

Candlewood Solar LLC
111 Speen Street
Framingham, MA 01701-2000
Attn: Michael Daigneault, Senior Vice President

Re: Registration Number: 202003778
Site Name: Candlewood Solar
Received on: March 11, 2020

Pursuant to Sections 4(h)(2) and 4(h)(3) of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, effective October 1, 2019 ("General Permit"), the Department of Energy and Environmental Protection ("the Department") hereby gives notice that Registration Number 202003778 received on March 11, 2020 ("the Registration") is disapproved. The Registration concerns Candlewood Solar, LLC's ("Candlewood Solar") proposed construction of a 20 MW solar photovoltaic array on Candlewood Mountain Road in New Milford, Connecticut ("the Site" or "the Project").

The registration is disapproved because it fails to demonstrate compliance with the requirements of the General Permit. As documented in the attached memorandum, a review by Department staff and observations of site conditions by Department staff during an October 3, 2019 site visit indicate that the site conditions and stormwater analysis, which is the basis for the location, design and sizing of stormwater controls, is flawed and that the Stormwater Pollution Control Plan ("Plan") submitted with the Registration fails to demonstrate compliance with numerous provisions of the General Permit. While detailed specifics are set forth in the attached memorandum, in general the Plan:

- Does not maintain an adequate buffer to protect on-site wetlands/watercourses;
- Does not comply with Sections 5(b)(1)(A) and 5(b)(2)(C) of the General Permit requiring consistency with the 2004 Connecticut Stormwater Quality Manual for the design of post-construction stormwater management measures;
- Does not comply with Sections 5(b)(1)(A) and 5(b)(2) of the General Permit requiring consistency with the 2002 Guidelines for Soil Erosion and Sediment Control (Guidelines) for the design of construction erosion and sediment control measures and site stabilization;
- Lacks sufficient justification of hydraulic and hydrologic parameters governing the design of post-construction stormwater management measures;
- Lacks sufficient documentation and justification of the ability to phase and construct erosion and sediment controls and post-construction stormwater management measures along steep and/or long slopes, and;
- Lacks sufficient documentation of the ability of outlet protection measures at discharge locations to prevent adverse downstream impacts.

The Department will not process the Candlewood Solar March 11, 2020 registration any further.

Moreover, given that this was the third registration submitted by Candlewood Solar for the Project, I have determined, pursuant to Conn. Gen. Stat. § 22a-430b(c) and section 5(b)(2)(C) of the General Permit, that Candlewood Solar will need to obtain an individual permit pursuant to Conn. Gen. Stat. § 22a-430 if a discharge permit is to be issued for stormwater associated with construction of the Project. While I have doubts, given the three prior attempts under the General Permit, that even an individual permit can be issued for the Project, I have determined that if a permit is to be issued, an individual permit will better protect the waters of the state from pollution.

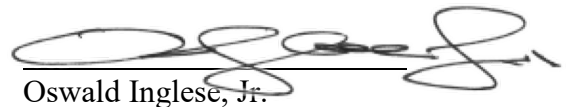
An individual permit will allow for the inclusion of terms and conditions in a permit that is customized for the particulars of the Project site. In addition, the technical judgments of my staff and a commenter regarding the Registration remain markedly different from those of Candlewood Solar. The General Permit does not have a process well suited to raising, considering and resolving such significant technical disagreements. A more considered process with the opportunity for a hearing is justified by the complexity of Candlewood Solar's latest proposal - its Registration and Plan exceeded 2,000 pages – by the difficulties posed by the particulars of the site chosen by Candlewood Solar and by the fact that on three prior occasions Candlewood Solar has not submitted a proposal for managing stormwater that the Department's staff has found acceptable.

Please be aware that performing an activity without the permit required by Title 22a of the Connecticut General Statutes may subject you to an injunction and penalties.

Please contact the Water Permitting and Enforcement division at 860-424-3025 if you have any questions about this notice or your registration.

May 12, 2020

Date



Oswald Inglese, Jr.

Director

Bureau of Materials Management
and Compliance Assurance

Attachment

CERTIFIED MAIL

RRR

Memo

To: Ozzie Inglese
From: Chris Stone, P.E.
CC: Karen Allen, Neal Williams
Date: 4/29/2020
Re: Registration Number 202003778
Candlewood Solar LLC
New Milford, CT

This review of the Candlewood Solar's Registration Number 202003778 and Plan received March 11, 2020 ("the Registration") including, but not limited to, the Stormwater Pollution Control Plan ("Plan") is based on the following:

- Previous submission of Registration Number 201816062 and Plan received January 2, 2019
- Review memo from Sharon Yurasevecz dated March 13, 2019
- My site walk conducted October 3, 2019
- My Plan and site walk review dated October 24, 2019
- Guidance Regarding Solar Arrays and the Construction General Permit dated January 8, 2020
- Registration Number 202003778 and Plan received March 11, 2020
- Town of New Milford's Comments on Registration # 202003778 dated March 25, 2020
- Candlewood Solar's Response to Town of New Milford's Comments dated April 7, 2020

Overall Concerns

Candlewood Solar, LLC ("Candlewood Solar") is proposing to construct a 20 MW solar photovoltaic array on Candlewood Mountain Road in New Milford, Connecticut ("the Site"). The Project includes a large disturbed area of approximately 84 acres to be developed on very rocky soils, shallow ledge, shallow groundwater, and grades on-site up to and exceeding fifteen percent (15%). Grades immediately off-site, to which the Site drains, are up to and exceeding fifty percent (50%) sloping toward residential neighbors to the west and Candlewood Lake to the southeast. Candlewood Solar proposes to have the Site fully developed, including vegetation necessary for management of stormwater, within approximately sixteen (16) months.

My overarching concerns with this proposed solar array relate primarily to conditions on the Site, the scale and layout of the array and the inability of the proposed control measures to function as expected, especially given the short timeframe for development. This Project includes dozens of acres of impervious solar panels elevated off the ground. As such, an additional concern is the creation of a significant amount of impervious area leading to an increase in the volume and rate of runoff from the Site. The narrow spacing of the panel rows as well as their orientation down the slope, as opposed to across the slope, increases the likelihood that

the panel rows will serve to significantly increase the rate and volume of runoff under post-construction versus pre-construction conditions.

Other concerns enumerated below relate to issues including potential wetland impacts, hydraulic and hydrologic design assumptions, stormwater management measure designs, project phasing, and erosion and sediment control. Review of the Registration and supporting documents indicates a lack of adequate information to support meeting the terms and conditions of the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ("General Permit").

Section 5(B) of the General Permit¹ requires that a Plan submitted be designed to minimize: (1) pollution caused by soil erosion and sedimentation during and after construction; and (2) stormwater pollution caused by use of the site after construction is completed. Section 5(b)(1)(A) requires, among other things, that the Plan be prepared in accordance with sound engineering practices and shall be consistent with the Department's Erosion and Sedimentation Control Guidelines ("E & S Guidelines") and the 2004 Connecticut Stormwater Quality Manual ("SQM"). Section 5(b)(2) requires Control Measures or Best Management Practices (BMPs) to minimize the discharge of pollutants from the permitted activity. Control Measures shall be designed in accordance with the Guidelines, the Stormwater Quality Manual or a Department of Transportation Qualified Product List.

I have cited these particular references here because for many of the reasons detailed below, the Registration submitted by Candlewood Solar does not meet these requirements. To avoid repeating these references, I cite them here once, although they apply to most, if not all, of the items discussed below.

Site Plan

1. Section 5(b)(1)(B) requires that a Plan include a site plan and site description. It goes without saying that this site plan and site description must be accurate. However, the submitted Plan and narrative contain several inconsistencies. For example, except on sheet C-110, there were no proposed grading plans that also showed the array configuration, making unclear how the array locations relate to the grading and stormwater management measures. In addition, the plan sheets, Best Management Practice ("BMP") profiles, BMP detail tables, detail sheets and test pit logs were not consistent with each other. For example, the profile sheet for BMP 8A (C-303) refers to this measure as a surface sand filter while the plan sheet (C-113) refers to it as an infiltration basin. Likewise, the profile for BMP 8B refers to it as an infiltration basin while the plans refer to it as a surface sand filter. Also, the profile for Infiltration Basin 9 (sheet C-303) shows ledge at an average of four (4) feet while the test pit logs (Appendix B3) show no ledge down to eight (8) feet.

Wetlands

2. Section 5(b)(1)(B)(ii)(e) of the General Permit requires that the Plan delineate the extent of wetland acreage on the Site. There are wetlands located primarily on the eastern and western sides of the site. The Plan

¹ All subsequent references to sections are to sections of the General Permit.

proposes a gravel staging area along the entrance road, yet no wetland boundary mapping for wetlands in proximity to this staging area has been done.

3. DEEP's General Permit Guidance regarding solar arrays specifies that a 100-foot buffer should be maintained between any part of the array and any "watercourse," as that term is defined in Conn. Gen. Stat. § 22a-38. Previous guidance also included a buffer of fifty (50) feet from wetlands. Based on the Department's observations of the Site, Surface Sand Filters 1A, 1B and 6P, are all within one hundred (100) feet of standing water that qualifies as a watercourse, given the broad definition of that term, and within fifty (50) feet of wetlands. I note also that the array location has been moved from previous submissions so that grading for Surface Sand Filters 1A and 6P and for the swale to Infiltration Basin 8A are within ten (10) feet of a wetland boundary, grading for Pocket Pond 3 is within five (5) feet and Surface Sand Filter 7C is within two (2) feet of a wetland boundary, without an indication in the Plan of how these wetland areas will be protected beyond the use of simple silt fence. While the Department's guidance itself is not binding, given the close proximity of these project components to a watercourse, the Plan fails to otherwise indicate how the watercourse and wetlands will be protected from activities occurring during and after construction of the Project. The Plan also fails to delineate all of the watercourses that may be present within the 100-foot buffer noted in the Department's solar guidance.

Drainage/Hydraulic Calculations

4. Section 5(b)(1)(B)(ii)(c) requires an estimate of the average runoff coefficient after construction activities are complete. Section 5(b)(1)(B)(v)(h) requires that a Plan include calculations regarding the retention of the water quality volume for a site.

a. The submitted Plan estimates that the post-construction ground cover will be "Grass cover, good condition (75% cover)" according to the Natural Resource Conservation Service (NRCS) standards, yielding a post-construction runoff Curve Number or CN of 80. However, in my judgment, this assumption is flawed. With the narrow spacing of the array rows, approximately two thirds (2/3) of the area within the array will be in shade. I do not think that 75% cover can be achieved within the first year. An estimate of "poor" (<50% cover) or "fair" (50-75% cover) condition is more realistic and would result in a CN of 89 or 84, respectively. This would increase the post-construction runoff estimates and, consequently, the sizing of the stormwater BMPs.

b. The assumptions regarding the time of concentration (T_c) used to calculate post-construction runoff are similarly flawed. The calculations in the submitted Plan assume sheet flow and shallow concentrated flow of runoff within the array, which increases the T_c and results in lower post-construction runoff estimates. However, proposed slopes within the array are rarely less than five percent (5%) and range up to fifteen percent (15%). Maintaining sheet flow on such slopes is difficult. Once slopes exceed five percent (5%), sheet flow tends to concentrate in shorter and shorter distances as slope increases. This issue is exacerbated further since, to maintain sheet flow, the slope itself must be graded perfectly smooth. This is unlikely given the areas of exposed ledge and the rocky nature of these soils. The slightest irregularity in the slope grading will serve to collect and concentrate the runoff, thereby eliminating sheet flow and decreasing the T_c . As such, the calculations in the Plan are simply not realistic.

c. The Plan proposes gravel level spreader trenches running across the slope in order to maintain sheet flow and gravel drip edge trenches under the drip line of the panel rows in areas of slopes exceeding five percent

(5%), which is the majority of the array, in order to encourage sheet flow and reduce the erosive force of runoff dripping from panels. However, since most of the panel rows are oriented down the slope rather than across it, the drip edge trenches will channel runoff from the panels into a downslope channel rather than sheet flow. The Plan does not indicate how the cross-slope level spreader trenches would convert these downslope drip edge channels into sheet flow where they intersect. In addition, for the level spreader trenches to convert runoff into sheet flow they would have to be dug in a manner that is unrealistic, namely perfectly level (i.e. 0.0% grade) with no low points along the trench for hundreds of feet. The consequence of not having a perfectly level trench excavation is that water will collect at the low points of the trench and overflow the trench as concentrated flow rather than sheet flow.

Reliance on unrealistic construction techniques is compounded by the construction sequence on sheet C-117, which indicates that the level spreader trenches would be constructed after the solar panels are mounted, which would be extremely difficult with any kind of machinery and impractical to do by hand. Concentrated overflows at low points, not sheet flow, is the likely result of this design and construction sequence.

The result of items a, b and c will be a significantly reduced T_c that will increase post-construction runoff rates and require design changes to accommodate that increase.

5. Section 5(b)(1)(B)(v)(j) requires that a Plan include calculations showing the proposed effective impervious cover for the Site. Sections 5(b)(2)(C)(i) and (ii) require the use of runoff reduction practices to meet runoff volume requirements specified in the General Permit. The stormwater control measures are based on these calculations. In addition, for the purpose of estimating post-construction runoff, while not binding, the Department's solar guidelines includes a provision stating that, in addition to other provisions, unless the spacing between the rows in the array is equal to or greater than the width of the impervious panel rows themselves, the panels should be considered as "connected" or "effective impervious cover" as defined in Section 2 of the General Permit.

The panel rows proposed are almost thirteen (13) feet wide with only seven (7) foot spacing between rows. However, the Plan submitted did not calculate post-construction runoff with the assumption of fully connected impervious panels as required in Section 5(b)(2)(C) or as indicated in the Department's solar guidance. Rather, the Plan relied upon the Minnesota Pollution Control Agency's (MPCA) Solar Calculator to determine the degree of "connectedness" of the impervious surface of the panels. I have spoken with the MPCA staff and they indicated that the calculator was designed upon the assumptions that the array rows were parallel to the contours (i.e. across the slope) on slopes less than five percent (5%) and certainly no greater than ten percent (10%). Neither of these conditions apply at the Site and therefore the use of the MPCA Solar Calculator is not appropriate for the Site and does not comply with Sections 5(b)(1)(B)(v)(j) and 5(b)(2)(C)(i). Without accounting for the narrow spacing of the panels and by utilizing the MPCA solar calculator, the post-construction runoff from the array has been underestimated, resulting in inadequate controls measures and a failure to minimize post-construction discharges from the Site.

Basin Designs

There are a total of sixteen (16) stormwater BMP basins adjacent to the array and one basin serving the interconnection route. These basins are proposed to collect and release post-construction runoff from the site. Eleven are surface sand filters, four are infiltration basins (3 array and 1 interconnection route), and two

are pocket ponds. However, for various reasons noted below, a number of these basins were designed and located in a manner inconsistent with the General Permit and the SQM.

Surface Sand Filters

Section 5(b)(1)(B)(i) requires that a Plan include a site plan that accurately depicts a number of features of a site. Section 5(b)(2)(C)(i)(b) requires that on sites undeveloped before construction, like the Site, post-construction stormwater treatment measures must be designed, installed and maintained to retain the full Water Quality Volume (WQV) in accordance with the SQM.

6. An overall factor in determining the appropriate location of surface sand filters is determining the total depth of the filter structure. Table B10 in Appendix B as well as the table for Detail C1 on Sheet C-505 of the Plan both indicate that the filter “bottom” is eighteen (18) inches below the “top” of the filter. Throughout the Plan this figure is used to determine the depth of the bottom of the surface sand filter below grade. In fact, this dimension is only the depth of the filter media within the overall structure of the filter. Detail D-2 on Sheet C-503 shows that the full depth of the surface sand filter structure from ground surface to the bottom of the underdrain pipe is approximately 2.5 to 3 feet, not 18 inches. This discrepancy would result in the bottom of the filter structure being deeper than reported on the plans.

7. The invert (or bottom) of the undrain pipe is reported in the table on Sheet C-505 to be within the filter media of the surface sand filters rather than below it. In this respect, Sheet C-505 is inconsistent with the detail on Sheet C-503 and with Section 11-P4 of the SQM, which both show the underdrain located in gravel below the filter media. This inconsistency is not immaterial in that it leads in several instances to an overestimation of the distance between the bottom of the surface sand filter and seasonal high groundwater or ledge.

Shallow ledge

8. Section 5(b)(1)(B)(i) requires that a Plan include a site plan that accurately depicts a number of features of a site. Profile sheets (C-301 to C-303) included with the Plan don’t always agree with the test pit logs or the BMP detail tables in the appendices making it unclear what the depth to ledge is at the Site. This is important since close proximity to ledge can lead to instances where the ledge surface can act as a failure plane when there is the weight of significant ponding in the basin, particularly if soils are saturated and the ledge surface is sloped as is typical at the Site.

9. Section 5(b)(1)(A) requires that a Plan be prepared in accordance with sound engineering practices. Based on the basin profiles, test pit logs and the issues regarding the true depth of the filter structure (see above), the bottoms of Surface Sand Filters 2A and 2B would be sitting almost directly on ledge and the bottoms of Surface Sand Filters 5A and 5B would be less than one foot above ledge. Sound engineering practice would indicate that this condition will make these basins prone to physical failure.

10. Section 5(b)(2)(C) requires that on sites undeveloped before construction, like the Site, post-construction stormwater treatment measures must be designed, installed and maintained in accordance with the SQM. The SQM states that infiltration basins should be at least three (3) feet above ledge. The bottom of Infiltration Basin 8A would be less than two (2) feet above ledge and, as a result of excavation to build Infiltration Basins 9 and 7A, these basins will also have areas that are potentially less than two (2) feet above ledge.

Temporary Sediment Traps

11. Section 5(b)(1)(B)(iv) requires that a Plan describe control measures that will be used to minimize the discharge of pollutants. Section 5(b)(2)(A)(ii) requires that a Plan describe how structural stormwater control measures will divert flows away from exposed soils and, store flows or otherwise limit runoff and minimize the discharge of pollutants.

The SQM says not to site temporary sediment traps used during construction in areas where an infiltration basin will be located post-construction. Yet, the Plan proposes to locate temporary sediment traps in locations where all three infiltration basins will be located.

Infiltration rates

12. Section 5(b)(1)(B)(iv) requires that a Plan describe control measures that will be used to minimize the discharge of pollutants. Section 5(b)(2)(A)(ii) requires that a Plan describe how structural stormwater control measures will divert flows away from exposed soils and, store flows or otherwise limit runoff and minimize the discharge of pollutants.

When siting an infiltration basin, Section 11-P3 of the SQM states that “Field-measured soil infiltration rates should not exceed 5.0 inches per hour”. The infiltration rates shown in the test pit logs for all four infiltration basins show rates of >6 inches per hour and in some instances up to >80 inches per hour.

Test pits

13. Section 5(b)(1)(B) requires that a Plan include a site plan identifying various site features. This includes information on tests performed to ascertain the location of such features. Despite this, I was unable to find test pit locations for test pits 2AS, 2CS 2ABP, 2ABN, and 2ABS.

14. Section 5(b)(1)(B)(iv) requires that a Plan describe control measures that will minimize the discharges of pollutants from a site, including calculations supporting the design of post-construction sediment and floatable removal controls. Test pits for Surface Sand Filters 2A and 2B are located forty (40) to seventy (70) feet away from their respective basin locations. Given the shallow ledge and groundwater prevalent and variable on this site, the design of these basins may be flawed because these test pit logs may provide inaccurate subsurface information for the siting of these basins.

Groundwater issues

Section 5(b)(2)(A)(ii) requires that a Plan describe how structural stormwater control measures will divert flows away from exposed soils and, store flows or otherwise limit runoff and minimize the discharge of pollutants. Section 5(b)(2)(C)(i)(b) requires that on sites undeveloped before construction, like the Site, post-construction stormwater treatment measures must be designed, installed and maintained in accordance with the SQM.

15. The SQM states that infiltration basins should be at least three (3) feet above seasonal high groundwater (i.e. mottling). Test pits for Infiltration Basin 8A show less than five (5) feet depth to seasonal high groundwater

but, due to the excavation of this basin indicated on Sheet C-113, the bottom of the basin would ultimately be less than three (3) feet above seasonal high groundwater.

16. Section 11-P1 of the SQM says that pocket ponds should intersect the groundwater table so as to maintain a permanent pool of water between three (3) to six (6) feet deep. Pocket Ponds 3 and 4A would intersect groundwater approximately one (1) foot below observed high groundwater, resulting in a permanent pool of less than three feet.

17. The SQM says that the bottom of a surface sand filter should be at least three (3) feet above seasonal high groundwater. The bottoms of Surface Sand Filters 1B and 7C would be less than three (3) feet above seasonal high groundwater. The bottoms of Surface Sand Filters 1A, 6P and 10 would be less than one (1) foot above seasonal high groundwater. The bottoms of Surface Sand Filters 4B and 8B would be below seasonal high groundwater.

All of these groundwater conditions enumerated in items 15, 16 and 17 would make these basins prone to malfunction and failure and unable to meet the requirements of Section 5(b)(2)(A)(ii) and 5(b)(2)(C) of the General Permit. In addition, the stormwater control measures are not in accordance with the SQM.

Pocket Ponds

Section 5(b)(2)(A)(ii) requires that a Plan describe how structural stormwater control measures will divert flows away from exposed soils and, store flows or otherwise limit runoff and minimize the discharge of pollutant. Section 5(b)(2)(C) requires post-construction stormwater management measures to be designed in accordance with the SQM.

18. Section 11-P1 of the SQM states that “a pocket pond is intended to serve relatively small drainage areas (between one and five acres)”. Pocket Pond 3 has a drainage area of approximately 7.4 acres (subcatchments 3AS and 3BS on the Watershed Map in Appendix B1).

19. In addition, the SQM says that it is preferable for pocket ponds to have only one inlet, while Pocket Ponds 3 and 4A both have two inlets.

20. The SQM also states that “the inlet should be located at the most hydraulically remote point from the outlet...”. However, the lower spillway outlet for Pocket Pond 3 is within thirty (30) feet of the inlet.

As mentioned above, both pocket ponds intersect the groundwater table at a point at which the permanent pool in the pond would be significantly less than three (3) feet. Under these conditions, the pocket ponds would not meet their intended function.

Pretreatment

21. Section 5(b)(1)(A)(iv) requires that a Plan include appropriate control measures that will be used to minimize the discharge of pollutants. Section 5(b)(2)(C)(ii)(b) specifies a goal of eighty percent (80%) sediment removal for post-construction stormwater control measures. To meet this goal, the SQM states that surface sand filters, infiltration basins and pocket ponds all require a forebay/pretreatment area meeting specific dimensional and quantitative design criteria. While Sheet C-505 shows pretreatment areas for each of the

three generic basin designs, the grading plans do not show any grading to accommodate this design. The grading plans do not show how and where the pretreatment area would be configured. Lacking proper design and implementation, the Plan does not satisfy section 5(b)(1)(A)(iv) or meet the requirements of Section 5(b)(2)(C)(ii)(b).

Steep grades

Section 5(b)(2)(A)(ii) requires that a Plan describe how structural stormwater control measures will divert flows away from exposed soils and, store flows or otherwise limit runoff and minimize the discharge of pollutants. Section 5(b)(2)(C)(i)(b) requires that on sites undeveloped before construction, like the Site, post-construction stormwater treatment measures must be designed, installed and maintained in accordance with the SQM.

22. The SQM states that surface sand filters “can be used with slopes of approximately 6 percent or less”. Despite this, Surface Sand Filters 2A, 2B, 4B, 5A, 5B, and 8B are located in areas with slopes greater than six percent (6%), sometimes significantly so. Such slopes will affect the efficacy of these filters.

23. The SQM states that infiltration basins “... should be located at least fifty (50) feet from slopes greater than 15 percent...”. The fifty foot buffer from steep slopes also applies to pocket ponds. Infiltration Basins 8A and 9, as well as Pocket Pond 4A, are located within fifty (50) feet of slopes greater than fifteen percent (15%). These buffers are in the SQM to prevent erosive flows leaving a site, in this case to avoid discharges to the neighbors to the west and to Candlewood Lake to the southeast.

24. Section 5(b)(1)(A)(iv) requires that a Plan describe how control measures will minimize the discharge of pollutants, including the calculations supporting the design of sediment and floatables removal controls for post-construction control measures. Section 5(b)(2)(B)(ii)(c) requires post-construction control measures to be designed in such a way as to maintain non-erosive velocities for their discharges.

The outfalls of all the basins discharge through a riprap spillway to an energy dissipater with a level spreader lip. Section 5-10 of the Department’s Guidelines for Soil Erosion and Sediment Control (“E&S Guidelines”) states that “[t]he grade of the channel for the last 20 feet of the dike or diversion entering the level spreader shall be no steeper than 1%.” The E&S Guidelines further state that the level spreader shall “discharge to an undisturbed well-vegetated area having a maximum slope of 5%.” All of the basin spillways have grades leading to the level spreader that greatly exceed one percent (1%) and almost all of the basins have slopes greater than five percent (5%) at the outfall of the level spreader. Such non-adherence to the E&S guidelines calls into the question the calculations regarding the efficacy of such controls.

To address this latter issue the submitted Plan proposes to seed the slopes downgradient of the level spreaders with “infill plantings” of New England Roadside Matrix Upland Seed Mix by New England Wetland Plants. It appears that several species in this mix require full sun. The Plan fails to state why this seed mix requiring full sun was chosen when many of these plantings are being placed in forested areas (i.e., not in full sun) and, frankly, how the chosen seed mix, which will not be in areas of full sun, will germinate and establish in a timely fashion, if at all.

In addition, the specifications for this mix found on the New England Wetland Plants website indicate that it should always be applied on a properly prepared “clean weed-free seed bed.” Since the manufacturer

specifies this planting for roadsides, it is unclear if a forest floor would provide an appropriate seed bed. The Plan did not include any information demonstrating that this seed mix had performed this function successfully on other sites. These seed mix problems may also render inaccurate the calculations used to determine compliance with Section 5(b)(2)(B)(ii)(c) regarding maintaining non-erosive velocities for discharges from post-construction control measures.

Erosion & Sediment Control

Section 5(b)(1)(B)(iii) requires that wherever possible, construction activities shall be phased to avoid the disturbance of more than five acres at one time. The following indicate that large areas of the Site will be disturbed at once, contrary to the provisions of Section (5)(b)(1)(B)(iii) and the phasing specified in the Plan.

25. Under the submitted Plan tree cutting is proposed to be conducted throughout the Site all at one time. This will inevitably lead to extensive disturbance of the Site by falling trees and heavy equipment. Even if fallen trees are not immediately cleared from the Site, some dragging and movement of fallen trees will be necessary to access parts of the Site.

26. In addition, the submitted Plan shows the Site being constructed in multiple successive phases, each less than five acres. However, in many places the overall grading of the Site spans across phase boundaries. How a contractor will be able to avoid disturbing subsequent phases while doing this grading, particularly in areas of cut or fill, is not explained.

27. The phasing plan also calls for the installation of panels to begin on a newly stabilized phase as grading progresses to the next phase. The Plan does not explain how to implement the panel installation process using the necessary equipment without redistributing the newly stabilized previous phase, resulting in the disturbance of more than one phase at a time. This is a direct consequence of the short construction timeframe. If adequate time were allowed for effective stabilization of each completed phase before panel installation there would be less risk of having multiple phases disturbed at one time.

28. Section 5(b)(1)(B)(iv) requires that a Plan describe control measures that will minimize the discharges of pollutants from a site. Section 5(b)(2)(A)(ii) requires that a Plan include how structural measures will store flows of otherwise limit runoff and minimize the discharge of pollutants.² In this case, the soils on the Site are classified as either “very stony” or “extremely stony” making grading, seeding and stabilization challenging and suggesting that erosion will continue to be a problem throughout the Site.

29. Section 5(b)(1)(B)(iv) requires that a Plan identify appropriate control measures to minimize the discharge of pollutants. Section 5(b)(2)(A)(i) requires, among other things, a narrative and drawings of interim soil stabilization practices for managing disturbed areas. While the submitted Plan calls for the use of seed with polymer and mulch OR erosion control blankets (ECB), the Plan does not describe the conditions that will dictate which alternative will be used. Given that ECB is considerably more expensive than polymer and mulch, it is much less likely to be used. Guidance on the selection of the appropriate choice is lacking in the Plan.

² Section 5(b)(2)(A)(iii) also requires that Plan indicate how all erosion and sedimentation control measures will be maintained.

General Construction Issues

30. Section 5(b)(2)(A)(i) requires that a Plan include a narrative and drawings of interim and permanent stabilization practices, including a schedule for implementing such practices. Section 5(b)(2)(A)(iii) requires that a Plan describe how such erosion and sediment control measures will be maintained. While the Plan submitted calls for straw wattles as erosion control measures (similar to the use of silt fence) across slopes throughout the site and immediately upgradient of the cross-slope level spreader trenches, it does not specify when these straw wattles will be installed and how long they will remain in place. Given that these wattles will be staked in place at a height of at least two feet, how such wattles will not interfere with the movement of equipment around the site for stabilization measures, panel installation, and the installation of the drip edge trenches is left unexplained.

31. The narrative for the project phasing on Sheet C-117 calls for the installation of the gravel cross-slope level spreader trenches to be conducted after the installation of the panels. This will make it impractical to install these trenches with the necessary elevation precision under the elevated panels.

32. Also, construction of the gravel drip edge trenches is scheduled to be installed after panel installation. With only seven feet between panel rows and the trench at the edge of that open space, it will be difficult to maneuver equipment to properly install these trenches without disturbing the panels. As mentioned previously, there is no detail showing how the intersection of the level spreader trenches and the drip edge trenches will be constructed. There will be hundreds of these intersections within the array and no indication that the drip edge trenches won't funnel runoff downhill and flow directly through and across the level spreader trenches.

Impact on Threatened and Endangered Species

33. Under Section 3(b) of the General Permit, an activity is only eligible for authorization under the General Permit if such activity does not threaten the continued existence of any species listed pursuant to section 26-306 of the Connecticut General Statutes as endangered or threatened and does not result in the destruction or adverse modification of habitat designated as essential to such species. See also Section 4(c)(2)(J)(iv) of the General Permit. While Candlewood Solar received a letter from the Department's Natural Diversity and Database Division noting that, provided certain conditions were met, the Project could proceed, since that time Candlewood Solar has altered the Project in a way that would threaten the continued existence of species listed pursuant to section 26-306 of the Connecticut General Statutes as endangered or threatened and result in the destruction or adverse modification of habitat designated as essential to such species. As such, the Project is not eligible for a General Permit.

Conclusion

Given the extent and nature of these deficiencies, I cannot recommend approval of the Registration.