

<p>PETITION NO. 1354 – Chatfield Solar Fund, LLC, petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 1.98-megawatt AC solar photovoltaic electric generating facility on approximately 25 acres located generally south of Route 80 (North Branford Road) and east of Chestnut Hill Road in Killingworth, Connecticut, and associated electrical interconnection to Eversource Energy’s Green Hill Substation located at 775 Green Hill Road, Madison, Connecticut.</p>	<p>} Connecticut</p> <p>} Siting</p> <p>} Council</p> <p>May 9, 2019</p>
---	--

Opinion

Introduction

On October 23, 2018, Chatfield Solar Fund, LLC (CSF) submitted a petition (Petition or Project) to the Connecticut Siting Council (Council), pursuant to Connecticut General Statutes (C.G.S.) §16-50k and §4-176, for a declaratory ruling for the proposed construction, maintenance, and operation of a 1.98 megawatt (MW) alternating current (AC) solar photovoltaic electric generating facility on an approximate 25 acre parcel, located generally south of Route 80 (North Branford Road) and east of Chestnut Hill Road in Killingworth, Connecticut and associated electrical interconnection to Eversource Energy’s Green Hill Substation located at 775 Green Hill Road, Madison, Connecticut.

Public Benefit

The project was selected in the state’s Low and Zero Emissions Renewable Energy Credit Program (LREC/ZREC Program) that was developed as part of Public Act 11-80, “An Act Concerning the Establishment of the [DEEP] and Planning for Connecticut’s Energy Future.” The LREC/ZREC Program creates a market-driven bidding process for renewable energy projects ranging from rooftop solar panels to fuel cells to compete to obtain a 15-year revenue stream from the sale of RECs to the electric utilities. It requires Eversource Energy (Eversource) and the United Illuminating Company (UI) to procure Class I Renewable Energy Certificates (RECs) under 15-year contracts with owners or developers of renewable energy projects in the state.

CSF has two valid ZREC contracts with Eversource, each for the delivery of 1 MW or less of RECs, with a term of 15 years. Both contracts were issued for a solar facility on the same parcel and are independent of each other.

Proposed Project

The proposed site is located on an approximately 24.1 acre parcel with frontage on the south side of Route 80 in Killingworth. No other road frontage exists. The parcel, owned by Rajvilla LLC, is undeveloped, consisting of a mix of forest and wetlands. CSF would enter into a long term lease agreement with the property owner to develop, operate and maintain the Project on the site property. The parcel is zoned residential and abuts other residentially-zoned parcels. According to the Town of Killingworth (Town) Zoning map, there is little commercial and industrial-zoned land within the Town.

The surrounding area consists of undeveloped properties generally to the north, south and east, developed residential properties to the northwest and west, and state forest and state park properties to the east and northeast. The nearest residential structure is approximately 300 feet northwest of the proposed Project area, across Route 80, at 497 Route 80. The nearest property line to the proposed solar field area is approximately 70 feet to the east.

The initial petition site layout was modified to account for an A-2 survey of the parcel that was conducted in December 2018. In general, the solar field layout was modified from four distinct solar array areas to three and the output was decreased from 1.98 MW to 1.92 MW.

The Project would consist of 6,552 355 Watt modules connected to 32 inverters to produce 1.92 MW AC power at the point of Project interconnection with Eversource's distribution system, connecting to Eversource's Green Hill Substation, approximately 5.7 miles south of the Project site.

Each panel would be measure 3 feet by 6 feet and would be installed at a 20 degree angle, facing south, to maximize total annual energy production. The solar panels would be installed in linear arrays on a driven post racking system, with a solar array row aisle width of 14.7 feet. A seven-foot tall security fence would enclose an area of 11.5 acres and would have one gated access point at the north end of the site.

The solar array area is divided into three distinct sections, separated by wetland corridors. The north section, the largest of the three section (5,184 panels), would be connected to two smaller sections- the southeast section (504 panels) and southwest section (864 panels)- by a 12-foot wide, 40-foot long gravel access drive through a wetland corridor.

A 12-foot wide by 75-foot long gravel access drive would extend south from Route 80 to the site access gate and a Project electrical interconnection area. The interconnection area consists of two pad-mounted transformers and associated metering equipment. Wiring from the inverters would extend to the utility interconnection area within above ground cable trays supported with concrete ballasts. The cable tray support ballasts would consist of concrete blocks set at 10 to 15 foot intervals.

Project Construction

The Project site is entirely forested. Approximately 12.7 acres of tree clearing would be required to develop the site for both the solar field areas and for shading mitigation around the periphery of the solar fields. CSF intends to flush cut stumps to reduce ground disturbance throughout the Project site except where grubbing is required for the installation of racking posts, equipment pads, stormwater control features, the entrance drive, and the access drive through a wetland. Approximately 2.1 acres of the Project site would require grubbing.

Slopes within the solar array area range from 8 percent to 30 percent. Site grading within the footprint of the array would be minimized to the extent possible. Most grading would occur to install linear stormwater control features throughout the site, the maintenance pad locations, and the site driveway area.

Public Safety

The proposed project would comply with the applicable codes including the National Electrical Code, National Electrical Safety Code, and International Building Code. The solar panel/racking system are designed for wind and snow loading.

The Project would not be a hazard to air navigation. Glare from the proposed facility would be minimal as the front surfaces of the solar panels are made of tempered glass, which has an anti-reflective coating. Additionally, the glass has a high transmittance quality to reduce the light reflected from the solar panel surface. The proposed facility would be in compliance with the Department of Energy and Environmental Protection (DEEP) Noise Control Standards.

The Killingworth Fire Marshal expressed several concerns regarding the Project, including the lack of a water supply on the site, no specifications for site driveways or the gravel wetland crossing that indicate these features are designed to support fire apparatus, lack of a non-combustible base material under the solar arrays, and lack of a secondary access point for fire personnel. The Killingworth Fire Marshal bases his conclusions on the 2018 CT State Fire Safety Code.

In the event of a fault within the facility, the facility would have protection systems that would isolate a section of the array or the entire facility, if necessary. CSF would train emergency responders as to how to manage an emergency at the solar facility.

A 20-foot wide perimeter access way would be maintained between the security fence and solar array rows. The access ways would utilize existing grades, some which have a 25 percent slope, and would have a surface of flush cut stumps interspersed with grass cover. Given the design and slopes of the access ways, and the lack of design details of the gravel access drive through the wetland, the Council is concerned sufficient and safe access for emergency response vehicles into the interior of the site has not been properly considered.

Decommissioning of the Project at the end of its useful life (estimated at 30 years) would include facility infrastructure removal and site restoration plans, upon consultation with the landowner.

Environmental

Air Quality

The project would have no adverse effect on air quality. During operation, the proposed project would not produce air emissions of regulated air pollutants or greenhouse gases. Thus, no air permit would be required. The proposed project would meet DEEP air quality standards. Given the loss of carbon dioxide sequestration over the life of the facility due to tree clearing versus the net carbon dioxide emissions reduction resulting from the solar facility displacing existing fossil fueled generation in the grid portfolio, the “carbon debt payback period” would be approximately 1.84 days of solar facility operation.

Historic and Archaeological Resources

There are no listings within the National Register of Historic Places (NRHP) on the proposed site. The closest previously recorded prehistoric archaeological site to the Project area is located at Chatfield Hollow, approximately one mile to the east.

The property is former agricultural/pasture land and contains approximately 3,375 linear feet of stonewalls. Approximately 2,430 linear feet of stonewalls would be removed to develop the Project and piled on-site or potentially used for site screening.

Visibility

Project related clearing would occur up to the property line along most of the southern and western sides of the site parcel. CSF proposes to plant scrub-shrub habitat in these areas up to a distance of 20 to 30 feet from the property lines.

Site clearing would occur within close proximity to the Route 80 state right-of-way. CSF would install plantings in this area to enhance a 25-foot wide wooded buffer that would remain between the proposed facility and Route 80. Route 80 is a State-designated scenic road in Madison, approximately 0.5 miles west of the Project site at its closest point. Chestnut Hill Road and North Chestnut Hill Road are Town-designated scenic roads and are approximately 750 feet west of the Project site at their closest point.

No adverse impact is expected at two DEEP state parks located east of the site or from the Chatfield Hiking Trail, approximately 0.5 miles east of the site.

The Council notes that the top of the solar panels would be approximately 8 feet above grade, similar to the height of the proposed seven-foot tall chain link fence and the transformer equipment. Clearing forested vegetation up to the property line at several locations would result in visual impact to these adjacent properties. A proposed shrub buffer would be installed along the property line for habitat enhancement but the shrub plantings would lose visual screening function during leaf-off conditions.

Agriculture and Soils

The Project site does not contain any mapped Connecticut Prime Farmland Soils. The site parcel is currently classified as “forestland” under the Public Act 490 Program. The parcel would have to be reclassified if the site use is other than forestland.

Core Forest

The Project site is partially within a 1,072-acre block of contiguous forest that occurs on numerous parcels. DEEP noted in their comments of December 17, 2018 that unfragmented contiguous forest blocks in excess of 1,000 acres have become increasingly rare in Connecticut and DEEP puts a high priority on the preservation of those that remain. Development of the Project would result in the loss of approximately 13 acres of forest, and thus, diminishes the size of the overall large contiguous forest.

The 2004 Environment Canada Report cited by the University of Connecticut Center for Land Use Education and Research suggests that 250 acres of upland forest should be considered the absolute minimum forest patch size needed to support area-sensitive edge-intolerant bird species. The recommended minimum forest patch size is 500 acres, as this is likely to provide enough suitable habitat to support more diversity of interior forest species. Of the 1,072 acres, 642 acres are considered core forest (forest at least 300 feet away from a disturbed area) and 432-acres are considered edge forest (forest within 300 feet of a disturbed area). Development of the Project would reduce the core forest area from 642 acres to 616 acres.

Wildlife

According to DEEP, two plant species (sand blackberry, pale green orchid) and one bird (eastern whippoorwill) occur on the site property. In its letter to CSF dated February 19, 2019, DEEP stated it needs in-season field surveys and conservation strategies or, species protection plans prior to determining if the proposed Project would have adverse impacts to these species. CSF, upon further consultation with DEEP, proposed habitat enhancement zones for the three species, including removal of invasive species and certain habitat plantings generally around the periphery of the solar field.

Water Quality

Wetlands and Watercourses

The Inland Wetlands and Watercourses Act (IWWA), CGS §22a-36, *et seq.*, contains a specific legislative finding that the inland wetlands and watercourses of the state are an indispensable and irreplaceable but fragile natural resource with which the citizens of the state have been endowed, and the preservation and protection of the wetlands and watercourses from random, unnecessary, undesirable and unregulated uses, disturbance or destruction is in the public interest and is essential to the health, welfare and safety of the citizens of the state.

There are six wetland areas on the Project Site. Site clearing would occur within four wetland areas, totaling approximately 4,800 square feet. Two of the wetlands would be entirely cleared, representing 2,935 square feet, but they are relatively small and are considered of low functional value. The two other wetlands with clearing are located in the southern portion of the site and are part of larger wetland complexes.

Direct wetland impacts include the addition of approximately 500 square feet of gravel to one of the small wetlands, and the clearing and filling of approximately 640 square feet of a wetland corridor that contains an intermittent stream to accommodate the gravel road crossing and a downstream stilling basin.

Of substantial concern to the Council is the minimal buffer zones afforded to the on-site wetlands as a result of the site development and the potential for adverse thermal impacts. CSF is proposing a three to five-foot forested upland buffer to the wetlands which is less than the 10-foot forested upland buffer initially proposed. The Council concurs with the DEEP's December 17, 2018 comments that the proposed wetland buffers are minimal and will deprive the adjacent wetland systems of the shading they currently receive, as well as reduce the protection from sedimentation after the site has been cleared. Although CSF proposes to install scrub-shrub habitat adjacent to some of 3-foot to 5-foot wide buffer areas, significant portions of the site would have no such buffer or would have a new scrub-shrub planting zone of narrow width (1 to 20 feet).

Vernal Pools

There are three potential vernal pools at the project site. Two of the potential vernal pools are in close proximity to each other (PVP 1A, PVP 1) and are located in the northern extent of Wetland 1A. The third potential vernal pool (PVP 2) consists of an old farm pond and is also located in Wetland 1A, in the south-central portion of the site.

The 100-foot area around a vernal pool is known as the vernal pool envelope. According to the U.S. Army Corps of Engineers New England District Vernal Pool Best Management Practices, disturbance within the vernal pool envelope should be avoided. For this project, CSF proposes to establish a minimum 50-foot undisturbed forested buffer around the three potential vernal pools rather than the recommended 100-foot no disturbance buffer.

DEEP noted in their comments that the initially proposed 100-foot no construction buffer around the vernal pools provides less than the standard amount of habitat typically afforded to vernal pools and that project clearing would occur within 100 feet of the vernal pools. Based on the revised site layout, vernal pool buffer areas were reduced so that site construction would now occur within the vernal pool envelopes of PVP 1A (fencing and gravel fill) and PVP 2 (gravel access drive, solar arrays, and a stormwater infiltration trench).

Based on the Project design and site topography, the Council concurs with DEEP that the Project would have several adverse impacts on the vernal pools if adequate vernal pool buffers are not maintained, including the loss of upland foraging habitat for vernal pool species that may be present, loss of pool shading, increase in water temperature, decreases in nutrient loading and increased sedimentation in the vernal pools following site clearing activities.

Stormwater

Pursuant to CGS Section 22a-430b, DEEP retains final jurisdiction over stormwater management. Project development would disturb over one acre of land and thus would require a DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (General Permit). All aspects of Project construction phasing, erosion and sedimentation control methods, temporary and permanent stormwater control features, and on-site monitoring and reporting requirements are reviewed and approved by DEEP as part of the General Permit registration. No site construction activities can occur until the General Permit is issued. DEEP has the authority to enforce compliance with the SWPCP.

The SWPCP requires appropriate construction phasing and the establishment of erosion control features in accordance with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control* and the *2004 Connecticut Stormwater Quality Manual*. In its December 17, 2018 correspondence to the Council, DEEP attached a document entitled *Stormwater Management at Solar Farm Construction Projects, September 8, 2017* that provides guidance to solar farm project developers for permit registration and SWPCP preparation.

The Project site upland soils consist of moderately well drained extremely stony fine sandy loam. Given the relatively steep slopes in the construction area, these soils are susceptible to erosion during rainfall events.

Construction-related stormwater control includes, but is not limited to, construction site phasing, perimeter erosion control barriers, and the establishment of four linear sediment trenches extending in a north-south direction along a certain contour interval. The trenches would be constructed after grubbing is complete and would feature a two-foot gravel berm on the downgradient side to capture sediment. Construction of the solar arrays would occur over and adjacent to the trenches, requiring proactive maintenance to ensure functionality.

The Project is designed so that post-construction stormwater flows would follow the same runoff pattern as pre-construction conditions. Stormwater flows would be intercepted by four linear water quality basins that generally extend along the north-south contours of the Project site. The water quality basins would be established by converting the construction sediment trenches to post-construction features. The stormwater basins are designed to capture the first inch of runoff, then discharge any additional runoff over the downgradient side of the basin in an even flow. The basins, however, as designed, have a low spot on either end which would allow water to discharge as a concentrated flow rather than as sheet flow, and could exacerbate soil erosion at the discharge point.

Given the erosive potential of the on-site soils, the current design of the stormwater control trenches and basins, construction activities that would occur over and adjacent to the trenches, and the potential for the stormwater basins to become an ongoing maintenance issue due to the accumulation of fine particulates within the basins, the Council is not convinced the proposed stormwater control features are adequate to protect the water quality of adjacent surface waters especially when considering the minimal wetland buffers proposed throughout the site.

Conclusion

Based on the record in this proceeding, the Council finds that there would be a substantial adverse environmental effect associated with the construction, maintenance and operation of a 1.92-megawatt AC solar photovoltaic electric generating facility at the proposed site. Furthermore, the Council finds that the proposed project would not comply with applicable U.S. Environmental Protection Agency and DEEP Water Quality Standards. Therefore, the Council will not issue a declaratory ruling for the proposed project and will deny the petition with prejudice.