

Information to use in the Determination of Stormwater Management (SWM) Impacts for Solar Projects

All construction projects need to have some consideration of the impact that the project has on stormwater runoff. With some projects, these impacts are so minimal that a detailed analysis is not required by the developer.

Under the following conditions, the project area of a fixed-panel photovoltaic solar farm project can be treated as pervious cover and not require any additional Post Construction Stormwater Best Management Practices (BMPs). If these conditions aren't or can't be met, an analysis of how the project will impact the amount and quality of the stormwater runoff from the site will need to be performed. The goal is to try to replicate the pre-development condition after the construction is finished. Depending on how much the project differs from the following conditions, the analysis may be relatively minor or if there is a large variation it could be more complicated.

1. Projects where earth disturbance and grading activities are minimized and where natural vegetal cover is preserved and/or restored. (See Stormwater BMP Manual, BMPs 5.6.1, 5.6.2 & 5.6.3) Utilizing low impact construction techniques is encouraged.ⁱ
2. Vegetal cover has **90%** or better uniform coverage since in a pervious cover scenario, the vegetation will typically be the primary (and sometimes the sole) BMP.
 - a. A meadow condition is preferable, particularly for slopes between **5 and 10%**.
 - b. Mowed areas, where approvable, should be kept to **4"** (min).
 - c. Vegetated areas will not be subject to chemical fertilization or herbicides/pesticides.ⁱⁱ
3. Individual photovoltaic panels within an array are arranged in a fashion that:
 - a. Allows the passage of runoff between each module thereby minimizing the creation of concentrated runoff.ⁱⁱⁱ
 - b. Allows the growth of vegetation beneath and between arrays.



4. Ground mounted solar panels are supported with structures/foundations occupying minimal space. (Maximum **5%** of the total project area)^{iv}
5. Solar panels are situated on mild slopes (**10% max**).^v
6. The lowest vertical clearance of the solar array is at an elevation of **10 feet** or less from the ground, but is also at an adequate height to promote vegetative growth below the array.^{vi}

Gravel may not be considered pervious cover (depending on the compaction or alteration of the soil layer beneath the gravel) and a pre-to-post comparative analysis will be required to compute the amount of runoff to be controlled by BMPs (i.e. CG-1). In this instance, actual conditions may be utilized for the pre-development condition – at the discretion of the regulatory agency – rather than a meadow assumption. (Exceptions: Special Protection Watersheds and Steep Slopes Areas)

Projects utilizing a minimum 6” layer of gravel (clean washed & uniformly graded) may utilize the void storage for stormwater purposes if site, project and underlying soil conditions allow.

Sand layers (or other filter media) may also be introduced into the design to help address water quality, where deemed appropriate by the regulatory agency.

All impervious areas associated with roadways and support buildings will need to follow normal protocol for Post-Construction SWM.

ⁱ Projects that are unable to minimize disturbance or grading activities may employ soil/landscape restoration and soil amendments in accordance with the PA BMP Manual.

ⁱⁱⁱⁱ Besides those applications that are necessary to get vegetation established and which follow an approved Erosion and Sediment Pollution Control Plan.

ⁱⁱⁱ If the width of the module exceeds 3 feet (i.e. there is inadequate spacing between modules), then BMPs such as infiltration trenches (min. 12” wide by 12” deep) or infiltration berms shall be installed downgradient between each row.

^{iv} If greater than 5% of the project area is occupied by support structure/foundations than drainage conveyance and PCSM controls will be necessary.

^v If larger than 10% slopes are proposed, then BMPs such as infiltration trenches (min. 12” wide by 12” deep) or infiltration berms shall be installed downgradient between each row.

^{vivi} If elevation is greater than 10’, BMPs will be necessary to prevent/control erosion & scour along the drip line or otherwise provide energy dissipation.