

STORMWATER CALCULATIONS AND MODELING SUMMARY

Stormwater Modeling

The purpose of the project is to construct a solar energy generating facility. The proposed solar array project consists of gravel access roads, transformer pads, and solar array panels. The panels will be installed on a screwed-in mounting system due to shallow rock conditions across the Site. The array will be completely surrounded by a 7-foot high chain-link fence.

The Project will require the clearing of trees and vegetation within and adjacent to the array area for array placement and elimination of shading. Areas that are cleared of trees will be re-vegetated with grass. The Project will not result in any significant changes to the existing drainage patterns or hydrology to the extent practicable for the approximately 90 acre watershed.

For this hydrologic analysis, the pre-development conditions include ten (10) subcatchments and Points of Analysis (POAs) within the approximately 90 acre watershed, while the post-development conditions include the (10) pre-development subcatchments and Points of Analysis (POAs) delineated to maintain a maximum 5 acre watershed area. Refer to the pre-development and post-development watershed plans included herein.

The NRCS Soil Report for the site provided information that the site is predominantly hydrologic soil group (HSG) 'C' and 'D' soils proximate to the Housatonic River.

Stormwater runoff calculations were performed for Type III 2, 10, 25, and 100-year 24-hour storm events. The rainfall data was taken from the Connecticut Department of Energy And Environment (CTDEEP) Stormwater Quality Manual, 2004.

In order to assess the impact of the proposed development with the addition of the array infrastructure on the site's stormwater characteristics, a hydrologic analysis for the pre-development and post-development conditions was conducted based upon computer modeling using HydroCAD version 10.0. This program incorporates the methodology based on the Soil Conservation Service unit hydrograph method in Technical Release 20 (TR 20). Curve number data was composed from the TR-20 tables for land cover and hydrologic soil type for the 10 (10) subcatchments within the approximately 90 acre watershed.

Design Criteria

The proposed stormwater management systems will be designed in accordance with the CTDEEP Stormwater Quality Manual, 2004. The CTDEEP stormwater regulations require stormwater to be managed for both quality and quantity using specified unified stormwater sizing criteria. The minimum CTDEEP stormwater management guidelines included:

- Water Quality Volume – WQV. The design rainfall for managing and treating the WQV is a 1.0 inch rain event for the area to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS).

- Groundwater Recharge Volume - GRV. The guidelines require extended detention of the 1-year, 24-hour storm for a period of 24 hours using structural stormwater controls. This standard is intended to maintain pre-development annual groundwater recharge volume through infiltration.
- Stream Channel Protection – Protection is provided by controlling the post-development 2-year, 24-hour storm peak discharge rate from exceeding the predevelopment 1-year, 24-hour storm peak discharge rate using stormwater management practices.
- Conveyance Protection – Protection is provided by managing the post-development 10-year, 24-hour storm peak discharge rates through the stormwater management practices.
- Peak Runoff Attenuation – Protection is provided by controlling the post-development 10-year, 25-year and 100-year 24-hour storm peak discharge rates from exceeding the predevelopment peak discharge rate using stormwater management practices.
- Emergency Outlet Sizing – Protection is provided by controlling and/or safely conveying the 100-year, 24-hour storm event by verifying that the proposed stormwater management features have adequate capacity to handle the 100-year event.

Stormwater Runoff

For the WQV requirement, water quality swales will be provided to treat the required 1.0 inch rain event from the post-developed subcatchments. The water quality swales will be located along the downgradient perimeter of the project areas.

In addition, the CTDEEP Water Quality Manual requires that a Recharge Volume be provided as part of stormwater BMPs. The recharge volume is considered part of the total WQv that must be provided at the Site and will be achieved by the stormwater quality swale.

Peak runoff attenuation rates will be controlled to below existing conditions by providing the water quality swales with overflow checkdam/spillways and level spreaders to return runoff flows to sheet flows with discharge to existing undisturbed/vegetated areas.

Overall peak runoff rates from the site will be controlled through the proposed stormwater management systems for modeled storm events, and the development project will be in accordance with CTDEEP water quality requirements.