

**THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE**

SEC DOCKET NO. 2019-02

**APPLICATION OF CHINOOK SOLAR, LLC FOR A CERTIFICATE OF SITE
AND FACILITY FOR THE CHINOOK SOLAR PROJECT IN FITZWILLIAM,
NEW HAMPSHIRE**

**PREFILED TESTIMONY OF JOSEPH PERSECHINO
ON BEHALF OF
CHINOOK SOLAR, LLC
OCTOBER 14, 2019**

1 Qualifications of Joseph Persechino

2 Q. Please state your name and business address.

3 A. My name is Joseph Persechino. My business address is Tighe & Bond, 177
4 Corporate Drive, Portsmouth, New Hampshire 03801.

5 Q. Who is your current employer and what position do you hold?

6 A. I am a Senior Project Manager at Tighe & Bond. Tighe & Bond is a company
7 that specializes in engineering and environmental services consulting, including
8 renewable energy, site/civil design, permitting and planning, geotechnical, structural,
9 electrical, site assessment, planning and remediation, health and safety, regulatory
10 compliance, wetlands and ecological services, design transportation engineering,
11 including traffic and roadways, and wastewater and stormwater engineering.

12 Q. Please describe your responsibilities at Tighe & Bond, including those that
13 relate to the Chinook Solar Project that is the subject of this docket.

14 A. As a Senior Project Manager, I am responsible for all aspects of a particular
15 Project, including project initiation, site evaluations, comprehensive site/civil design and

1 permitting. I specialize in the development, design, and engineering of renewable energy
2 projects throughout New England. Tighe & Bond was engaged by Chinook Solar, LLC
3 (“Chinook Solar”) to work on various aspects of the proposed 30MW Chinook solar
4 generating facility in Fitzwilliam, New Hampshire (“the Project”), including site
5 evaluation and comprehensive site/civil design work. As the result of all of these
6 activities, I am very familiar with the proposed Project, including the civil design of the
7 Project, the Alteration of Terrain permit application, stormwater design considerations,
8 wetlands impacts and the decommissioning plan. We prepared the Alteration of Terrain
9 (“AoT”) Permit Application for the Project, which is referred to in the Application and
10 has been marked as Appendix 4 to the Application (“Permit Applications”).

11 **Q. What are your background and qualifications?**

12 A. I have over 16 years of experience in civil design, solar array design and
13 permitting, and stormwater design. I am a professional engineer with a license in New
14 Hampshire and Massachusetts. I am also a designer of subsurface disposal systems in
15 New Hampshire and a Leadership in Energy and Environmental Design Accredited
16 Professional. I have a Bachelor of Science in Civil Engineering from the University of
17 New Hampshire. More detail on my background and experience is included in my
18 resume, which is included as Attachment A to this testimony.

19 **Q. Have you previously testified before this Committee and/or any other state**
20 **permitting agencies?**

1 A. I have not testified before the New Hampshire Site Evaluation Committee (“SEC”
2 or “Committee”), but I have testified in other public forums in the course of my career.

3 **Purpose of Testimony**

4 **Q. What is the purpose of your testimony?**

5 A. The purpose of my testimony is to provide the Committee with an overview of the
6 design of the Project, including the civil design, the soils analysis, the AoT Permit, the
7 stormwater design, the decommissioning plan, and various other aspects of the Project.

8 **Site Information**

9 **Q. Please describe the location and basic characteristics of the proposed Project**
10 **site.**

11 A. The Project is proposed to be located in Fitzwilliam, New Hampshire.
12 Specifically, the Project footprint is proposed to be located on approximately 110 acres of
13 private lands which are currently under either an option to purchase or an option to lease
14 agreement between Chinook Solar and each of five landowners. The total amount of land
15 subject to these agreements is in excess of 500 acres of land, though as noted above the
16 footprint of the proposed Project and thus the amount of land that will be cleared for the
17 Project is a much smaller portion of the land under agreement. The Project is a 30MW
18 electric generating facility, with the electricity to be generated through the use of solar
19 panels. In general, the Project site is one which has been actively forested for a number
20 of years. The Project as proposed would include ground-based solar panels, 15 inverters
21 for converting Direct Current (“DC”) to Alternating Current (“AC”), and one substation

1 with a switchyard to step-up the voltage of power delivered to the transmission grid. The
2 Project includes the interconnection lines and equipment necessary to connect the Project
3 to the National Grid transmission line, which is a short distance from the Project.

4 **Tighe & Bond's Design for the Project**

5 **Q. Did you and others with whom you work at Tighe & Bond prepare the**
6 **design plans for this Project?**

7 A. Yes. In conjunction with others at Tighe & Bond, I prepared the design plans for
8 this Project.

9 **Q. Please provide an overview of the site/civil design for the Project.**

10 A. The design for the Project incorporates detailed field studies including
11 topographic and boundary surveys, wetland and resource studies, archeological studies,
12 soils surveys, etc. The information obtained in the field was used to limit impacts to
13 environmental resources while attempting to optimize the energy output of the solar
14 array. Where practical, existing logging roads are to be upgraded to provide access to the
15 site with additional access roads as needed. After multiple consultations with the New
16 Hampshire Department of Environmental Services ("NHDES") Alteration of Terrain
17 Bureau ("AoT Bureau"), the Project Team moved forward with the design of the site
18 solar array layout and stormwater Best Management Practices ("BMPs") in accordance
19 with the NHDES' "Stormwater Design Guidance for Large Scale Solar Arrays (January
20 2019)". To reduce potential stormwater runoff issues during construction, the Project will
21 be constructed in phases to limit the amount of contiguous cleared areas at any given

1 time. Stormwater features such as sedimentation basins and swales will be constructed
2 prior to the installation of roads, equipment pads, solar racking, solar modules, and
3 underground electrical runs. The Project includes a bridge and an open bottom box
4 culvert that will span the two wetland crossings. Because of this the Project will have no
5 direct wetland impact. The array will be enclosed by a 7' tall chain-link fence with a 6"
6 wildlife passage gap at the bottom. There are also breaks in the fenced-in areas to allow
7 for the migration of wildlife through the Project. To the north side of the Project, the
8 electrical substation is proposed. The substation will be constructed on a gravel pad and
9 enclosed by an 8' tall chain-link fence.

10 **AoT Permit Application**

11 **Q. Did you and others with whom you work at Tighe & Bond prepare the**
12 **AoT Permit Application for this Project?**

13 A. Yes. In conjunction with others under my direct supervision at Tighe & Bond, we
14 prepared the AoT Permit Application for this Project.

15 **Q. Please describe what is included in the AoT Permit application for this**
16 **Project.**

17 A. The AoT Permit application, a copy of which is included as Appendix 4 to the
18 Application, includes a compilation of narrative, site/civil drawings, GIS Figures, a Site-
19 Specific Soils Map ("SSSM") and a detailed stormwater analysis and design. The Project
20 was designed in accordance with the NHDES Solar Guidance for Large Scale Solar
21 Projects (January 2009) and the New Hampshire Stormwater Manual, where applicable.

1 The permanent stormwater BMPs designed for the Project include level spreaders,
2 detention basins, and vegetated buffers.

3 **Decommissioning Plan for the Project**

4 **Q. Did you and others with whom you work at Tighe & Bond prepare the**
5 **decommissioning plan for this Project?**

6 A. Yes. In conjunction with Dennis Moran and others under my direct supervision at
7 Tighe & Bond, we prepared the decommissioning plan for this Project, which is
8 Appendix 16C to the Application. Mr. Moran has demonstrated knowledge and
9 experience in similar solar energy projects and cost estimates, including but not limited to
10 working on decommissioning plans for the following projects:

- 11 • Woodville Road Solar, Richmond, RI, (5 MW)
- 12 • New Marlborough Solar, New Marlborough, MA (5.8 MW)
- 13 • Redrock Solar, Ludlow and Grandy, MA (5.9 MW)
- 14 • Spencer Landfill Solar, Specner, MA (4.4 MW)
- 15 • Nutmeg Solar, Endfield CT (20 MW)

16 **Q. Has Chinook Solar asked for a waiver from some of the decommissioning**
17 **requirements in the rules?**

18 A. Yes, Chinook Solar has asked for a partial waiver from the requirement in Admin.
19 Rule Site 301.08(d)(2)d that all underground infrastructure at depths less than four feet
20 below grade be removed from the site. That rule allows the abandonment of underground
21 infrastructure at greater depths. Based on our experience with other solar projects and the

1 kind of infrastructure that is used in these projects, as explained in more detail in the
2 Applicant's Request to Waive Certain Decommissioning Plan Requirements, we believe
3 that removing all infrastructure at depths less than 36 inches should be sufficient. It is
4 important to note that under the National Electric Code electric cables are required to be
5 buried a minimum of three feet below grade when the cable is above a certain voltage
6 class, as is the case here. Since AC collection cables for the Project will be installed at a
7 minimum depth of three feet in accordance with the electric code, and their subsequent
8 removal would cause significant ground disturbance, Chinook Solar requests that only
9 cables installed at three feet in depth or less, as well as other equipment that is located
10 underground at depths of three feet or less, be removed during decommissioning.

11 Chinook Solar also requests a further waiver from the rule when solar racking piles have
12 been concreted into rock. Solar racking piles are typically driven into the ground using
13 pile driving equipment to a depth of 6 to 10 feet below grade, depending on soil
14 conditions. During decommissioning, piles that have been installed using pile driving
15 equipment can be removed using equipment similar to the equipment used for pile
16 installation. At the proposed Project site, due to the presence of shallow rock, there will
17 be locations where it will not be feasible to install piles using conventional pile driving
18 equipment. In these circumstances, it is customary to drill a hole into the rock, insert the
19 pile and then install concrete to anchor the pile to the shallow rock for structural support
20 of the solar racking. Chinook Solar is requesting a waiver from having to remove piles at
21 depths shallower than three feet that have been concreted into rock. It is proposed that

1 these piles will be cut off at the interface to the concrete in lieu of removing the pile to a
2 depth of three feet. Doing this will avoid even greater disturbance to the terrain that
3 would be caused by having to drill or possibly dynamite rocks with piles in them at
4 shallower depths.

5 **Q. Please describe what is included in the decommissioning plan for this Project.**

6 A. The decommissioning plan includes a detailed opinion of the probable cost to
7 remove the system from the parcel. As required in the Committee rules, the plan does not
8 account for the anticipated salvage value of facility components or materials. Chinook
9 Solar intends to provide financial assurance in the form of a surety bond, which is
10 described in more detail in the prefiled testimony of Joseph M. Balzano. The plan also
11 includes a detailed description of the removal of all of the equipment from the site,
12 including the transformer, other than underground structures as described in more detail
13 below.

14 **Conclusion**

15 **Q. In your opinion, will the Project have an unreasonable adverse effect on**
16 **water quality, the natural environment, and public health and safety?**

17 A. No. Based upon the information set forth in the AoT Permit, in the design plans
18 for the Project, in the decommissioning plan, and in my testimony above, I believe that
19 the Project will not have an unreasonable adverse effect on water quality, the natural
20 environment, and public health and safety.

21 **Q. Does this conclude your testimony?**

- 1 A. Yes, this concludes my testimony at this time, though I reserve the right to file
- 2 supplemental testimony in accordance with the Committee's procedural schedule.

ATTACHMENT A



JOSEPH PERSECHINO, PE, LEED AP

SENIOR PROJECT MANAGER

Joe Persechino is a project manager who specializes in the development, design, and engineering of renewable energy projects throughout New England. His experience on renewable energy projects ranges from project initiation and site evaluations to comprehensive site/civil design and permitting. He has successfully acquire necessary permits for a range of renewable energy projects at the local, state, and federal level. In addition to his renewable energy work, he has more than 16 years of experience in civil engineering, site design, permitting and construction for various commercial, roadways, healthcare, municipal, government, and educational projects. Joe advocates sustainability and Low Impact Design (LID) whenever possible.

EXPERIENCE

16 Years

SPECIALTIES

Site/Civil Design

Low Impact Design

Stormwater Design

Water & Wastewater Design & Permitting

Solar Array Design & Permitting

Local, State, & Federal Permitting

EDUCATION

Bachelor of Science

Civil Engineering

University of New Hampshire

Institute of Corporate Sustainability

University of New Hampshire

Designer of Subsurface Disposal

Systems, New Hampshire

Certified Professional in Erosion and Sediment Control (CPESC)

Certified Aboveground Storage Tank Inspector

LICENSES & REGISTRATIONS

Professional Engineer

MA #52349

NH #12389

Leadership in Energy and Environmental Design (LEED)
Accredited Professional

Septic Designer Permit (#1620)

CPESC (#4970)

PROFESSIONAL AFFILIATIONS

USGBC-NH Chapter

Leadership Seacoast Alumnus – Class of 2010

American Society of Civil Engineers

RENEWABLE ENERGY PERMITTING AND DESIGN

UTILITY SCALE SOLAR – NEW ENGLAND

Served as Project Manager for the design and permitting of four utility-scale solar projects up to 30 MW in generating capacity. Provided the design and permitting support to complete Maine Site Location of Development Law Applications (SLODA) and New Hampshire Alteration of Terrain Applications (AoT).

EASTON LANDFILL SOLAR ARRAY – EASTON, MA

Designed, permitted, and performed construction oversight for the construction of a 1.86 MW solar array on an existing capped and closed landfill in Easton, Massachusetts. The project was one of the first solar projects in Massachusetts on a landfill with an existing active gas collection system. Permits were required and approved by the local Conservation Commission, MEPA, NHESP, and the MassDEP.

DARTMOUTH LANDFILL SOLAR ARRAY – DARTMOUTH, MA

Assisted with design, permitting, and construction oversight for the construction of a 1.28 MW solar array on an existing capped and closed landfill in Dartmouth, Massachusetts.

SITE/CIVIL DESIGN

SOUTH DRIVE - UNIVERSITY OF NEW HAMPSHIRE – DURHAM, NH

Provided design and permitting services for a 3,000 foot roadway extension of South Drive in Durham, NH. The design included four bus stops, a separate multi-use path, intersection realignment, a 65-car parking lot, an athletic field, and an 18-foot wide open bottom box culvert with stream simulations for the College Brook stream crossing. As part of the permitting, an NHDES alteration of terrain permit and wetlands permit were required. Wetland mitigation for the project was provided by three rain gardens downstream of the project that will treat stormwater runoff from more than nine acres of previously untreated impervious areas.

PETTEE BROOK RESTORATION – UNIVERSITY OF NEW HAMPSHIRE – DURHAM, NH

Provided design and permitting services for a 500-foot section of Pettee Brook in Durham, NH. Geomorphic and natural channel design guidelines were used to realign the brook from eroding the adjacent parking area. The floodplain around the brook was also expanded to allow for additional flood

storage. The NHDES Wetlands Bureau deemed the project "self-mitigating" as erosion was reduced, the floodplain was expanded, and wetland plantings were used to enhance bordering wetland.

HOOD HOUSE DRIVE - UNIVERSITY OF NEW HAMPSHIRE – DURHAM, NH

Partnered with the University of New Hampshire Stormwater Center and the Interlocking Concrete Pavement Institute to design and reconstruct a parking area and roadway at the University of New Hampshire. The design included the complete replacement of the existing pavement with porous pavers by use of a mechanical installation process. A long term monitoring plan has been implemented to compare the stormwater treatment capacity of the porous paver system with other porous pavement systems.

THE LODGES AT WEST EDGE STUDENT HOUSING DEVELOPMENT – DURHAM, NH

Designed and permitted a 26-building, 460-bed, student housing development at the University of New Hampshire. The project included the design of a shared drive and bus stop with University and a 1,000 foot long porous asphalt multi-use path from the development to the University path network. The stormwater design included porous asphalt parking areas, a gravel wetland, and three rain gardens. Permits were received from the NHDES Wetlands Bureau, Alteration of Terrain Bureau, Wastewater Bureau, and the Town of Durham.

THE COTTAGES OF DURHAM STUDENT HOUSING DEVELOPMENT – DURHAM, NH

Designed and permitted a 21-acre "cottage" style student housing development at the University of New Hampshire that includes 99 buildings that collectively house a total of 600 students. The stormwater design included over an acre of porous asphalt and two state of the art gravel wetlands. Permitting included approval from the NHDES Wetlands Bureau, Alteration of Terrain Bureau, Wastewater Bureau, Strafford Regional Planning Commission review and local approvals from the Town of Durham.

QUAD WAY - UNIVERSITY OF NEW HAMPSHIRE – DURHAM, NH

Designed the construction of a new stadium across from the existing fieldhouse with seating for approximately 10,000 spectators. Engineering services included all utilities, service/emergency access, and pedestrian access. These enhancements greatly improve the overall functionality of the stadium where intercollegiate Division 1 football and soccer games, as well as track occur.

QUAD WAY - UNIVERSITY OF NEW HAMPSHIRE – DURHAM, NH

Designing utility replacement and roadway reconstruction that includes the removal and replacement of utilities along Quad Way and within the Lower Quad. The utilities include approximately 900 feet of domestic hot water and heating lines, 1,200 feet of sewer, 1,200 feet of domestic hot water, and 100 feet of drain lines.

WINDHAM HIGH SCHOOL – WINDHAM, NH

Designed and permitted a new \$50 million high school for the Windham, New Hampshire School District. The project included 600 parking spaces, athletic fields and the design of a future track and field facility. Access to the site required the design of a new $\frac{3}{4}$ mile roadway that preserved a historically significant bridge structure.

UNIVERSITY OF NEW HAMPSHIRE POROUS PARKING LOT – DURHAM, NH

Partnered with the University of New Hampshire Stormwater Center to design and reconstruct a 150-car parking lot. The design included the complete replacement of the existing pavement with porous asphalt. A custom stormwater monitoring station was designed for long term analysis of runoff from the site.

COMMERCIAL, RETAIL & OFFICE PROJECTS – NEW ENGLAND

Provided design, permitting and construction administration services for numerous commercial, retail, supermarket, and office projects in Massachusetts, New Hampshire, and Maine. Site designs included traffic circulation, parking lot layout, stormwater quantity and quality measures, utilities services, and landscaping.

WATER/WASTEWATER

DURHAM WATER AND SEWER – DURHAM, NH

Designed and managed the installation of 1,000 feet of 10" water main, and 1,500 feet of 12" gravity sewer for the Town of Durham, New Hampshire. The project included two locations that were directional drilled under NHDOT roadways and a perennial stream.

RYE ASSISTED LIVING FACILITY – RYE, NH

Designed and permitted a 10,000 gallon per day package wastewater treatment system for an assisted living facility in Rye, New Hampshire. The project included a Groundwater Discharge permit and monitoring plan from the NHDES.

WINDHAM HIGH SCHOOL – WINDHAM, NH

Designed and permitted a 17,000 gallon per day subsurface disposal system for the new Windham High School in Windham, New Hampshire. The design included a groundwater mounding analysis and interceptor drains up-gradient of the system.