APPENDIX I
Stormwater Management at
Solar Array Construction Projects

In addition to the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (general permit), registrations for construction of Solar Array (as that term is defined in Section 2 of the general permit) shall adhere to the following conditions:

Design and construction requirements for solar arrays

(1) The entire solar array including, but not limited to, solar panels, roadways, gravel surfaces and transformer pads, shall be considered effective impervious cover for the purposes of calculating Water Quality Volume, unless the following design conditions have been met:

(a) The vegetated area receiving runoff between rows of solar panels (see Figures 1 and 2) is equal to or greater than the average width of the row of solar panels draining to the vegetated area.

(b) Site conditions shall be maintained such that the runoff remains as sheet flow across the entire site.

- For slopes less than 5%, appropriate vegetation shall be established as indicated in Figure 1.
- For slopes greater than 5% and less than 10%, practices such as, but not limited to, level spreaders, terraces or berms to ensure long term sheet flow conditions as indicated in Figure 2.
- Installations on slopes greater than 10% and less than 15% will require an engineered plan that ensures adequate treatment and the safe and non-erosive conveyance of runoff to the property line or downstream stormwater management practice.
- Under no circumstances may solar panels be installed on slopes greater than 15%.

(c) For slopes greater than or equal to 8%, erosion control blankets or stump grindings or erosion control mix mulch or hydroseed with tackifier must be applied within 72 hours of final grading, or when a rainfall of 0.5 inches or greater is predicted within 24 hours, whichever time period is less.

(d) The solar panels are constructed in such a manner as to allow the growth of vegetation beneath and between the panels.

(e) A fifty (50) foot buffer shall be maintained between all parts of the solar array and any adjacent wetlands. The buffer shall consist of undisturbed existing vegetation or native shrub plantings.

(2) The lowest vertical clearance of the solar panels above the ground should not be greater than ten (10) feet. They shall, however, be at an adequate height to promote vegetative growth beneath the panels. If the lowest vertical clearance of the solar panels above the ground is greater than ten (10) feet, control measures will be necessary to prevent/control erosion and scour along the drip line or otherwise provide energy dissipation.

(3) The registrant shall include staff from the appropriate District in the pre-construction meeting pursuant to Section 3(*b*)(15) prior to commencement of any construction activity on the site. The date of such meeting and a report summarizing the meeting shall be included in the registrant's SWPCP (Plan).

(4) The registrant shall ensure that a qualified professional engineer shall serve as the qualified inspector for the purposes of the routine inspections in Section 5(*b*)(4) of the general permit ("authorized professional"). Unless otherwise approved in writing by the Commissioner, such qualified professional shall be retained for the duration of the construction project until the Notice of Termination acceptable to the Commissioner has been filed as described below. The registrant shall ensure that the credentials for the qualified professional proposed by the

registrant and the proposed inspection checklist prepared by such qualified professional are submitted for the review and approval of the Commissioner and are included with the registration for the general permit. No other professional may serve as the qualified professional without the prior submittal of relevant credentials and inspection checklist for the Commissioner's review and written approval.

(5) The registrant must ensure that reporting and record-keeping of all inspection checklists and inspection reports complies with the requirements of Section 5(*d*) of the general permit, except that a copy shall also be submitted electronically to the Department email (DEEP.stormwaterstaff@ct.gov) within three (3) days from the date such inspection was performed.

(6) The District shall inspect the site at the completion of each phase of construction to assess compliance the general permit and the Plan, including the phasing and sequencing of the project. The permittee shall notify the appropriate District when each phase of construction is complete. In addition, the District shall inspect the site at least every six (6) weeks or more frequently, if necessary, for general permit and Plan compliance during construction. The District shall also conduct the Post-Construction Inspection and Final Stabilization Inspection pursuant to Section 6(*a*) of the general permit.

(7) The registrant must ensure, after completion of a construction project, that a Notice of Termination is filed in compliance with Section 6 of the general permit, including the requirement that such Notice of Termination be stamped and signed by a District representative certifying that such District representative has personally conducted a Post-Construction Inspection and Final Stabilization Inspection in accordance with Section 6(*a*) of this permit and verified compliance with the requirements of that section.

(8) The registrant, in accordance with Section 22a-6(a)(7) of the Connecticut General Statutes, shall secure a letter of credit to ensure the solar farm construction project maintains compliance with the terms and conditions of the general permit and the Plan. Such letter of credit shall be for an amount sufficient to ensure that, upon the potential failure of the site to meet the construction and post-construction requirements of the general permit, the Commissioner would have adequate funds to engage appropriate design professionals and contractors to stabilize the site, repair on-site and off-site damage and ensure the long term stability of the site from future erosion. The registrant shall provide documentation of time, materials, contract and bid preparation, consultant and contractor fees, contingencies and other necessary expenditures to substantiate the amount of the letter of credit. The registrant must use the letter of credit template attached to this appendix. The registrant must provide proof that the bank is regulated under state or federal authority.

Note: Additional design guidance for meeting these requirements for solar panel installations can be found on the DEEP stormwater webpage at www.ct.gov/deep/stormwater

Design requirements for post-construction stormwater management measures for solar arrays.

(1) Orientation of panels shall be considered with respect to drainage pattern (i.e. row parallel to flow direction results in higher runoff)

(2) Hydrologic analysis must evaluate 2, 25, 50 and 100-year storm pre-and post-construction stormwater flows

(3) Site specific soil mapping shall be conducted to confirm soil types for hydrologic analyses.

(4) Must perform hydrologic analysis based on slope gradient, surveyed soil type (adjusted per paragraph (5), below), infiltration rate, length of slope, occurrence of bedrock, change in drainage patterns (see also page 23 at https://www.ct.gov/deep/lib/deep/Permits_and_Licenses/Land_Use_Permits/Inland_Water_Permits/IWRD_inst.pdf).

(5) The hydrologic analyses necessary to confirm the infiltrative capacity of any stormwater management measures shall reflect a reduction of the Hydrologic Soil Group present on-site by one (1) step (e.g. soils of HSG B shall be considered HSG C) to account for the compaction of soils that results from extensive machinery traffic over the course of the construction of the array.

(6) Hydrologic analysis for engineered stormwater management system must demonstrate no net increase in peak flows or cause adverse impacts to downstream properties.

Figure 1
Solar Panel Installation with Slopes ≤ 5%

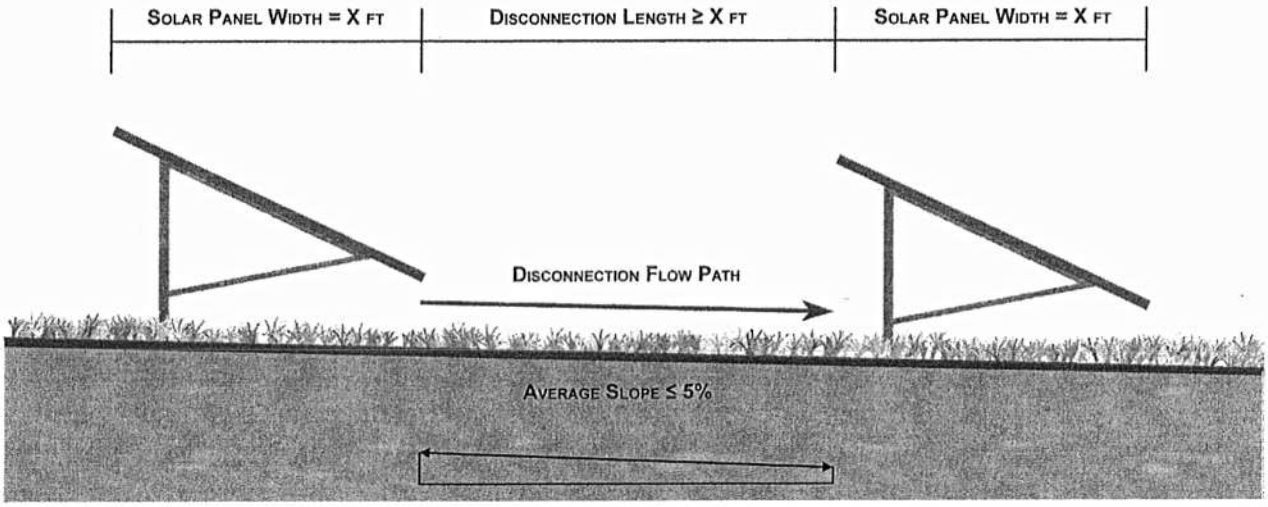
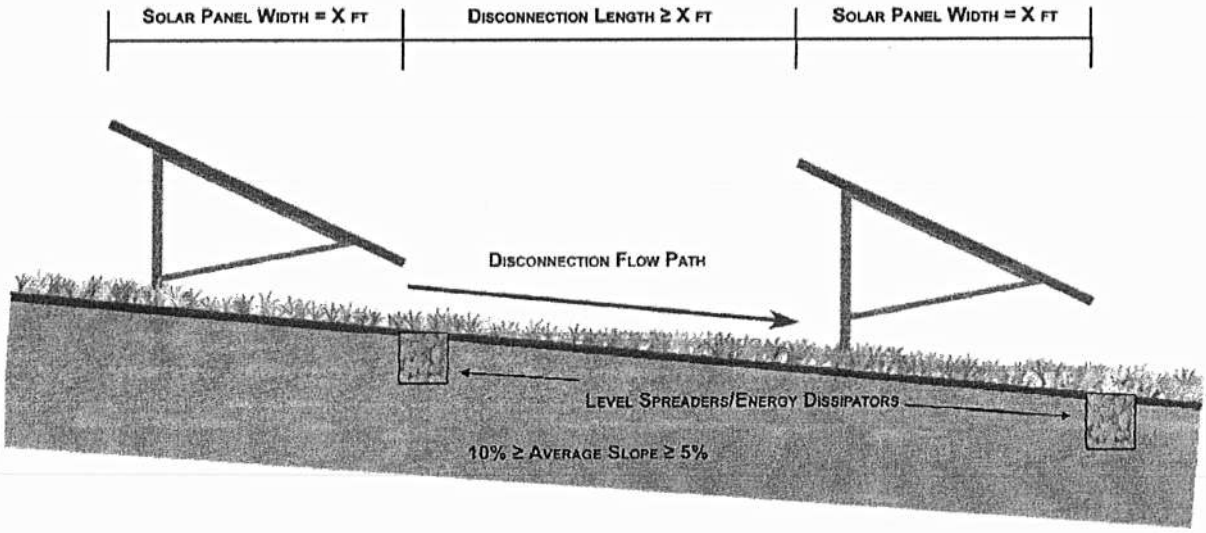


Figure 2
Solar Panel Installation with Slopes > 5% and ≤ 10%



Source: Maryland Department of the Environment: Stormwater Design Guidance – Solar Panel Installations