

Chapter 102 Permitting for Solar Panel Projects

Frequently Asked Questions (FAQ)

Revised, February 19, 2026

Version 1.3

Background

Responsible development of solar photovoltaic installations (solar panel projects) involves balancing the growth of this industry in Pennsylvania with the need to protect natural resources and manage stormwater runoff. This FAQ document was developed to clarify the Department of Environmental Protection's (DEP's) interpretations concerning applicability and implementation of National Pollutant Discharge Elimination System (NPDES) permits for stormwater discharges associated with construction activities, including erosion and sediment control (E&S) and post-construction stormwater management (PCSM), for solar panel projects. This document provides recommended guidance for ground level solar projects with at least one (1) acre of earth disturbance. References to additional guidance are found in [Attachment A](#).

Nothing in this document affects regulatory requirements. The interpretations herein are not an adjudication or a regulation. There is no intent on the part of DEP to give the interpretations in this document that weight or deference. This document provides a framework within which DEP and delegated county conservation districts (CCDs) will exercise administrative discretion in the future. DEP reserves the discretion to deviate from the interpretations in this document if circumstances warrant.

For additional information on solar energy, visit DEP's [Solar Energy Resource Hub](#).

FAQ #1: Is NPDES permit coverage required for the development of a solar panel project?

If the earth disturbance associated with the construction of a solar panel project, over the life of the project, will equal or exceed one (1) acre, NPDES permit coverage is required pursuant to [25 Pa. Code § 102.5\(a\)](#).

FAQ #2: What earth disturbance is associated with development of a solar panel project?

The definition of earth disturbance activity per [25 Pa. Code § 102.1](#) is:

A construction or other human activity which disturbs the surface of the land, including land clearing and grubbing, grading, excavations, embankments, land development, agricultural plowing or tilling, operation of animal heavy use areas, timber harvesting activities, road maintenance activities, oil and gas activities, well drilling, mineral extraction, and the moving,

depositing, stockpiling, or storing of soil, rock or earth materials.

Earth disturbance activities necessary to construct solar panel projects will vary depending on the topography, slopes, and soils of the proposed location of the solar panel project, the layout of the solar arrays, and whether the arrays are fixed tilt or solar tracking. Each project is different and needs to be evaluated independently. In some instances, significant grading, including clearing and grubbing, of the site may be necessary. In other cases, limited disturbance may be necessary to evenly grade the ground and to de-compact and restore the soils after panel array installation is complete. The total earth disturbance of the project would be the cumulative impacts of all earth disturbances associated with the installation of the support and mounting structures for each module, as well as any associated earthwork which may include, but is not limited to, access roads, support building(s) and temporary staging areas. Please refer to [FAQ #3](#) for more information on E&S best management practices (BMPs).

Soil compaction associated with earth disturbance activities generally cannot be avoided and occurs when vehicles, machinery, and equipment trailers pass over the panel array area during installation. Light vehicle usage is encouraged since this may help to limit the depth of compaction. Compaction is increased when the soils are wet as water acts as a lubricant, allowing soil particles to compress tighter together, reducing pore space and increasing the soil bulk density. Because compacted areas will require restoration, these areas should be included in the total earth disturbance for the site. Refer to [FAQ #4](#) for guidance on restoration of soils.

Solar panel projects can be challenging on heavily wooded sites as the proposed condition can create a significant change in land cover, generating extensive disturbance, and often requiring more detailed analysis or PCSM planning. For those situations where the pre-construction condition is wooded, any pre-timbering that occurs will need to be considered in the project's PCSM evaluation. Refer to [FAQ #4](#) and [FAQ #5](#) for more information on PCSM stormwater control measures (SCMs).

FAQ #3: What E&S BMPs are necessary for the installation of a solar panel project?

The amount and degree of E&S BMPs needed will be proportional to the amount of earth disturbance. Applicants must consider the cumulative effect of installing posts for panel arrays, not only where the posts are placed but also earth disturbance from construction vehicles needed to perform that work, when determining the amount of earth disturbance and E&S BMPs needed.

A proposed solar panel project must utilize E&S BMPs that are applicable to the size and scope of the project. Acceptable E&S BMPs are identified in DEP's [Erosion and Sediment Pollution Control Program Manual](#) (E&S Manual) and DEP's [Alternative BMPs list](#). The type of E&S BMPs will be dependent upon the configuration and method of installation of the solar panels.

All solar projects should include the following:

- 1) Provide a stable means of ingress and egress to and from the site;
- 2) Minimize the extent and duration of the earth disturbance activity (large projects should

- consider phasing so that large areas are not disturbed at one time);
- 3) Maximize protection of the existing drainage features and vegetation; and
 - 4) Minimize soil compaction and de-compact soils that will be compacted by construction activities.

FAQ #4: What are the PCSM requirements for a solar panel project?

All solar panel projects needing a Chapter 102 permit must satisfy DEP's PCSM requirements at [25 Pa. Code § 102.8](#). This FAQ provides recommendations on how applicants can meet PCSM requirements. There are two sets of recommendations in this FAQ: one set that applies to all projects and another set for those that can meet a site restoration standard.

PCSM Recommendations Applicable to All Solar Panel Projects

1. Preferably, the project site should not be located directly upslope of areas that are subject to flooding, particularly inhabited structures, unless the project will result in a reduced risk of flooding.
2. Earth disturbance and grading activities should be minimized, and natural vegetative cover should be preserved or restored. The utilization of low impact construction techniques should be used to the maximum extent practicable. For more information, refer to the following sections of the [Pennsylvania Stormwater Best Management Practices Manual](#) (Stormwater BMP Manual):
 - BMP 5.6.1: Minimize Total Disturbed Area – Grading;
 - BMP 5.6.2: Minimize Soil Compaction in Disturbed Areas; and
 - BMP 5.6.3: Re-Vegetate and Re-forest Disturbed Areas, Using Native Species

With respect to the actual panels, attention should be given to the concepts in BMP 5.8.1: Rooftop Disconnection, which aims to disconnect, distribute, and decentralize runoff, as well as BMP 6.4.10: Infiltration Berm & Retentive Grading, which addresses berms and other retentive grading techniques.

3. Vehicular traffic should be kept to designated areas and minimized to the maximum extent practicable. Areas that will be compacted during construction and are proposed to remain vegetated, or used for infiltration purposes, should be restored in accordance with BMP 6.7.3: Soil Amendment & Restoration, when there is no longer the need to travel or transport equipment or materials across these areas. These areas include gaps between panel array rows, and access around the solar panel project perimeter.
4. A minimum uniform 70% perennial vegetative cover is required under and between all solar panel arrays if vegetation is proposed in these areas, for permanent stabilization, as identified at [25 Pa. Code § 102.22\(a\)\(i\)](#). Shade-tolerant vegetation under panels is encouraged. Refer to DEP's [Erosion & Sediment Control FAQ](#) (specifically, FAQ #15-18) for more information. Vegetated areas should not be subject to chemical fertilization or herbicide/pesticides

application, except for those applications necessary to establish the vegetative cover (in accordance with an approved E&S Plan) or to support crop production related to agrivoltaics (refer to [FAQ #16](#)).

5. The lowest vertical clearance of the solar panel bottom should be minimized while retaining sufficient height to sustain perennial deep-rooted vegetation and optimizing infiltration below the panel. Limiting the vertical clearance of the solar panel will minimize the potential for accelerated erosion to occur along the drip line of the solar panel. If areas beneath the solar panels require mowing, the vegetative cover should not be cut to less than 6 inches in height.
6. Drip edge protection such as turf reinforcement or similar should be employed to address erosion along the dripline.

If the following criteria are met, DEP and delegated county conservation districts (CCDs) will consider the area associated with solar panels to meet the equivalent of a site restoration project per § 102.8(n), and PCSM requirements of [§ 102.8](#) will be considered satisfied (other areas to be disturbed may require additional measures). Otherwise, if the project cannot meet these criteria, refer to [FAQ #5](#).

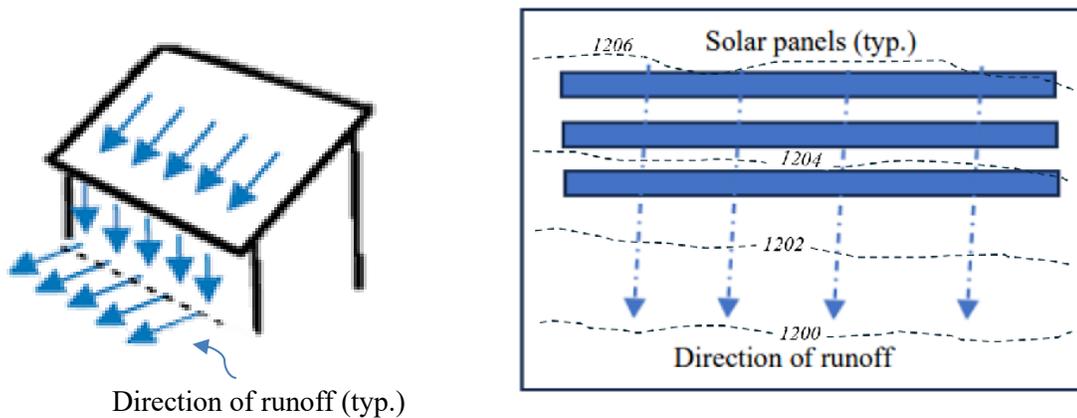
NOTE 4.1 – A portion of the project site may meet the criteria below and qualify as site restoration per § 102.8(n). Refer to DEP’s [Site Restoration FAQ](#) for more information.

Site Restoration Recommendations for Solar Panel Projects

1. The site should be designed to maintain applicable buffer distances from water bodies, including delineated wetlands, in accordance with federal, state, and/or local regulations. For example, there should not be earth disturbance within 150 feet of a perennial or intermittent river, stream, creek, lake, pond or reservoir when the project site is in a High Quality (HQ) or Exceptional Value (EV) watershed (see [§ 102.14\(a\)](#)).
2. Solar panels should be configured in a manner such that they disconnect surfaces, promoting sheet flow and natural infiltration into the ground beneath the panels, and minimizing the production of concentrated runoff. This can be accomplished when the bottom edge of the solar panel follows site contours. Refer to **Figure 4.A** below.

Fixed solar panel arrays installed in the northern hemisphere need to be orientated facing south for maximum efficiency; thus, not all installations will promote sheet flow. Solar panel arrays on a tracking system may provide more flexibility with respect to orientation during storm events, depending on the level of sophistication. Such systems may qualify as site restoration per § 102.8(n), when approved by DEP/CCD (refer to [FAQ #18](#)).

**Figure 4.A: Perpendicular flow condition - runoff is close to perpendicular to the arrays.
(Isometric view—left; Plan view—right)**

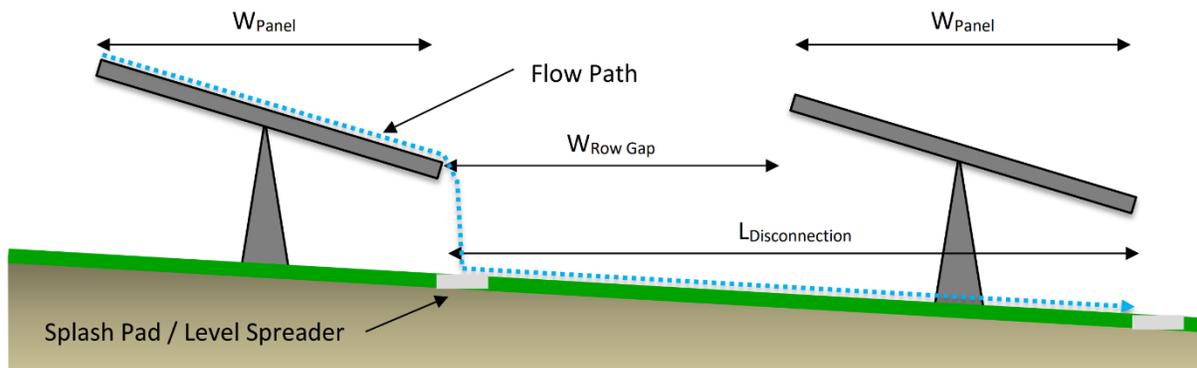


3. The individual photovoltaic panels should be arranged in a fashion that:
 - a. Allows for the growth of vegetation beneath panels and between arrays. A post-construction meadow condition, preferably utilizing a native deep-rooted perennial vegetation type¹, is recommended. Please refer to DEP’s [Erosion & Sediment Control FAQ](#) (specifically, FAQ #15-18) for more information on meadow cover.
 - b. Vegetation should provide a minimum uniform 90% perennial vegetative cover with a density capable of resisting accelerated erosion and sedimentation². The 90% standard exceeds the minimum uniform 70% perennial vegetative cover standard identified in [25 Pa. Code § 102.22\(a\)\(i\)](#), since the vegetation also functions as the primary PCSM SCM for the area associated with solar panels.
 - c. The length of disconnection (the row gap distance between arrays and the distance beneath the downslope array) should be sufficient to infiltrate the runoff from the upslope array. At a minimum, the gap distance between arrays ($W_{\text{Row Gap}}$) should be greater than or equal to the width of the panel array (W_{Panel}). See **Figure 4.B** below.

¹ To achieve a native deep-rooted vegetative cover, a mixture of perennial grasses and wildflowers is recommended with a diversity of forbs or flowering plants that bloom throughout the growing season. Blooming shrubs may also be used in buffer areas as appropriate for visual screening. Perennial vegetation (grasses and forbs) should be native to Pennsylvania, but where appropriate to the vegetative management plan goals, may also include other naturalized and non-invasive species which provide habitat for pollinators and wildlife and/or other ecosystem services.

² To incentivize a native or pollinator ground cover, which can take longer to establish than basic turf grass, the permittee can submit a Notice of Termination (NOT) upon achieving 70% vegetative cover when a native ground cover is established and there is a clear plan for achieving 90% establishment, or other provisions are employed until the ground cover meets the 90% threshold. If there is a sale of the property and the NOT has been acknowledged, the new owner will assume the responsibility of achieving and maintaining the 90% standard as part of the PCSM Operation and Maintenance Plan.

Figure 4.B: Schematic Profile of Solar Panel Array Providing Impervious Area Disconnection



Source: [Ohio EPA](#), April 2022

4. Post-construction slopes in the area associated with solar panels should be 10% or less, on average.
5. Compaction of subsoil should be avoided to the maximum extent practicable. Construction vehicles and equipment should avoid areas receiving disconnected runoff during installation of the solar panels. Areas receiving runoff should also be protected from future compaction.
6. Sites with soils having low strength/landslide prone limitations, should employ stabilization methods such as benches, also known as gradient terraces. The maximum vertical spacing between benches should not exceed those shown in Table 6.12 in the E&S Manual.

FAQ #5: My project cannot meet the site restoration criteria outlined above; how should the solar panel project be modeled for the PCSM stormwater analysis?

If an applicant is unable to meet the site restoration criteria in [FAQ #4](#), the applicant must complete a stormwater analysis to determine how the proposed solar panel project will impact the rate, volume, and quality of stormwater runoff from the site pursuant to 25 Pa. Code § 102.8(g). A comparison of pre- to post-construction runoff conditions is generally necessary to determine the level of PCSM planning to be provided for the project.

Four main factors influence stormwater runoff from solar panel array areas:

- 1) Soil characteristics, such as texture, depth, and bulk density;
- 2) Ground cover;
- 3) Panel array orientation (relative to the contours) and spacing; and
- 4) Land slope.

Research has suggested that solar panel project stormwater runoff is more accurately modeled when solar arrays are considered disconnected impervious surfaces (Mulla et al., 2024). To simplify the stormwater analysis for solar panel projects, DEP recommends use of the [Photovoltaic Stormwater Management Research and Testing \(PV-SMaRT\)](#) runoff calculator tool (© 2023 Regents of the University of Minnesota). Project site and solar panel characteristics are entered

into the PV-SMaRT tool to obtain runoff curve numbers (CNs) and runoff depths for the area associated with solar panels. Site-specific soil characteristics from a pre-development site investigation are preferred when utilizing the tool. Careful consideration should also be given when selecting ground cover/vegetation; please reference the instructions provided with the tool and [FAQ #9](#).

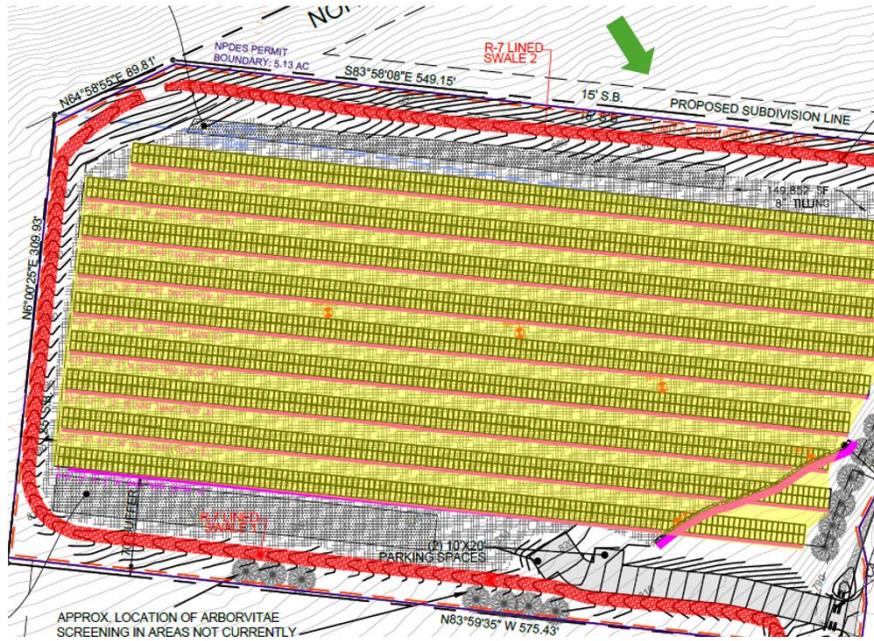
NOTE 5.1 – The PV-SMaRT tool should be used to determine CN values and runoff depths for both pre-construction and post-construction conditions within solar panel areas, including the gaps between arrays. If other impervious surfaces such as roads, SCMs, etc. are associated with the solar panel areas, those surfaces should be excluded from the PV-SMaRT tool area and calculated separately (refer to [FAQ #9](#)).

If the PV-SMaRT tool is not used, the applicant should contact DEP’s Bureau of Clean Water (BCW) at RA-EPChapter102@pa.gov to determine CN values and runoff depths for use in the stormwater analysis for the area associated with solar panels. When contacting BCW the following information should be supplied:

- Area associated with solar panels, in acres.
- Soil texture (sand, loamy sand, sandy loam, sandy clay, clay, silt, silt loam, loam, silty clay loam, silty clay, sandy clay loam, or clay loam).
- Soil depth (average) to an impermeable layer or zone, in inches.
- Bulk density (median) of the soil profile, in grams per cubic centimeter (g/cm^3), preferably measured in the field although use of the NRCS Web Soil Survey is acceptable.
- Type of vegetation in pre-construction and post-construction conditions (bare soil, gravel, row crop (straight row, poor or good management), row crop (contoured, good management), turf grass, newly established pollinator, or forest).
- Panel width, in feet (distance from one edge of the panel to the other, perpendicular to the panel array row).
- Panel spacing, in feet (distance from the center of one panel row to the center of the next panel row).
- Array orientation (follows slope contours, up and down slope, or combination).
- Percent slope (up to 20%).
- 2-year/24-hour precipitation depth.
- A map of the planned solar panel project.

EXAMPLE 5.A - The soil on a site in Montgomery County is comprised of Neshaminy Silt Loam (NaC) 8 to 15% slopes. Pre-development site characterization indicated an average depth of overburden (soil cover over bedrock) of 20 inches. The soil bulk density, as found on the USDA-NRCS Web Soil Survey, is $1.3 \text{ g}/\text{cm}^3$. The proposed ground cover will be open space/lawns (turf grass). The panel width and spacing will be 15 feet and the stormwater runoff will flow diagonally across the panel arrays as indicated by the green arrow shown on the drawing below (**Figure 5.A**). The array orientation will therefore be a combination of following slope contours and perpendicular to slope (up and down slope). The slope of the project site in the panel area is approximately 10%. The 2-year/24-hour rainfall depth is 3.24 inches for the 90th upper confidence interval using NOAA Atlas 14 data.

Figure 5.A: Partial PCSM Plan Site Drawing



A CN value for the solar panel array shown as the yellow shaded region above can be computed with the PV-SMaRT tool as demonstrated below:

Figure 5.B: PV-SMaRT Tool

Soil Texture	Silt Loam	***BLUE CELLS REQUIRE USER INPUT***	
Soil Depth (inches)	20	***MAROON CELLS REPRESENT TOOL OUTPUTS***	
Bulk Density (g/cm ³)	1.3		
Vegetation Present	Turf Grass	Runoff Curve Number	91.8
Are Solar Panels Present?	YES	24-Hr Precip Event (inches)	3.24
Panel Width (feet)	15	Expected Runoff (inches)	2.37
Panel Spacing (feet)	15		
Array Orientation	Combination		
Percent Slope	10		

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The resultant CN for the solar panel array is 91.8, rounded up to 92. The expected runoff of 2.37 inches can be used to determine the total volume of runoff for the area associated with solar panels, which would need to be added to runoff volume outside the solar panel area for the stormwater analysis.

Any impervious areas associated with gravel drip edge protection, access roads and/or support buildings should follow standard protocols when performing the stormwater analysis (e.g., DEP PCSM Spreadsheet).

If the applicant concludes that SCMs will be necessary to meet the PCSM requirements at §§ 102.8(g)(2) and (3), preference is given to the use of localized and low impact SCMs that mimic existing drainage patterns and preserve pre-development hydrology during and after the life of the solar panel project.

Significant topographic variations (i.e., steep slopes and undulating topography) are one of the most pressing challenges to overcome for ground mounted solar projects. Whenever possible, existing slopes on the project site should not exceed 20%. Projects that involve slopes steeper than 20% should have a professional engineer design a system with non-intrusive mounting options that can work with the slope variance and minimize earth disturbance or provide conveyance and/or stabilization SCMs. Arrays on slopes 20% or greater may also require a greater length of disconnection. See [FAQ #15](#) for more information.

FAQ #6: Can you clarify the conditions in which a stormwater analysis under § 102.8(g) is required for a solar panel project?

See the table below for a summary of stormwater analysis requirements.

Scenario	Stormwater Analysis Requirements
Projects meeting site restoration criteria (including slope \leq 10%)	The area associated with solar panels is excluded from the stormwater analysis unless impervious access roads are proposed or gravel drip edge protection is proposed within the solar panel area, in which case these areas are subject to a stormwater analysis. Additionally, any impervious areas outside of the solar panel area are generally subject to a stormwater analysis.

Scenario	Stormwater Analysis Requirements
Projects not meeting site restoration criteria (including slope > 10% and ≤ 20%)	The entire project site is subject to a stormwater analysis. The CN and runoff depth for the area associated with solar panels should be calculated using the PV-SMaRT tool or information should be submitted to DEP BCW to calculate these values. Runoff for impervious access roads within or outside of the solar panel area, gravel drip edge protection within the solar panel area, and all other impervious outside of the solar panel area should be calculated using standard methods (e.g., DEP PCSM Spreadsheet).
Projects with steep slopes (slope > 20%)	The entire project site is subject to a stormwater analysis. A professional engineer should use best professional judgment in determining CN values. Additional BMPs and SCMs would generally be expected.

FAQ #7: Portions of my solar panel areas meet all site restoration criteria, including slope (≤ 10%), while other portions meet all criteria except for slope (>10%). How should the stormwater analysis be completed?

As indicated in Note 4.1, portions of the project site may qualify as site restoration. The applicant can exclude the solar panel areas that meet all site restoration criteria from the stormwater analysis, and complete a stormwater analysis for the remaining areas. The site restoration areas should be clearly identified on the PCSM Plan.

FAQ #8: How can the net change in volume and water quality be determined in the PCSM Spreadsheet when the PV-SMaRT tool is used?

The designer can use the PV-SMaRT tool to determine the pre- and post-construction runoff depths and volumes for the area associated with solar panels. For the area not associated with solar panels, the pre- and post-construction runoff depths and volumes can be determined using the PCSM Spreadsheet or other methods. All results can then be entered into the Volume Worksheet of the PCSM Spreadsheet manually by unchecking the box next to “Automatically Calculate CN, Ia, Runoff and Volume.” On the Quality Worksheet the designer will need to enter land covers for water quality and pollutant concentrations to calculate pollutant loads (use of Attachment C of the [PCSM Spreadsheet Instructions](#) is recommended).

EXAMPLE 8.A – The following pre- and post-construction PV-SMaRT results were obtained for a solar project:

Pre-Construction

Soil Texture	Silt Loam	***BLUE CELLS REQUIRE USER INPUT***	
Soil Depth (inches)	28	***MAROON CELLS REPRESENT TOOL OUTPUTS***	
Bulk Density (g/cm ³)	1.48		
Vegetation Present	Row Crop (Contoured, Good Management)	Runoff Curve Number	76.4
Are Solar Panels Present?	NO	24-Hr Precip Event (inches)	3.00
Panel Width (feet)	7.8	Expected Runoff (inches)	1.04
Panel Spacing (feet)	23		
Array Orientation	Up and down slope		
Percent Slope	15		

Post-Construction

Soil Texture	Silt Loam	***BLUE CELLS REQUIRE USER INPUT***	
Soil Depth (inches)	28	***MAROON CELLS REPRESENT TOOL OUTPUTS***	
Bulk Density (g/cm ³)	1.48		
Vegetation Present	Newly Established Pollinator	Runoff Curve Number	83.0
Are Solar Panels Present?	YES	24-Hr Precip Event (inches)	3.00
Panel Width (feet)	7.8	Expected Runoff (inches)	1.45
Panel Spacing (feet)	23		
Array Orientation	Up and down slope		
Percent Slope	15		

The following information is manually entered into the Volume worksheet of the PCSM Spreadsheet; note that the box for “Automatically Calculate CN, Ia, Runoff and Volume” is unchecked, a value for Ia does not need to be entered, and the PCSM Spreadsheet only accepts whole CN values (round to the nearest whole number):

Pre-Construction Conditions: No. Rows: Exempt from Meadow in Good Condition Automatically Calculate CN, Ia, Runoff and Volume

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Row Crop (Contoured, Good Management)	5.95	N/A	76		1.04	22,462
TOTAL (ACRES):		5.95			TOTAL (CF): 22,462	

Post-Construction Conditions: No. Rows:

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Solar Panels with Newly Established Pollinator	5.95	N/A	83		1.45	31,318
TOTAL (ACRES):		5.95			TOTAL (CF): 31,318	

NET CHANGE IN VOLUME TO MANAGE (CF):

For the Quality worksheet of the PCSM Spreadsheet, enter the Land Cover for Water Quality that best matches the land cover entered into the Volume worksheet as well as the pollutant concentrations using the crosswalk in Attachment C of the PCSM Spreadsheet Instructions. For post-construction conditions, the Land Cover for Water Quality can consider the planned cover beneath and between the future solar panels.

Pre-Construction Pollutant Loads:

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Row Crop (Contoured, Good Management)	Pasture/Hay	5.95	N/A	22,462	145.0	0.55	5.71	203.37	0.77	8.01
TOTAL (ACRES):		5.95			TOTALS:			203.37	0.77	8.01

Post-Construction Pollutant Loads (without SCMs):

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Solar Panels with Newly Established Pollinator	Grassland/Herbaceous		N/A	31,318	48.8	0.22	2.30	95.43	0.43	4.50
TOTAL (ACRES):					TOTALS:			95.43	0.43	4.50

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):

FAQ #9: The PV-SMaRT tool calculates expected runoff. Does that runoff apply to the solar panels themselves or the solar panels plus the area between panels?

The expected runoff applies to the entire area associated with solar panels (panels plus gaps between panels). Note that if there are impervious surfaces such as roads within the area associated with solar panels, those surfaces should be removed from the calculation of volume associated with the solar panel area and calculated separately.

FAQ #10: What vegetation type on the PV-SMaRT tool should be used?

For pre-construction conditions, select the vegetation type that best matches existing conditions:

one of the Row Crop options if the proposed area associated with solar panels is currently in agricultural production, Mature Prairie if there are meadow conditions, or Forest if the solar panel area is currently forested. For post-construction, most often the designer should select Turf Grass or Newly Established Pollinator, depending on the seed mix selected. Note that if there is a mixture of pre-construction land covers, the tool should be used to calculate CN values and expected runoff for each cover separately.

FAQ #11: Can the area associated with solar panels be considered an exclusion area for the purpose of the pre-development site characterization (PDSC)?

Yes, unless PCSM SCMs are being considered within the gaps between panels, in which case only the solar panels themselves may be excluded.

NOTE 11.1 - Even though the solar panel areas may initially be considered an exclusion area, additional testing may be needed if the PDSC results for preferred SCM locations are not favorable and the solar panel locations can be reasonably reconfigured. Failure to complete additional testing and/or consider a reconfiguration must be supported with further justification.

FAQ #12: What if I propose concrete support footings or gravel drip edge protection under the solar panels?

Impervious surfaces associated with the mounting of solar panels do not need to be considered for the stormwater analysis. Impervious surfaces not associated with the mounting, such as gravel drip edge protection, do need to be considered for the stormwater analysis.

For example, for a project not meeting site restoration criteria, if the area associated with solar panels is 100 acres in total, and within this area there will be a total of 10 acres of impervious surfaces (not including the panels), the PV-SMaRT tool would be used to calculate the CN value for 90 acres and standard methods (e.g., DEP PCSM Spreadsheet) would be used to calculate the CN value for 10 acres.

Driven posts, helical anchors, or other minimally intrusive structural supports that are fully and easily removable are recommended. These techniques can also assist with future decommissioning of the site, if applicable. Turf reinforcement mats are also recommended in lieu of gravel drip edge protection. Turf reinforcement mats do not need to be considered impervious surface for a stormwater analysis.

FAQ #13: Are there any additional requirements if I need to re-grade the entire site?

As previously noted, the goal is to minimize earth disturbance to the maximum extent practicable. Projects that are unable to minimize earth disturbance should employ additional E&S BMPs such as those identified in Chapter 11 (Stabilization Methods and Standards) of the E&S Manual, and

additional PCSM SCMs such as soil/landscape restoration and soil amendments in accordance with the recommendations of the Stormwater BMP Manual (see BMP 6.7.2: Landscape Restoration and BMP 6.7.3: Soil Amendment and Restoration, respectively). Areas with slopes greater than 10% may require additional slope stabilization analysis/slope protection measures. Please refer to Chapter 11 of the E&S Manual for areas with slopes that exceed 10%.

FAQ #14: Is there a maximum size of solar panel modules that will trigger additional SCMs or design considerations?

If individual solar panels are too large to maintain sheet flow on the ground surface, then an adequate vegetative cover may not be able to be established and maintained. The areal extent of the solar panel(s) should be analyzed by a licensed professional to determine whether the permanent vegetative cover is sufficient for anticipated runoff and whether additional SCMs are necessary. Examples from other projects with similar site/project characteristics may be utilized to demonstrate resiliency of the vegetated system once established. When necessary, additional SCMs including, but not limited to, infiltration trenches and infiltration berms may be installed downgradient. Please refer to the Stormwater BMP Manual, specifically BMP 6.4.4: Infiltration Trench and BMP 6.4.10: Infiltration Berm and Retentive Grading for additional guidance. Also see the References found in [Attachment A](#).

FAQ #15: Portions of my solar panel project contain areas of slope that exceed 20%. Can the project be permitted?

Solar panel projects containing areas of slopes exceeding 20% can be permitted, however they do push the threshold of current constructability, as would any project with steep slopes that does not include significant regrading. Maximum permissible slope lengths for perimeter controls are sharply reduced on steep slopes, and exterior slopes for constructed berms require a significantly larger area to transition to existing grade. Additionally, PCSM requirements increase when slope increases.

Locations within a project site with slopes greater than 20% may be incorporated into a project design depending on other site conditions. These would need to be evaluated on a case-by-case basis. At a minimum, additional E&S BMPs such as benches or terraces, and additional PCSM SCMs such as retentive grading berms or infiltration trenches between rows should be installed. Also, increased disconnection length between panels would be necessary since infiltration is severely decreased on steep slopes.

Refer to Chapter 6 (specifically Benches/Gradient Terraces) and Chapter 11 of the E&S Manual and Stormwater BMP Manual (specifically [BMP 6.4.4: Infiltration Trench](#) and [BMP 6.4.10: Infiltration Berm and Retentive Grading](#)) for additional guidance. Other BMPs/SCMs may also be proposed at the discretion of a licensed professional or may be required by permit reviewers to meet the requirements of Chapter 102. DEP also has the discretion to require an Individual NPDES Permit depending on the complexity of the project and if special conditions are warranted.

FAQ #16: Can agricultural activities be conducted beneath and around solar panels?

Yes, this practice is known as agrivoltaics – the simultaneous use of land for both agricultural production and solar photovoltaic energy. Co-developing land for both farming and solar power generation is possible, provided certain conditions are met. The following list of conditions should be satisfied in order to comply with erosion and sediment control regulations related to agricultural activities under [25 Pa. Code § 102.4\(a\)](#) and manure management regulations under [25 Pa. Code § 91.36\(b\)](#):

1. A written Agricultural Erosion and Sediment Control Plan (Ag. E&S Plan) must be developed and implemented on any operation with plowable/tillable land (including no-till), Animal Heavy Use Area (AHUA), and/or combined areas equal to or greater than 5,000 square feet of earth disturbance in accordance with the requirements of [25 Pa. Code §102.4\(a\)](#). A Manure Management Plan (MMP) must be developed and implemented for any operation that land applies manure or agricultural process wastewater in accordance with [25 Pa. Code §91.36\(b\)](#). See DEP/s Agricultural Compliance website for more [Ag E&S](#) and [Manure Management](#) information.
2. Utilize shade tolerant crops beneath panel arrays to ensure expected yields and vegetative growth as described in the Ag. E&S Plans can be attained.
3. Ensure appropriate livestock stocking rates on pasture beneath panel arrays to ensure at least six (6) inches of vegetation height and 70% cover when animals are present on pasture.
4. Panel array design and layout should accommodate farming equipment and conventional agricultural activities, such as irrigation, planting, and harvesting so that the agricultural operation can be maintained in accordance with the Ag. E&S Plan. Additional SCMs should be implemented to prevent and/or address accelerated erosion and sedimentation along the dripline.
5. The agricultural operation must be maintained in accordance with the Ag E&S and MMP, as applicable.

FAQ #17: Can an alternative design standard be used to model solar panel projects?

Yes, alternative design standards can be proposed and may be approved on a case-by-case basis. Sufficient supporting documentation would be required to show that the proposed alternative will provide equal or better environmental protection.

FAQ #18: Are solar panel projects with tracking arrays designed differently than fixed panel arrays?

If solar tracking panel arrays are proposed, the applicant should describe how the panels will be programmed, including the indication of on-site weather sensing equipment. A preset rain stow vertical or near vertical position during rain events is recommended. The rain stow position and horizontal panel area should be shown on the detail sheet and illustrated on the plan view to determine how the panels should be modeled for stormwater analysis. If panel arrays are not designed to go to a preset rain stow mode during rain events, the designer should design in accordance with [FAQ #5](#), depending on the slope of the arrays.

NOTE 18.1 – When determining whether solar panel areas can be considered site restoration, the use of tracking systems only provides flexibility on the panel orientation requirement. All other site restoration standards listed in [FAQ #4](#) must still be met.

FAQ #19: Can multiple applicants (such as LLCs or Partnerships) be listed on a solar project NPDES application or Notice of Intent (NOI)?

Yes, multiple applicants can be listed on the application/NOI, with permit coverage issued to all LLCs or Partners as co-permittees. All co-permittees are then held responsible to adhere to the conditions of the permit, for the entire project site, unless or until a co-permittee is removed from the permit via an amendment. If multiple applicants are included, a primary contact should be indicated on the application/NOI.

ATTACHMENT A: REFERENCES

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Version History

Date	Version	Revision Reason
2/19/2026	1.3	Updated Figure 4.A; revised Note 5.1; added FAQs #7 – 11 and renumbered FAQs following #11; added Note 18.1; and replaced “solar panel farm” with “solar panel project” throughout.
12/9/2025	1.2	Modified FAQ #4 to include recommended criteria for all solar projects and additional separate criteria for when the area associated with solar panels can be considered a site restoration activity; in addition, certain site restoration criteria were modified. Updated FAQ #5 to provide specific technical guidance for sites that cannot meet site restoration criteria. Established new FAQ #6 to clarify when a stormwater analysis is required and renumbered remaining FAQs. The previous FAQ #7 and FAQ #10 were removed and its guidance placed into other FAQs. For new FAQ #10 (previous FAQ #11), the referenced slope was increased to 20%. Added new FAQs #12-14.
4/30/2021	1.1	The FAQ was rewritten in its entirety to reflect the latest knowledge in stormwater management at solar panel farms including recommendations from other states and published research.
1/2/2019	1.0	Original