

Lisa Daigle, Land Use Coordinator
Town of Beacon Falls
10 Maple Avenue
Beacon Falls, Connecticut 06403

RE: Proposed Photovoltaic Array
343 Lopus Road
Supplemental Stormwater Memo

Dear Ms. Daigle:

Comments provided by members of the Inland Wetlands Commission indicate that the Commission has requested that the applicant analyze the stormwater management scheme associated with the proposed solar array for potential prudent or feasible alternative layouts or discharge points. The intent of this memo is to provide a discussion on possible alternative stormwater management schemes related to the proposed photovoltaic array to be located at 343 Lopus Road. To accommodate this request, the Applicant has investigated the potential of multiple proposed discharge points from the Site, directing additional stormwater discharge toward the State ROW and the possibility of introducing proposed drywells or other typical stormwater management products that are used on development of similar sizes. This memo will provide a summary of the potential alternatives and a discussion related to the feasibility of implementation.

ALTERNATIVE STORMWATER SCHEMES

Multiple Discharge Points

Current site conditions indicate that there are two distinct discharge points from the property. These discharge points are depicted on the Existing Drainage Area Plan (ED-1) provided in the stormwater management report submitted with the application and provided again with this letter for reference. The Site discharges runoff across the southern property boundary, through an abutting property and ultimately to Railroad Avenue, which is referred to as Design Point 1 (DP-1) in the report. The Site also discharges from a low point along the eastern property boundary into the Route 8 ROW, which is referred to as Design Point 2 (DP-2) in the report. Existing topography as well as the historic removal of material from this site render it impossible to discharge runoff in a northerly or westerly direction as the Site is at a lower elevation than all points immediately west or north of the property. One of the purposes of a stormwater management system and a requirement of the 2004 Connecticut Stormwater Quality Manual is to mimic the existing drainage patterns. The runoff must continue to flow to the same discharge points as the existing conditions; therefore, in the post developed condition the stormwater runoff must continue to be discharged to the south and east of the property.

Having established that the direction of flow of the stormwater discharge must continue to be to the south and east, the concept of potentially adding additional discharges in these directions was explored. Additional discharges to the east becomes problematic with respect to meeting the water quality and pretreatment requirements of the 2004 Connecticut Stormwater Quality Manual. The Applicant cannot propose a discharge from the areas of the Site that will be developed with the solar array without first routing the runoff through some type of pretreatment device and stormwater quality treatment. The general shape of the Site, specifically that the Site is much longer north to south than east to west, limits the ability to propose a stormwater quality feature along the eastern boundary of the Site that could provide the necessary pretreatment and water quality treatment without greatly impacting the footprint of the development.

The concept of additional discharges off the southern property line becomes problematic when considering the desired goal of limiting point discharges of stormwater from a site. Currently, the site is designed to direct stormwater runoff into an infiltration basin that runs along the entire southern property line in the area of the proposed development. Discharge from this proposed basin will be directed to a 300 foot long level spreader that will distribute runoff as sheet flow across the southern property line. Essentially, the entire southern property line is a “discharge point” and it would be impossible to introduce multiple discharges in this area without creating multiple point sources that would be less desirable and could actually increase the potential impact to abutting properties than the currently proposed sheet flow across the entire property line.

Directing Additional Runoff to the DOT ROW

The Applicant has investigated directing additional runoff easterly towards the DOT ROW (DP-2 in the stormwater report). This concept differs slightly from the topic discussed above in that all the runoff could potentially leave the Site in the same location at a single discharge point; however, the ability to accomplish this is problematic for similar reasons. In the current grading scheme all of the stormwater runoff within the limit of disturbance of the photovoltaic development is conveyed to the proposed stormwater infiltration basin along the southern property line. The proposed grading scheme acts to reduce the drainage area contributing runoff to DP-2 which also reduces the total rate and volume of runoff discharged to the State ROW. In order to increase the runoff conveyed to DP-2, a portion of the solar development would need to be regraded to direct runoff easterly towards the ROW. However, as discussed above, stormwater runoff from the developed portion of the Site cannot be discharged without first being routed through a pretreatment system and then a stormwater quality treatment feature. The northern most portion of the Site that could potentially be directed easterly does not have the adequate real estate to install a pretreatment component or water quality feature without significant impacts to the size of the solar development.

Proposing Individual Dry Wells or Other Stormwater Management Devices

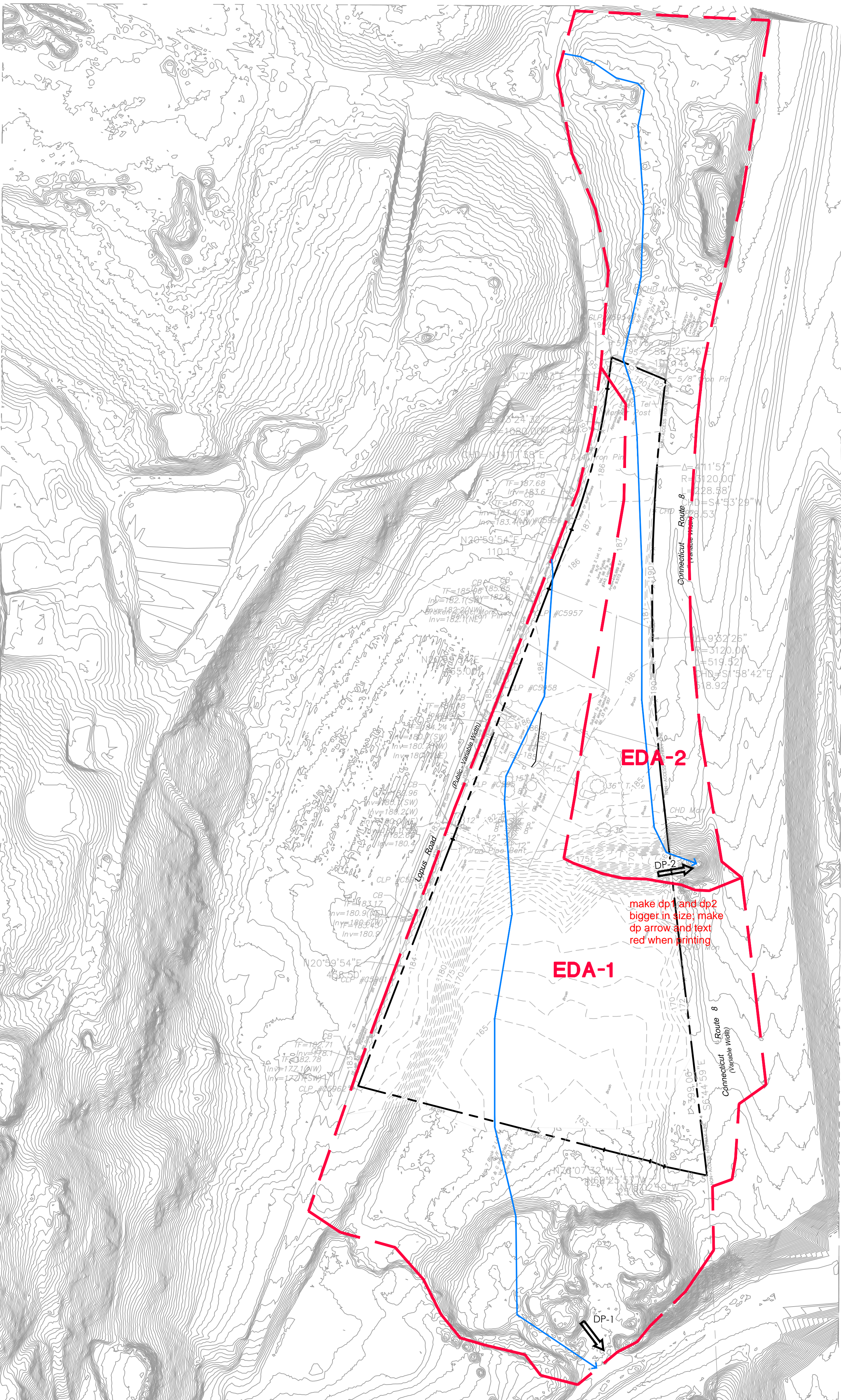
The Applicant has investigated the potential use of the traditional stormwater management devices that are typically used in retail/commercial/residential site developments for this project. In traditional site developments, stormwater runoff from connected impervious areas (parking lots and roofs) is directed by curbs and gutters to a series of catch basin inlet structures and then conveyed to the proposed management features like excavated basins, underground chambers, dry wells and hydrodynamic separators. The use of one feature over the other, or in combination with each other, is determined by the site specific constraints of a particular development. Small sites with minimal real estate for excavated ponds may propose underground chambers for detention/retention and infiltration of stormwater runoff. Larger sites can utilize excavated infiltration basins to provide water quality treatment instead of using hydrodynamic separators. A site specific analysis was completed to design the proposed stormwater management features for this development. There is one critical difference between photovoltaic sites and traditional developments. The proposed impervious areas are disconnected on the photovoltaic sites, specifically, the panels and gravel access roads are separated from one another by vegetated areas. This disconnect of impervious areas does not lend itself to a traditional stormwater collection system consisting of curbs and gutters and catch basin inlets to convey runoff to the stormwater management and treatment features. A traditional stormwater collection system is necessary to convey runoff to dry wells, underground chambers, and hydrodynamic separators. Therefore, the traditional underground stormwater management features are not prudent or feasible for a solar development because of the lack of the traditional stormwater collection system.

At the request of the Commission, the Applicant has investigated a number of alternate stormwater management scenarios for the proposed photovoltaic site located at 343 Lopus Road. The Applicant has reviewed the possibility of increasing the number of discharge points, modifying the rate of runoff exiting the Site at the established design points and the implementation of traditional stormwater management components typically used on other land development projects. Due to regulatory requirements related to stormwater treatment and following pre-development flow patterns, the geometry of the Site and the nature of the disconnected impervious areas for photovoltaic sites, the currently proposed stormwater management system is the most prudent and feasible design for the Site.

Sincerely,



Christopher D. Gagnon P. E.
Senior Project Manager



EXISTING HYDROLOGY

DRAINAGE AREA	TOTAL AREA	IMPERVIOUS AREA (S.F.)	PERVIOUS AREA (S.F.)	PERCENT IMPERVIOUS (%)	CN	TC (MIN)
EDA-1	615,510	18,763	594,747	3.10%	57	49.30
EDA-2	317,060	884	316,176	0.30%	55	55.5
TOTAL AREA:	932,570	19,647	910,923			

LEGEND

- EXISTING DRAINAGE AREA BOUNDARY
- EXISTING SOIL BOUNDARY
- TIME OF CONCENTRATION PATH
- DESIGN POINT
- CURVE NUMBER
- TIME OF CONCENTRATION

NOTES

- THE FOLLOWING IS CONSIDERED "IMPERVIOUS AREA": BITUMINOUS DRIVEWAYS, BITUMINOUS WALKS, BITUMINOUS CURB, CONCRETE DRIVEWAYS, CONCRETE WALKS, CONCRETE PADS, CONCRETE CURB AND BUILDINGS.
- ONSITE TOPOGRAPHY BASED ON BL COMPANIES FIELD SURVEY PERFORMED ON 08/06/2021 AND OFFSITE TOPOGRAPHY BASED ON STATE LIDAR INFORMATION.

18/07/2021: BCDRAWING: C:\CORP\18901\18901\DWG\ED118901.DWG (ED1: 240X, 110X)
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REVISIONS	
No.	Date

Designed	R.M.D.
Drawn	R.M.D.
Reviewed	E.A.E.
Scale	1"=110'
Project No.	2101189
Date	08/27/2021
CAD File:	ED210118901
Title	EXISTING DRAINAGE AREA PLAN
Sheet No.	

