity review.

<u>Freeport LNG Liquefaction Project</u> - The project involves construction and operation natural gas liquefaction and export facilities at and near an existing LNG terminal in Freeport. Provided the third-party review of FERC Resource Report 9 submittals (Air Quality) for FERC jurisdictional and non-jurisdictional facilities.

<u>Sabine Pass Liquefaction Expansion / Cheniere Creole Trail Pipeline</u> <u>Expansion</u> - The project involved expansion of natural gas liquefaction and export facilities and pipeline facilities in Louisiana. Prepared the FERC Resource Report 9 (Air Quality) submittal.

<u>Total Peaking Services</u> - The project involved installation of new compressors, emergency engines, and vaporizers at a liquefied natural gas terminal in Milford, Connecticut. Prepared the FERC Resource Report 9 (Air Quality) submittal.

Air Pollution Engineering and Permitting - Renewable Energy (TRC Environmental Corporation, 2000 - Present)

Mr. Fennell prepared air quality impacts evaluations for renewable energy facilities. Typical project experience includes the following:

<u>Eight Point Wind Energy Center</u> The project involved construction of and operation of a 103.4 megawatts (MW) with 32 wind turbines in Steuben County,



New York. Prepared the air quality exhibit for the Article 10 submittal to the New York State by the Board on Electric Generation Siting and the Environment (Siting Board).

<u>Shoreham Solar Commons</u> The project involved construction of and operation of a 24.9 MW solar photovoltaic facility in the Town of Brookhaven, New York. Prepared the air quality analyses and narrative for the Environmental Analysis.

Air Pollution Engineering and Permitting - Surface Mines (TRC Environmental Corporation, 2000 - Present)

Mr. Fennell prepared air permit applications and emissions inventories for surface mines. These included the tailpipe emissions from stationary and mobile mining equipment, blasting emissions, and fugitive dust emissions from mining operations and wind erosion. Typical project experience includes the following:

<u>Great Northern Project Development South Heart Project</u> - The project involved preparing the air permits for a lignite mine and a 600 MW circulating fluidized bed mine-mouth power plant in Stark County, North Dakota.

Odor Assessment and Environmental Compliance (TRC Environmental Corporation, 2000 - Present)

Mr. Fennell provides environmental compliance services to commercial, industrial and academic facilities. Typical project experience includes the following:

<u>Due Diligence Assessment of Power Plant Acquisition (New York State)</u> -Performed the due-diligence assessment of air quality-related concerns and liabilities associated with the potential acquisition of a 1,000 MW combinedcycle combustion turbine power plant in New York State.

<u>Feasibility Assessments of Power Plant Permit Consolidation (Northern</u> <u>California)</u> - Performed the feasibility assessments of the potential consolidation of the NSR and Title V operating permits for a reciprocating internal combustion engine power plant in the North Coast Air Quality Management District and a combustion turbine power plant in the Colusa County Air Pollution Control District.

<u>Orange Grove Energy Center</u> - Prepared routine and non-routine the air quality compliance submittals to the San Diego Air Pollution Control District, California Energy Commission, California Air Resources Board, and U.S. EPA for two simple-cycle LM6000 combustion turbines.

<u>Waste Transfer Station Odor Study</u> - Performed a third-party review for the City of Waterbury, Connecticut of the potential odor impacts of a proposed municipal solid waste transfer station. Testified at Planning and Zoning Board Hearing.



<u>Asphalt Plant Odor Study</u> - Performed a third-party assessment of odor impacts of an asphalt plant pursuant to a consent order with the Connecticut Department of Environmental Protection. Identified causes of potential nuisance odors and mitigation measures.

<u>Wastewater Treatment Plant Odor Study</u> - Performed an odor assessment of a Connecticut municipal wastewater treatment plant and sewage sludge incineration operation.

<u>Environmental Laboratory Air Permitting and Enforcement Action Response</u> - Assisted a Massachusetts environmental laboratory obtain an air permit for its operations and respond to an enforcement action by the Massachusetts Department of Environmental Protection and the Office of the Attorney General.

<u>Odor Hotline</u> - Staff an odor complaint hotline for a Connecticut municipal solid waste resource recovery facility. On a rotating basis, assume on-call responsibility for responding to odor complaint calls to a 24-hour hour hotline. Investigate complaints and report on findings.

<u>Emergency Plans</u> - Prepared spill prevention control and countermeasure plans, stormwater plans, and wastewater general permit applications for power plants, hospitals, office buildings, and industrial facilities.

ABB, Inc., Corporate Environmental Health and Safety - Windsor, CT (Senior Environmental Engineer: 1994 - 2000)

Mr. Fennell developed and implemented regulatory compliance programs and procedures, prepared permit applications, conducted inspections and audits, developed emergency plans, performed regulatory reviews, and conducted training for the ABB Windsor, Connecticut facility, a 600-acre site with nuclear and fossil energy engineering, research and development, construction, maintenance, and remediation activities. Also served as Program Manager for the successful ISO 14000 certification of three ABB facilities.

ABB Inc./Combustion Engineering, Nuclear Safety and Nuclear Licensing - Windsor, CT (Nuclear Engineer: 1977 - 1994)

Mr. Fennell held a series of positions from Staff Engineer to Principal Nuclear Engineer. His responsibilities included performing seismic and structural analyses and accident simulations for nuclear power plants, providing project management and regulatory compliance support for the decommissioning of a nuclear reactor fuel manufacturing facility, and performing compliance and licensing functions for an operating nuclear fuel manufacturing facility.

SPECIALIZED TRAINING

- California Climate Action Registry Green House Gas Verifier, 2007
- ABB, Inc. Courses in Environmental Management Systems, 1999 2000
- OSHA 40-Hour HAZWOPER Course, 1996



- DOT Hazardous Materials Transportation Courses, 1996
- Arthur D. Little Institute, Environmental Auditing Course, 1995

PROFESSIONAL AFFILIATIONS

- Air and Waste Management Association
- American Academy of Environmental Engineers Board Certified Environmental Engineer

TEACHING AND ADVISORY

- Associate Adjunct Professor, College of Engineering, Technology, and Architecture, University of Hartford, 1998 to the present
- Advisory Committee, Department of Civil, Environmental, and Biomedical Engineering, University of Hartford, 2001 to the present.

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Petro W. Kazaniwsky, P.E.

TRC Companies, Inc.

16000 Commerce Parkway, Suite B

Mount Laurel, NJ 08054

Case No. 16-F-0062

Kazaniwsky

- 1 Q: Please state your name, employer, and business address.
- A: Petro W. Kazaniwsky, P.E., TRC Companies, Inc. (TRC), 16000 Commerce Parkway,
 Suite B, Mount Laurel, NJ 08054.
- 4 Q: What is your position at TRC?
- 5 A: Chief Geotechnical Engineer.
- 6 Q: How long have you been employed with TRC?
- 7 A: I have been employed at TRC since 1977.
- 8 Q: Please describe your educational background and professional experience.

A: I earned Bachelor and Master of Science degrees in Civil Engineering from Drexel 9 University. I am a licensed professional engineer in New York, Pennsylvania, Virginia, 10 Delaware, Maryland, Louisiana, North Carolina, New Jersey, Maine, South Carolina and 11 12 West Virginia. I have over 40 years of experience in geotechnical engineering and field guality control on a wide variety of residential, commercial and industrial projects, including 13 power generation facilities and electrical transmission. This experience includes 14 development of subsurface investigations, geotechnical interpretation and analysis of 15 subsurface data, deep and shallow foundation analysis, slope stability analysis and other 16 related subjects. See the attached curriculum vitae for details. 17

18 Q: Please describe your current responsibilities with TRC

A: I am responsible for all phases of a project, including client contact, proposal preparation,
 coordination and management of all phases of the project, supervision of personnel,
 engineering analyses, preparation of reports and specifications and consultation during
 construction. Provide peer reviews of geotechnical reports prepared by engineering staff.
 Q: Have you previously testified before the New York State Public Service Commission

- 24 or Siting Board on Electric Generation?
- 25 A: Yes. For a Cogeneration Facility proposed in Borough of Brooklyn, NY.

26	Q:	Have you previously served as an expert witness before any other court, agency,
27		or other body on the subject you plan to offer testimony on today?
28	A:	I have provided expert witness reports and testimony related to geotechnical engineering
29		issues for various litigation cases some identified in the attached curriculum vitae; and
30		testimonies before local municipal boards on behalf of developers.
31	Q:	What is the purpose and scope of your testimony in this proceeding?
32	A:	To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
33		or the Exhibits thereto.
34	Q:	What portion(s) of the Application is your testimony sponsoring?
35	A:	Exhibit 21: Geology, Seismology and Soils.
36	Q:	Were these Exhibits, Application sections, or studies prepared by you or under your
37		direction and supervision.
38	A:	Yes.
39	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
40		publications, data or documents produced by persons other than yourself/your
41		company? If so, please cite these sources. [These are independent studies, etc.]
42	A:	See Exhibit 21 for references.
43	Q:	Does this conclude your testimony?

44 A: Yes.



PETRO W. KAZANIWSKY, PE

EDUCATION

M.S., Civil Engineering, Drexel University, 1981 B.S., Civil Engineering, Drexel University, 1977

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Professional Engineer, New York (#081310-0), 2003 Professional Engineer, Pennsylvania (#PE-031597E), 1982 Professional Engineer, Virginia (#0402-022160), 1991 Professional Engineer, Delaware (#8666), 1991 Professional Engineer, Maryland (#18238), 1990 Professional Engineer, Louisiana (#31880), 2005 Professional Engineer, North Carolina (#017204), 1991 Professional Engineer, New Jersey (#24GE02919900), 1983 Professional Engineer, Maine (#7237), 1984 Professional Engineer, South Carolina (#19751), 1999 Professional Engineer, West Virginia (#014547), 2000

AREAS OF EXPERTISE

Mr. Petro W. Kazaniwsky, PE has project management and technical experience in the following general areas:

- Development of Subsurface Investigations
- Geotechnical Interpretation and Analyses of Subsurface Data
- Deep and Shallow Foundation Analyses and Recommendations
- Ground Improvement
- Slope Stability Analyses
- Slope Stabilization
- Stabilization of Foundation Settlement
- Foundation and Earthwork Construction Quality Control
- Pavement Design
- Litigation Support
- Expert Testimony
- Development of Geo-instrumentation Programs

REPRESENTATIVE EXPERIENCE

Mr. Kazaniwsky possesses over 40 years of experience in geotechnical engineering and field quality control for such projects as low to high-rise residential developments, industrial processing facilities, power generation facilities, electrical transmission, hospitals, ilow to high-rise office complexes, regional shopping centers, multi-story parking facilities, highways, bridges, schools and churches. Primary responsibilities include all phases of a project including client contact, proposal preparation, coordination and management of all phases of the project, supervision of personnel, engineering analyses, preparation of reports and specifications, and consultation during construction. Specialized experience includes site stabilization, modeling and in-situ testing of pile and drilled pier foundations, design and installation of geotechnical



instrumentation monitoring systems, and pavement design. He has provided third-party reviews for construction claims resolution, as well as expert witness testimony in connection with geotechnical-related claims. He also currently serves at the Quality Assurance Manager for the firms geotechnical engineering and drilling practices and is responsible for peer reviews of all technical aspects of the practice. He has been with the firm since 1977 and has been involved in over 2,600 geotechnical projects.

Champlain Hudson Power Express- Canada to New York City High DC Voltage Transmission Line (Chief Geotechnical Engineer/Senior Project Manager: 2012-2013)

The project consists of the installation of a buried high voltage DC power line delivering energy from Canada to New York City, traveling through entire length of Lake Champlain, highways, along railroad right-of-ways, and then eventually through the Hudson River. TRC was responsible for the terrestrial portion of the project which begins in Dresden, NY where the route runs in a southerly direction along NY Route 22, transitions to the Canadian (CP) Pacific railroad right-of-way, then the route follows the CSX Transportation (CSX) railroad right of-way terminating in Catskill, NY. The entire length of the terrestrial portion of the project entailed a trenched buried cable with a large number of horizontal direction drilling (HDD), as well as jack and bore (JB) locations. The entire terrestrial route length was approximately 125 miles and a total of 209 test borings were drilled for the project. Mr. Kazaniwsky acted as the senior project manager and was responsible for developing all the geotechnical requirements for the project and coordinating the geotechnical field investigation program (test borings and field thermal and electrical resistivity testing), as well as the laboratory testing program (geotechnical testing of soil and rock and thermal resistivity testing). Responsibilities included coordinating all the work with the client and the client's construction manager/constructor. At the completion of the field and laboratory program for each relevant terrestrial section of the project, a geotechnical data report was prepared under Mr. Kazaniwsky's technical oversight. A total of three comprehensive geotechnical data reports were prepared and submitted on a timely basis to meet the client's schedule.

86 Bayside Drive (Pepe Property) – Borough of Atlantic Highlands, NJ (Geotechnical Consultant: 2014)

Currently Mr. Kazaniwsky is providing geotechnical consultation services for this ongoing project. To date he reviewed the construction documents associated with the slope remediation construction at the property located at 86 Bayside Drive in the Borough of Atlantic Highlands. The purpose of this review was to establish the potential adverse impact of the proposed construction at this property on the existing Henry Hudson Trail. Any requirements for protection or restoration of the trail property were also identified. A brief letter report was prepared subsequent to the review and a site visit. Mr. Kazaniwsky continues reviewing the construction photos and updated drawings and additional site visits are planned.



ASC-64 Locomotive Commissioning Facility AMTRAK Maintenance Facility-Wilmington, DE (Chief Geotechnical Engineer: 2013)

Mr. Kazaniwsky directed a geotechnical investigation that included test borings and laboratory testing for the proposed construction consisting of a new locomotive commissioning facility at AMTRAK's Wilmington, DE maintenance facility. The project consists of a new truss-supported roof structure approximately 100 ft wide and 200 ft long with a peak roofline extending approximately almost 40 ft above the adjacent exterior grade. The facility will include new locomotive platforms and maintenance pits connecting to two existing tracks, office space located on a raised platform, and associated ramps and slabs. Due to presence of deep uncontrolled fills and soft compressible soils all structure and equipment support was to consist of deep foundations such as auger-cast, driven timber, or concreted pipe pile alternatives.

Stormwater Management Upgrades at Westchester County Airport – Westchester County, NY (Geotechnical Engineer: 2013)

Led a geotechnical investigation associated with the expansion of existing storm water basins A and B, as well as the installation of a new water quality improvement area. Directed the completion of a test boring (26) program, laboratory testing program and infiltration tests in the field in general accordance with the New York State Stormwater Management Design Manual. Also performed a global stability analyses to assess the feasibility and/or potential concerns related to construction of the proposed berms in Basins A and B. Based on the results of such investigative measures, he provided recommendations associated with earthwork and groundwater impacts.

New York City Department of Parks and Recreation, Ferry Point Park Golf Course, Borough of The Bronx, NYC (Lead Geotechnical Engineer: 2008 – 2009)

Mr. Kazaniwsky assumed the role of Lead Geotechnical Engineer during the development and design of a tournament quality 18-hole golf course over an existing municipal waste landfill. Responsibilities included his development and implementation of a geotechnical investigation program which consisted of nearly 70 test borings to establish municipal waste depths, as well as the thickness of compressible river silts. Laboratory testing was completed on the compressible silts to evaluate their performance under load of new fills required to attain final grades. After the evaluation of anticipated settlements under imposed fill load, recommendations were then developed to mitigate the settlements for the critical golf course components such as greens and tees. irrigation basin and utility corridors. Solutions included Deep Dynamic Compaction and surcharging. Furthermore, geogrids were incorporated under the greens and tees, as well as the irrigation basin and parking/driveway areas, to limit localized subsidence. Structures such as the comfort station and rain shelters were to be founded on shallow mat foundations in connection with deep dynamic compaction and use of cellular concrete to create a "net zero load" condition.



Consolidated Edison, Corona Substation Circuit Breaker Upgrades -Queens, New York (Lead Geotechnical Engineer: 2008 - 2009)

Located just northwest of the intersection of 98th Street with 55th Avenue, the project involved the installation of new and replacement circuit breakers. According to historic test borings performed in 1975 at the project site during initial construction of the substation, the site is underlain by uncontrolled fill materials extending to 20 to 30 ft below the ground surface. Underlying the fill material the test borings encountered natural soils consisting of alternating layers of sand with varying quantities of silt and clay, and silt/clayey silt. Utilizing this information, Mr. Kazaniwsky characterized the engineering properties of the subsoils at the specific location of proposed construction, and developed foundation solutions to support the new electrical equipment on micro-piles or alternatively helical screwed-in anchor piles, including the preparation of associated foundation specifications.

Market Street Elevated Reconstruction-Stations & Cobbs Creek Contracts, Philadelphia, PA (Chief Geotechnical Engineer 2004-2007)

Responsibility included client contact and technical oversight and direction of TRC's Foundation Quality Control Engineer during the reconstruction of SEPTA's Market Street Elevated rail system between 46th Street and Millbourne Station. Project requirements included monitoring the installation of drilled shaft and mat foundations for the new platforms and stations, as well as the soldier pile-based support of excavation systems. Additionally reviewed the Osterberg Cell load testing program, soil placement and compaction, and material testing operations. Project also included field oversight by the Foundation Quality Control Engineer during a 3000 lineal foot test boring program which included over 1600 lineal feet of rock coring.

NJ Department of Transportation, Route 47 Bridge Over Grassy Sound -Cape May County, NJ (Chief Geotechnical Engineer: 1997-2000)

Mr. Kazaniwsky was responsible for managing all aspects of a geotechnical study to investigate two bridge piers that were tilting, including determining the probable cause and providing recommendations to halt or mitigate additional tilting. The bridge structure itself consists of seven bridge spans, six piers, and two abutments supported on timber piles. A compaction grouting program was designed to stabilize the subsoils.

Masonic Temple Settlements and Stabilization - Philadelphia, PA (Geotechnical Consultant: 1995)

Mr. Kazaniwsky provided consultation to the owner with regard to settlements that were allegedly caused by the construction of deep foundations for a new detention center adjacent to the historic Masonic Temple. He directed a very comprehensive subsurface investigation to establish the mechanism of the settlements and to provide sufficient subsurface information for stabilization of the existing masonry foundations. The study showed that the structure is underlain by a layer of very sensitive soil subject to liquefaction and the study verified that the observed settlements in fact were caused by the construction



related vibrations. A stabilization program consisting of compaction grouting was designed and implemented to stabilize the problematic soils. Monitoring of the structure was performed during the stabilization program to minimize heave-associated problems. The information obtained by this study was then used to settle the outstanding claim on behalf of the Masonic Temple.

Riverfront State Medium Security Prison - Camden, NJ (Geotechnical Engineer: 1981-1984)

Mr. Kazaniwsky assumed the role of Geotechnical Engineer during the completion of a subsurface investigation for this new medium security prison that was constructed on a 35-acre parcel of land adjacent to the Delaware River. The project included multiple 3-story cast-in-place concrete structures for inmate housing, a visitors building, a dining facility, and three (3) guard towers. The resulting foundation system employed concrete-filled pipe piles, while a methane gas abatement system was incorporated into the project due to the discovered presence of such gas. A load testing program was developed to minimize production pile lengths, while a program to stabilize old remnant piers was also implemented.

Slope Failure Below Residential Structure Claim - Bethel Park, PA (Geotechnical Consultant: 2002)

Claim involved a down-slope failure impacting an upslope property and residence. Mr. Kazaniwsky represented the owner who experienced significant instability of an approximately 50 ft high slope, which caused excessive vertical and horizontal movements and cracking of an in-ground swimming pool. This slope was reportedly rebuilt and stabilized by the developer in accordance with a designed remediation approach prior to development of this property. A comprehensive study was performed to establish the subsurface conditions and overall condition of the slope and likely mechanism of failure. The study established that the remediation approach was not implemented as per the original stabilization design, and the ongoing slope failure can be attributed to poor construction procedures and lack of the stabilization implementation.

Valley Creek Coalition v. Commonwealth of Pennsylvania DEP and Vanguard Group (Geotechnical Consultant: 2005)

Vanguard Group developed an 80 acre site in Whiteland Twp., PA as part of their corporate office complex. The project site is located in karst terrain subject to sinkhole development. Various environmentalist groups represented by the Valley Creek Coalition felt that the currently designed storm water management systems (SWMS) were insufficient and brought suit against the PADEP and Vanguard Group to expand the SWMS to include on-site recharge systems. Mr. Kazaniwsky prepared expert reports and testimony on behalf of the Vanguard Group that identified, from a geotechnical perspective, the potential for future problems and difficulties associated with implementing such an on-site recharge system at this project site. The courts ruled on behalf of the Vanguard Group.



Residential Development Roadway Pavement Distress Claim - Wall Township, NJ (Geotechnical Consultant: 2005)

At the request of the owner's association, Mr. Kazaniwsky directed a detailed investigation to establish the causes of pavement blistering and disintegration throughout the relatively large development. Localized removal of the pavement and subgrade materials was performed to expose the pavement components and extensive laboratory testing was conducted to establish conformity of pavement construction materials to accepted standards, and find the cause of the pavement blistering. The study established that the cause of the pavement blistering was due to the presence of reactive product within the subbase material having highly expansive properties and subsequently causing pavement heave and the observed localized blistering. Furthermore, the laboratory testing showed that the subbase materials and pavement sections were deficient. An expert report was prepared.

Pocahontas Parkway - Chesterfield and Henrico Counties, VA (Chief Geotechnical Engineer: 1995-2001)

Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer for this major, \$325 million Design-Build project that involved the design of a 3.9 mile long section of new, 4-lane limited-access interstate highway with toll facilities. Included a major crossing of the James River (segmental concrete), new ramp (4) and mainline (6) bridges, bridge widenings (2), a bridge replacement over the CSX railroad, toll facilities, a new four-level interchange with I-95, and a trumpet type interchange with Laburnum Ave. Mr. Kazaniwsky was responsible for the completion of a geotechnical investigation for a new bridge over the James River and nine (9) new ramps that tied the bridge into I-95. Responsibilities included: preparation, implementation, and supervision of subsurface investigations and laboratory testing programs for over 300 test borings; foundation design for each ramp and bridge substructure unit (H-piles, pipe piles, drilled shafts, and spread footings); design of gravity, Mechanically-Stabilized Earth (MSE), and ground anchor-supported retaining walls; large-scale earthwork operations (high embankments, steep reinforced slopes, geosynthetic stabilization, and undercut of soft roadbed soils); load testing of drilled pier and pile foundations; preparation of specifications; value engineering, and construction consultation. A pavement analysis was performed and recommendations made for the toll plaza portion of the project. A geotechnical instrumentation system consisting of vibrating wire piezometers and settlement platforms was designed and installed as part of the project.

R.E. Michael Co. Building Floor Slab Settlement Claim - Wilmington, DE (Geotechnical Consultant: 1997)

Mr. Kazaniwsky provided consultation to the owner regarding large settlements that were being experienced by a building that was constructed along the Christiana River. At the request of counsel representing the building owner, a subsurface investigation was implemented to determine the causes of the settlements and potential remediation methods. The study established that the building site is underlain by very soft highly compressible organic soils that settled under the weight of fill required to raise the grades, as well as the live



floor loads. The building frame was supported on deep foundations. An expert report was prepared concluding the mechanism of settlements and finding that the original geotechnical engineer neglected to consider the impact of the required grading in the decision not to support the floor slab on piles. Expert testimony was then provided on behalf of the building owner.

Transgas Energy Systems 1,100 Megawatt Combined Cycle Cogeneration Facility - Borough of Brooklyn, NY (Chief Geotechnical Engineer: 2003-2005)

Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer during the completion of a preliminary geotechnical investigation at the planned location of a cogeneration facility that was proposed for construction within an existing fuel storage facility on the East River. The purpose of this investigation was to characterize the subsurface conditions and evaluate alternative foundation systems for support of the proposed facility. A preliminary geotechnical report was prepared which included recommendations for alternative deep pile foundations. In conjunction with Transgas Energy Systems' public need and environmental compliance application to the New York Public Service Commission, a written rejoinder testimony was prepared and expert witness testimony was provided during the Public Service Commission hearings.

Alfred Pierce Generating Station Upgrades - Wallingford CT (Sr. Geotechnical Engineer)

Mr. Kazaniwsky was a Sr. Geotechnical Engineer responsible for compiling the geotechnical report associated with upgrades to this existing power plant. Major new structures included a new turbine generator, electrical transformers, oil and water tanks, a new stack, roadways, above and below grade utilities, and many other small ancillary buildings/structures. The report included an evaluation of subsurface conditions, evaluation and recommendation of feasible foundation alternatives for heavy, highly sensitive structures and smaller lightly loaded structures, recommendations for re-use of onsite soils in structural fills and recommendations for maintaining the stability of temporary excavations. Pavement design was also prepared for this facility.

Dynegy Combined-Cycle Power Station, Frederick, MD (Chief Geotechnical Engineer: 2001-2002) – Mr. Kazaniwsky provided technical oversight during the planning and execution of all aspects of a comprehensive geotechnical evaluation for this new combined cycle power plant covering approximately 35 acres of a 115 acre property. The proposed construction consists of a combined cycle electric power generating station. Major structures associated with this facility include 4 gas turbine generators, numerous transformers, condensing units, roadways, water tanks, fuel oil storage tanks, storm water detention basins, and many small ancillary buildings. The site is underlain by solution-prone limestone conglomerate. During the geotechnical investigation, a parallel hydrogeologic study being completed by others in which a groundwater pump test was being conducted caused the occurrence of a 50 ft wide and 30 ft deep sinkhole. Mr. Kazaniwsky reviewed the recommendations for repair of this



sinkhole and the results of a detailed reconnaissance of the site and surrounding area to evaluate the potential for future sinkhole activity. Recommendations for foundations and earthwork activities were developed to account for the potential for subsidence under Mr. Kazaniwsky's oversight.

Brookhaven Energy Facility- Long Island, NY (Chief Geotechnical Engineer: 2004 – 2006)

Mr. Kazaniwsky was responsible for planning and directing all aspects of a comprehensive geotechnical evaluation for this new combined cycle power plant covering approximately 20 acres. Major structures include cooling towers, combustion turbine generators, steam turbine generators, heat recovery steam generators, electrical transformers, oil and water tanks, stacks, roadways, above and below grade utilities, and many other small ancillary buildings/structures. Work also included resistivity survey arrays. Mr. Kazaniwsky also planned and oversaw a seismic cross-hole survey at this site with a team subcontractor that was conducted to provide typical shear and compression-wave velocities (Vs and Vp). Pavement recommendations were provided.

Puddledock Substation, Manchester, ME (Chief Geotechnical Engineer: 2012)

Mr. Kazaniwsky was responsible for a peer review of a geotechnical report prepared for a substation upgrade consisting of new transformers, a new control building and dead end structures. Subsurface conditions consisted of clayey glacial marine deposits underlying by dense glacial till. Groundwater was at shallow depths, which provided a challenge for the anticipated site work. Shallow foundations founded in the stiff natural soils were recommended in conjunction with dewatering.

Paulsboro Marine Terminal, Paulsboro, NJ (Chief Geotechnical Engineer: 2008 – 2009)

Mr. Kazaniwsky was responsible for planning and directing all aspects of a comprehensive geotechnical investigation and evaluation for this new 167 acre marine terminal located on the Delaware River. Major structures include a 2,350 ft long ship berth to accommodate up to three "Handy-Max" 650 LOA bulk carrier ships , a 44 acre forest products storage area and five transit buildings, a 52 acre metal scrap storage and steel shredder facility, 16 acres of wheeled cargo storage, as well as numerous terminal roads and terminal railways. Mr. Kazaniwsky also planned and oversaw environmental sampling and testing of river sediments for proposed dredging. Deep foundation systems, consisting of concrete or concrete filled pipe piles were evaluated for the berth system.

Science Center Buildings at 3711 and 3737 Market Street- Philadelphia, PA (Chief Geotechnical Engineer: 2006 – 2010)

Mr. Kazaniwsky served as the senior project manager for these two multi story structures. His responsibilities included technical oversight for the geotechnical studies and geotechnical engineering analyses for these two projects. He provided geotechnical consultation during drilled pier foundation construction at



3711 Market Street. He also provided geotechnical engineering consultation during conceptual plan development at 3737 Market Street which included foundation constructability review and ground water management during construction and permanent, as well as storm water recharge. Additionally, alternative drilled pier foundation inspection methods were considered and their impact on design and construction evaluated. A formal geotechnical report was prepared for both projects.

Chesterfield County Dept. of Public Works, Old Buckingham Road Realignment - Chesterfield County, VA (Chief Geotechnical Engineer: 2001) Mr. Kazaniwsky provided technical oversight for this roadway rehabilitation project which included the preparation of a Geotechnical Engineering Report for

the substructure of a proposed new bridge in accordance with AASHTO Load Factor Design (LFD) specifications. Mr. Kazaniwsky performed the roadway pavement design.

Drexel University- North Hall, 33rd and Race Streets, Philadelphia, PA (Chief Geotechnical Engineer: 1997 – 1999)

Directed the completion of a geotechnical investigation and associated consultation for the design and construction of an 8-story residence hall on the campus of Drexel University. Project included the completion of a cost-based feasibility study for foundation selection (drilled piers versus auger-cast piles), monitoring and analysis of auger-cast pile load tests, and the direction of field inspection personnel during construction.

Drexel University- East Hall (former AMTRAK property), 32rd Streets, Philadelphia, PA (Chief Geotechnical Engineer: 1999 – 2000)

Directed the completion of a geotechnical investigation and associated consultation for the design and construction of the new residence hall on the campus of Drexel University. Project included the completion of a cost-based feasibility study for foundation selection (drilled piers versus auger-cast piles) with the auger-cast found to be more cost effective. Providing monitoring and analysis of auger-cast pile load tests during construction.

Laurel Creek Office Buildings - Burlington County, NJ (Chief Geotechnical Engineer: 2002)

Mr. Kazaniwsky provided technical oversight during the geotechnical study performed for this proposed corporate complex that consists of three (3) threestory steel frame office buildings and related infrastructure. Oversaw the preparation of the Geotechnical Engineering Report which included an evaluation and recommendation of foundation support for structures and floor slabs, groundwater conditions and management, soil material and compaction requirements for the support and backfill of structures, reusability of on-site soils in compacted fill, and frost penetration depth. Mr. Kazaniwsky prepared a pavement design for this project.



Franklin Mills Mall, Philadelphia, PA (Geotechnical Project Manager: 1986) -Mr. Kazaniwsky was responsible for managing all of the required geotechnical engineering work for this 2,000,000 sq ft regional mall, as well as all out-parcels. Portions of the site were underlain by extensive fill materials with a thickness of up to 30 feet, which would experience significant amounts of settlement under applied load. To remedy this, and minimize the potential for differential settlement across the project area, deep dynamic compaction in conjunction with a limited soil exchange was employed at the site. The use of dynamic compaction offered a less time consuming alternative to preloading and allowed for the use of shallow spread footing foundations rather than deep foundation systems and/or extensive soil removal and replacement, which were deemed to be more costly alternatives. Extensive pavement design was also required to offer economical pavement alternatives to deal with the variable subsurface conditions. Storm water management was designed to be contained in both retention and detention basins, which required very tall embankment sections. These were considered and designed as earthen dams. Included oversight of the quality control testing for all earthwork, foundations, steel erection, roofing, drainage installation, and pavement construction.

Temple University School of Podiatric Medicine Office and Parking Garage (Geotechnical Project Manager: 1986) - Philadelphia, PA

Mr. Kazaniwsky assumed the role of Geotechnical Project Manager responsible for the development of a geotechnical investigation program for a multi-story parking garage and office over-built on Race Street between 8th and 9th Streets. Because the building is uniquely situated over the Center City Commuter Tunnel, the building would need to span approximately 60 ft over the tunnel which in turn required maximization of the bearing capacity for drilled pier foundations. During construction he provided engineering direction and redesigned the piers to take advantage of locally better quality rock which was better than 50 tsf.

Seapointe Village - Lower Twp., NJ (Geotechnical Engineer: 1990-2006)

Mr. Kazaniwsky assumed the role of Geotechnical Engineer for the investigation and resulting construction of a residential condominium complex located on a barrier island in Cape May County on the New Jersey coast. Employed partial excavation, ground water monitoring, dewatering and surface stabilization to allow for the use of shallow footings and/or deep pile foundations for certain structures. Evaluated storm water recharge feasibility.

Gallery II Parking Garage, 11th and Filbert Streets, Philadelphia, PA - (Geotechnical Project Manager: 1985)

Mr. Kazaniwsky developed and implemented a geotechnical study for a 6 story parking garage facility constructed at 11th and Filbert Streets in Philadelphia, PA. Due to proximity of the Center City Commuter Tunnel and on the basis of subsurface conditions, utilized high capacity drilled pier foundations. He provided engineering consultation and oversight of drilled pier foundation construction, as well as subgrade preparation for support of the slab on-grade.



Coring of a pier shaft and evaluation of the concrete due to concrete quality problems was also performed.

Hilton Garden Inn Overbuild- Gallery II Garage, 11th and Filbert Streets, Philadelphia, PA (Geotechnical Project Manager: 1988)

Mr. Kazaniwsky developed and implemented a geotechnical study for a hotel structure overbuild over the constructed parking garage at 11th and Filbert Streets in Philadelphia, PA. Provided engineering evaluation of the existing drilled pier foundations to maximize the bearing capacity for support of portions of the building overbuild. Evaluated high capacity drilled pier foundations for portions of the overbuild that need to span certain portions of the existing garage and considering the vicinity of the Center City Commuter Tunnel.

Queens West Development Stages III and IV- Queens, NY (Chief Geotechnical Engineer: 2006-2007)

Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer during the completion of a geotechnical feasibility study in connection with a due diligence study being conducted for this project. The project site is located along the East River in Long Island City (Queens), NY and is approximately 30 acres in size. An AMTRAK and the Queens Midtown Tunnels traverse below the project site. Preliminary plans called for 12 residential towers up to 40 stories in height, and multiple 3 to 6 story garage structures. The purpose of this geotechnical study was to characterize the subsurface conditions on a preliminary basis and evaluate the impact of the conditions on foundations and anticipated site development. A total of 13 test borings were drilled at the project site. Due to the presence of deep heterogeneous fills, thick highly compressible silts, and localized boulders, as well as the presence of tunnels, alternative deep foundations such as H-piles, concrete filled pipe piles and micro piles were recommended based on specific subsurface conditions and location. Additionally, deep dynamic compaction and surcharging were recommended for roadways to stabilize the fill and silt and minimize post construction settlements.

University of Pennsylvania UDAG Development - Philadelphia, PA (Geotechnical Project Manager: 1982-1994)

Mr. Kazaniwsky assumed the role of Geotechnical Project Manager for this major health care facility project. The development consists of two biomedical research facilities, the CHOP Ambulatory Care Facility, Children's Seashore House, the CHOP Stokes Research Facility, a below grade parking facility and plaza, and a 6-story parking facility. All of the buildings have three levels of below grade parking, are typically up to 13 stories in height, and occupy an area of approximately 8 acres. Mr. Kazaniwsky was responsible for developing and implementing specific geotechnical investigations for each of these buildings which were built at separate times. He also evaluated alternative foundation systems and concluded that the cost-effectiveness and practicality of using straight shaft drilled piers with rock sockets was the most practical. Due to shallow ground water and deep basements, he also conducted in-place permeability tests and designed permanent subdrainage systems for most of the



buildings. During foundation and earthwork construction he provided engineering oversight and consultation regarding geotechnical-related issues.

Marriott Convention Hotel - Philadelphia, PA (Geotechnical Project Manager: 1996-1998)

Mr. Kazaniwsky assumed the role of Geotechnical Project Manager responsible for the development and implementation of a geotechnical exploration study for a 21-story hotel located at 12th and Market Streets in Philadelphia, PA. While alternative shallow and deep foundation systems were evaluated, a drilled pier foundation system was recommended that would bear in mica schist rock due to a shallow basement. Due to the presence of soft, liquefiable soils at basement level, he developed a subgrade stabilization method to act as a construction platform and provide support for the basement slab. During construction, he was responsible for oversight of the drilled pier foundations and subgrade preparation, as well as for providing consultation relating to geotechnical issues and foundation inspection.

The Murano, 2101 Market Street - Philadelphia, PA (Chief Geotechnical Engineer: 2006)

Mr. Kazaniwsky served as the chief geotechnical engineer overseeing the completion of a geotechnical investigation for this 45-story, \$165 million, condominium tower built at 21st and Market Streets in Center City Philadelphia. Responsibilities included the planning, and coordination of oversight for a supplemental subsurface investigation consisting of Pressuremeter Testing (PMT) and Borehole Shear Testing (BST) of the site bedrock. Pavement subgrade recommendations were made and a pavement design was provided for the access driveways.

Commerce Square Twin Towers - Philadelphia, PA (Geotechnical Project Manager: 1984-1987)

Mr. Kazaniwsky assumed the role of Geotechnical Project Manager responsible for the preliminary and then final geotechnical engineering studies for each of two 40-story towers that were built at 22nd and Market Streets in Center City. Based on his evaluation of a combination of shallow footings and drilled pier foundations, drilled piers were utilized due to simplicity and ease of excavation, some of which were relatively shallow while most were deep. He also designed a permanent ground water control system based on results of in-place permeability testing, as well as developed a unique method of reducing lateral loads on basement walls by utilizing a compressible foam drainage board. During construction, he provided direction and consultation during the contractor's foundation and earthwork activities. To reduce costs, drilled pier sockets were continually redesigned based on the quality of rock that was encountered. He additionally provided monitoring and evaluation of vibrations and their impact on fresh concrete due to localized blasting for deep elevator pits.



Temple University, Temple University Health Science Garage - Philadelphia, PA (Geotechnical Project Manager: 1988)

Mr. Kazaniwsky assumed the role of Geotechnical Project Manager responsible for the development and implementation of a geotechnical study for a 4-story parking garage structure at 15th and North Carlisle Streets. Based on highly variable rock conditions, he evaluated various deep foundation systems and concluded that a straight shaft drilled pier socketed in weathered rock was most effective. Also developed an extensive soil exchange scheme for slab support due to extensive unstable on site soils and fills. Years after construction, he performed a comprehensive re-evaluation of the adequacy of existing foundations for the addition of two parking levels. Prepared alternative stabilization schemes, including pin-pile underpinning, where conditions warranted.

Paulsboro Marine Terminal Bridge and Roadway-Pilot Surcharge, Paulsboro/West Deptford, NJ (Chief Geotechnical Engineer: 2010)

Mr. Kazaniwsky was responsible for assisting the design engineer with planning and installation of geotechnical instrumentation for monitoring a pilot surcharge. The purpose of the pilot surcharge was to evaluate magnitude and rates of settlements, as well as the lateral deformation at the toe of the surcharge to be used in the final design of the roadway and bridge approaches. Mr. Kazaniwsky oversaw all aspects of the installation of the geotechnical instrumentation consisting of slope inclinometers with Sondex vertical settlement measuring capabilities and multi stage vibrating wire piezometers for measuring pore pressure dissipation in the compressible layer.

Hog Island Road Extension - Tinicum Twp., PA (Geotechnical Project Manager: 1999-2002)

Mr. Kazaniwsky directed the completion of a geotechnical investigation (2 phases) for a 3,500 LF extension and 2,000 LF realignment of Hog Island Road which serves as the main loop road around the Philadelphia International Airport. Because the locations of both the extension and realignment are situated over marshland that was hydraulically-filled, the subsurface conditions consisted of underconsolidated soft compressible organic silts. In order to establish stability and limit post-consolidation settlements, a preloading system was developed that consisted of an earthen surcharge and wick drains to accelerate the time of consolidation. An instrumentation system consisting of 20 vibrating wire piezometers and settlement platforms was subsequently designed to monitor the consolidation. A pile foundation system was developed to support a bridge. The work included monitoring of the piezometers and settlement plates, as well as load testing of bridge foundations, and inspecting the installation of production piles.

LA Department of Transportation and Development, I-10 Bridges over Lake Pontchartrain - St. Tammany and Orleans Parishes, LA (Geotechnical Consultant: 2005-2006)

Mr. Kazaniwsky was responsible for providing geotechnical engineering analyses



associated with the fast-track design of approximately 5-mile long parallel segmental bridges to replace an existing bridge that was severely damaged by Hurricane Katrina. The two parallel bridges consist of both low deck and high spans, with the high span subject to large barge collision loads. Tasks include: review of existing subsurface data from the existing bridge and provision of preliminary geotechnical analysis and recommendations for precast concrete piles and drilled piers; review of LADOTD-developed preliminary foundation systems; assist LADOTD with the development of a supplementary geotechnical sampling and laboratory testing program to be performed by LADOTD; assist LADOTD with the development of an advanced pile and drilled pier testing program to be performed by LADOTD; provide part-time oversight of the supplementary geotechnical sampling and the advanced pile and drilled pier testing programs; review the results of the supplementary geotechnical sampling and laboratory testing programs and re-evaluate the foundation systems in view of the supplementary data; review the results of the pile and drilled pier testing program and re-evaluate the foundation recommendations: provide assistance during the bid process and review of the submitted bids. (2006)

Camden Aquarium Parking Garage - Camden, NJ (Geotechnical Project Manager: 1988)

Mr. Kazaniwsky assumed the role of Geotechnical Project Manager during the completion of a geotechnical investigation for this 7-story parking garage located across from the New Jersey State Aquarium. The footprint of the structure was approximately 51,000 ft² with column loads that ranged from 600 to 1,300 kips. Due to a significant thickness of compressible organic silt, driven piles were recommended for support of the structure, with subsequent consultation and monitoring being provided during pile load testing and production pile installation.

Monopile Mooring System for Berth No. 2 Reconstruction at Beckett St. Terminal – Camden, NJ (Geotechnical Engineer: 2003)

Mr. Kazaniwsky directed the completion of a geotechnical investigation for this project which consisted of the analysis of a large-diameter (60-inch) monopile for lateral loading and drivability studies for pile installation, including the evaluation of subsurface investigation data obtained by others. The project involved the design of a permanent mooring for the bow line of a ship to be docked at the reconstructed Berth No. 2. at Beckett Street Terminal adjacent to the Delaware River. The permanent mooring was proposed to consist of a large (60 in.) diameter monopile. Mr. Kazaniwsky's responsibilities included an evaluation of the monopole system and modeling of alternative pile driving systems. A report was then prepared with recommendations for design and construction.

VA Department of Transportation, I-64/Mercury Boulevard Interchange -City of Hampton, VA (Chief Geotechnical Engineer: 1997-2003)

Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer for this \$70 million urban interstate project that involved the addition of HOV lanes in the median of I-64 along a 2.6 mile section; auxiliary, acceleration and deceleration lanes; and the reconfiguration of an existing interchange with I-64 to include high-speed ramps, 5 new curved steel ramp bridges and 2 replacement bridges.


Mr. Kazaniwsky's responsibilities included the implementation of subsurface investigation and laboratory testing programs for over 110 test borings, pile foundation design for five (5) multi-span curved girder flyover bridges and two (2) major highway overpass bridges, design of over 150,000 sq. ft. of Mechanically Stabilized Earth (MSE) retaining walls using lightweight aggregate fills, slope stability, and design of six (6) miles of new highway. A geotechnical instrumentation system consisting of settlement platforms and vibrating wire piezometers was designed and installed. Load testing of deep pile foundations was also conducted.

SC Department of Transportation, Statewide Design-Build Bridge Replacement (Geotechnical Engineer: 2004-2006)

Mr. Kazaniwsky participated in the completion of geotechnical studies that were completed for this fast-tracked, design/build contract that included the replacement of 33 bridges throughout the state. Provided an evaluation of subsurface conditions, feasible foundation types, foundation design recommendations and pile driveability analyses (where applicable) for 6 replacement bridges. Driven piles were recommended for use as foundation support, while all substructure design for this project was completed in accordance with AASHTO Load and Resistance Factor Design (LRFD) specifications.

NJ Department of Transportation, NJ Route 9, Section 15 D

Instrumentation - Atlantic County, NJ (Geotechnical Engineer: 2002) Mr. Kazaniwsky directed the oversight and installation of specialty geotechnical instrumentation, including four (4) vibrating wire piezometers, seven (7) inclinometers and six (6) extensometers to monitor pore pressures, lateral displacements and vertical settlements induced by applied surcharge loads. Extensometers and inclinometers were installed to depths of 90 to 100 feet below ground surface under difficult drilling conditions. Included the establishment of baseline measurements for each instrument that was installed and training the owner representatives who were responsible for on-going monitoring.

St. Mary's RC Church Floor Slab and Foundation Deficiencies Claim -Cherry Hill, NJ (Geotechnical Consultant: 1990)

Mr. Kazaniwsky directed a subsurface study to establish alleged deficiencies in foundation and floor slab construction as part of an overall forensic study being performed by a team of experts. The study in fact verified that the foundations and floor slabs were found to be insufficient in view of the current loading conditions, and the potential for future problems was identified by this study. An expert report was prepared and verbal testimony was then provided on the behalf of the church.

Farnham Park Wetlands Restoration - Camden, NJ (Geotechnical Project Manager: 2004)



Mr. Kazaniwsky assumed the role of Project Manager for the geotechnical data acquisition activities his duties and responsibilities included cost estimating, contract preparation, scheduling, and coordination of field activities. He also acted as the client liaison and technical manager. TRC provided all test boring drilling, laboratory analysis and data interpretation. With the site being located along the Cooper River within a tidal wetlands area, the test borings were completed using ATV-mounted equipment due to extremely wet and soft conditions. Laboratory analysis of the subsoils will include a full suite of physical analysis in TRC's AASHTO-accredited soil mechanics laboratory.

1800 and 1880 JFK Boulevard Twin Office Towers - Philadelphia, PA (Geotechnical Engineer: 1980-1981)

Mr. Kazaniwsky assumed the role of Geotechnical Engineer during the completed of a preliminary and final investigation for each of two, 21-story office towers that were constructed in the 1800 block of JFK Boulevard in Center City Philadelphia. Concluded that a drilled pier foundation system designed for a 25 to 40 tsf rock bearing capacity could be utilized in the design. Provided engineering oversight during foundation construction and general earthwork, as well as redesigned socket lengths based on the rock that was encountered.

PA Department of Transportation, S.R. 3040, Section 01A/01B, Park Road Corridor - Berks County, PA (Chief Geotechnical Engineer: 1989-1992)

Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer responsible for all aspects of a subsurface investigation program and providing design recommendations for this project which involved the design of a four-lane limited access expressway on new alignment. A major portion of this project involved the construction of eight (8) new multi-span bridge structures along 5 miles of highway, all of which traversed highly solution-prone limestone formations. All of the new bridge crossings were grade separation structures, with two of the crossings representing dual bridge structures. Preliminary pavement design was performed for this project.

SC Department of Transportation, US 76 Bridge Replacement over Chattooga River on South Carolina/Georgia State Line (Geotechnical Engineer: 2005-2006)

Mr. Kazaniwsky assisted with the evaluation of subsurface conditions, feasible foundation types and foundation recommendations for this project which represented a major crossing of the Chattooga River between Oconee County, SC and Rabun County, Georgia. Due to the variable depth to rock that was encountered at substructure locations, a combination of driven piles and drilled shafts were recommended. He also participated in the development of preliminary soil nail wall evaluations for consideration as an alternative to performing large volume cuts in existing slopes and evaluated the stability of cut slopes and cantilever walls that were selected for use on the project. All substructure and wall evaluations for this project were performed in accordance with AASHTO Load and Resistance Factor Design (LRFD) specifications.



PA Department of Transportation, Stabilization of the Route 76 and Route 676 Interchange - Philadelphia, PA (Geotechnical Engineer: 1984-1990) Mr. Kazaniwsky assumed the role of Geotechnical Engineer for this project site

which was located over deep man-made fills and river silts adjacent to the Schuylkill River. Because of noticeable movements observed during construction, alternative schemes were evaluated for stabilization. These included the "net zero load" concept using cellular concrete, deep dynamic compaction, stone columns and deep foundations. An instrumentation program consisting of slope inclinometers and piezometers was subsequently implemented during construction to monitor the horizontal and vertical movement, as well as pore pressure, of the subsoils as a result of embankment loads. Load testing of pile foundations was also conducted.

NJ Department of Transportation, I-295, Section 1-BC, Embankment Instrumentation and Monitoring - Gloucester County, NJ (Chief Geotechnical Engineer: 1997)

Mr. Kazaniwsky designed and implemented an embankment instrumentation and monitoring program for a new NJDOT bridge over I-295. Installed vibrating wire piezometers and porous tube-type piezometers prior to construction of the main approach embankments for the bridge. Also provided monitoring of the pore pressure in compressible subsoils compared with height of fill, rate of placement, and settlements that were determined from settlement platforms. Also performed analyses to determine when completion of the embankment settlement would be achieved.

NJ Department of Transportation, Route 42 Widening, Section 13M/14S -Camden and Gloucester Counties, NJ (Chief Geotechnical Engineer: 1990-1993)

Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer involved with overseeing a geotechnical investigation for the widening of an existing highway from three lanes to four lanes in each direction, including three bridge structures. Length of the roadway that was subject to his work was 3½ miles. Project involved the installation of the sound barriers, culverts, retaining walls, signs and exterior lighting, as well as bridge widenings. A combination of deep and shallow foundations was utilized to support the structures.

NJ Department of Transportation, Route 47 Bridge Over Grassy Sound -Cape May County, NJ (Chief Geotechnical Engineer: 1997-2000)

Mr. Kazaniwsky was responsible for managing all aspects of a geotechnical study to investigate two bridge piers that were tilting, including determining the probable cause and providing recommendations to halt or mitigate additional tilting. The bridge structure itself consists of seven bridge spans, six piers, and two abutments supported on timber piles. A compaction grouting program was designed to stabilize the subsoils.



WV Department of Transportation, Division of Highways, Elkins Bypass, US 219 to Canfield - Randolph County, WV (Chief Geotechnical Engineer: 1996-1999)

Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer during the design of a new roadway through the Appalachian Mountains along Corridor H in West Virginia. Responsibilities for this project included: development of subsurface investigation and laboratory testing programs for over 120 test borings, stability analysis and design of rock cuts over 100 ft high in weak, steeply dipping shale bedrock, rock slope hazard reduction studies, stability analysis for roadway fill and embankments over 70 ft high, foundation design and analysis for two bridges and culverts, and the production of geotechnical engineering reports.

Plant 15-2B Crane Foundation Analysis, Sunoco Plant - Marcus Hook, PA (Geotechnical Project Manager: 2000)

Mr. Kazaniwsky assumed the role of Geotechnical Project Manager during the completion of geotechnical analyses associated with the placement of a Demag CC1800 track-mounted crane that would lift a maximum 150 kip load. From a soil-based analysis, it was determined that use of the crane would be feasible without subsurface modification. The primary concern, however, became the presence of subsurface utilities and their associated tolerable stresses and displacements upon load application and corresponding compression of the upper soil mass. Based on crane information provided by the client, it was determined that ultimate distributed loads of up to 10.5 ksf were possible during setup and/or operation directly under the crane tracks. Strictly from a soil performance standpoint, the use of continuous double-stacked matting placed in alternate directions to ensure rigidity was recommened. However, due to the concern for utility performance, it was stressed that consideration be given to the construction of a 3 ft thick working pad directly below the crane matting to aid in distributing and dissipating the applied loads.

Crane Foundation Analysis – Units 1232 & 431, Sunoco Plant – Philadelphia, PA (Geotechnical Project Manager: 2003)

Mr. Kazaniwsky assumed the role of Geotechnical Project Manager during this project which involved the completion of a geotechnical investigation associated with the placement of five (5) different cranes, each at a different location, as part of a regularly scheduled maintenance program. The first stage of our analysis evaluated the placement of a 500-ton Demag AC1200 crane and a 300-ton Grove GMK 6300 B crane near the CAT facility at Unit 1232. Two of the remaining cranes would be placed on the recovery side of Unit 1232 while the last crane would be placed in the street at Unit 431. The two cranes at Unit 1232 are a 50-ton Grove RT 750 and a 175-ton Grove GMK 5175, while the 500-ton crane at Unit 431 is a Grove GMK 7450. Analyses were performed at each of the lift sites to evaluate allowable contact pressures in view of existing subsoil conditions and subsurface utilities. Utilization of various matting and steel plating systems were utilized based on the site specific loacations.



SELECTED PUBLICATIONS AND PRESENTATIONS

Partos, A. and Kazaniwsky, P.W., "Geoboard Reduces Lateral Earth Pressures", *Proceedings of North American Conference on Geosynthetics*, New Orleans, LA, 1987.

Partos, A. and Kazaniwsky, P.W., "Case Histories of Shallow Foundations on Improved Soils", *Proceedings of Foundation Engineering Congress*, Evanston, IL, 1989.

Brinker, F.A., Kazaniwsky, P.W., Logan, M., "Case History Illustrating The Challenges of Foundation Design and Construction in Karst Terrain", *Fifth International Conference on Case Histories in Geotechnical Engineering*, New York, NY, April 2004.

PROFESSIONAL AFFILIATIONS

- Member, American Society of Civil Engineers
- Member, International Society for Soil Mechanics and Foundation Engineering
- Member, Deep Foundation Institute
- Member, American Society of Highway Engineers
- Member, International Code Council

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Richard M. Lampeter

Epsilon Associates, Inc.

3 Mill & Main Place, Suite 250

Maynard, MA 01754

Case No. 16-F-0062

Lampeter

- 1 Q: Please state your name, employer, and business address.
- A: Richard M. Lampeter, Epsilon Associates, Inc. (Epsilon), 3 Mill & Main Place, Suite 250,
 Maynard, MA 01754.
- 4 Q: What is your position at Epsilon Associates?
- 5 A: I am an Associate at Epsilon.
- 6 Q: How long have you been employed with Epsilon Associates?
- 7 A: I have been employed by Epsilon for 16 years.

8 Q: Please describe your educational background and professional experience.

9 A: I am an Associate at Epsilon Associates, Inc. (Epsilon), with over 10 years of experience 10 in conducting impact assessments for various developments across the United States. 11 Prior to joining Epsilon, I graduated from Lyndon State College in Vermont with a B.S. in 12 Environmental Science. While at Epsilon, I have been involved in approximately 80 wind 13 energy projects evaluating potential impacts from noise and shadow flicker with 14 approximately 35 of these projects involving shadow flicker impact assessments. With respect to shadow flicker analyses, the projects have ranged in size from 1.5 MW to 320 15 16 MW. I utilize the WindPRO software package to calculate shadow flicker durations in the 17 vicinity of a project on both a worst-case and expected basis. As part of project 18 evaluations, I have assisted in refinements in wind turbine layouts to minimize shadow 19 flicker at residences, evaluated curtailment options, and analyzed the impact of existing 20 vegetation to modeled shadow flicker durations. In addition to conducting and/or 21 managing the impact assessments, I have presented the results of the analyses at 22 public meetings to county and township boards.

In addition to shadow flicker, my areas of expertise include the measurement of ambient
 sound levels, modeling sound levels from proposed developments, evaluation of
 conceptual mitigation, and compliance sound level measurements. I have conducted
 impact assessments for power generating facilities, commercial developments, industrial

Lampeter

27		facilities, and transfer stations. Additional detail regarding my education, background and
28		experience is contained in my curriculum vita which is attached
29	Q:	Please describe your current responsibilities with Epsilon Associates.
30	A:	As an Associate of Epsilon Associates, my role on a given project ranges from project
31		manager, to modeler, to field scientist. For projects that include a presentation at a
32		public hearing, I am typically the Epsilon representative to discuss the shadow flicker
33		analysis.
34	Q:	Have you previously testified before the New York State Public Service
35		Commission or Siting Board on Electric Generation?
36	A:	No.
37	Q:	Have you previously served as an expert witness before any other court, agency,
38		or other body on the subject you plan to offer testimony on today?
39	A:	Yes. I was the expert witness before the Perquimans County Board of Commissioners,
40		North Carolina on shadow flicker for the Desert Wind Project in 2011. I was the expert
41		witness before the Pasquotank County Board of Commissioners, North Carolina on
42		shadow flicker for the Desert Wind Project in 2011. In addition, I have provided sworn
43		testimony regarding shadow flicker during several county hearings for various projects in
44		the U.S.
45	Q:	What is the purpose and scope of your testimony in this proceeding?
46	A:	To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
47		or the Exhibits thereto.
48	Q:	What portion(s) of the Application is your testimony sponsoring?
49	A:	The shadow flicker component of Exhibit 24: Visual Impacts. Epsilon Associates, Inc.
50		prepared a Shadow Flicker Report for the Eight Point Wind Energy Center.
51	Q:	Were these Exhibits, Application sections, or studies prepared by you or under
52		your direction and supervision?

- 53 A: Yes.
- 54 Q: In your testimony, will you refer to, or otherwise rely upon, any studies,
- 55 publications, data or documents produced by persons other than yourself/your
- 56 company? If so, please cite these sources. [These are independent studies, etc.].
- 57 A: References are provided in Exhibit 24.
- 58 Q: Does this conclude your testimony?
- 59 A: Yes.



Richard M. Lampeter, INCE

Associate

EDUCATION

B.S., Environmental Science, Lyndon State College

PROFESSIONAL MEMBERSHIPS

Institute of Noise Control Engineering (INCE)

Mr. Lampeter is a senior consultant with over 10 years of experience in conducting community sound level impact assessments. His areas of expertise include the measurement of ambient sound levels, modeling sound levels from proposed developments, evaluation of conceptual mitigation, and compliance sound level measurements. Mr. Lampeter has conducted impact assessments for power generating facilities, commercial developments, industrial facilities, and transfer stations. Richard's understanding of acoustical standards and modeling software has allowed him to provide accurate and reliable modeling results to developers and communities.

Since 2004, Mr. Lampeter has been involved in approximately 80 wind energy projects. In addition to performing numerous sound level impact assessments for wind energy facilities, Mr. Lampeter has conducted shadow flicker analyses for approximately 35 wind energy projects across the United States. Mr. Lampeter frequently presents key aspects of analyses to boards and committees and has provided sworn expert testimony.

Mr. Lampeter utilizes his diverse skill set as he serves in a variety of rolls on projects, ranging from project manager, to modeler, to field scientist. Richard is adept at using Larson Davis, Norsonic, RION, and CEL sound level meters and various modeling software packages including, Cadna/A and WindPRO.

Mr. Lampeter also has experience in air quality modeling and meteorological monitoring. Richard has used a range of air dispersion models including CAL3QHCR, AERMOD, and CALPUFF and has displayed expertise in working with HOBO and NovaLynx portable weather stations.

Mr. Lampeter has co-authored several papers ranging in topics from wind energy to metal shredders, one of which appeared in a peerreviewed journal. Mr. Lampeter has been a speaker at CanWEA's annual conference on the topic of low frequency noise from wind turbines and presented shadow flicker guidance and a regulatory update in a New England Wind Energy Education Project webinar.

PROFESSIONAL EXPERIENCE

Noise Impact Assessment – Power Projects

• NextEra Energy Resources – Tuscola Wind II, Tuscola County, MI. Project manager for pre- and postconstruction sound level impact assessments for a 100 megawatt (MW) wind energy facility composed of 59 GE wind turbines. Modeling was performed in order to demonstrate compliance with the sound level limits in each community. During multiple public hearings, Mr. Lampeter responded to questions and comments. Following construction, operational sound levels were measured in each of the four townships per ordinance requirements.

• *Medical Area Total Energy Plant (MATEP), Boston, MA.* Managed multiple sound level measurement programs for the plant following the installation of two combustion turbines, gas compressors, and cooling towers. These programs included background sound level measurements, compliance operational sound level measurements, and evaluations of noise mitigation. The results of these measurement programs have been summarized in reports submitted to Veolia Energy and regulatory agencies. Assisted in the sound level modeling of a proposed 14.4 MW combustion turbine with a Heat Recovery Steam Generator.

• *Palmer Renewable Energy Project, Springfield, MA*. Predicted future sound levels from a proposed 38 MW renewable biomass energy plant using the Cadna/A software package. Impacts were compared to state and local regulations with the results presented in the Environmental Notification Form

• *Hollingsworth & Vose, Inc. Combined Heat & Power Project, West Groton, MA.* Conducted a sound level impact assessment for the proposed CHP. Sound levels were modeled using the Cadna/A noise calculation software. Evaluated multiple project designs. Presented the analysis to the local planning board.

• *FPL Energy (now NextEra Energy Resources) – Horse Hollow Wind Energy Center, Taylor County, TX.* Assisted in the development and execution of multiple sound level measurement programs for the 735 MW wind farm which at the time of its in-service date it was the world's largest wind farm. Analyzed sound level data in conjunction with power output data provided by NextEra Energy Resources and assisted in the preparation for legal proceedings.

Noise Impact Assessment – Quarries / Sand & Gravel / Asphalt

• Aggregate Industries, Peabody, MA. Project Manager for sound level measurement programs developed as part of the Special Permit requirements for the quarry and asphalt plant. Gathered data before and after mitigation measures were implemented, analyzed potential impacts due to a proposed relocation of equipment, and presented results at a Peabody Board of Health Meeting.

• *McCullough Crushing, Calais, VT.* Collected reference sound level data at an operating sand and gravel pit and modeled future sound levels due to sand and gravel extraction and processing using Cadna/A. Prepared a comprehensive report evaluating potential community noise impacts.

Noise Impact Assessment – Additional Projects

• *Holliston Solid Waste Transfer Station, Holliston, MA*. Participated in a sound level measurement program at a solid waste transfer station in Massachusetts. Coordinated with the transfer station and with local residences on the placement of noise equipment. Weekday and weekend measurements (short-term and continuous) were taken at up to six locations around the facility. Participated in additional sound level measurement programs following the enclosure of the C&D facility to evaluate various mitigation options.

RICHARD M. LAMPETER, INCE

• Berwick Iron and Metal Recycling, Berwick, ME. Modeled a proposed metal shredder at an existing metal recycling facility using Cadna/A and proposed mitigation to minimize sound level impacts to the community. Participated in a post-construction sound level measurement program to assess compliance with respect to local sound level limits.

Shadow Flicker

• *Iberdrola Renewables – Desert Wind, Perquimans and Pasquotank Counties, NC.* Managed a shadow flicker impact assessment for a proposed wind power generation facility to be located in North Carolina. Shadow flicker from the 150 Gamesa G97 2.0 MW wind turbines was calculated. Separate reports were prepared for each county. Gave sworn testimony to the Board of Commissioners in each county.

• NextEra Energy Resources – Tuscola Bay Wind Energy Center, Tuscola, Bay, & Saginaw Counties, MI. Project Manager for a shadow flicker analysis for a proposed 120 MW wind power generation facility composed of 75 wind turbines. The expected duration of shadow flicker was calculated at sensitive receptors in the vicinity of the project. Responded to questions and comments at multiple public hearings.

• State of Connecticut Siting Council, CT. Contributor to the Epsilon project team providing professional consulting services for renewable energy projects to the Siting Council in CT. Examined analyses conducted, including shadow flicker, for a proposed wind energy project in CT. Reviewed submittals provided by the council and submitted comments

• State of New Hampshire, Concord, NH. Conducted an independent review of the shadow flicker analysis for the proposed 24 MW Lempster Mountain Wind Power Project in Lempster, NH. Calculated the duration of shadow flicker using WindPRO software and compared the results to the developer's analysis.

• *Pioneer Green Energy – Great Bay Wind I, Somerset County, MD.* Calculated the expected annual duration of shadow flicker from a 25-wind turbine project. Multiple layouts and wind turbine types were evaluated for the project. Reductions in shadow flicker due to vegetation were calculated for individual residences. A scaling factor due to curtailments was incorporated into the analysis. There results were presented in a stand-alone report.

PUBLICATIONS

- "Low frequency sound and infrasound from wind turbines." Noise Control Engineering Journal, Institute of Noise Control Engineering, Volume 59, Number 2, March-April 2011. O'Neal, R.D., Hellweg, Jr., R.D. and R. M. Lampeter.
- "Sound Defense for a Wind Turbine Farm." North American Windpower, Zackin Publications, Volume 4, Number 4, May 2007. O'Neal, R.D., and R. M. Lampeter.

PRESENTATIONS

- "Sound Levels and the Evolving Regulatory Landscape." AWEA WINDPOWER 2016 Poster Presentation, May 23-26, 2016.
- "Shadow Flicker Regulations and Guidance: New England and Beyond." New England Wind Energy Education Project Webinar, February 10, 2011.
- "Low Frequency Sound and Infrasound from Wind Turbines." CanWEA 2010, Montreal, Canada, November 1-3, 2010. O'Neal, R.D., Hellweg, Jr. R.D. and R. M. Lampeter.

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Robert D. O'Neal

Epsilon Associates, Inc.

3 Mill & Main Place, Suite 250

Maynard, MA 01754

Case No. 16-F-0062

O'Neal

- 1 Q: Please state your name, employer, and business address.
- A: Robert D. O'Neal, Epsilon Associates, Inc. (Epsilon), 3 Mill & Main Place, Suite 250,
 Maynard, MA 01754.
- 4 Q: What is your position at Epsilon Associates?
- 5 A: I am a Principal at Epsilon.
- 6 Q: How long have you been employed with Epsilon Associates?
- 7 A: I have been employed by Epsilon for 17 years.

8 Q: Please describe your educational background and professional experience.

9 A: I received a Bachelor of Arts degree in Engineering Science from Dartmouth College in 10 1983. I earned a Masters in Atmospheric Science from Colorado State University in 11 1987. I have over 30 years of experience in the areas of community noise impacts, 12 meteorological data collection and analyses, and air guality modeling. My noise impact 13 evaluation experience includes the design and implementation of sound level 14 measurement programs, modeling of future impacts, conceptual mitigation analyses, and compliance testing. I am a member of the Institute of Noise Control Engineers 15 16 (INCE), the Acoustical Society of America, and the American Meteorological Society. I 17 am Board Certified by INCE in Noise Control Engineering and I am a Certified 18 Consulting Meteorologist (CCM) by the American Meteorological Society. Both of these 19 certifications are national programs.

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. Since 2004 I have performed noise impact assessments and meteorological analyses for wind energy facilities in over 25 states across the U.S. and Canada. Other types of projects I have worked on include fossil fuel power generation facilities, hard rock quarries, aggregate handling, asphalt and concrete plants, C&D processing facilities, landfills, real estate development, and mobile sources. Additional detail regarding my education, background and experience is contained in my curriculum vita which is attached.

32 Q: Please describe your current responsibilities with Epsilon Associates.

A: As a Principal of Epsilon Associates, I share in responsibility for overall direction and
 operation of the company. As the leader of the Acoustics Group, I manage staff and
 assign resources on our noise-related projects. In addition, I perform technical studies
 myself on wind energy projects ranging from sound level measurements, sound
 modeling, noise control design, and expert testimony.

38 Q: Have you previously testified before the New York State Public Service

39 Commission or Siting Board on Electric Generation?

- 40 A: Yes. I testified in 2003 on behalf of the Besicorp-Empire Development Company, LLC
- 41 505 MW combined cycle cogeneration plant, Rensselaer, NY [Article X Case No. 00-F-
- 42 2057].

43 Q: Have you previously served as an expert witness before any other court, agency, 44 or other body on the subject you plan to offer testimony on today?

- A: Yes. I have testified on noise issues before numerous agencies, including the Maine
 Board of Environmental Protection, the Massachusetts Energy Facilities Siting Board,
 the Environmental Review Tribunal, Ontario, Canada, the Vermont Superior Court, and
 the New Hampshire Site Evaluation Committee, and in many other judicial and quasijudicial settings. A more complete list is found in my attached CV.
- 50 Q: What is the purpose and scope of your testimony in this proceeding?
- 51 A: To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
- 52 or the Exhibits thereto.

Case No. 16-F-0062

53	Q:	What portion(s) of the Application is y	your testimony sponsoring?
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- A: Exhibit 19: Noise and Vibration. Epsilon Associates, Inc. prepared a Noise Impact
 Assessment for the construction and operation of the Eight Point Wind Energy Center,
 related facilities and ancillary equipment.
- 57 Q: Were these Exhibits, Application sections, or studies prepared by you or under
- 58 your direction and supervision?
- 59 A: Yes.
- 60 Q: In your testimony, will you refer to, or otherwise rely upon, any studies,
- 61 publications, data or documents produced by persons other than yourself/your
- 62 company? If so, please cite these sources. [These are independent studies, etc.].
- 63 A: References are provided in Exhibit 19.
- 64 Q: Does this conclude your testimony?
- 65 A: Yes.



Robert D. O'Neal, CCM, INCE Board Certified

Principal

EDUCATION

M.S., Atmospheric Science, Colorado State University

B.A., Engineering Science, Dartmouth College

PROFESSIONAL REGISTRATION

Certified Consulting Meteorologist, #578

Institute of Noise Control Engineering, Board Certified

PROFESSIONAL MEMBERSHIPS

American Meteorological Society

Institute of Noise Control Engineers (INCE), Board Certified Member, Board of Directors (2014-2016)

Acoustical Society of America

A Principal of the firm, Mr. O'Neal is a Certified Consulting Meteorologist with over 30 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, compliance testing, and expert witness testimony.

His expert witness testimony experience includes state and local boards, courts of law, and adjudicatory hearings. Specifically, Rob has testified before the MA Energy Facilities Siting Board, Maine Board of Environmental Protection, Vermont Superior Court, NH Site Evaluation Committee, NY DEC Administrative Law Judge, 42nd District Court of Texas, MA Land Court, Environmental Review Tribunals (Ontario, Canada), and Boards of County Commissioners.

Rob is a nationally recognized acoustics expert in the wind energy field having performed noise impact assessments in over 25 states across the U.S. and Canada. Other industries served include fossil fuel power generation facilities, hard rock quarries, aggregate handling, asphalt and concrete plants, C&D processing facilities, landfills, real estate development, and mobile sources.

Mr. O'Neal is active on siting and environmental committees associated with the wind and materials handling industries. He has presented the results of wind turbine low frequency noise and infrasound research at major conferences and peer-reviewed scientific journals. He was invited by the Commissioner of the Massachusetts Department of Environmental Protection to serve as a technical expert on the Wind Noise Technical Advisory Group (WNTAG) for the period 2013-2016. In addition, Rob has been an invited speaker at conferences on a variety of noise and meteorological topics.

PROFESSIONAL EXPERIENCE

Wind Energy Projects

• Apex Clean Energy – Lighthouse Wind, Orleans & Niagara Counties, NY. Mr. O'Neal developed an extensive sound level measurement and modeling program for a proposed 200-megawatt (MW) wind farm in western NY. In addition to the technical noise studies, Epsilon provided input and response to comments for the Preliminary Scoping Statement and Stipulations as part of the Article 10 permitting process. The results will be presented as expert witness testimony during the NYS Public Service Board public hearings.

• Avangrid Renewables – North Ridge Wind, St. Lawrence County, NY. Mr. O'Neal developed an extensive sound level measurement and modeling program for a proposed 100-megawatt (MW) wind farm in northern NY. In addition to the technical noise studies, Epsilon provided technical support as part of the Article 10 permitting process.

• *NextEra Energy Resources – Eight Point Wind, Stueben County, NY.* Mr. O'Neal developed an extensive sound level measurement and modeling program for a proposed 100-megawatt (MW) wind farm in the southern tier of NY. In addition to the technical noise studies, Epsilon provided technical support as part of the Article 10 permitting process.

• *Iberdrola Renewables – Groton Wind, Groton, NH.* Mr. O'Neal developed an extensive sound level measurement and modeling program for a proposed 48-megawatt (MW) wind farm. Concurrent sound level data and meteorological data were collected and analyzed and 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.

• 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.

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

• *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.

• 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.

Independent Power Projects

• Braintree Electric Light Department, Braintree, MA. Mr. O'Neal conducted long-term continuous ambient sound level measurement program for this 116 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.

• 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 EFSB.

Linear Siting and Transmission Projects

• *NSTAR 345 kV Transmission Reliability Project, Stoughton, Canton, Milton, Boston, MA.* Mr. O'Neal was responsible for the noise impact assessment for this 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 and expert testimony before the EFSB was provided.

• Weaver's Cove Energy, Fall River, MA. This project proposed a new liquefied natural gas (LNG) import terminal and natural gas pipeline to be located on the Taunton River. Mr. O'Neal managed the implementation of an extensive existing condition sound level measurement program including long-term continuous and short-term measurements. Expected future sound level impacts from operation of the LNG import terminal were calculated and community sound level impacts from associated dredging were also evaluated. The Federal Energy Regulatory Commission Resource Report 9 section on noise impacts was prepared.

Industrial/Commercial Projects

• General Electric Company, Hudson River PCBs Superfund Site, Hudson River, NY. Mr. O'Neal 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 made and sound level monitoring was done during Phase 1 dredging and processing of the sediment to determine compliance with the Quality of Life Performance Standards.

Sand & Gravel Operations, Asphalt Plant, and Rock Quarry Projects

• 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 in support of the New York State Department of Environmental Conservation Mined Land Reclamation Permit and SEQRA process. Mr. O'Neal measured ambient background sound level around the site and measured project-specific impacts of the excavation and haul equipment at an existing excavation site, which were used to calculate future sound level impacts. Expert testimony on noise impacts was presented before a New York State Administrative Law Judge.

Transfer Station/Landfill Projects

• Juniper Ridge Landfill, Old Town, ME. Prepared a noise impact assessment for the 9.35 million cubic yard expansion of an existing landfill. This project involved ambient background noise monitoring at sensitive receptors around the site, predictive modeling of future activity, a compliance evaluation with State and local noise regulations, and expert testimony before the Maine Board of Environmental Protection and City of Old Town during the licensing hearings.

EXPERT TESTIMONY EXPERIENCE

- Expert witness before the Maine Board of Environmental Protection, on noise issues for the Juniper Ridge Landfill expansion, Old Town, ME (2016).
- Expert witness before the Board of Commissioners, Chowan and Perquimans Counties, NC, on blade and ice drop for Timbermill Wind Conditional Use Permit (2016).
- Expert witness before the Environmental Review Tribunal (via skype), Ontario, Canada on noise issues for wpd White Pines Wind, Prince Edward County, Ontario [Case ERT 15-071, Alliance to Protect Prince Edward Co. v. Director, Ministry of the Environment] (2015).
- Expert witness before the Jackson Township Board of Supervisors, Cambria County, PA on noise issues for a 980 MW natural gas-fired combined-cycle power generation plant (2015).
- Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for Grey Highlands Clean Energy GP Corp., Grey Highlands, Ontario [Case ERT 15-026, Fohr v. Director, Ministry of the Environment] (2015).
- Expert witness in Vermont Superior Court, Environmental Division, on noise issues for an aggregate extraction and crushing operation, McCullough Crushing, Calais, VT (2015).
- Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for Grey Highlands Zero Emission People Wind Farm, Grey Highlands, Ontario [Case ERT 15-011, Dingeldein v. Director, Ministry of the Environment] (2015).
- Prepared witness statement for the Environmental Review Tribunal, Ontario, Canada on noise issues for Niagara Region Wind Corporation, Haldimand County, Ontario [Case ERT 14-096, Mothers Against Wind Turbines, Inc. v. Director, Ministry of the Environment] (2015).
- Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for SP Armow Wind Ontario GP Inc., Kincardine, Ontario [Case ERT 13-124 to 13-125, Kroeplin v. Director, Ministry of the Environment] (2014).
- Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for K2 Wind Ontario, Inc., Ashfield-Colbourne-Wawanosh, Ontario [Case ERT 13-097 to 13-098, Drennan v. Director, Ministry of the Environment] (2013).

- Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for Dufferin Wind Power, Melancthon, Ontario [Case ERT 13-070 to 13-075, Bovaird v. Director, Ministry of the Environment] (2013).
- Expert witness before the NH Site Evaluation Committee on noise issues for the 30 MW Antrim Wind Project (2012; 2016); 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), West Medway II power plant (2015), Woburn-Wakefield electric transmission line (2016).
- 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).

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

- Kaliski, K., O'Neal, R.D., et al 2016. Massachusetts Research Study on Wind Turbine Acoustics: Over view and Conclusions. NOISE-CON 2016, Providence, RI.
- O'Neal, R.D., 2014. Wind Energy Sound Monitoring Under High Wind Shear Conditions. NOISE-CON 2014, Fort Lauderdale, FL.
- 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.

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Samantha W. Kranes

TRC Environmental Corporation

225 Greenfield Parkway, Suite 115

Liverpool, NY 13088

Case No. 16-F-0062

- 1 Q: Please state your name, employer, and business address.
- 2 A: Samantha W. Kranes, TRC Environmental Corporation (TRC), 225 Greenfield Parkway,

3 Suite 115, Liverpool, NY 13088.

- 4 Q: What is your position at TRC?
- 5 A: I am a Planner and Project Manager.
- 6 Q: How long have you been employed with TRC?
- 7 A: I have been employed with TRC since June 2014.

8 Q: Please describe your educational background and professional experience.

9 I received a Bachelor of Arts in Environmental Studies from William Smith College and a А Masters of Professional Studies in Ecology, with a focus in Environmental Policy, from the 10 11 State University of New York College of Environmental Science and Forestry (SUNY 12 ESF). I have worked in the environmental consulting industry for over nine years. I worked 13 as a Project Scientist for several years, working on environmental resource studies for 14 development, including wetland and ecology field evaluations and associated permitting at the local, state and federal level. This included baseline evaluations and planning for 15 16 development to avoid and minimize impacts to sensitive ecological resources and in line 17 with applicable regulations, as well as coordination with clients and regulatory agencies.

18 Q: Please describe your current responsibilities with TRC.

A: My current responsibilities as a Planner and Project Manager include managing a variety
 of renewable and traditional energy projects, including proposal preparation, budget and
 task management, technical oversight and quality control, and client relations.

Q: Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?

24 A: No.

25 Q: Have you previously served as an expert witness before any other court, agency,

26 or other body on the subject you plan to offer testimony on today?

27	A:	No.
28	Q:	What is the purpose and scope of your testimony in this proceeding?
29	A:	To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
30		or the Exhibits thereto.
31	Q:	What portion(s) of the Application is your testimony sponsoring?
32	A:	Exhibit 4, Land Use; Exhibit 31, Local Laws and Ordinances; Exhibit 32, State Laws and
33		Regulations.
34	Q:	Were these Exhibits, Application sections, or studies prepared by you or under your
35		direction and supervision?
36	A:	Yes.
37	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
38		publications, data or documents produced by persons other than yourself/your
39		company? If so, please cite these sources. [These are independent studies, etc.]
40	A:	See Exhibits listed above for references.
41	Q:	Does this conclude your testimony?
42	A:	Yes.



SAMANTHA W. KRANES

EDUCATION

B.A., Environmental Studies, William Smith College, 2008 M.P.S., Ecology, SUNY College of Environmental Science and Forestry, 2015

PROFESSIONAL COURSEWORK & TRAINING

- NYSDEC Erosion & Sediment Control Training
- 40-Hour HAZWOPER Certification
- Technical Writing
- Natural Resource Policy (2012)
- Environmental Impact Analysis (2013)
- Watershed Ecology & Management (2013)
- Ecology & Management of Invasive Species (2014)
- Environmental Law and Policy (2014)
- Stormwater Management (2014)
- Natural Resource Law (2015)
- CSX Training, e-RAILSAFE
- Internal TRC 8-Hour FERC 101 Training
- NAS Open Water SCUBA Diving Certification
- First Aid/CPR

AREAS OF EXPERTISE

- Environmental Permitting
- Agency Consultation
- Proposal Writing
- Project Management
- Wetland Delineation
- Wetland Mitigation Site Design
- Wetland Mitigation Construction Oversight
- Environmental Assessments
- State Environmental Quality Review Act
- National Environmental Policy Act
- Ecological Risk Assessment
- Stormwater Pollution Prevention Plans
- Stormwater Inspections
- Environmental Compliance
- Environmental Assessments
- Environmental Impact Statements
- Implementation of Best Management Practices

REPRESENTATIVE EXPERIENCE

Ms. Kranes is a Planner and Project Manager with over nine years of experience working on a variety of scientific and regulatory projects in the environmental field, including federal, state and local permitting and compliance, wetland delineation and ecological assessment, risk assessment, project siting and stormwater pollution



prevention plan development and inspection. She is experienced in client and regulatory coordination and prepares proposals and cost estimates for a variety of environmental projects. She manages projects from the proposal stage to project completion, including client coordination, staffing, oversight of project completion, monthly invoicing and project budget management.

NextEra Energy Resources, Eight Point Wind Energy Center – Steuben County, NY (Project Manager)

Manages the budget, monthly invoicing and client coordination for the preparation of an Article 10 Application for a wind energy project in Steuben County, New York. Tasks managed as part of the project include wetland delineation field work and data collection, completion and compilation of the Article 10 Application, coordination for review and submittal of the application to applicable agencies, and coordination with the client regarding project status and budget. Scope also includes the preparation of an Article VII Application for the associated project transmission line. Ms. Kranes is also the lead author on Exhibit 4 (Land Use), Exhibit 13 (Real Property), Exhibit 31 (Local Laws and Regulations), Exhibit 32 (State Laws and Regulations) and Exhibit 33 (Other Applications and Filings). She has also been a lead reviewer on several exhibits prior to submittal to the client.

Dunkirk Gas Corporation, Article VII Application, Wetland Delineation and Mitigation (Planner)

Assisted in preparing responses to NYS Public Service Commission comments on the Environmental Effects section of the Article VII Application for Major Electric and Gas Transmission Facilities for the proposed Dunkirk Natural Gas Pipeline in western New York State. Assisted in wetland and waterbody delineations and impact calculations associated with revisions to the pipeline route and at potential mitigation site (*i.e.*, wetland enhancement area). Perfomed Water Budget Analyses in accordance with the Pierce (1993) Methodology to evaluate current and future conditions at the mitigation site.

SolarCity, Plattsburgh Solar Project, State Environmental Quality Review Act (Planner)

Prepared Part 1 of the State Environmental Quality Review Act (SEQRA) Full Environmental Assessment Form (FEAF) and supplemental information attachments to address SEQRA and concerns of town, county and state agencies as part of the siting, permitting and development of a 1.25 megawatt fixed-tilt ground-mounted solar photovoltaic system in Clinton County, New York. Performed desktop analysis of project site to evaluate potential permitting concerns and required approvals. Prepared project consultation packages and coordinated review with the New York State Historic Preservation Office (SHPO), New York Natural Heritage Program (NYNHP) and the US Fish and Wildlife Service (USFWS) as part of SEQRA review.



SolarCity, Broome County Solar Project, State Environmental Quality Review Act (Planner)

Coordinated and oversaw the preparation of Part 1 of the State Environmental Quality Review Act (SEQRA) Full Environmental Assessment Form (FEAF) to address SEQRA and concerns of town, county and state agencies as part of the siting, permitting and development of a 5.46 megawatt fixed-tilt ground-mounted solar photovoltaic system in Broome County, New York. Performed desktop analysis of project site to evaluate potential permitting concerns and required approvals. Coordinated project consultation with the New York State Historic Preservation Office (SHPO), New York Natural Heritage Program (NYNHP) and the US Fish and Wildlife Service (USFWS) as part of SEQRA review.

SolarCity, Multiple Solar Projects, State Environmental Quality Review Act and Local Permitting (Planner)

Coordinated and oversaw the preparation of Part 1 of the State Environmental Quality Review Act (SEQRA) Full Environmental Assessment Form (FEAF) to address SEQRA and concerns of town, county and state agencies as part of the siting, permitting and development of approximately eight (8) commercial fixed-tilt ground-mounted solar photovoltaic systems throughout New York State. Performed desktop analysis of project site to evaluate potential permitting concerns and required approvals. Coordinated project consultation with the New York State Historic Preservation Office (SHPO), New York Natural Heritage Program (NYNHP) and the US Fish and Wildlife Service (USFWS) as part of SEQRA review. Coordinated with applicable agencies through formal consultation processes and prepared local permitting documents in accordance with local, regional, county and state requirements.

SolarCity, Multiple Solar Projects, Local Permitting Review (Planner)

Evaluated local, state and county regulations for the development of multiple solar sites throughout New York State. Review included coordination with multiple local, state and county offices and evaluation of codes and regulations pertaining to solar development, as well as desktop review of mapped natural and historic resources.

SolarCity, Multiple Solar Projects, Wetland Delineation Reporting (Planner)

Coordinated field teams for completion of wetland delineations on multiple potential solar development sites throughout New York State. Oversaw completion of wetland delineation reports according to the US Army Corps of Engineers (USACE) Wetland Delineation Manual (1987) and the Northcentral and Northeast Regional Supplement to the Wetland Delineation Manual (2012) for use in permitting.

Confidential Client – Multiple Solar Sites, Environmental Due Diligence (Project Manager and Planner)

Managed the environmental due diligence and constraints analyses of over 70 proposed ground-mounted solar projects (approximately 1-2 MW in size) throughout New York State, including oversight of field work and associated reporting. Coordinated field work, including wetland delineation and other field surveys, and oversaw preparation of technical reports and GIS mapping. Consults client regarding



regulatory requirements and potential agency jurisidiction for each of the project sites. Prepared formal consultation letters to agencies for their regulatory determination and advises client on local requirements. Perfomed regulatory database review of existing mapping, aerial photography, and online databases to evauate potential permitting implications for each Project site and completion of a Limited NEPA/SEQRA Report summarizing findings and recommendations to the client regarding siting, potential concerns, and permitting strategies.

Confidential Client – Ground-Mounted Solar Project, Town of Montgomery, Orange County (Project Manager)

Manages the environmental due diligence and permitting of a ground-mounted solar project on approximately 20 acres in the Town of Montgomery, Orange County, New York. Applicable permits being sought include an Article 15 (Protection of Waters) permit from the NYSDEC for crossing of a Class B waterbody onsite. Coordinates and reviews the preparation of the permit application package to the NYSDEC and USACE and advises client on regulatory framework and recommended path forward. Coordinates with TRC civil engineers regarding preparation of the stream crossing design in line with agency requirements.

Confidential Client – 2 MW Solar Project, Town of Harpersfield, Delaware County (Project Manager)

Manages the environmental due diligence and permitting of a ground-mounted solar project on approximately 60 acres in the Town of Harpersfield, Delaware County, New York. Attended multiple town meetings/hearings as the environmental representative to discuss the project and potential impacts to regulated resources, including wetlands and waterbodies, RTE species, land use and cover, archaeological resources, and stormwater. Advises client on agency consultations and recommended path forward.

Spectra Energy, Texas Eastern Appalachian Lease Project, Resource Report 7 – Soils (Lead Author)

Prepared Resource Report 7 (Soils) for submittal to the Federal Energy Regulatory Commission (FERC) for the proposed Texas Eastern Appalachian Lease Project in Ohio, which includes the installation of two pipeline segments and associated compressor stations and regulator facilities. Evaluated and described soils on the Project area and reported on avoidance and minimization of impacts to soils.

NEXUS Pipeline, Master of Change Reviews (Planner)

Performed reviews of proposed pipeline routing changes for the NEXUS pipeline in Ohio and Michigan, including review of ROW, wetland/waterbody resources, flood zones, RTE species, cultural resources, land use types, residences, and federal and state lands impacted. Advised regarding avoidance and minimization to documented resources and provides to client for final review.

Millennium Pipeline Company, LLC. Valley Lateral Project, Resource Report 3 – Fisheries, Vegetation and Wildlife and Wetland Delineation Report (Lead Author)



Prepared Resource Report 3 – Fish, Wildlife and Vegetation – for submittal to FERC for a 7.8 mile pipeline installation in Orange County, New York. Developed an Invasive Species Management Plan for the project based on field visits and construction techniques planned. Evaluated fisheries and species of concern at both the state and federal levels and coordinated with the USFWS to receive applicable permits for project completion.

National Grid, MV EDGE Gas Pipeline, Environmental Site Assessment and Siting Analysis (Project Manager)

Managed the siting analysis for the MV EDGE Gas Pipeline Project, which involves the installation of an approximately 3.5 mile gas pipeline in Utica and Marcy, Oneida County, New York, to serve the Marcy Nanocenter. Assisted National Grid's gas engineering department in selection of a final pipeline route, entirely within new right-of-way. Performed a desktop review of environmentally sensitive resources as well as a preliminary field visit to identify potential wetlands, and prepared an Environmental Site Assessment submitted to National Grid for use in permitting, design and coordination with MV EDGE. Reviewed potential permitting implications for the project in light of local, state and federal regulations and developed a permitting matrix indicating which permits and approvals are required, as well as the recommended notifications and consultations needed to complete the project. Participated in weekly meetings with National Grid's gas engineering, environmental and real estate departments.

National Grid, MV EDGE Gas Pipeline, Environmental Permitting (Project Manager)

Managed the permitting and environmental services for implementation of the permitting plan for the MV EDGE gas pipeline project in Oneida County, New York. Coordinated field team for wetland and waterbody delineations along the proposed pipeline route and reviewed the wetland delineation report per USACE protocol. Prepared a permit application for the Project under Section 10 of the Rivers and Harbors Act (RHA) for horizontal directional drilling under the Mohawk River and the Erie Canal. Prepared consultation letters and coordinated with the NYNHP, USFWS and SHPO regarding potential resources under their jurisdiction in the vicinity of the Project. Coordinated with TRC archaeologists to prepare a Phase 1A/1B Report for potential impacts to archaeologically sensitive resources within the project area. Oversaw preparation of a SWPPP in accordance with SPDES GP-0-15-002 and oversees weekly SWPPP inspections for the project, as necessary, during construction.

National Grid, MV EDGE Gas Pipeline, State Environmental Quality Review Act (SEQRA) and Local Permitting (Project Manager)

Managed the local and State Environmental Quality Review Act (SEQRA) permitting for a 12 inch natural gas pipeline in the Town of Marcy and City of Utica, Oneida County, New York. Reviewed and evaluated local permitting requirements and attended local planning board meetings/hearings to present the project to the planning board/zoning board and local community. Worked with National Grid's gas



engineering department to fully complete local permit applications for successful completion of the project, which is currently under construction.

National Grid, Pipeline #16 Upgrades Project and Chestnut Street Regulator Station Project (Project Manager)

Managed the environmental monitoring and stormwater inspections portion of the pipeline installation and restoration in Phoenix, New York. The project involved work in an archaeologically-sensitive agricultural field as well as work in wetlands and directional drilling under the Oswego River. Performed weekly stormwater inspections in accordance with the SPDES General Permit. Also managed the permitting and stormwater inspections of the second phase of work, which involved the expansion of the gas regulator station.

National Grid, Oneida-Porter #7 115 kV Transmission Line Conductor Clearance Refurbishment Project (Project Manager)

Managed the Oneida-Porter #7 Conductor Clearance Refurbishment Project. Performed wetland and waterbody delineations for the project area. Coordinated with the NYSDEC, NYNHP, SHPO, and USFWS through the IPaC process to meet permit requirements for the project under USACE Nationwide Permit #12. Prepared the Part 102 Report for submittal to the New York State Public Service Commission. Prepared and submitted a General Permit Notice for the project to the NYSDEC under National Grid's General Permit for maintenance. Developed a SWPP per NYSDEC SPDES General Permit.

National Grid, Clay-Teall #11 115 kV Transmission Line Conductor Clearance Refurbishment Project

Managed the Clay-Teall Conductor Clearance Project to alleviate substandard clearances along the line. Coordinated wetland delineations and associated field work, including the development of access for construction and subsequent GIS mapping. Prepared a Part 102 report in accordance with the NYS Public Service Commission's most recent guidance (August 2014). Prepared notification of the project to the NYSDEC for coverage under National Grid's maintenance permit (NYSDEC GP-0000-01147). Assisted in preparation of the SWPPP in accordance with NYSDEC GP-0-15-002 and performed weekly SWPPP inspections.

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Steven D. Wilkinson, PE

Fisher Associates

135 Calkins Road

Rochester, NY 14623

Case No. 16-F-0062

Wilkinson

- 1 Q: Please state your name, employer, and business address.
- A: Steven D. Wilkinson, Fisher Associates, P.E., L.S., L.A., D.P.C. (Fisher), 135 Calkins
 Road, Rochester, New York 14623.
- 4 Q: What is your position at Fisher?
- 5 A: Senior Project Manager.
- 6 Q: How long have you been employed with Fisher?
- 7 A: I have been employed by Fisher since January of 2006.
- 8 Q: Please describe your educational background and professional experience.
- 9 A: I received a Bachelor of Science Degree in Civil Engineering Technology from the
- 10 Rochester Institute of Technology and am a licensed professional engineer in New York,

11 Indiana and North Carolina. I have approximately 18 years of experience civil/site design,

- 12 storm water analysis and permitting and transportation design. My resume is attached.
- 13 Q: Please describe your current responsibilities with Fisher.
- A: In my current capacity at Fisher, my practice is focused on the civil/site design issues
 relating to wind energy development, including turbines, laydown yards and substations. I
- 16 am also responsible for roadway design along the access roads and public roads required
- for construction and maintenance of the wind turbines and ancillary facilities and for the preparation of studies to assess the impact of construction and operation of wind projects
- 19 roads and traffic.

Q: Have you previously testified before the New York State Public Service Commission
 or Siting Board on Electric Generation?

- 22 A: No.
- 23 Q: Have you previously served as an expert witness before any other court, agency,
- or other body on the subject you plan to offer testimony on today?
- 25 A: No.
- 26 Q: What is the purpose and scope of your testimony in this proceeding?

Case No. 16-F-0062

Wilkinson

- A: To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
 or the Exhibits thereto.
- 29 Q: What portion(s) of the Application is your testimony sponsoring?
- 30 A: Exhibit 25: Effect on Transportation.
- **Q:** Were these Exhibits, Application sections, or studies prepared by you or under your
- 32 direction and supervision.
- 33 A: Yes.
- 34 Q: In your testimony, will you refer to, or otherwise rely upon, any studies,
- 35 publications, data or documents produced by persons other than yourself/your
- 36 company? If so, please cite these sources.
- A: References are provided in the corresponding Exhibits and Reports.
- 38 Q: Does this conclude your testimony?
- 39 A: Yes.

Steve Wilkinson, P.E.

Senior Project Manager



P: (585) 334-1310 x282 E: swilkinson@fisherassoc.com

Education

B.S., Civil Engineering, 1998 Rochester Institute of Technology

Years of Experience

18

Registration

Professional Engineer:

- New York
- North Carolina
- Indiana

Affiliations

- AWEA
- American Public Works
 Association

Areas of Specialization

- Hydrologic Studies
- Stormwater Quantity & Quality Control
- Erosion & Sediment Control
- Highway Crossing Permits
- Wetland Permits
- Utility Permits and Extensions
 U.S. Corps of Engineer Joint Permits
- Site Development

Steve Wilkinson, P.E. has a diverse background that includes civil/site design, storm water analysis & permitting, and transportation design. Wind Power projects are a unique combination of civil/site design around the turbines, laydown yards, and substation; storm water analysis & permitting for the entire project; and roadway design along the access roads and public roads. The following is a brief summary of select projects in New York. Additional New York projects, projects from other States, and references can be provided upon request.

Project Experience

Jericho Rise Wind Farm, New York: Mr. Wilkinson is the Project Manager for the Civil Engineering and Survey of this 80 MW project in northern New York. This project had a fast track schedule and Steve mobilized multiple teams to complete the design, storm water analysis, and NYS DOT permitting in a short time frame.

Arkwright Wind Farm, New York: Mr. Wilkinson is the Project Manager for the Civil Engineering of this 80 MW wind farm in the Town of Arkwright, New York. The project area has a significant number of wetlands and Steve provided optimized access road and collection layout options to minimize impacts, while also keeping constructability in mind. He also managed the Survey, Geotechnical, and Foundation design contracts for the project.

Ball Hill Wind Farm, New York: Mr. Wilkinson is the Project Manager for the Civil Engineering of this 120 MW wind farm in Lewis County, New York.

Number 3 Wind Farm, New York: Mr. Wilkinson is the Project Manager for the Civil Engineering of this 100 MW wind farm in Lewis County, New York. This project is in the preliminary stages preparing for an Article 10 submission.

Alabama Ledge Wind Farm, New York: Mr. Wilkinson has provided Civil Engineering services for this 80 MW wind farm in Genesee County, New York.

Horse Creek Wind Farm, New York: Mr. Wilkinson was the Project Engineer for the Preliminary Design of this 100 MW wind farm in the Town of Clayton, New York. He quickly mobilized a team for the horizontal and vertical alignments of 14 miles of access roads as well as the SWPPP to accompany the SDEIS. He balanced the cut/fill volumes for the project and minimized the wetland impacts. This was all completed in 2 short months through the end of the year holiday period. Of particular note was that the SWPPP for the project was required to follow the new NYSDEC regulations which were substantially more challenging than previous regulations and required the assessment of new "Green Practices" for approval.

Preliminary Engineering Term Agreement: Mr. Wilkinson led the engineering on several of the projects for this Preliminary Engineering Term Agreement. Fisher Associates was provided project layouts (10 projects to date) and was tasked with conducting constraint analyses, developing optimized access roads, collection corridor layout, drainage design, transportation plan, and preliminary engineering plans.



NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Timothy R. Sara, RPA

TRC Environmental Corporation

4425 Forbes Blvd, Suite B

Lanham, MD 20707
- 1 Q: Please state your name, employer, and business address.
- A: Timothy R. Sara, TRC Environmental Corporation (TRC), 4425 Forbes Blvd, Suite B,
 Lanham, MD 20707
- 4 Q: What is your position at TRC?
- 5 A: I am the Office Practice Leader and Cultural Resources Program Manager.

6 Q: How long have you been employed with TRC?

7 A: I have been employed by TRC for over 9 years.

8 Q: Please describe your educational background and professional experience.

9 A: I have a B.A. (1984) from Binghamton University, double major in Geography and 10 Anthropology, I have an M.A, in Anthropology (1994) from City University of New York. I 11 am a Registered Professional Archaeologist (RPA) with 33 years of professional 12 experience in cultural resources management and historic preservation planning. Over the 13 course of amassing this experience I have designed and directed surveys and excavations 14 of historic and prehistoric archaeological resources in the Northeast, Mid-Atlantic, Southeast, Midwest, Southwest, and Caribbean. I have also obtained a thorough 15 16 knowledge of Section 110 and Section 106 and of the National Historic Preservation Act 17 as amended (NHPA) and applying the National Register of Historic Places (NRHP) 18 eligibility criteria to cultural resources. I have received honors and awards for both 19 academic and professional studies.

20 Q: Please describe your current responsibilities with TRC.

A: I am responsible for all business functions of TRC's Lanham, Maryland office and serve
 as the Principal Investigator on cultural resources studies conducted for our clients in
 support of project permitting. I also conduct quality control on all products produced in our

24 office and am responsible for staff management, fiscal budgets, and hiring staff.

25 Q: Have you previously testified before the New York State Public Service Commission

26 or Siting Board on Electric Generation?

27	A:	No.
28	Q:	Have you previously served as an expert witness before any other court, agency,
29		or other body on the subject you plan to offer testimony on today?
30	A:	No.
31	Q:	What is the purpose and scope of your testimony in this proceeding?
32	A:	To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
33		or the Exhibits thereto.
34	Q:	What portion(s) of the Application is your testimony sponsoring?
35	A:	Exhibit 20: Cultural Resources
36	Q:	Were these Exhibits, Application sections, or studies prepared by you or under your
37		direction and supervision?
38	A:	Yes.
39	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
40		publications, data or documents produced by persons other than yourself/your
41		company? If so, please cite these sources. [These are independent studies, etc.]

42 Q: Please refer to Exhibit 20.

EDUCATION

M.A., Anthropology, Hunter College, City University of New York, 1994 B.A., Anthropology and Geography, State University of New York at Binghamton, 1984

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Register of Professional Archaeologists (1995 – Present)

REPRESENTATIVE EXPERIENCE

Mr. Sara is a Registered Professional Archaeologist (RPA) with 33 years of professional experience in cultural resources management and historic preservation planning. Over the course of amassing his experience he has designed and directed surveys and excavations of historic and prehistoric archaeological resources in the Northeast, Mid-Atlantic, Southeast, Midwest, Southwest, and Caribbean. He has also obtained a **thorough knowledge of Section 110 and <u>Section 106</u> and of the National Historic Preservation Act as amended (NHPA) and applying the National Register of Historic Places (NRHP) eligibility criteria to cultural resources. Mr. Sara has received honors and awards for both his academic and professional studies.**

As a professional in the field of cultural resources management, Mr. Sara has also worked directly with other environmental conservation program areas implemented by the National Environmental Policy Act (NEPA). He has served as a key member of overall environmental planning teams, working with other environmental professionals including soil scientists, wetlands specialists, biologists, and hazardous waste managers. He has been a contributing author on more than 100 Environmental Assessments (EAs) and/or Environmental Impact Statements (EIS) and principal or contributing author to more than 250 cultural resources management reports. Mr. Sara currently serves as Program Manager and Office Practice Leader for TRC's Lanham, Maryland office with responsibility for all business functions of the office as well as quality control and staff management.

Mr. Sara has a broad knowledge of cultural resource management principles and practices, archaeological survey, evaluation, and data recovery methodologies, and presentation of research results within Federal and state agency, academic, and public sector frameworks. His areas of expertise include:

- Northeastern Historical and Prehistoric Archaeology
- Cultural Resource Permitting for Energy Development Projects
- Survey and Resource Evaluation
- Project Management for Cultural Resources Studies
- Environmental Impact Assessment and Studies
- Public Outreach and Exhibit Services

SELECTED PROJECTS:

Eight Point Wind Energy Center, Steuben County, New York (Project Manager/Principal Investigator 2016 - 2017). Prepared research design and directed all aspects of archaeological background and field research associated with wind energy development project in central New York. Contributing author of report submitted to NextEra Energy Resources, LLC, and New York State Historic Preservation Office. Prepared Exhibit 10 (Cultural Resources) for Article 20 New York State environmental documentation.

Dominion Eastern Market Access Project: Loudoun Compressor Station, Loudoun M&R Station, Pleasant Valley Compressor Station, and Pleasant Valley M&R Station, Loudoun and Fairfax Counties, Virginia (Project Manager/Principal Investigator 2015 - 2016). Prepared research design, directed archaeological fieldwork, and prepared project report for Phase I investigation of improvements to Dominion's LNG facilities. Contributing author report submitted to Virginia Department of Historic Resources.

Cypress Creek Renewables - **Multiple Solar Projects, New York State (Principal Investigator 2017).** Oversaw Phase I fieldwork for nine proposed solar projects in central New York State. Performed QA/QC review of technical reports submitted to CCR, LLC and New York State Historic Preservation Office.

Capon Bridge Replacement Project – **Phase I and II Archaeological Studies, Hampshire County, West Virginia, State Project S314-50-31.02 (Project Manager/Principal Investigator 2016).** Directed all aspects of archaeological background and field research associated with a bridge replacement project in eastern West Virginia. Two newly recorded sites were recorded during Phase I investigation. Site 46HM210 was found to have poor integrity and was recommended as not eligible for NRHP-listing. Site 46HM211, a multi-component site contained both historic and prehistoric cultural deposits and was recommended for further study. Phase II study conducted in 2017 determined site 46HM211 eligible for the NRHP. Co-author of reports submitted to the West Virginia Department of Transportation, Division of Highways (WVDOH); lead author of research design for Phase III date recovery approved by WVDOH and West Virginia State Historic Preservation Office.

Millville Quarry, Phase I and II Archaeological Investigations, Prince George's County Maryland (Project Manager/Principal Investigator 2014 and 2017). Directed all aspects of archaeological background and field research associated with a sand and gravel mine expansion project in southern Maryland. The Phase I survey identified twelve (12) archaeological sites yielding 1,521 artifacts. NRHP evaluation (Phase II) was conducted on two prehistoric sites (18PR1079 and 18PR1081) yielding 3,200 artifacts. Lead author of technical reports submitted to Aggregate Industries and the Maryland State Historic Preservation Office.

Bird Run Bridge Replacement Project, Pocahontas County, West Virginia, State Project S338-84-1.53 (Project Manager/Principal Investigator 2016). Directed all aspects of archaeological background and field research associated with a bridge replacement project in southeastern West Virginia. Documented elements of an abandoned CCC camp just outside the project area. No artifacts were recovered and no archaeological features were identified within the APE. Co-author of report submitted to the West Virginia Department of Transportation, Division of Highways.

Eastern System Upgrade Project, Orange, Sullivan, Delaware, and Rockland Counties, New York, Phase I Archaeological Investigation (Project Manager/Principal Investigator 2015 - 2016). Oversaw all aspects of archaeological background and field research associated with proposed 7.3-mile natural gas pipeline construction project in southern New York. Contributing author of the technical report to be submitted to FERC and Millennium Pipeline Company.

HDD Fiber Optic Exit Site for Potomac River Crossing, Loudoun County, Virginia (**Project Manager/Principal Investigator 2015** - **2016**). Directed all aspects of archaeological background and field research associated with Phase I archaeological survey for proposed Horizontal Direction Drill (HDD) installation of fiber optics line beneath the Potomac River. Principal author of technical report submitted to U.S. Army Corps of Engineers and Virginia Department of Historic Resources.

Northfield Mountain Pumped Storage Project (No. 2485) and Turners Falls Hydroelectric Project (No. 1889), Franklin County, Massachusetts and Cheshire County, New Hampshire, and Windham County, Vermont (Project Manager/Principal Investigator 2013-2016). Directed Phase IA archival and field investigations as part of environmental impact studies required for 30-year license renewal. Principal author of report submitted to FirstLight Power Resources and the Massachusetts, New Hampshire, and Vermont SHPOs.

Cairo Bridge Replacement Project, Ritchie County, West Virginia, State Project S243-31-9.82 (Project Manager/Principal Investigator 2015). Oversaw all aspects of archaeological background and field research in support of a new bridge construction in western West Virginia. One previously unrecorded historic archaeological site was identified. Based on lack of stratigraphic integrity and absence of structural features or remains, the site was recommended as ineligible for inclusion on the National Register. Co-author of report submitted to the West Virginia Department of Transportation, Division of Highways.

McDonalds Upper Plaza Bridges Project, Marshall County, West Virginia, State Project S326-2-19.50 (Project Manager/Principal Investigator 2015). Oversaw all aspects of archaeological background and field research associated with a project to widen WV 2 through the town of Moundsville. One historic archaeological site was identified and recommended as ineligible for inclusion in the NRHP and for no further work. Principal author of technical report submitted to the West Virginia Department of Transportation, Division of Highways.

Pratt Burial Archaeological Monitoring and Documentation, Pratt, Kanawha County, West Virginia (Project Manager/Principal Investigator 2015). Oversaw all aspects of archaeological monitoring and documentation associated with the unanticipated discovery of Native American burials encountered during excavations of a buried water line in the town of Pratt. Over 4,700 artifacts were recovered from two apparent burials during the investigation. The collection was prepared for curation and submitted to the West Virginia Division of Culture, Grave Creek Mound Archaeological Complex Research Facility for future research. Principal author of letter report submitted to the WV SHPO.

NiSource Utica Access Natural Gas Pipeline Project, Kanawha and Clay Counties, West Virginia (Project Manager/Principal Investigator 2014 - 2015). Oversaw all aspects of archaeological background and field research associated with proposed 9.4-mile natural gas pipeline construction project in south-central West Virginia. One historic site was identified but recommended for no further study. Contributing author of technical report submitted to FERC and Columbia Gas Transmission, LLC.

Utica Marcellus Texas Natural Gas Project, Brooke, Doddridge, and Tyler Counties, West Virginia (Principal Investigator 2014 - 2015). Oversaw all aspects of archaeological background and field research associated with proposed 75-mile natural gas pipeline construction project in northeastern West Virginia. Eight archaeological sites and two isolated finds were identified. Two prehistoric sites (46BR80 and 46BR90) were recommended for further investigation to determine National Register significance. Contributing author of technical report submitted to FERC and Utica Marcellus Pipeline LLC. **Utica Marcellus Texas Natural Gas Project, Mercer, Lawrence, Allegheny, and Washington Counties, Pennsylvania (Principal Investigator 2014 - 2015).** Oversaw all aspects of archaeological background and field research associated with proposed 75-mile natural gas pipeline construction project in western Pennsylvania. Five archaeological sites (36WH1687, 36WH1688, 36WH1689, 36WH1690, and 36WH1692) and three isolated finds were identified. Based on the lack of integrity and limited research value, none of the resources were recommended as eligible for inclusion in the National Register of Historic Places (NRHP).

Dunkirk Natural Gas Pipeline Project, Phase I Archaeological Survey, Chautauqua County, New York (Project Manager/Principal Investigator 2014 - 2015). Directed all aspects of Phase I archaeological study for proposed 11 miles of new 16-inch buried pipeline to transport natural gas from the Tennessee Gas Transmission Pipeline to the Dunkirk Generating Station. Principal author of project report and Article VII documentations submitted to Dunkirk Gas Corporation and state review agencies.

Service Wire Industrial Access Road Project, Cabell and Putnam Counties, West Virginia, State Project X306-164/12-0.00 (2014 - 2015). Oversaw all aspects of archaeological background and field research associated with road construction project in southwestern West Virginia. One prehistoric archaeological site was identified and recommended for further investigation to determine National Register significance. Principal author of technical report submitted to the West Virginia Department of Transportation, Division of Highways.

Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC (Senior Archaeologist 2013 - 2014). Conducted background research and prepared Cultural Resources section of Draft SEIS for State Pollutant Discharge Elimination System (SPDES) Permit (No. NY-0004472), as required by New York State Environmental Quality Review Act. Submitted to Entergy Services, Inc., Jackson, Mississippi.

Martins Creek - Siegfried #2 230kV Transmission Line Reconstruction Project, Northampton County, Pennsylvania, Phase I Archaeological Studies (Project Manager/Principal Investigator 2012). Directed all aspects of archaeological background and field research associated with rebuild of 11-mile long transmission line. Principal author of technical report submitted to PPL Electric Utilities, Lehigh Valley, Pennsylvania.

Conowingo Hydroelectric Relicensing Project, Cecil and Harford Counties, Maryland, and Lancaster and York Counties, Pennsylvania, FERC No. 405, Phase IA and IB Cultural Resources Study (Project Manager/Principal Investigator 2011 -**2012).** Directed background research and Phase I field investigations as part of environmental impact studies required for 30-year license renewal. Principal author of report submitted to Exelon Generation Company, LLC and the Pennsylvania and Maryland SHPOs.

Conley Industrial Access Road Project, Wood County West Virginia, State Project S354-14/47-0.04 (Project Manager/Principal Investigator 2014). Directed all aspects of archaeological background and field research associated with road construction project in northwestern West Virginia. Principal author of technical report submitted to the West Virginia Department of Transportation, Division of Highways.

Manor–Graceton 230kv Transmission Line Corridor, Lancaster and York Counties, Pennsylvania, Phase I Archaeological Survey (Project Manager/Principal Investigator 2011). Directed all aspects of archaeological and background and field research associated with rebuild of 10-mile long transmission line. Principal author of technical report submitted to PPL Electric Utilities, Lehigh Valley, Pennsylvania.

Tabler Station Connector Access Road Project, Berkeley County, West Virginia, Phase I and II Archaeological Studies, State Project S302-51-2.24 00, (Project Manager/Principal Investigator 2013 - 2014). Directed all aspects of archaeological background and field research associated with road construction project in northeastern West Virginia. Phase II investigation was conducted on one historic archaeological site but was recommend ineligible for inclusion in the National Register. Principal author of technical report submitted to the West Virginia Department of Transportation, Division of Highways.

Phase II Archaeological Evaluation of Sites 28HU566 and 28HU567 and Historic Architecture Studies of the Edward Fox House and Fox/Phillips/Pittenger House in the Frenchtown III Solar Park, Hunterdon County, New Jersey, (Archaeologist 2013-14). Directed all aspects of archaeological research in support of solar park development. The work was conducted for Con Edison Development, Valhalla, NY under Subcontract to Whitman, Cranbury, New Jersey. Contributing author of technical report and public outreach program in preparation for the New Jersey Historic Preservation Office.

CPV Valley Energy Center and Transmission Corridors, Archaeological Studies, Town of Wawayanda, Orange County, New York (Project Manager/Principal Investigator 2008 - 2010 and 2015). Prepared research design and oversaw all aspects of field and laboratory research in support a proposed gas-fired 630MW power plant. Principal author of project report and Environmental Impact Statement submitted to CPV Valley, LLC and state and municipal review agencies.

Leonardtown Educational and Recreational Site - **Phase II Archaeological and Geophysical Studies, St. Mary's County, Maryland (Project Manager/Principal Investigator 2014** - 2015). Directed archaeological field research associated with school construction project in southern Maryland. Phase II investigation was conducted on one historic archaeological site recommend ineligible for inclusion in the NRHP. Lead author of report submitted to Soltesz, Inc. and St. Mary's County.

Caithness Long Island Energy Center II, Phase I Archaeological Survey, Town of Brookhaven, Suffolk County, New York (Project Manager/Principal Investigator 2013). Directed all aspects of Phase I archaeological study for proposed natural gas fired power facility in Town of Brookhaven. Principal author of project report and Environmental Impact Statement submitted to Caithness Long Island II, LLC and state and municipal review agencies.

NYSEG Corning Valley Upgrade Project, Towns of Erwin and Campbell, Steuben County, New York Phase I Archaeological Survey (Project Manager/Principal Investigator 2009 - 2010). Prepared research design and oversaw all aspects of archival research, field and laboratory research in support of modernization of a 9-mile electrical transmission corridor and substations. Principal author of project report submitted to New York State Electric and Gas and the New York Office of Parks Recreation and Historic Preservation.

Paradise Solar Energy Project, Gloucester County New Jersey; Phase I and II Archaeological Studies (Project Manager/Principal Investigator 2009 - 2010). Prepared research design and supervised all aspects of field and laboratory research in support of a proposed photovoltaic solar array in southern New Jersey. Conducted Phase II National Register eligibility evaluations of prehistoric site 28GL415. Principal author of project reports submitted to Paradise Solar, LLC (NextEra) and the New Jersey State Museum.

Phase II and III Archaeological Investigations of Sites 46BY229 and 46BY230, Cattle Pass Bridge Realignment Project, Berkeley County, West Virginia, State Project S302-51-2.24 00 (Project Manager/Principal Investigator 2012 - 2013). Directed all aspects of archaeological research on National Register-eligible site in support of road straightening project in eastern West Virginia. The work was conducted for the West Virginia Department of Transportation, Division of Highways.

Mantua Grove Solar Energy Project, Gloucester County, New Jersey, Phase I and II Archaeological Studies (Project Manager/Principal Investigator 2009 - 2010). Prepared research design and supervised all aspects of field and laboratory research in support of proposed photovoltaic solar array in southern New Jersey. Conducted Phase II National Register eligibility evaluations of two multicomponent sites (28GL417 and 28GL418). Principal author of project reports submitted to SunPower Corporation and the New Jersey State Museum.

Mount Olive Solar Energy Project, Morris County, New Jersey, Phase I Archaeological Survey (Project Manager/Principal Investigator 2010). Directed background and field research for proposed ground-mounted photovoltaic solar facility in central New Jersey. Principal author of project report submitted to Constellation Solar I, LLC and the New Jersey State Museum.

Ash Landfill Siting Evaluation, Franklin, Connecticut (Principal Investigator 2009-2010). Directed background research and conducted field reconnaissance for archaeological resource sensitivity in support of a siting investigation for an ash landfill. Initiated formal consultation with the Connecticut State Historic Preservation Office and Tribal Historic Preservation Offices (Mohegan and Mashantucket Pequot Tribes).

Queen Anne's Solar Energy Project, Queen Anne's County, Maryland, Phase I Archaeological Survey (Project Manager/Principal Investigator 2010). Directed archaeological survey of 80-acre solar energy development parcel on Maryland's Eastern Shore. Principal author of project report submitted to NextEra Energy Resources, LLC and the Maryland Historical Trust.

Snowy Creek Wind Power Project, Cultural Resource Studies, Preston County, West Virginia (Project Manager/Principal Investigator 2009-2010). Directed archaeological research in support of a 54-turbine wind power development project along mountaintops in northeastern West Virginia. Survey included ROW and proposed substation development. The work was conducted for AES New Creek LLC, Arlington Virginia.

SWEPI LP Natural Gas Pipelines, Cultural Resources Studies, Tioga County, Pennsylvania (Project Manager/Principal Investigator 2010 – 2011). Prepared research design and supervised all aspects of field and laboratory research in support of a more than 50 miles of proposed natural gas pipeline construction in north-central Pennsylvania. Principal author of 12 technical reports submitted to Entech and PHMC.

Penn Main Interceptor, Wastewater Collection and Conveyance System, Penn Township, York County, Pennsylvania, Phase I Archaeological Survey. (Project Manager/Principal Investigator 2010). Directed archaeological background and field research for new sewer line installation in York County. The work was conducted for CET Engineering Services and Penn Township.

Proposed Upper Allen Township Waste Water Treatment Plant Sludge Storage Pad, Cumberland County, Pennsylvania; Phase I Archaeological Survey (Project Manager/Principal Investigator 2009). Prepared research design and supervised all aspects of field and laboratory research in support of a proposed waste water treatment sludge storage pad in south-central Pennsylvania. Principal author of project report submitted to CET Engineering Services and Upper Allen Township.

Proposed Waste Water Treatment Plant and Interceptor, North Londonderry Township, Lebanon County, Pennsylvania; Phase I Archaeological Survey (Project Manager/Principal Investigator 2009). Prepared research design and supervised all aspects of field and laboratory research in support of a proposed waste water treatment plant and interceptor in south-central Pennsylvania. Principal author of project report submitted to CET Engineering Services and North Londonderry Township.

18.5 Mile East Resources Gas Pipeline, Bradford and Lycoming Counties, Pennsylvania, Phase I Archaeological Survey (Project Manager/Principal Investigator 2009). Prepared research design and supervised all aspects of field and laboratory research in support of a proposed gas pipeline in north-central Pennsylvania.

New Creek Mountain Wind Power Project, Cultural Resource Studies, Grant and Mineral Counties, West Virginia (Project Manager/Senior Archaeologist 2008 - 2009). Directed archaeological research in support of a 48 turbine wind power development project along a nine-mile ridge in northeastern West Virginia. Survey included ROW and proposed substation development. The work was conducted for AES New Creek LLC, Arlington Virginia.

Mountaineer CCS II Project, Mason County, West Virginia, Archaeological Studies, 2010, (Project Manager/Principal Investigator 2010). Spearheaded consultation with State and Federal review agencies, prepared research design, and oversaw all aspects of field research in support proposed CO2 capture and storage project. Principal author of project report and cultural resources section of EIS submitted to American Electric Power Corporation and the U.S. Department of Energy.

Buckeye Truss Bridge Replacement Project, Pocahontas County, West Virginia Phase I Archaeological Survey, State Project S238-219/15-0.33 00 (Project Manager/Principal Investigator 2011). Directed all aspects of archaeological and geomorphological research in support of a new bridge construction in eastern West Virginia. The work was conducted for the West Virginia Department of Transportation, Division of Highways.

West Virginia Department of Transportation - Division of Highways, Cattle Pass Bridge Replacement, Archaeological Studies, Berkeley County, West Virginia (Project Manager/Principal Investigator 2011). Directed all aspects of archaeological research in support of a new bridge construction in eastern West Virginia. The work was conducted for the West Virginia Department of Transportation, Division of Highways.

Czar to Helvetia Bridge Replacement, Archaeological Studies, Randolph County, West Virginia (Project Manager/Principal Investigator 2011). Directed all aspects of archaeological research in support of a new bridge construction in central West Virginia. The work was conducted for the West Virginia Department of Transportation, Division of Highways.

Annamoriah Bridge Replacement, Archaeological Studies, Calhoun County, West Virginia (Project Manager/Principal Investigator 2009 - 2010). Directed all aspects of archaeological and geomorphological research in support of a new bridge construction in central West Virginia. The work was conducted for the West Virginia Department of Transportation, Division of Highways.

Armenia Mountain Wind Power Project, Bradford and Tioga Counties, Cultural Resource Studies, Pennsylvania (Project Manager/Senior Archaeologist 2007-2008). Supervised archaeological research in support of a 124-turbine wind power development project within 10,000 acres of leased land in north central Pennsylvania. Survey included three substations, two 18,000 m transmission lines, operations and maintenance building. The work was conducted for AES Armenia Mountain, LLC, Arlington, Virginia.

National Register Eligibility Evaluations of Sites 18ST659 and 18ST754 and Data Recovery Excavations at Site 18ST659, VXX Presidential Helicopter Facility, Naval Air Station Patuxent River, St. Mary's County, MD (Principal Investigator/Project Manager 2005 – 2006). Mr. Sara prepared research design for large-scale data recovery excavations of National-Register-eligible Archaic site; directed all aspects of field execution, laboratory analysis of more than 25,000 specimens, and was principal author of project report.

West Point Military Academy Integrated Cultural Resources Management Plan (ICRMP), West Point, New York. U.S. Army Corps of Engineers, Fort Worth District; U.S. Military Academy (Principal Archaeologist 2003 – 2004). Mr. Sara developed the archaeological research design, cultural overview, and standard operating procedures for protection of archaeological resources for Plan Years 2001-2006. The planning document aids in management of historic buildings, structures, and archeeological sites for Nation's oldest military academy.

Section 106 Oversight for USDA/Natural Resources Conservation Service, New York (**Principal Investigator/Project Manager, 2002 – 2003).** Mr. Sara managed a year-long program for conducting Initial Project Reviews, Field Inspections, and Phase 1 surveys for all planned NRCS conservation projects throughout New York State. He directed a project team of historians, project archaeologists, and GIS specialists in executing Section 106 compliance review process on behalf of the NRCS and OPRHP (NY SHPO).

Webster Field Annex, Patuxent River Naval Air Station, Archaeological Evaluation of Sites 18ST234 and 18ST328 Maryland. U.S. Navy, Chesapeake (Principal Investigator/Project Manager 2002). Mr. Sara prepared research design and directed testing of two National Register-eligible prehistoric sites dating to the Middle Woodland period. Mr. Sara designed an avoidance plan that allowed construction to proceed on schedule and within budget while avoiding impacts to significant archaeological deposits.

Patuxent River Naval Air Station, Archaeological Survey of 3,250 Acres, St. Mary's County, Maryland Principal Investigator/Project Manager 2001-2002). Prepared research design and directed intensive survey of remaining portions of the Naval Air Station in order to bring the Navy into compliance with Section 110 of the NHPA.

Archaeological Studies in Support of Section 110 Compliance at Five Naval Facilities Engineering Command Mid-Atlantic (MIDLANT) Support Facilities Project Manager/Principal Investigator 2006-2007). Prepared research designs, directed archaeological fieldwork, and prepared project reports for Phase I and II investigations at five Naval support facilities in Peninsula and Tidewater Virginia. Project sites in included NAS Norfolk, FTC Dam Neck, FISC Craney Island, Cheatham Annex and Yorktown Naval Weapons Station.

Archaeological Survey and Site Evaluation, Naval Station Roosevelt Roads, Puerto Rico (Principal Investigator/Project Manager 2004 - 2005). Contract No. N62470-02-D-9997, Task Order 0031, Modification No. 5. U.S. Department of the Navy, Atlantic Division (NAVFACLANT), Norfolk. Directed all aspects of archaeological survey of 80 acres of High Probability lands and evaluative testing of one pre-Columbian, one multi-component, and one Historic-age site within the Naval Station. Responsible for overall fiscal management and coordination with Federal and Commonwealth agencies. Principal author of report submitted to Naval Facilities Engineering Command, Atlantic Fleet, Norfolk, Virginia.

Archaeological Survey and Site Evaluation, Naval Station Roosevelt Roads, Puerto Rico(Principal Investigator/Project Manager 2003 - 2004). Contract No. N62470-02-D-9997, Task Order 0031, Modification No. 2. U.S. Department of the Navy, Atlantic Division (LantDiv), Norfolk. Directed all aspects of archaeological survey, archaeological reconnaissance, and evaluative testing of four pre-Columbian sites within the naval station. Responsible for overall fiscal management and coordination with Federal and Commonwealth agencies. Principal author of report submitted to Naval Facilities Engineering Command, Atlantic Fleet, Norfolk, Virginia.

Archaeological Survey and Paleoenvironmental Investigations of Portions of U.S. Naval Station Guantanamo Bay, Cuba (Principal Investigator/Project Manager 2003 - 2004). Contract No. N62470–02–D–9997 Task Order 0004. U.S. Department of the Navy, Atlantic Division (LantDiv), Norfolk. Coordinated archival, palynological, and macrobotanical research and directed archaeological investigations within 1200 acres of the naval station. Principal author of report submitted to Naval Facilities Engineering Command, Atlantic Fleet, Norfolk, Virginia.

SPECIALIZED TRAINING

Section 106 Principals and Practices, SRI Foundation, 1999 24-Hour HAZWOPER Training, 2007 First Aid and Adult CPR, Multiple Years

PROFESSIONAL AFFILIATIONS

Society for American Archaeology (member) International Association of Caribbean Archaeologists (member) New York Archaeological Council (voting member)

NEW YORK STATE BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

Application of Eight Point Wind Energy Center for a Certificate under Article 10 of the Public Service Law Case No. 16-F-0062

PRE-FILED TESTIMONY OF:

Trevor S. Peterson

Stantec Consulting Services, Inc.

30 Park Drive

Topsham, ME 04086

1 Q: Please state your name, employer, and business address.

- 2 A: Trevor S. Peterson, Stantec Consulting Services Inc., 30 Park Drive, Topsham, ME 04086
- 3 Q: What is your position at Stantec?
- 4 A: I am a Senior Wildlife Biologist and Project Manager.
- 5 Q: How long have you been employed with Stantec?
- 6 A: I have been employed at Stantec since 2003.

7 Q: Please describe your educational background and professional experience.

A: I earned my Bachelor's degree in Biology and Environmental Studies from Bowdoin
College in 2002. I am currently a PhD candidate in University of Maine's Ecology and
Environmental Science program where I am studying use of long-term acoustic bat data
to study bat migration and manage potential impacts at wind projects. During my time at
Stantec, I have conducted and managed a wide range of ecological surveys, focusing
since 2006 on bird and bat issues at proposed and existing wind projects. Please see my
resume attached.

15 Q: Please describe your current responsibilities with Stantec.

16 A: I design, conduct, and manage field studies and analyze survey results to support our 17 clients' needs. I also work with clients, agency representatives, and other stakeholders to 18 determine appropriate scope and level of effort for pre-construction and post-construction 19 studies at wind projects. Typical projects include surveys for rare species presence, bat 20 activity and species composition, bird and bat fatality rates, and effectiveness of 21 operational curtailment programs. I am also technical lead within the company for acoustic 22 bat survey methods.

Q: Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?

A: Yes. I provided written and oral testimony related to EverPower's Cassadaga project
(Case No. 14-F-0490).

Case No. 16-F-0062

Peterson

27	Q:	Have you previously served as an expert witness before any other court, agency,
28		or other body on the subject you plan to offer testimony on today?
29	A:	I provided written and oral testimony on potential impacts to birds and bats at the proposed
30		Laurel Mountain Wind Energy Project in West Virginia, before the West Virginia Public
31		Service Commission (Case No. 08-0109-E-CS-CN).
32	Q:	What is the purpose and scope of your testimony in this proceeding?
33	A:	To sponsor certain portions of the Eight Point Wind Energy Center Article 10 Application
34		and associated Exhibits.
35	Q:	What portion(s) of the Application is your testimony sponsoring?
36	A:	Exhibit 22: Terrestrial Ecology and Wetlands. Specifically my testimony is to provide
37		explanations of results of pre-construction bird and bat studies conducted by Stantec.
38	Q:	Were these Exhibits, Application sections, or studies prepared by you or under your
39		direction and supervision?
40	A:	Yes.
41	Q:	In your testimony, will you refer to, or otherwise rely upon, any studies,
42		publications, data or documents produced by persons other than yourself/your
43		company? If so, please cite these sources. [These are independent studies, etc.]
44	A:	I will rely upon references cited in individual reports prepared by Stantec.

Project Manager, Senior Wildlife Biologist



Mr. Peterson is a senior wildlife biologist and project manager specializing in renewable energy projects, bird and bat migration, and rare species assessments. He focuses on solutions to quantify and manage turbinerelated wildlife impacts at terrestrial and offshore commercial wind projects. Since joining the company in 2003, Trevor's project experience has included a wide range of wide range of wildlife surveys at proposed and existing wind projects, rare bat surveys, breeding bird surveys, raptor surveys, nocturnal radar surveys, vernal pool water quality and ecological monitoring, rare turtle telemetry and demographic studies, natural community characterization, and vegetation monitoring. He is a PhD candidate in the University of Maine's Ecology and Environmental Science program, where he is researching the use of long-term acoustic bat data to study bat migration and predict and manage potential impacts from land-based and offshore wind projects. Before working at Stantec, Trevor worked seasonally for the National Park Service at Acadia National Park and Isle Royale National Park and as an island caretaker for the Maine Island Trail Association. Mr. Peterson serves as Stantec's technical lead for acoustic bat surveys, responsible for updating equipment, survey methods, and data analysis/reporting methods.

PROFESSIONAL EXPERIENCE

- Stantec Consulting Services Inc. 2007-present. Project Manager and Senior Wildlife Biologist
- Woodlot Alternatives, Inc. 2003-2007. Project Manager
- Acadia National Park. 2000. Biological Technician
- Isle Royale National Park. 1999. Biological Technician

EDUCATION

PhD candidate in Ecology and Environmental Science program, University of Maine, expected completion 2018

Semester Program in Costa Rica, Tropical Field Biology, Environmental Studies, and Spanish, Duke University, Durham, North Carolina, 2000

AB, Biology/Environmental Studies, Summa cum Laude, Phi Beta Kappa, Bowdoin College, Brunswick, Maine, 2002

40-Hour Hazwoper Certification, OSHA, Topsham, Maine, 2005 (refreshed annually).

McMillan Offshore Survival Training, Castine, Maine, 2016

MEMBERSHIPS

The Wildlife Society The Northeastern Bat Working Group Northeastern Migration Monitoring Network

SELECTED PROJECT EXPERIENCE

Offshore Renewable Energy Regional Offshore Acoustic Bat Monitoring, Gulf of Maine, mid-Atlantic, Great lakes

Senior Biologist and Project Manager. Developed and implemented survey techniques and data analysis for longterm (2009–2014) acoustic bat monitoring in the Gulf of Maine, mid-Atlantic, and Great Lakes. Surveys included longterm monitoring at over 40 locations including remote islands, offshore weather buoys, ships, and coastal sites. Project was funded by Stantec, the US Department of Energy, and supported by federal, state, academic, and NGO partners.

Tracking Bats using Nanotag Telemetry in the Gulf of Maine

Senior Biologist and Project Manager. Developed and implemented survey techniques to track bats along the Maine coast using nanotag technology. Constructed and installed 5 telemetry receivers along the coast to supplement an existing network of monitoring stations. Project was funded by Stantec and supported by federal, state, academic, and NGO partners.

Project Manager, Senior Wildlife Biologist

Renewable Energy

Pre-construction Avian and Bat Surveys at Proposed Wind Energy Project, Texas

Project Manager and Field Supervisor. Developed an innovative work scope to conduct a variety of field surveys focusing on assessing potential impacts to Mexican free-tailed bats and managed a variety of field surveys including nocturnal radar surveys, NEXRAD data analysis, acoustic bat monitoring, and visual night-vision surveys. Mr. Peterson also coordinated discussions between project developers, state wildlife agencies, and non-profit groups.

Avian and Bat Surveys at New Creek Wind Energy Project, Grant County, West Virginia

Project Manager, Field Supervisor, Expert Witness. Developed protocols for pre-construction and post-construction bird and bat field surveys within wind project. Coordinated field efforts, including breeding bird surveys, raptor surveys, bat mist-netting surveys, bat telemetry surveys, acoustic bat surveys, carcass monitoring, and curtailment studies. Managed correspondence between the developer, operator, and state and federal wildlife agencies. Prepared survey reports, a site-specific bird and bat risk assessment, and direct testimony, all of which were presented at public hearings.

Avian and Bat Surveys at Laurel Mountain Wind Energy Project, Randolph and Barbour Counties, West Virginia

Project Manager, Field Supervisor, Expert Witness. Conducted bird and bat field surveys within proposed wind project. Coordinated pre-construction and post-construction field efforts, including breeding bird surveys, raptor surveys, bat mist-netting surveys, acoustic bat surveys, carcass monitoring, and curtailment studies. Managed correspondence between the developer, operator, and state and federal wildlife agencies. Prepared survey reports, avian bird and bat risk assessment, testimony, and a site-specific Avian and Bat Protection Plan.

Avian and Bat Surveys at Armenia Mountain Wind Energy Project, Tioga and Bradford Counties, Pennsylvania

Project Manager and Field Supervisor. Conducted bird and bat field surveys within proposed wind project. Coordinated field efforts, including breeding bird surveys, raptor surveys, bat mist-netting surveys, and acoustic bat surveys. Managed correspondence between the developer and state and federal wildlife agencies. Prepared survey reports and a site-specific bird and bat risk assessment for the project. Managed two years of post-construction monitoring according to Pennsylvania Game Commission protocols.

Post-construction Avian and Bat Mortality Monitoring at Forward and Lookout Wind Projects, Somerset County, Pennsylvania

Project Manager and Field Supervisor. As the Project Manager for post-construction bird and bat mortality surveys at two of the first operational wind projects to participate in Pennsylvania's Voluntary Cooperative Wind Energy agreement, Mr. Peterson developed survey work scopes, and coordinated fieldwork for multiple years of monitoring, including daily mortality surveys, acoustic bat surveys, and diurnal raptor surveys. Mr. Peterson also coordinated projectrelated agency communications with state and federal wildlife agencies.

Natural Resource Services

Acoustic Bat Surveys: Proposed Road Corridors, Tennessee

Technical and Field Supervisor. Conducted acoustic bat surveys in a variety of habitats within 67-kilometer long segments of multiple potential highway corridors within a National Forest for the Tennessee Department of Transportation. Completed data analysis and prepared survey reports.

Indiana Bat and Rare Bird Surveys at Proposed Wind Energy Project, Jefferson and Oswego Counties, New York

Project Manager and Field Supervisor. Coordinated multiple years of habitat evaluations, acoustic bat surveys, and radio telemetry surveys for Indiana bats at a proposed wind project in northwestern New York. Mr. Peterson also coordinated and conducted field surveys for breeding birds and rare birds within the area.

Project Manager, Senior Wildlife Biologist

Spotted Turtle and Vernal Pool Monitoring on Greenbush Railroad, Southeastern Massachusetts

Project Manager, Field Team Leader, Field Technician. Managed a field crew responsible for monitoring the water quality, invertebrate diversity, amphibian populations, and plant communities within vernal pools located in a commuter rail corridor. Led efforts to document and track populations of spotted turtles within the same corridor. Assisted with development of amphibian/turtle crossing structures, and protocols for testing the effectiveness of these structures.

Natural Community Surveys and Resource Inventory, Moosehead Lake Region, Maine

Field Scientist. Mr. Peterson conducted natural community surveys and rare species surveys, classified natural communities, identified rare plants and animals, and evaluated potential wildlife habitat within parcels proposed for development and conservation within a large proposed development in Maine's north woods.

Eastern Box Turtle Protection Plan, Construction Monitoring, and Relocation, Duxbury, Massachusetts

Field Scientist. Mr. Peterson developed a protocol to protect box turtles during construction in compliance with MESA, and participated in fieldwork efforts, which included preconstruction searches, construction monitoring, turtle handling/relocation, and habitat management.

Blue-Spotted Salamander Surveys and Relocation, Reading, Massachusetts

Field Scientist. Mr. Peterson developed and implemented a survey protocol to inventory, identify, and relocate blue and yellow-spotted salamanders from an upland area proposed for development. Coordinated communications with state wildlife agencies.

Diamondback Terrapin Habitat Assessment and Nesting Surveys, Massachusetts

Field Scientist. Mr. Peterson developed survey protocols and conducted and assessment of suitable habitat features to evaluate mating and nesting activities of a newly discovered diamondback terrapin population at a former landfill proposed for mixed use development in southern Massachusetts.

Project Manager, Senior Wildlife Biologist

PUBLICATIONS

Peterson, T.S., S.K. Pelletier and M. Giovanni. 2016. Long-term bat monitoring on islands, offshore structures, and coastal Sites in the Gulf of Maine, mid-Atlantic, and Great Lakes—final report. Prepared for the US Department of Energy.

Peterson, T.S., S.K. Pelletier, S.A. Boyden, and K.S. Watrous. 2014. Offshore acoustic monitoring of bats in the Gulf of Maine. *Northeastern Naturalist* 21(1): 86-107.

Pelletier, S.K., K.S. Omland, K.S. Watrous, and T.S. Peterson. 2013. Information synthesis on the potential for bat interactions with offshore wind facilities—final report. US Department of the Interior, Bureau of Ocean Energy Management, Headquarters, Herndon, Virginia. OCS Study BOEM 2013-01163. 119 pp.

Johnson, J.S., L.E. Dodd, J.D. Kiser, T.S. Peterson, and K.S. Watrous. 2012. Food habits of Myotis leibii along a forested ridgetop in West Virginia. *Northeastern Naturalist* 19(4): 665-672.

Johnson, J.S., K.S. Watrous, G.J. Giumarro, T.S. Peterson, S.A. Boyden, and M.J. Lacki. 2011. Seasonal and geographic trends in acoustic detection of tree-roosting bats. Acta *Chiropterologica*, 13(1): 157-168.

Peterson, T.S., A. Uesugi, and J. Lichter. 2005. Tree recruitment limitation by introduced snowshoe hares, Lepus americanus, on Kent Island, New Brunswick. Canadian Field Naturalist 119 (4). 569-572.

PRESENTATIONS

Peterson, T.S. Bats in the rotor zone...managing risk with acoustics. Presented at the 2nd International Bat Echolocation Symposium, Tucson, Arizona, 2017.

Peterson, T.S., and A.J. Gravel. How to mortality and activity Relate? Presented at the American Wind Energy Association Wind Project Siting and Environmental Compliance Conference, Austin, Texas, 2017.

Peterson, T.S. Unprecedented change in Maine bats: evidence of the widespread effects of whitenose syndrome. Presented at the Maine Chapter of The Wildlife Society 41st Annual Meeting, Bangor, Maine, 2017.

Peterson, T.S. Bats in the rotor zone...managing risk with acoustics. Presented at the National Wind and Wildlife Coordinating Collaborative Wind and Wildlife Research Meeting XI, Broomfield, Colorado, 2016.

Peterson, T.S. Bats offshore! WREN Webinar Presented Online, 2016.

Peterson, T.S. Managing risk to bats at offshore wind projects: Applying Lessons Learned from Onshore. Presented at the Northeast Bat Working Group, South Portland, Maine, 2015.

Peterson, T.S., S. Pelletier. Bats Offshore...Results of a long-term regional acoustic study. Poster Presentation at the American Wind Energy Association Offshore WindPower 2015, Baltimore, Maryland, 2015.

Project Manager, Senior Wildlife Biologist

Peterson, T.S., S. Pelletier, S. Boyden, L. Wight, and K. Watrous. Tracking bats on the Maine coast using nanotags. Presented at the Northeast Natural History Conference, Springfield, Massachusetts, 2015.

Peterson, T.S. Northern long-eared bats and potential impacts on wind projects in New England. Maine Ocean & Wind Industry Initiative Webinar Presented Online, 2015.

Peterson, T.S., S. Pelletier, S. Boyden, L. Wight, and K. Watrous. Tracking bats offshore using nanotag technology – a pilot study in the Gulf of Maine. Presented at the Energy Ocean International Conference, Atlantic City, New Jersey, 2014.

Peterson, T.S., S. Pelletier, S. Boyden, L. Wight, and K. Watrous. Where, When, and Why are Bats Offshore...and What are the Implications for Offshore Wind Energy? Presented at the Northeast Fish and Wildlife Conference, Portland, Maine, 2014.

Peterson, T.S., S. Boucher, and L. Berube. The aerosphere as wildlife habitat – managing risk. Presented at the Northeastern Association of Fish and Wildlife Agencies, Portland, Maine, 2014.

Hildt, S., and T. Peterson. Surveying the damage: tools and techniques. Invited Presentation at the NRDA Short Course, University of Massachusetts, 2014.

Pelletier, S.K., and T.S. Peterson. Wind Power & Bats Offshore—What are the risks? A current understanding of offshore bat activity. Presented at the American Wind Energy Association Offshore WindPower 2013, Providence, Rhode Island, 2013. Peterson, T.S., S. Boyden, and K. Watrous. Comparison of automated and manual identification methods for acoustic bat survey datasets: implications for future protocols. Poster Presentation at the Northeast Bat Working Group Meeting: Albany, New York, 2013.

Pelletier, S.K., T. Peterson, S. Boyden, K. Watrous, and J. Perkins. Ongoing offshore acoustic bat research in the Atlantic and Great Lakes regions. *Poster Presentation at the Northeast Bat Working Group Meeting: Albany, New York*, 2013.

Peterson, T.S. A new look at bat activity and wind speed in the rotor zone. Poster Presentation at the Northeast Bat Working Group Meeting: Carlisle, Pennsylvania, 2012.

Peterson, T.S., J. Costa, K. Omland, and K. Watrous. Use of pre-construction acoustic bat data to design and forecast site-specific curtailment plans. Poster Presentation at the NWCC Wind Wildlife Research Meeting IX: Denver, Colorado, 2012.

Peterson, T.S., S.K. Pelletier, S.A. Boyden. Acoustic survey of offshore bat activity and migration in the Gulf of Maine. Presentation at the Maine Chapter of the Wildlife Society Wind and Wildlife Meeting, Orono, Maine, 2011.

Peterson, T.S. A Discussion of a suitable framework and scale for modeling and managing impacts to migratory bats at wind projects. Presented at the NWCC Wind Wildlife Research Meeting VIII; Lakewood, Colorado, 2010.

Peterson, T.S, K.S. Watrous, and S.K. Pelletier. Combining technologies to assess potential impacts to Mexican free-tailed bats in central Texas. Poster presentation at the NWCC Wind Wildlife Research Meeting VIII, Lakewood, Colorado, 2010.

Project Manager, Senior Wildlife Biologist

Giumarro, G.J., K.S. Watrous, J.S. Johnson, T.S. Peterson, S.A. Boyden, and M.J. Lacki. Correlation of bat acoustic activity to bat mortality in the eastern United States: a broader understanding of seasonal and geographic trends in acoustic detection of tree-roosting bats. *Presented at the NWCC Wind Wildlife Research Meeting VIII, Lakewood, Colorado,* 2010.

Pelletier, S.K., G.C. Kendrick, T.S. Peterson, and A.J. Gravel. Atlantic offshore bird & bat pilot study: 2009 results. Poster Presentation at the AWEA Offshore Energy Conference, Atlantic City, New Jersey, 2010.

Pelletier, S.K., T.S. Peterson, and G.C. Kendrick. Understanding of the current knowledge of offshore wind and wildlife Issues. *Presented at the NWCC Wind Wildlife Research Meeting VIII; Lakewood, Colorado*, 2010.

Giumarro, G.J., K.S. Watrous, T.S. Peterson, S.A. Boyden, M.J. Lacki, and J.S. Johnson. Seasonal and geographic trends in acoustic detection of treeroosting bats. Presented at the Windpower Conference and Exhibition, Dallas, Texas, 2010.

Giumarro, G., T.S. Peterson, C.W. Meinke, and S.K. Pelletier. Understanding risk to long-distance migratory bats in Canada using an ecological risk framework. Presented at the CanWEA Environmental Assessment Siting Workshop, Halifax, Nova Scotia, 2009.

Pelletier, S., G. Kendrick, G. Giumarro, T. Peterson, and A. Gravel. Gulf of Maine offshore bat and bird project. *Poster Presentation at AWEA Offshore Energy Conference; Boston, Massachusetts, 2009.* Giumarro, G., J.S. Johnson, T.S. Peterson, K.S. Watrous, and S. Boyden. Summary of seasonal distribution of migratory tree bats in the northeastern United States using passive acoustic sampling. *Presented at the 1st International Symposium on Bat Migration. Berlin, Germany*, 2009.

Giumarro, G., S. Pelletier, K. Watrous, T. Peterson, and J. Johnson. Seasonal distribution of tree bats in the Northeast using passive acoustic sampling. *Poster Presentation at the Windpower Conference and Exhibition, Chicago, Illinois,* 2009.

Pelletier, S.K., C.W. Meinke, T.S. Peterson, and A.J. Gravel. Radar and acoustic bat surveys in pre and post-construction bird and bat mortality monitoring. *Poster Presentation at the AWEA Conference in Los Angeles, California*, 2008.

Pelletier, S.K., A.J. Gravel, and T.S. Peterson. Nocturnal avian flight heights relative to risk of collision with wind turbines. *Presented at the NWCC Wind Wildlife Research Meeting VII, Milwaukee, Wisconsin,* 2008.

Meinke, C.W., T.S. Peterson, J.P. Lortie, and S.K. Pelletier. Assessing risk to bats from wind facilities using the weight-of-evidence approach to ecological risk assessment. Presentation at the joint meeting of the Northeast Bat Working Group and the Southeastern Bat Diversity Network. Blacksburg, Virginia, 2008.

Lortie, J.P., G. Giumarro, R.D. Roy, and T.S. Peterson. Using ecological risk assessment to characterize risk to birds and bats at wind farms. *Presentation at the* 14th Annual Conference of the Wildlife Society, Tucson, Arizona, 2007.