

**STATE OF VERMONT  
PUBLIC SERVICE BOARD**

Petition of South Forty Solar, LLC for a )  
certificate of public good, pursuant to 30 )  
V.S.A. § 248, authorizing the installation and )  
operation of a 2.5 MW solar electric )  
generation facility located off of Sunset Cliff )  
Road in Burlington, Vermont, to be known as )  
the “South Forty Solar Farm” )

Docket No. \_\_\_\_\_

**PREFILED DIRECT TESTIMONY OF KARINA DAILEY**

1 **Q. Please state your name, occupation and business address.**

2 A. My name is Karina Dailey. I am an environmental scientist at Trudell Consulting Engineers  
3 (“TCE”), which is an engineering, environmental, and consulting firm located at 478 Blair  
4 Park Road, Williston, Vermont 05495.

5  
6 **Q. Please describe your professional background, qualifications, and experience.**

7 A. I graduated from Antioch University of New England in May of 2010, earning a Master of  
8 Science degree in Environmental Science with a focus in Conservation Biology. Prior to  
9 joining TCE in 2011, I worked as a naturalist ranger for Grand Teton National Park, project  
10 manager for the Winooski Natural Resources Conservation District, restoration ecologist for  
11 US Fish and Wildlife Service, and as a consulting ecologist for Biota Research and  
12 Consulting, Inc. in Jackson Hole, Wyoming. My duties and professional experience at TCE  
13 include responsibility for the Environmental Department at TCE, project management,  
14 natural resource compliance, field data collection, and technical review and testimony for  
15 federal, state, and local permitting including Act 250 and Section 248 review.

16 My resume is attached as *Exhibit SFS-KD-1*.

17

1 **Q. Have you previously testified before the Public Service Board or in other judicial or**  
2 **administrative proceedings?**

3 A. Not at the PSB. However, I am involved in a number of solar projects that will file  
4 applications for a Certificate of Public Good with the PSB this year.

5 I have testified as an expert in other regulatory and judicial venues including  
6 Environmental Court for Fontaine, Daniel and Michael VTEC 12-1-10 & 143-9-10,  
7 LUP#4C0893-6 and Costco Wholesale Corporation, VTEC 13-1-12, 75-6-12, 24-2-12, 104-  
8 8-12, 181-12-11, & 41-4-13.

9  
10 **Q. What work have you conducted with respect to the Project?**

11 A. TCE was retained by South Forty Solar, LLC to conduct environmental consulting services  
12 for the proposed solar electric generation facility on Sunset Cliff Road in Burlington,  
13 Vermont. This work included wetlands delineation and permitting, preparing a vegetation  
14 management plan, natural community mapping, rare plant survey, wildlife assessment, and  
15 vernal pool surveys. In addition, Meghan Lout of Western Ecosystems Technology, Inc.  
16 conducted an avian study, which I reviewed in the course of performing my environmental  
17 assessment work, in preparing the wetlands permit application, and in preparing this  
18 testimony.

19 The wetland delineation was conducted on November 6, 7, and 12, 2012, with the  
20 assistance of April Moulart (of EMR2 Consulting). The purposes of the site visit were: 1)  
21 to determine if any wetlands, as defined in the 1987 U.S. Army Corps of Engineers  
22 (“ACOE”) Wetlands Delineation Manual (Environmental Laboratory 1987), exist within the  
23 Project area; 2) if so, to determine the locations and boundaries of all wetlands within the

1 Project area; and 3) to ensure compliance with Section 404 of the Federal Clean Water Act  
2 and the Vermont Wetland Rules. These rules prohibit the disposal of fill material into  
3 wetlands and waters of the United States without a permit.

4 Data for the routine wetland delineation was gathered from several sources including  
5 Vermont significant wetlands mapping; US Fish and Wildlife Service's National Wetlands  
6 Inventory (NWI) mapping; the national list of plant species that occur in wetlands in  
7 Northwest-Region 1; and color aerial photography.

8 The wetland delineation was reviewed and approved by ACOE and the Vermont  
9 Department of Environmental Conservation's ("DEC") Wetlands Section. Marty Abair  
10 from ACOE determined that the Project did not require the Corps's authorization on March  
11 3, 2014. *Exhibit SFS-KD-6*. The State of Vermont's District Wetland Ecologist, Laura  
12 Lapierre visited the site most recently on May 2, 2014 accompanied by me, April Moulaert,  
13 and Frank von Turkovich. Prior to this visit, State Wetland Ecologist Alan Quackenbush  
14 visited the site on November 28, 2012, accompanied by me and April Moulaert. Both State  
15 Ecologists verified the wetland delineation boundaries.

16 I also prepared a vegetation management plan for the proposed Project to provide  
17 additional detail concerning vegetative treatment (including cutting and mowing) and  
18 prescribed tree height management, and a non-native invasive species control plan.

19 On April 12, 2013, I conducted Natural Community Mapping concurrently with the  
20 wetland delineation. Eric Sorenson of the State Wildlife Diversity Program verified the rare  
21 natural community (Wet Sand-Over-Clay Forest).

22 I visited the site with Errol Briggs and Patti Green-Swift of Gilman & Briggs  
23 Environmental to survey rare plants on June 4 and August 16, 2013, and identified a small

1 population of *Juncus torreyi* (Torrey's Rush). We prepared and submitted a mitigation plan for  
2 this population to the Agency of Natural Resources ("ANR").

3 I conducted site visits in January and February 2013, and prepared a wildlife  
4 assessment based on my prior consultation with John Austin (Biologist with the Vermont  
5 Fish and Wildlife Department ("DFW")). The assessment included a memorandum based on  
6 observations of wildlife sign and desktop GIS analysis.

7 Ms. Moulaert and I conducted a vernal pool survey on May 3, 2013, with an  
8 additional site visit by Ms. Moulaert on May 15, 2013.

9  
10 **SECTION 248 CRITERIA**

11 **Wetlands – 10 V.S.A. § 6086(a)(1)(G)**

12 **Q. Is the Project located in or adjacent to a wetland or wetland buffer? If so, will the**  
13 **Project comply with the Water Resources Board rules regarding significant (Class 1**  
14 **or 2) wetlands?**

15 A. The Project is located within a portion of a 22-acre (approximate) wetland complex,  
16 including 13 acres of forested wetland, 3 acres of wet meadow, and 6 acres of scrub-shrub  
17 wetland. *Exhibit SFS-KD-3 (Revised Vegetation Management Plan)*, Appendix 1. The  
18 wetland complex is a Class 2 wetland because it meets the presumption of significance under  
19 the Wetland Rules. SFS has obtained an Individual Wetland Permit (#2013-251) from ANR  
20 determining the Project will comply with 10 V.S.A. chapter 37 and the Wetland Rules and  
21 will have no undue adverse effect on protected functions and values of the wetland.  
22 *Exhibit SFS-KD-2 (Individual Wetland Permit #2013-251)*. The Individual Wetland  
23 Permit also sets forth conditions SFS must abide by to protect the wetland.

1           The 22-acre wetland complex is an isolated wetland. It is not associated with a  
2 perennial watercourse. The main source of hydrology for the complex appears to be a  
3 combination of a high water table and precipitation. The soils on this site mainly have a high  
4 water table and/or standing water in the fall and the spring and after rain events. The  
5 wetland complex is located in the City of Burlington and is surrounded by dense residential  
6 development. Several informal walking trails run through this property and are generally  
7 used for dog walking. The Project parcel has an agricultural history. In recent years, the  
8 wooded areas on the property have been left intact. The field along Sunset Cliff Road has  
9 been mowed and/or brush hogged periodically in the past.

10           The dominant wetland community type on the property would be the forested  
11 wetland. Typical species in the forested wetland include red maple (*Acer rubrum*), American  
12 elm (*Ulmus americana*), buckthorn (*Rhamnus cathartica*), and skunk cabbage (*Symplocarpus*  
13 *foetidus*). The remaining wetland on the parcel is comprised of wet meadow vegetation and  
14 scrub-shrub wetland. The NRCS Soil Survey has mapped a few different soil series in the  
15 wetland on the site. The wetland soils on this site are a mix of Au Gres sand-over-clay soils  
16 and Covington clays. Both have a restricting layer of clay that reduces the rate of water  
17 infiltration through the soil. Hydric soil indicators include a depleted soil matrix, sandy  
18 redox, and iron-manganese masses. The wetland hydrologic indicators include soil  
19 saturation, high water table, surface water, and oxidized rhizospheres found within the upper  
20 12 inches of the soil profile.

21           To avoid and minimize impacts on the Class 2 wetland, the Project has been  
22 designed (and the Wetland Permit provides) as follows:

- 1           • No earth moving, grading, or excavation will be required in the wetland or its buffer  
2           zone.
- 3           • Clearing of forest vegetation in wetland will be limited to approximately 1.2 acres  
4           within wetlands and 1.5 acres of wetlands buffer. Direct impacts to the wetland is  
5           limited to approximately 91 square feet of wetlands from the placement of solar  
6           array and fence posts.
- 7           • The vegetation will be cut flush to the ground, and no de-stumping will occur in  
8           wetlands.
- 9           • Solar array support structures and inverter enclosure foundations will be pile driven  
10          steel to eliminate the need for concrete footings and foundation excavation.
- 11          • Electrical conduit will be run above grade in the wetland and its buffer zone.
- 12          • A rare wetland natural community (Wet Sand-Over-Clay Forest) located on the  
13          Project parcel will not be impacted.
- 14          • The selective tree height management zone within the designated 50 foot natural  
15          communities buffer, which is needed to prevent shading of the solar project, will be  
16          limited and will follow the *South Forty Solar Farm Revised Vegetation Management Plan*  
17          approved by ANR in the Wetland Permit.
- 18          • All contractors' equipment will be cleaned of observable soil or vegetation prior to  
19          work in wetlands and buffer zones to prevent the spread of invasive species. SFS is  
20          required under the Wetland Permit to monitor and control invasives in the portion  
21          of the wetland in question in accordance with the Revised Vegetation Management

1 Plan. No herbicide treatment can take place without prior approval from the  
2 Vermont Wetlands Program.

- 3 • SFS is required to retain an environmental compliance monitor to monitor its  
4 compliance with the Individual Wetland Permit, and to submit weekly reports to the  
5 Vermont Wetlands Program.
- 6 • SFS will mow the area of the solar array no more than once a year, no earlier than  
7 August 1, and in a way which allows shrubby vegetation to persist the majority of the  
8 year. SFS will only mow within and adjacent to the rare plant population no more  
9 than once a year, and no earlier than October 15.

10 See *Exhibits SFS-KD-2 and -3*.

11 The only impervious surfaces associated with the Project are the 91 sq. ft. of direct  
12 wetland impact associated with the driven piles and an additional 16.5 sq. ft. of impact from  
13 the driven piles within the wetland buffer. In addition, there will be no earth moving in the  
14 wetland or its buffer zone. Some woody and herbaceous vegetation will be cut from the  
15 wetland and its buffer zone but the herbaceous vegetation will continue to grow after the  
16 solar array is installed. Therefore, the wetland will continue to provide storage for storm  
17 runoff once this Project is completed. This Project will not have an undue adverse impact  
18 on this function.

19 In my opinion, and as determined in the Wetlands Permit, no undue adverse impact  
20 will occur to the wetland.

21  
22

1 **Q. Will the Project have an undue adverse impact on any non-significant (Class 3)**  
2 **wetlands?**

3 A. The Project is not located in the vicinity of any Class 3 wetlands.  
4

5 **Necessary Wildlife Habitat and Rare, Threatened,**  
6 **and Endangered Species – 10 V.S.A. § 6086(a)(8)(A)**

7 **Q. Is the Project located in or adjacent to any necessary wildlife habitat or habitat of any**  
8 **endangered species? If so, will the Project destroy or significantly imperil necessary**  
9 **wildlife habitat or any endangered species?**

10 A. For the reasons discussed below, the Project will not destroy or significantly imperil  
11 necessary wildlife habitat or any endangered species.

12 A wildlife assessment and an avian study were conducted on the Project site, as  
13 described below:

14 *Avian Study*

15 Meghan Lout of Western Ecosystems Technology, Inc. conducted the avian study.  
16 The study was requested by the DFW to examine whether any necessary habitat existed at  
17 the site for the American Woodcock, a game species in Vermont. The study included weekly  
18 fixed-point surveys from February 5 through June 3, 2013. No American woodcock were  
19 observed during any of the visits. ***Exhibit SFS-KD-4.***

20 Fifty-four species were detected during the fixed-point bird surveys. Four sensitive  
21 species were detected in flight over the Project area: fish crow, great-blue heron, chestnut-  
22 sided warbler, and black-throated blue warbler. These bird species have declining habitat in  
23 Vermont and thus are identified as species of concern by the DFW. The fish crow and

1 great-blue heron were only observed flying over the Project site, and were not observed  
2 utilizing any habitat on the site.

3 Likewise, the chestnut-sided warbler and black-throated blue warbler were only  
4 observed in flight over the Project site on their migration route to off-site summer breeding  
5 ground, and were not observed utilizing any habitat on the site. I note that these warbler  
6 species are known to best utilize second growth habitat, and have benefited from the  
7 clearing of mature forests. They forage in low to mid-level forests and prefer to nest in  
8 shrubs that are low to the ground. Although the avian study noted that the Project site  
9 includes habitat for wintering and breeding species and potential stopover habitat for  
10 migratory species, “no significant impacts are expected to affect the bird species observed at  
11 the population level.”

12 Based on this study and the habitat needs of these species, the Project will not  
13 destroy or significantly imperil migratory or breeding habitat for these species. As a result,  
14 the Project will not have an undue adverse impact on any of these species.

15 DEC and DFW staff were provided a copy of the avian study, DFW staff conducted  
16 their own site visit on January 3, 2013, and both departments have been actively involved in  
17 the review of this Project through the wetlands permit application. Agency staff have raised  
18 no concerns regarding the species discussed above or about any other potential bird habitat  
19 on the parcel. DEC concluded in issuing the Wetland Permit that the Project “will not result  
20 in an undue adverse impact to [the wetlands habitat] function.” *Exhibit SFS-KD-2.*

21  
22  
23

1        *Wildlife Study*

2                On January 25, 2013, I met with John Austin, Alan Quackenbush, and Eric Sorenson  
3 of ANR. Mr. Austin asked that SFS conduct a wildlife assessment, which I performed based  
4 on two site visits in January and February 2013. The assessment resulted in a memorandum  
5 based on observations of wildlife sign and desktop GIS analysis. In addition, during a site  
6 visit in the winter of 2014, I observed little to no change in wildlife. ***Exhibit SFS-KD-5.***

7                The wildlife sign and species observed on the site included a variety of winter  
8 songbird species, woodpeckers (*Picoides pubescens*, *Dryocopus pileatus*, and *Picoides villosus*), barred  
9 owl, porcupine, red fox, eastern cottontail, gray squirrel, and whitetail deer. These species  
10 are common and typical of that found in a suburban environment. The Project area is  
11 diverse in that it offers wildlife a mosaic of vegetative cover types; however, the potential  
12 habitat is small, has a past history of disturbance, and is largely fragmented from other  
13 undeveloped parcels.

14                No necessary wildlife habitat for deer—deer wintering yards—exist on or within one  
15 mile of the Project site (ANR Natural Resources Atlas). Additionally, the Project as  
16 proposed leaves undeveloped and protects the largest undisturbed portion of the parcel, the  
17 Wet-Sand-Over-Clay-Forest which is recognized as a rare natural community.

18                The wetland located on the Project site provides some winter habitat for white-tailed  
19 deer and breeding habitat for wood frogs. ANR found that “[b]ecause of the urban  
20 surroundings, the wetland’s potential to serve wildlife is lowered. The wetland will continue  
21 to have a variety of habitat types and a portion will be left untouched, including the forested  
22 wetland portion with past confirmed amphibian breeding.” It concluded that “the Project

1 will not result in an undue adverse impact to this function.” *Exhibit SFS-KD-2*. I agree  
2 with these conclusions.

3  
4 *Vernal Pool Survey*

5 April Moulart and I conducted a vernal pool survey on May 3, 2013, with an  
6 additional site visit by Ms. Moulart on May 15, 2013. No amphibian egg masses were  
7 found, but approximately five wood frog tadpoles and mosquito larvae were identified. Two  
8 additional vernal pool surveys were conducted in 2014. None of these surveys yielded any  
9 evidence of the presence of salamander species (*Ambystoma*).

10  
11 *RTE Plants*

12 A small population of *Juncus torreyi* (Torrey’s Rush), a rare plant (S2), was located in  
13 the subject wetland near Sunset Cliff Road. The population of approximately 10 specimens  
14 is located in the western corner of the Project area within the Project fence line but outside  
15 the proposed array racking limits. SFS consulted with Bob Popp, State Botanist, who  
16 recommended that if the plants are not going to be disturbed, they should be left in place.  
17 Under the Wetlands Permit, maintenance mowing can only take place in the fall when the  
18 plant is dormant. Additionally, the population will be monitored by a qualified botanist as  
19 the permit requires. For these reasons, the population is anticipated to persist and the  
20 Project will not result in any undue adverse impact on this population.

21 The design of the Project and the monitoring of the rare rush ensure that the Project  
22 will have no undue adverse effect on necessary wildlife habitat or rare, threatened, and  
23 endangered species.

1                    **Rare and Irreplaceable Natural Areas – 10 V.S.A. § 6086(a)(8)**

2    **Q.    Is the Project located in or adjacent to any Rare and Irreplaceable Natural Areas**  
3           **(“RINA”)? Will the Project have an undue adverse effect on any rare and**  
4           **irreplaceable natural areas?**

5    A.    The natural communities on the parcel can be generally described as follows:

- 6           • Northeast portion – A large stand of white pines (*Pinus strobus*), with a Northern  
7           Hardwood Forest (S5) along the remaining east and south margins.
- 8           • Northwest portion – An open field that is predominantly wet meadow (Shallow  
9           Emergent Marsh – S4) with portions transitioning to shrub communities dominated  
10           by speckled alder (*Alnus incana*), dogwood (*Cornus amomum* and *Comus alba*), staghorn  
11           sumac (*Rhus typhina*), and white pine (*Pinus strobus*) (S4).
- 12           • Southern portion – A Wet Sand-Over-Clay Forest (S2). The Wet Sand-Over-Clay  
13           Forest is comprised of an overstory dominated by red maple (*Acer rubrum*), green ash  
14           (*Fraxinus pennsy/vanica*), and gray birch (*Betula populifolia*). It has a Vermont Natural  
15           Communities designation of State Rank of S2, or rare (VT NHP 2004). We have  
16           consulted numerous times with ANR staff concerning this area and it was never  
17           identified as a RINA. Even if it were designated a RINA, the Project as proposed  
18           will not be within and will have no direct impacts on the Wet Sand-Over-Clay  
19           Forest, and will incorporate a buffer to further protect it. These restrictions will  
20           ensure that the Project does not have an undue adverse effect on the Wet Sand-  
21           Over-Clay Forest community. ***Exhibit SFS-KD-3 (Revised Vegetation***  
22           ***Management Plan).***

1 **Q. Does this conclude your testimony at this time?**

2 A. Yes, it does.