SUPPORTING DOCUMENTATION
1.99 MW SOLAR ARRAY
PLATT HILL ROAD
WINCHESTER – CONNECTICUT
PREPARED FOR LODESTAR ENERGY
MARCH 20, 2020

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Property Description

The subject property is located on the east side of Platt Hill Road in Winchester, Connecticut, north of Taylor Brook Road and south of Dayton Road/Reaching Hill Road. The original site contained 104.5 acres and a 24-lot Conservation Subdivision was designed and approved on the 104.5 acre site back in 2005. The current owners are selling all the land except for three approved building lots which front on Platt Hill road. There an Eversource Easement containing utility poles located in the northeast corner of the site.

Vegetative Conditions

The majority of site is wooded. There are some former meadow areas found in the western portion of the site which are going through the Early Succession process to become a forested area. The dominant tree species on the site are a mixture of Black Oak, Red Oak, Sugar Maple, Red Maple, Black Cherry and American Beech. There are clusters of White Pines in the southern portion of the site. A selective timber harvest was conducted a portion of the property (area of proposed building lots) in 2006 and roughly 700 trees were removed. In these areas, herbaceous and shrub layers have become re-established on the forest floor.

Wetland/Watercourses

There are numerous wetland/watercourses systems on the subject property. The original wetland delineation was done in 2003 and confirmed in 2019. See document entitled "Wetlands Soil Evaluation" – 100 acres – Platt Hill Road – Winchester, Connecticut; dated: March 11, 2020 by this office for a detailed discussion of the wetland/watercourses on this site.

Wetland and watercourse systems are highlighted in Figure 1.

Environmental Evaluations

At the time of the subdivision application, two environmental assessments of the wetland/watercourse systems were performed by Matt Popp, Professional Wetland Scientist of Environmental Land Solutions and Penelope Sharp, Environmental Consultant.

A request was filed with the CT DEEP Natural Diversity Database in October 2019 and two species were identified: Bridle shiner (State Special Concern) and Eastern pondmussel (State Special Concern).

Matt Popp of Environmental Land Solutions has prepared a response to the CT DEEP Natural Diversity Database report. All of the environmental reports and the response from the CT DEEP Natural Diversity Database are found in the document entitled: "Environmental Evaluations" – 100 acres – Platt Hill Road – Winchester, Connecticut; dated: March 11, 2020.

Non-Wetland Soil Types

The upland soils on the site were field delineated by Mr. Beroz. They consist of Charlton, Paxton and Woodbridge. Additionally, deep test holes were excavated for the subdivision throughout the site to a depth of 7' to 8'. In the area of the solar array, Paxton soils are the dominant type. Only near Platt Hill Road was bedrock encountered at a depth less

than 7'. Test hole results are found in Appendix "C" of the Stormwater Management Report by Trinkaus Engineering, LLC.

The site is surrounded by residential development (lots of various sizes) and local roads which provide access to the residential properties and is not defined as core forest.

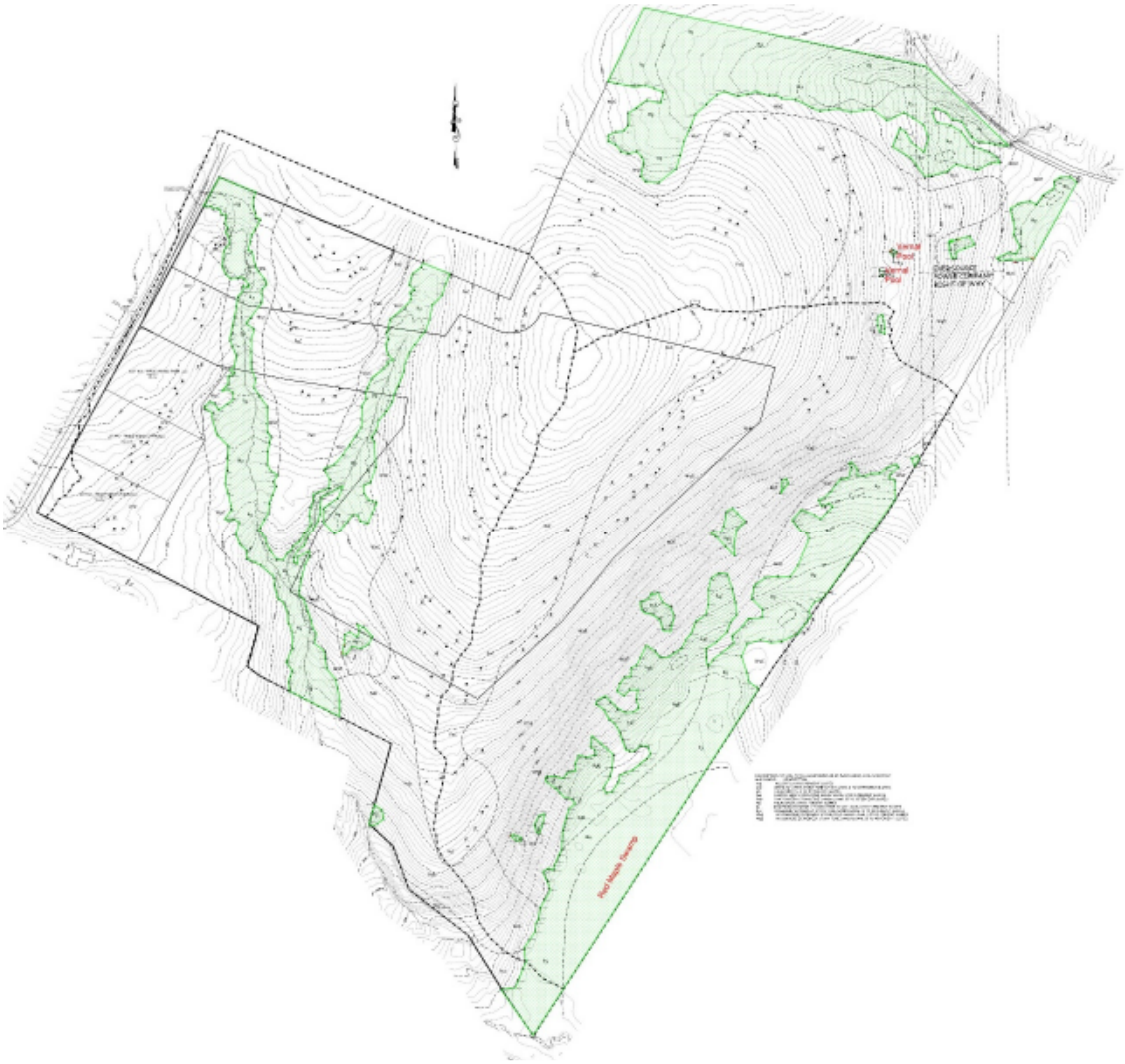

Figure 1 – Wetland/Watercourse/Vernal Pool Mapping

According to the Natural Resource Conservation Service Websoil survey, only two small portions of the subject property are considered Prime Farmland. The first area is located in the north central portion of the site which is outside the area of the proposed solar array. This portion of the site will be preserved as Open Space and conveyed to the Winchester Land Trust.

The second area is located in the northwest portion of the site between the two intermittent stream corridors. The proposed driveway crosses the southern edge of this area and there is no other development proposed on the farmland soils. The majority of the farmland soils in this area are located in the proposed open space area.

Mapping and description of the Prime Farmland Soils are found in Appendix "B" of this report.

Topographic Conditions

The topography of the site is variable. From Platt Hill Road, it slopes gently down in an easterly direction to the two intermittent watercourse/wetland corridors. There is an upland area in the northern area between the two intermittent watercourse/wetland corridor. From this wetland corridor the land slopes up to the east where there is a north/south ridge line. The high point of the site is located in the central portion of this area and from here the land slopes moderately to the north toward Dayton Road, it slopes to the east down moderate then steep slopes to the wetland system located along the bottom of the slope. The land slopes to the south on mild and moderate slopes in the general direction of Taylor Road. The topography of the site is clearly visible in Figure 1.

The subject property and adjacent residential properties and local roads are shown in Figure 2 which was taken from Town of Winchester GIS mapping.

Figure 2 – Town of Winchester GIS Mapping showing project site.

FEMA Mapping

Figure 3 shows the site (in red outline) on the FEMA mapping. There is no floodway, 100-year or 500-year flood plain within 0.5 mile of the site. There is no active farm land within 0.5 miles of the subject property. Platt Hill State Park Scenic Reserve is located 1,100 north of the subject property and 2,100 feet from the parcel containing the soil array. Other State of Connecticut land is located 1,500 feet to the east of the subject parcel.

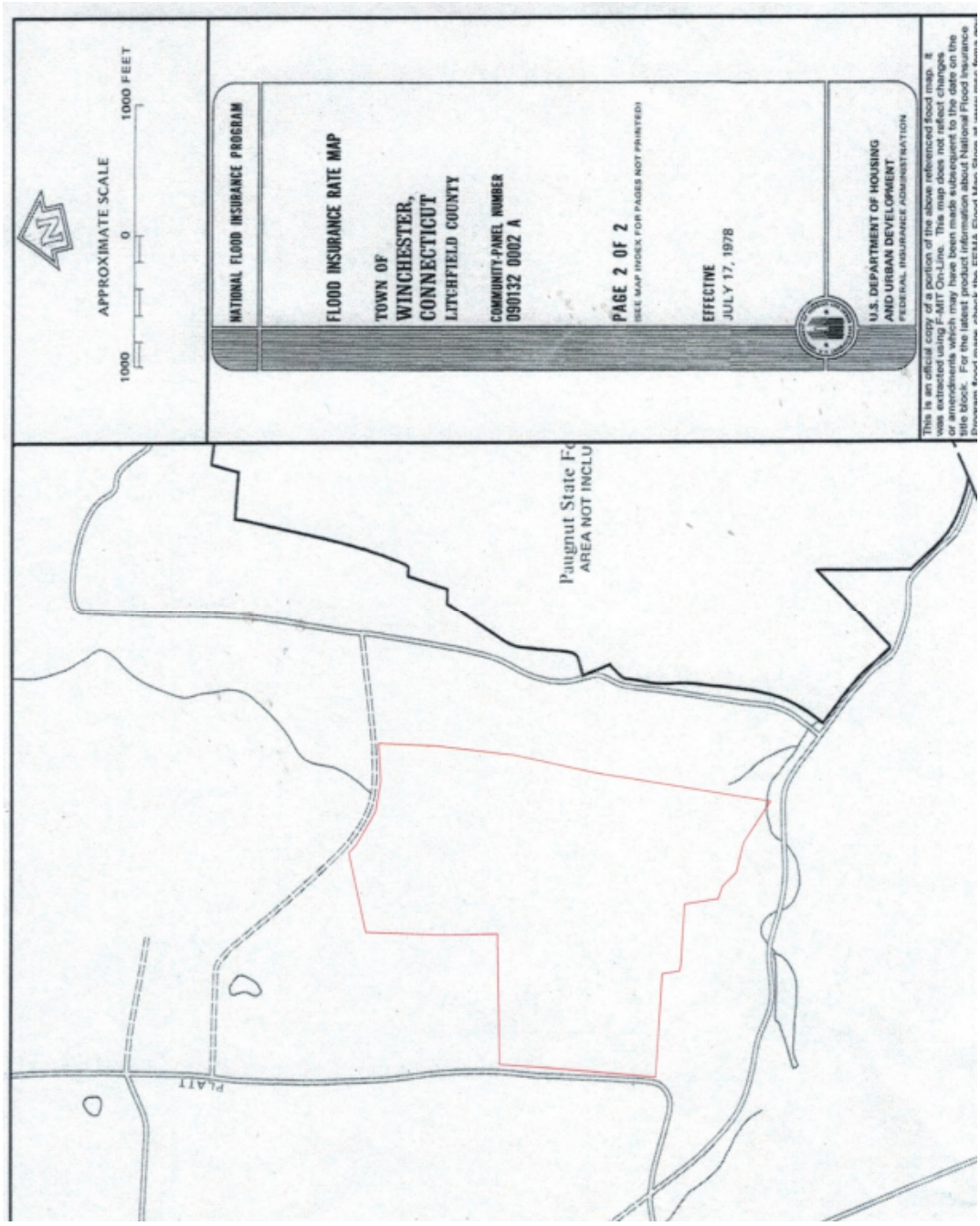

Figure 3 - FEMA Mapping

Aquifer Mapping

According to Town of Winchester mapping there are no primary or secondary recharge zones or aquifer protection areas on or within 0.5 miles of the subject property.

Project Description

The 100 acres will be divided into two parcels. One of 24.8 acres will contain the solar array, electrical equipment and access driveway from Platt Hill Road. The second parcel containing 75 acres will be deeded to the Winchester Land Trust to be preserved in perpetuity. The solar array will be installed in the central portion of the site on the south facing slopes noted above. The area of the solar array is 8 acres, an additional 5.36 acres will be cleared for providing solar access for the panels. The array will consist of 7,908 panels on a steel racking system.

A twelve (12') wide gravel driveway will provide access from Platt Hill Road to the solar array. The driveway will cross the two intermittent stream/wetland corridors found in the western portion of the site. Each intermittent stream will have a 15" HDPE pipe installed along the watercourse flow path to convey any flows safely under the driveway. Boulder headwalls will be used to minimize the extent of fill associated with the two crossings. Both crossings are in the same location as for the road for the subdivision which were reviewed and approved by the Winchester Inland Wetlands Commission. Once the driveway reaches the area of the array it will turn to the south and run along the west side of the array to the southern end of the array to provide access.

The proposed solar array will be located more than 100' from the delineated wetlands located to the west of the array. The array is located more than 200' to the closest wetland area found to the east of the array. The northeast corner of the solar array is located a minimum of 540' from the closest vernal pool. The discharge from the constructed wetland system designed to handle runoff from the solar array will be directed to the western wetland area. The area of the solar array relative to the property boundaries is shown in Figure 4 below.

The solar panels will be installed at a 25-degree angle to maximize the solar exposure. The panel rows will be separated by 15'. The array will be enclosed by a 7.5' high fence as shown on the site plans prepared by Trinkaus Engineering, LLC. The bottom edge of the fence will be 8" above the ground surface to permit the movement of small animals.

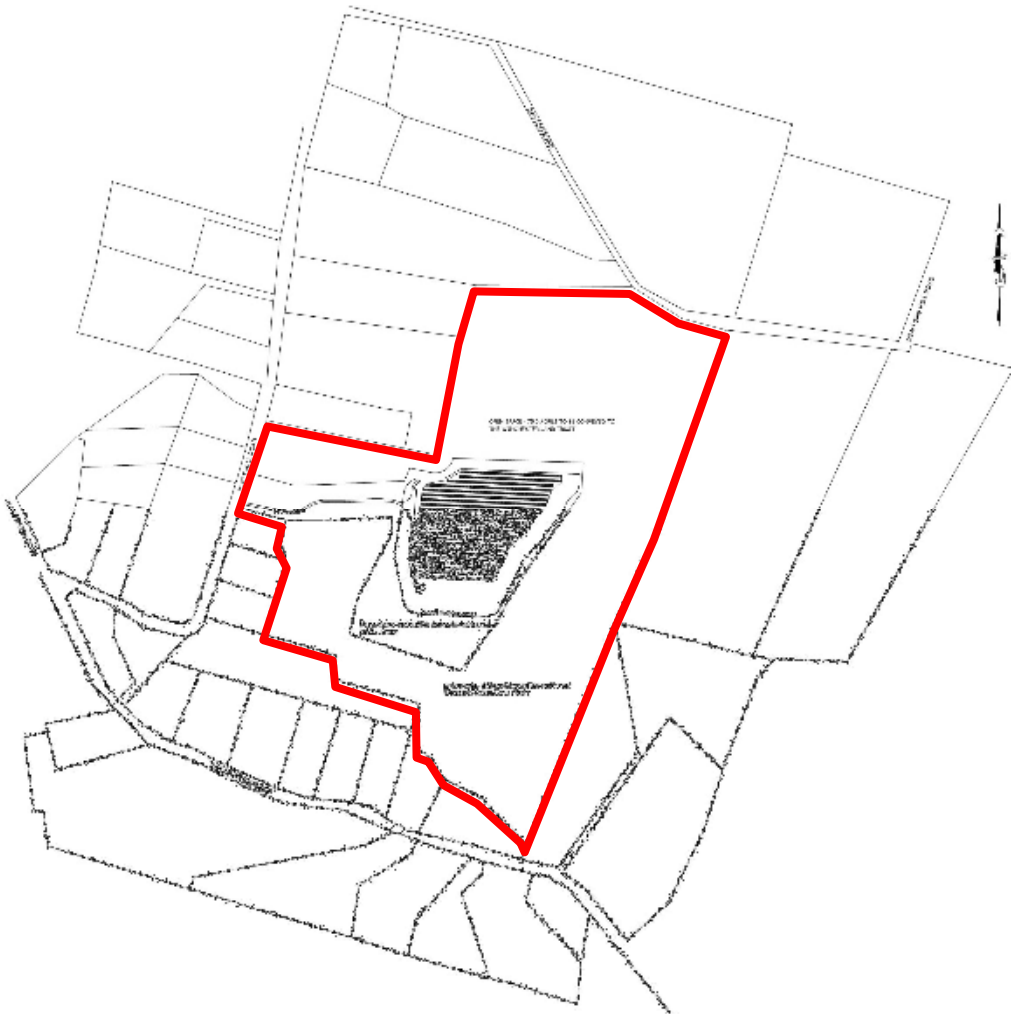

Figure 4 – Location of Solar Array on Subject Property (Town of Winchester GIS Mapping)

Summary of Stormwater Management

Stormwater from the proposed impervious surfaces in two ways. The proposed driveway from Platt Hill Road will have a 2.5% cross slope as shown on the plans to allow runoff from the gravel surface to travel as overland flow into the densely vegetated areas on either side of the driveway. Runoff will naturally infiltrate into the un-disturbed soils in these areas.

Runoff from the area of the solar array will occur as overland flow across the slightly disturbed ground surface and will enter swales on the east and west sides of the array. The swales will convey the runoff with non-erosive velocities (< 3 fps) to a Constructed Wetland System, located to the southeast of the array. An outlet control structure will restrict outflows to the downgradient wetland system. More detailed information and computations are provided in the Stormwater Management Report which follows. Figure 5 shows an overview of the stormwater management system.

Impacts to Wetland/Watercourses

The driveway to the solar array must cross two intermittent stream/wetland corridors. Both crossings are unavoidable, but the impact to the wetland has been minimized. Crossing

#1 will impact 775 square feet of wetlands with 83 cubic yards of fill material. Crossing #2 will impact 842 square feet of wetlands with 106 cubic yards of fill material. The outlet from the Constructed Wetland System and the emergency spillway will both discharge to the edge of the wetland boundary. There is no direct wetland impact associated with the Constructed Wetland System.

Figure 5 – Overview of Stormwater Management system

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Stormwater Management Report – Lodestar Energy – Platt Hill Road – Winchester, Connecticut

Date: March 20, 2020

Existing Conditions

The site of the proposed solar array is located on the former Trade Winds Farm Subdivision, which contained 24 lots developed under the Open Space regulations of the Town of Winchester. Trade Winds Farm, LLC is maintaining ownership of the three approved lots which front on Platt Hill Road. The remaining portion of the site is being sold to Reservoir Holding, LLC which will then lease a portion of the site to Lodestar Energy for the solar array.

The site consists of overgrown meadow, brush area mostly located in the western portion of the site. The balance of the site is wooded with a mixture of northern hardwood species and a small concentration of white pines in the southeastern portion of the site.

Proposed Conditions

A parcel containing 24.8 acres for the solar array is being created with the required minimum lot width onto Platt Hill Road. An open space parcel of 75.0 acres will surround the solar array and will be given to the Winchester Land Trust for preservation in perpetuity.

The solar array will be in the south-central portion of the site. A gravel driveway, 12' in width will provide access to the array from Platt Hill Road. The driveway will cross two small intermittent streams, found in the western portion of the site in the same locations as the road for the subdivision was approved. The initial 900'+ of the driveway will have a 2.5% cross slope to allow runoff from the gravel driveway to sheet off as overland flow into the adjacent upland areas where it will infiltrate into the undisturbed soils.

A "T" intersection is proposed just to the west of the solar array to allow for the turning movements of trailer trucks which will deliver the photovoltaic panels and support systems for installation. The driveway will then go south to a smaller parking area of approximately 900 square feet (gravel surface).

The proposed solar array, consisting of 23 rows of panels, containing 7,936 panels is located on the west and east sides of the central ridgeline/slope on slopes less than 15.0%. There is a 15' spacing between the panel rows. The area of the solar array is 8.0 acres. The cleared areas to the west, east and south of the actual array is 5.6 acres.

Stumps will be removed from the area of the actual array. The areas under and between the solar panels will be seeded with "New England Semi-Shade Grass and Forbs Mix" from New England Wetland Plants (www.newp.com/catalog/seed-mixes/#erosionDry) . This seed mix is a low mow and maintenance species. The stumps will remain in the cleared areas.

The ground within the cleared areas outside the area of the array will be seeded with "New England Wildflower Mix" by New England Wetland Plants ((www.newp.com/catalog/seed-mixes/#erosionDry) to provide a food source for pollinator species. Both seed mixtures are provided on the project plan set.

The soil types as determined by Mr. Beroz in the area of the solar array are Paxton, which are Hydrologic Soil Class C in TR-55. As part of the subdivision, 150 deep test holes were done to determine the suitability for on-site sewage disposal systems. Many of these test holes are in the area of the solar array and are approximately 7' in depth. The results of the test holes in and near the proposed solar array are shown in Appendix "A" of this report

Stormwater Management

The design of the stormwater management collection, treatment and detention system fully complies with the requirements found in Appendix "I" of the Connecticut General Permit by the CT DEEP. First, the solar panels are considered impervious (RCN of 98), the gravel driveway is also considered impervious with a slightly lower RCN as the top 4" layer of gravel will be washed (RCN of 96) and thus porous, while the 8" base of the driveway will be compacted processed stone.

The ground cover under and between the rows of panels were considered as Meadow, Fair Condition on Class D soils (required by Appendix "I" by CT DEEP) as there will be some disturbance of the soil surface (removal of stumps, debris) even though no other grading of these soils being proposed for this solar array. The Fair condition was used to be conservative as it takes two full years for the vegetation to become fully established and thus initially after the installation of the array, the rate and volume of runoff will be higher.

Runoff from the area of the solar array will drain as overland flow in three directions. Runoff from that portion of the array located on either side of the ridge line will drain perpendicular to the panel rows to the south.

Other runoff will follow the natural contours to the east or west to the perimeter of the array. A parabolic swale lined with modified riprap is located just beyond the limit of the panel rows on the east side. This swale will collect any runoff which does not infiltrate in the vegetated areas between the rows which is following the natural contours. The swale will convey the runoff to the constructed wetland system, located to the southwest of the array.

Runoff from the western portion of the array will drain as overland flow following the contours toward the gravel driveway. Any runoff which does not infiltrate will drain across the gravel driveway and then to a parabolic swale lined with modified riprap and will be conveyed to the constructed wetland system.

The parabolic riprap swales will reduce flow velocities while safely conveying the peak rate of runoff generated by the 10-year rainfall event as required by the CT DEP 2004 Storm Water Quality Manual "2004 Manual". Computations are provided later in this report.

Stormwater Treatment/Detention

Near the southwest corner of the array, the east and west swale join up and a slightly larger parabolic swale will convey the runoff to the constructed wetland system. The constructed wetland system has a 6' deep forebay providing 14.9% of the calculated Water Quality Volume (WQV) per the 2004 Manual. The forebay, located in the northeast corner of the system will trap any sediment which is not trapped within the east and west riprap swales.

The outlet structure is in the southwest corner of the system. In order to provide a higher level of treatment of the runoff, a series of 3' wide by 8" high earth berms will be installed in the bottom of the system to increase the flow path from inlet to outlet.

Appendix "I" requires that a zero increase in the peak rate of runoff is achieved for all design storms. Literature and other solar arrays in Connecticut have shown that runoff volumes are significantly increased over pre-development conditions. These increased runoff volumes when discharged to receiving streams have caused erosion of the native channel and downstream sedimentation of the eroded material. To address the increased runoff volumes, the outlet structure of the constructed wetland has been designed to provide the Channel Protection Volume (CPV) found in the 2004 Manual. The CPV requires the reduction of the post-development peak rate for the 2-year storm to be reduced to 50% of the pre-development peak rate for the 2-year storm.

The lowest orifice will be set 1' above the bottom of the system to provide a permanent pool of water containing 63% of the WQV. When combined with the fixed storage volume in the forebay, a total of 77.9% of the WQV is provided in the permanent pool. The bottom of the basin and berms will be seeded with New England Wetmix by New England Wetland Plants (www.newp.com/catalog/seed-mixes/#erosionDry). The side slopes of the basin shall be seeded with New England Erosion Control/Restoration Mix for Detention Basins and Moist sites by New England Wetland Plants(www.newp.com/catalog/seed-mixes/#erosionDry) .

The design of the constructed wetland will provide the following aspects:

a. Reduction of non-point source pollutants loads by having a permanent pool, vegetated bottom and long flow paths,
b. The Channel Protection Volume is provided in the system, reducing the post-development peak rate to 4.28 cfs which is only 45.6% of the pre-development peak rate for the 2-year rainfall event. Thus, the CPV will be met by this design. This is shown as bold in Table 3 below.
c. Zero increase in the peak rate of runoff is provided for the 1-year, 2-year, 5-year, and 10-year rainfall events. There is an increase of 0.03 cfs for the WQ storm, however, this is effectively 0 because of the inherent limitations found in TR-55. There is a 1.06 cfs increase for the 25-year storm, 0.84 cfs increase for the 50-year storm, and 0.62 cfs increase for the 100-year storm. These negligible calculated increases are well with the tolerances for the TR-55 Methodology. It is important to understand that 90% of the annual rainfall events are less than 1" of rainfall in 24 hours and that 98% of the annual rainfall events are less than 3.48" of rainfall in 24 hours (2-year storm) when long term rainfall events are evaluated. It is most important from a peak rate and runoff volume perspective to focus on those storms equal to or less than the 2-year event to prevent adverse environmental impacts to receiving streams.

Table 1 shows the changes in peak rates of runoff from the solar array

Storm Event	Pre-development	Post-development	Net Change
WQ storm	0.03 cfs	0.73 cfs	+0.70 cfs
1-year	5.30 cfs	12.89 cfs	+7.59 cfs

2-year	9.38 cfs	19.59 cfs	+10.21 cfs
5-year	17.00 cfs	31.16 cfs	+14.16 cfs
10-year	23.92 cfs	41.10 cfs	+17.18 cfs
25-year	33.90 cfs	54.91 cfs	+21.01 cfs
50-year	41.28 cfs	64.87 cfs	+23.59 cfs
100-year	49.72 cfs	76.11 cfs	+26.39 cfs

Table 2 shows the changes in runoff volumes from the solar array

Storm Event	Pre-development	Post-development	Net Change
WQ storm	0.019 acre-feet	0.129 acre-feet	+0.11 acre-feet
1-year	0.790 acre-feet	1.333 acre-feet	+0.543 acre-feet
2-year	1.313 acre-feet	1.999 acre-feet	+0.686 acre-feet
5-year	2.300 acre-feet	3.175 acre-feet	+0.875 acre-feet
10-year	3.205 acre-feet	4.205 acre-feet	+1.000 acre-feet
25-year	4.528 acre-feet	5.665 acre-feet	+1.137 acre-feet
50-year	5.519 acre-feet	6.736 acre-feet	+1.217 acre-feet
100-year	6.666 acre-feet	7.959 acre-feet	+1.293 acre-feet

Table 3 shows the reductions of peak rates of runoff from Constructed Wetlands

Storm Event	Pre-development	Post to CW	CW Discharge	Net Change
WQ storm	0.03 cfs	2.28 cfs	0.06 cfs	+0.03 cfs
1-year	5.30 cfs	14.56 cfs	2.26 cfs	-3.04 cfs
2-year	**9.38 cfs**	**20.29 cfs**	**4.28 cfs**	**-5.10 cfs**
5-year	17.00 cfs	29.72 cfs	8.13 cfs	-8.87 cfs
10-year	23.92 cfs	37.60 cfs	17.59 cfs	-8.39 cfs
25-year	33.90 cfs	48.36 cfs	34.96 cfs	+1.06 cfs
50-year	41.28 cfs	56.06 cfs	42.12 cfs	+0.84 cfs
100-year	49.72 cfs	64.69 cfs	50.34 cfs	+0.62 cfs

WATER QUALITY VOLUME CALCULATION:
WQV = (1")(Rv)(A)/12, WHERE Rv = 0.05 + 0.009 (I)
A = 7.9714 acres
I = 3.4762 acres (43.6%)
Rv = 0.05 + 0.009 (43.6) = 0.4424
WQV = (1)(0.4424)(7.9714)/12 = 0.2939 acre-feet = 12,801 cubic feet

GROUNDWATER RECHARGE VOLUME CALCULATION:
GRV = (D)(A)(I)/12
A = 7.9714 acres
I = 3.4762 acres (0.436)
D = 0.10 (Class C soils)
GRV = (0.10)(7.9714)(0.436)/12 = 0.0290 acre-feet = 1,262 cubic feet

SIZING OF OUTLET PROTECTION FOR DISCHARGE PIPE FROM CONSTRUCTED WETLANDS:
Q = 25.53 cfs
D = 24" HDPE
TW = 0.89'
La = 1.7 $(Q)/(D)^{3/2}$ + 8(D) = 1.7(34.96)/$(2)^{3/2}$ + 8(2) = 37.0',
Width at Apron End = 3(D) + 0.4 (La) = 3(2) + 0.4(37) = 20.8', USE W = 21.0'

CAPACITY CALCULATION OF PARABOLIC RIPRAP SWALES:
BOTH SWALES HAVE A TOP WIDTH = 8.0' AND A CENTERLINE DEPTH OF 2.0'

AVERAGE SLOPE - WEST SWALE = 3.06%, Q = 18.18 CFS
Depth of flow = 0.88', Flow velocity = 8.70 fps, Percent full = 44%

AVERAGE SLOPE – EAST SWALE = 2.50%, Q = 19.42 CFS
Depth of flow = 0.92', Flow velocity = 8.86 fps, Percent full = 45%

SOLAR ARRAY – PRE-DEVELOPMENT

WQ STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 0.03 cfs @ 15.55 hrs, Volume= 0.019 af, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.00"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

1-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 5.30 cfs @ 12.55 hrs, Volume= 0.790 af, Depth> 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.74"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

2-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 9.38 cfs @ 12.52 hrs, Volume= 1.313 af, Depth> 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

5-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 17.00 cfs @ 12.50 hrs, Volume= 2.300 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.69"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

10-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 23.92 cfs @ 12.49 hrs, Volume= 3.205 af, Depth> 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.70"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

25-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 33.90 cfs @ 12.48 hrs, Volume= 4.528 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.09"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

50-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 41.28 cfs @ 12.48 hrs, Volume= 5.519 af, Depth> 4.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.09"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

100-YEAR STORM

Summary for Subcatchment 3S: Solar Array Area - PRE

Runoff = 49.72 cfs @ 12.48 hrs, Volume= 6.666 af, Depth> 5.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=9.22"

Area (sf)	CN	Description
593,934	73	Woods, Fair, HSG C
593,934		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.48"
6.5	483	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.5	631	0.0790	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.6	1,214	Total			

SOLAR ARRAY – POST-DEVELOPMENT
WQ STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 0.73 cfs @ 12.43 hrs, Volume= 0.129 af, Depth> 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.00"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

1-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 12.89 cfs @ 12.26 hrs, Volume= 1.333 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.74"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

2-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 19.59 cfs @ 12.26 hrs, Volume= 1.999 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

5-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 31.16 cfs @ 12.25 hrs, Volume= 3.175 af, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.69"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

10-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 41.10 cfs @ 12.25 hrs, Volume= 4.205 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.70"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

25-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 54.91 cfs @ 12.25 hrs, Volume= 5.665 af, Depth> 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.09"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

50-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 64.87 cfs @ 12.25 hrs, Volume= 6.736 af, Depth> 5.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.09"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

100-YEAR STORM

Summary for Subcatchment 4S: Solar Array Area - POST

Runoff = 76.11 cfs @ 12.25 hrs, Volume= 7.959 af, Depth> 7.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=9.22"

	Area (sf)	CN	Adj	Description
	10,000	96		Gravel surface, HSG D
	151,423	98		Unconnected pavement, HSG D
*	261,537	84		Meadow in array area, Fair, HSG D
	170,974	71		Meadow, non-grazed, HSG C
	593,934	84	82	Weighted Average, UI Adjusted
	442,511			74.51% Pervious Area
	151,423			25.49% Impervious Area
	151,423			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.4	1,214	Total			

SOLAR ARRAY WEST SWALE
WQ STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 1.10 cfs @ 12.22 hrs, Volume= 0.111 af, Depth> 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.00"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

1-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 7.04 cfs @ 12.20 hrs, Volume= 0.649 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.74"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

2-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 9.81 cfs @ 12.19 hrs, Volume= 0.911 af, Depth> 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

5-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 14.37 cfs @ 12.19 hrs, Volume= 1.353 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.69"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

10-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 18.18 cfs @ 12.19 hrs, Volume= 1.731 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.70"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

25-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 23.37 cfs @ 12.19 hrs, Volume= 2.257 af, Depth> 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.09"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

50-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 27.09 cfs @ 12.19 hrs, Volume= 2.639 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.09"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

100-YEAR STORM

Summary for Subcatchment 7S: Solar Array - West Swale

Runoff = 31.27 cfs @ 12.19 hrs, Volume= 3.072 af, Depth> 7.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=9.22"

	Area (sf)	CN	Description
	9,000	96	Gravel surface, HSG D
	66,349	98	Unconnected pavement, HSG D
*	128,627	84	Meadow in array area, Fair, HSG D
	203,976	89	Weighted Average
	137,627		67.47% Pervious Area
	66,349		32.53% Impervious Area
	66,349		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

SOLAR ARRAY EAST SWALE
WQ STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 1.18 cfs @ 12.22 hrs, Volume= 0.118 af, Depth> 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.00"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

1-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 7.52 cfs @ 12.20 hrs, Volume= 0.693 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.74"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

2-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 10.48 cfs @ 12.19 hrs, Volume= 0.973 af, Depth> 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

5-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 15.36 cfs @ 12.19 hrs, Volume= 1.446 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.69"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

10-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 19.42 cfs @ 12.19 hrs, Volume= 1.850 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.70"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

25-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 24.98 cfs @ 12.19 hrs, Volume= 2.412 af, Depth> 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.09"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

50-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 28.95 cfs @ 12.19 hrs, Volume= 2.820 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.09"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

100-YEAR STORM

Summary for Subcatchment 8S: Solar Array - East Swale

Runoff = 33.42 cfs @ 12.19 hrs, Volume= 3.282 af, Depth> 7.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=9.22"

	Area (sf)	CN	Description
	85,074	98	Unconnected pavement, HSG D
*	132,910	84	Meadow in array area, Fair, HSG D
	217,984	89	Weighted Average
	132,910		60.97% Pervious Area
	85,074		39.03% Impervious Area
	85,074		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0200	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.48"
2.2	483	0.0620	3.73		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.5	631	0.0790	4.22		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
14.1	1,214	Total			

CONSTRUCTED WETLAND ROUTING RESULTS:
WQ STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 0.28" for WQ Storm event
Inflow = 2.28 cfs @ 12.22 hrs, Volume= 0.229 af
Outflow = 0.06 cfs @ 23.01 hrs, Volume= 0.027 af, Atten= 97%, Lag= 647.9 min
Primary = 0.06 cfs @ 23.01 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,279.16' @ 23.01 hrs Surf.Area= 8,254 sf Storage= 8,817 cf

Plug-Flow detention time= 540.8 min calculated for 0.027 af (12% of inflow)
Center-of-Mass det. time= 385.9 min (1,261.3 - 875.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.06 cfs @ 23.01 hrs HW=1,279.16' (Free Discharge)
- **1=Culvert** (Passes 0.06 cfs of 6.93 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 1.36 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Orifice/Grate** (Controls 0.00 cfs)
  - **6=Orifice/Grate** (Controls 0.00 cfs)
  - **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

1-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 1.66" for 1-year event
Inflow = 14.56 cfs @ 12.20 hrs, Volume= 1.342 af
Outflow = 2.26 cfs @ 12.94 hrs, Volume= 0.984 af, Atten= 85%, Lag= 44.4 min
Primary = 2.26 cfs @ 12.94 hrs, Volume= 0.984 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,281.45' @ 12.94 hrs Surf.Area= 11,021 sf Storage= 30,859 cf

Plug-Flow detention time= 239.1 min calculated for 0.984 af (73% of inflow)
Center-of-Mass det. time= 150.7 min (974.1 - 823.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.26 cfs @ 12.94 hrs HW=1,281.45' (Free Discharge)
- **1=Culvert** (Passes 2.26 cfs of 23.70 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.64 cfs @ 7.28 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.04 cfs @ 5.28 fps)
  - **4=Orifice/Grate** (Orifice Controls 0.58 cfs @ 2.30 fps)
  - **5=Orifice/Grate** (Controls 0.00 cfs)
  - **6=Orifice/Grate** (Controls 0.00 cfs)
  - **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

2-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 2.33" for 2-year event
Inflow = 20.29 cfs @ 12.19 hrs, Volume= 1.884 af
Outflow = 4.28 cfs @ 12.74 hrs, Volume= 1.500 af, Atten= 79%, Lag= 32.7 min
Primary = 4.28 cfs @ 12.74 hrs, Volume= 1.500 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,282.38' @ 12.74 hrs Surf.Area= 12,217 sf Storage= 41,576 cf

Plug-Flow detention time= 206.7 min calculated for 1.500 af (80% of inflow)
Center-of-Mass det. time= 131.1 min (944.9 - 813.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=4.28 cfs @ 12.74 hrs HW=1,282.38' (Free Discharge)
- **1=Culvert** (Passes 4.28 cfs of 27.80 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.75 cfs @ 8.63 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.38 cfs @ 7.02 fps)
  - **4=Orifice/Grate** (Orifice Controls 1.72 cfs @ 4.92 fps)
  - **5=Orifice/Grate** (Orifice Controls 0.43 cfs @ 2.09 fps)
  - **6=Orifice/Grate** (Controls 0.00 cfs)
  - **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

5-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 3.47" for 5-year event
Inflow = 29.73 cfs @ 12.19 hrs, Volume= 2.800 af
Outflow = 8.13 cfs @ 12.65 hrs, Volume= 2.389 af, Atten= 73%, Lag= 27.3 min
Primary = 8.13 cfs @ 12.65 hrs, Volume= 2.389 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,283.67' @ 12.65 hrs Surf.Area= 13,976 sf Storage= 58,491 cf

Plug-Flow detention time= 177.3 min calculated for 2.384 af (85% of inflow)
Center-of-Mass det. time= 116.1 min (918.9 - 802.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=8.13 cfs @ 12.65 hrs HW=1,283.67' (Free Discharge)
- **1=Culvert** (Passes 8.13 cfs of 32.69 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.89 cfs @ 10.22 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.75 cfs @ 8.90 fps)
  - **4=Orifice/Grate** (Orifice Controls 2.57 cfs @ 7.36 fps)
  - **5=Orifice/Grate** (Orifice Controls 1.94 cfs @ 5.57 fps)
  - **6=Orifice/Grate** (Orifice Controls 0.97 cfs @ 2.79 fps)
  - **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

10-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 4.44" for 10-year event
Inflow = 37.60 cfs @ 12.19 hrs, Volume= 3.581 af
Outflow = 17.59 cfs @ 12.49 hrs, Volume= 3.150 af, Atten= 53%, Lag= 17.9 min
Primary = 17.59 cfs @ 12.49 hrs, Volume= 3.150 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,284.32' @ 12.49 hrs Surf.Area= 14,896 sf Storage= 67,847 cf

Plug-Flow detention time= 159.4 min calculated for 3.150 af (88% of inflow)
Center-of-Mass det. time= 105.1 min (901.2 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=17.48 cfs @ 12.49 hrs HW=1,284.32' (Free Discharge)
- **1=Culvert** (Passes 17.48 cfs of 34.88 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.95 cfs @ 10.93 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.91 cfs @ 9.71 fps)
  - **4=Orifice/Grate** (Orifice Controls 2.90 cfs @ 8.32 fps)
  - **5=Orifice/Grate** (Orifice Controls 2.37 cfs @ 6.78 fps)
  - **6=Orifice/Grate** (Orifice Controls 1.67 cfs @ 4.77 fps)
  - **7=Broad-Crested Rectangular Weir** (Weir Controls 7.69 cfs @ 1.52 fps)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

25-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 5.78" for 25-year event
Inflow = 48.36 cfs @ 12.19 hrs, Volume= 4.669 af
Outflow = 34.96 cfs @ 12.33 hrs, Volume= 4.208 af, Atten= 28%, Lag= 8.7 min
Primary = 34.96 cfs @ 12.33 hrs, Volume= 4.208 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,284.66' @ 12.34 hrs Surf.Area= 15,392 sf Storage= 72,946 cf

Plug-Flow detention time= 137.5 min calculated for 4.199 af (90% of inflow)
Center-of-Mass det. time= 90.7 min (879.7 - 789.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=34.88 cfs @ 12.33 hrs HW=1,284.65' (Free Discharge)
- **1=Culvert** (Passes 33.78 cfs of 35.96 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.98 cfs @ 11.27 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.98 cfs @ 10.10 fps)
  - **4=Orifice/Grate** (Orifice Controls 3.06 cfs @ 8.77 fps)
  - **5=Orifice/Grate** (Orifice Controls 2.56 cfs @ 7.33 fps)
  - **6=Orifice/Grate** (Orifice Controls 1.93 cfs @ 5.52 fps)
  - **7=Broad-Crested Rectangular Weir** (Weir Controls 23.27 cfs @ 2.24 fps)
- **8=Broad-Crested Rectangular Weir** (Weir Controls 1.10 cfs @ 0.92 fps)

50-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 6.76" for 50-year event
Inflow = 56.05 cfs @ 12.19 hrs, Volume= 5.458 af
Outflow = 42.12 cfs @ 12.32 hrs, Volume= 4.972 af, Atten= 25%, Lag= 7.8 min
Primary = 42.12 cfs @ 12.32 hrs, Volume= 4.972 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,284.91' @ 12.32 hrs Surf.Area= 15,771 sf Storage= 76,944 cf

Plug-Flow detention time= 127.2 min calculated for 4.972 af (91% of inflow)
Center-of-Mass det. time= 83.1 min (868.1 - 784.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=41.86 cfs @ 12.32 hrs HW=1,284.90' (Free Discharge)
- **1=Culvert** (Inlet Controls 36.75 cfs @ 11.70 fps)
  - **2=Orifice/Grate** (Passes < 1.01 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 2.04 cfs potential flow)
  - **4=Orifice/Grate** (Passes < 3.17 cfs potential flow)
  - **5=Orifice/Grate** (Passes < 2.69 cfs potential flow)
  - **6=Orifice/Grate** (Passes < 2.10 cfs potential flow)
  - **7=Broad-Crested Rectangular Weir** (Passes < 39.95 cfs potential flow)
- **8=Broad-Crested Rectangular Weir** (Weir Controls 5.12 cfs @ 1.59 fps)

100-YEAR STORM

Summary for Pond 9P: Constructed Wetland

Inflow Area = 9.687 ac, 35.89% Impervious, Inflow Depth > 7.87" for 100-year event
Inflow = 64.69 cfs @ 12.19 hrs, Volume= 6.354 af
Outflow = 50.34 cfs @ 12.31 hrs, Volume= 5.838 af, Atten= 22%, Lag= 7.2 min
Primary = 50.34 cfs @ 12.31 hrs, Volume= 5.838 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,285.20' @ 12.31 hrs Surf.Area= 16,199 sf Storage= 81,590 cf

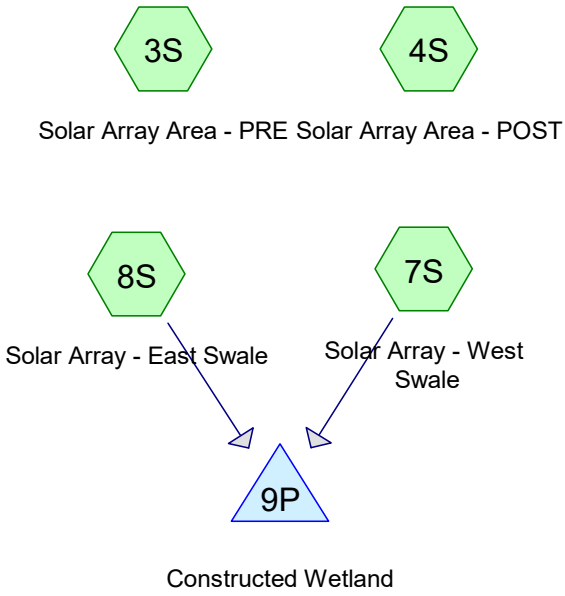
Plug-Flow detention time= 117.2 min calculated for 5.826 af (92% of inflow)
Center-of-Mass det. time= 76.5 min (857.6 - 781.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,278.00'	94,982 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,278.00	6,940	0	0
1,280.00	9,205	16,145	16,145
1,282.00	11,702	20,907	37,052
1,284.00	14,426	26,128	63,180
1,286.00	17,376	31,802	94,982

Device	Routing	Invert	Outlet Devices
#1	Primary	1,278.00'	**24.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,278.00' / 1,276.00' S= 0.0364 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	1,279.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,280.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,281.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	1,282.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	1,283.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#7	Device 1	1,284.00'	**16.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#8	Primary	1,284.50'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=50.14 cfs @ 12.31 hrs HW=1,285.20' (Free Discharge)
- **1=Culvert** (Inlet Controls 37.65 cfs @ 11.98 fps)
  - **2=Orifice/Grate** (Passes < 1.03 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 2.10 cfs potential flow)
  - **4=Orifice/Grate** (Passes < 3.30 cfs potential flow)
  - **5=Orifice/Grate** (Passes < 2.84 cfs potential flow)
  - **6=Orifice/Grate** (Passes < 2.29 cfs potential flow)
  - **7=Broad-Crested Rectangular Weir** (Passes < 64.38 cfs potential flow)
- **8=Broad-Crested Rectangular Weir** (Weir Controls 12.49 cfs @ 2.24 fps)



HydroCAD Diagram

CONCLUSION

The analysis and design of the stormwater conveyance system exceeds the requirements found in Appendix "I" from the CT DEP. The design of the Constructed Wetland conforms to the standards found in the CT DEEP 2004 Storm Water Quality Manual in order to reduce non-point source pollutants from the site. The design provides the Channel Protection Volume per the 2004 Manual which will prevent adverse impacts to the receiving streams on this site. Peak rate attenuation is provided for the 1-year, 2-year, 5-year and 10-year rainfall events.

Flows directed to the existing wetland system from the Constructed Wetlands will have velocities less than 3 fps, which are non-erosive for this type of soil, so there will be no erosion of the receiving inland wetlands.

While there will be some filling of wetlands for the access driveway, it is unavoidable and has been minimized to the maximum extent possible through using a narrow driveway and boulder retaining wall to limit the extent of fill within the wetland area.

There will be no impact on any of the other wetlands on this site as a result of the construction of the access driveway, stormwater management system and solar array.

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APPENDIX “A”
SOIL TEST RESULTS WITHIN AREA OF PROPOSED SOLAR ARRAY

DT – 28

0 – 9”	TOPSOIL
9 – 22”	YELLOW BROWN FINE SANDY LOAM
22 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 22”, MOTTLING AT 22”

DT – 29

0 – 6”	TOPSOIL
6 – 26”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
26 – 77”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 77”, ROOTS TO 26”, MOTTLING AT 26”

DT – 32

0 – 6”	TOPSOIL
6 – 20”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
20 – 75”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 75”, ROOTS TO 22”, MOTTLING AT 22”

DT – 33

0 – 6”	TOPSOIL
6 – 15”	YELLOW BROWN FINE SANDY LOAM
15 – 22”	LIGHT YELLOW BROWN SANDY LOAM
22 – 77”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 77”, ROOTS TO 22”, MOTTLING AT 22”

DT – 35

0 – 6”	TOPSOIL
6 – 20”	ORANGE BROWN FINE SANDY LOAM
20 – 30”	YELLOW BROWN FINE SANDY LOAM
30 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 30”, MOTTLING AT 30”

DT – 71

0 – 6”	TOPSOIL
6 – 23”	ORANGE BROWN FINE SAND & SILT LOAM
23 – 81”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 81”, ROOTS TO 23”, MOTTLING AT 23”, WATER
	BLEEDING AT 27”

DT – 72

0 – 6”	TOPSOIL
6 – 26”	O0RANGE BROWN FINE SANDY LOAM, SOME SILT
26 – 84”	GREY BROWN MEDIUM COMPACT SAND AND SILT
	LEDGE > 84”, ROOTS TO 26”, MOTTLING AT 26”, WATER BLEEDING AT 24”

DT – 73

0 – 6”	TOPSOIL
6 – 24”	ORANGE BROWN FINE SANDY LOAM, SOME SILT
24 – 81”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 81”, ROOTS TO 24”, MOTTLING AT 24”, WATER
	BLEEDING AT 28”

DT – 74

0 – 6”	TOPSOIL
6 – 24”	ORANGE BROWN FINE SAND & SILT LOAM
24 – 75”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 75”, ROOTS TO 24”, MOTTLING AT 24”, WATER BLEEDING AT 28”

DT – 75

0 – 6”	TOPSOIL
6 – 23”	PALE YELLOW BROWN FINE SAND & SILT LOAM
23 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 23”, MOTTLING AT 23”, WATER BLEEDING AT 28”

DT – 76

0 – 6”	TOPSOIL
6 – 24”	ORANGE BROWN FINE SAND & SILT LOAM
24 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 24”, MOTTLING AT 24”, WATER BLEEDING AT 27”

DT – 77

0 – 5”	TOPSOIL
5 – 23”	ORANGE BROWN FINE SAND AND SILT LOAM
23 – 77”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 77”, ROOTS TO 23”, MOTTLING AT 23”, WATER BLEEDING AT 28”

DT – 78

0 – 3”	TOPSOIL
3 – 19”	ORANGE BROWN FINE SAND & SILT LOAM
19 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 19”, MOTTLING AT 19”, WATER BLEEDING AT 23”

DT – 79

0 – 5”	TOPSOIL
5 – 20”	YELLOW BROWN SILT LOAM
20 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 20”, MOTTLING AT 20”, WATER BLEEDING AT 24”

DT – 80

0 – 6”	TOPSOIL
6 – 20”	YELLOW BROWN FINE SAND & SILT LOAM
20 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 20”, MOTTLING AT 20”, WATER BLEEDING AT 23”

DT – 81

0 – 5”	TOPSOIL
5 – 20”	PALE YELLOW BROWN FINE SAND & SILT LOAM
20 – 81”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 81”, ROOTS TO 20”, MOTTLING AT 20”, WATER BLEEDING AT 23”

DT – 82

0 – 5”	TOPSOIL
5 – 22”	PALE YELLOW BROWN FINE SAND & SILT LOAM
22 – 77”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 77”, ROOTS TO 19”, MOTTLING AT 19”, WATER BLEEDING AT 22”

DT – 83

0 – 6”	TOPSOIL
6 – 23”	PALE YELLOW BROWN FINE SAND & SILT LOAM
23 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 23”, MOTTLING AT 23”, WATER BLEEDING AT 28”

DT – 84

0 – 6”	TOPSOIL
6 – 21”	PALE YELLOW BROWN FINE SAND & SILT LOAM
21 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 21”, MOTTLING AT 21”, WATER BLEEDING AT 22”

DT – 85

0 – 6”	TOPSOIL
6 – 24”	PALE YELLOW BROWN FINE SAND & SILT LOAM
24 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 24”, MOTTLING AT 24”, WATER BLEEDING AT 27”

DT – 86

0 – 5”	TOPSOIL
5 – 23”	YELLOW BROWN FINE SAND & SILT LOAM
23 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 23”, MOTTLING AT 23”, WATER BLEEDING AT 27”

DT – 87

0 – 3”	TOPSOIL
3 – 21”	YELLOW BROWN FINE SAND & SILT LOAM
21 – 80”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 80”, ROOTS TO 21”, MOTTLING AT 21”, WATER BLEEDING AT 24”

DT – 88

0 – 4”	TOPSOIL
4 – 21”	YELLOW BROWN FINE SAND & SILT LOAM
21 – 83”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 83”, ROOTS TO 21”, MOTTLING AT 21”, WATER BLEEDING AT 24”

DT – 89

0 – 6”	TOPSOIL
6 – 21”	YELLOW BROWN FINE SAND & SILT LOAM
21 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND
	LEDGE > 84”, ROOTS TO 21”, MOTTLING AT 21”, WATER BLEEDING AT 24”

DT – 102

0 – 3”	TOPSOIL
3 – 24”	YELLOW BROWN FINE SANDY LOAM
24 – 36”	GREY BROWN MEDIUM COARSE SAND
36 – 84”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL
	LEDGE > 84”, ROOTS TO 36”, LIGHT MOTTLING AT 36”,

DT – 103

0 – 3”	TOPSOIL
3 – 22”	YELLOW BROWN FINE SANDY LOAM
22 – 361”	GREY BROWN MEDIUM COARSE SAND
31 – 81”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL
	LEDGE > 81”, ROOTS TO 31”, LIGHT MOTTLING AT 31”,

DT – 104

0 – 3”	TOPSOIL
3 – 24”	YELLOW BROWN FINE SANDY LOAM
24 – 36”	GREY BROWN MEDIUM COARSE SAND
36 – 84”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL
	LEDGE > 84”, ROOTS TO 36”, LIGHT MOTTLING AT 36”,

DT – 105

0 – 3”	TOPSOIL
3 – 19”	YELLOW BROWN FINE SANDY LOAM
19 – 31”	GREY BROWN MEDIUM COARSE SAND
31 – 84”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL
	LEDGE > 84”, ROOTS TO 31”, LIGHT MOTTLING AT 31”,

DT – 106

0 – 3”	TOPSOIL
3 – 19”	YELLOW BROWN FINE SANDY LOAM
19 – 30”	GREY BROWN MEDIUM COARSE SAND
30 – 83”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL
	LEDGE > 84”, ROOTS TO 30”, LIGHT MOTTLING AT 30”,

DT – 107

0 – 3”	TOPSOIL

3 – 21” YELLOW BROWN FINE SANDY LOAM
21 – 33” GREY BROWN MEDIUM COARSE SAND
33 – 84” GREY BROWN MEDIUM COMPACT SAND & GRAVEL
LEDGE > 84”, ROOTS TO 33”, LIGHT MOTTLING AT 33”,

DT – 108
0 – 4” TOPSOIL
3 – 24” YELLOW BROWN FINE SANDY LOAM
26 – 84” GREY BROWN MEDIUM COMPACT SAND & GRAVEL
LEDGE > 84”, ROOTS TO 26”, LIGHT MOTTLING AT 26”,

DT – 109
0 – 8” TOPSOIL
8 – 26” YELLOW BROWN FINE SANDY LOAM
26 – 84” GREY BROWN MEDIUM COMPACT SAND & GRAVEL
LEDGE > 84”, ROOTS TO 26”, LIGHT MOTTLING AT 26”,

DT – 111
0 – 6” TOPSOIL
6 – 28” ORANGE BROWN FINE SAND & SILT LOAM
28 – 77” GREY BROWN MEDIUM COMPACT SILTY SAND
LEDGE > 77”, ROOTS TO 28”, LIGHT MOTTLING AT 28”

DT – 112
0 – 3” TOPSOIL
3 – 22” ORANGE BROWN FINE SANDY LOAM
22 – 32” YELLOW BROWN FINE SANDY LOAM
32 – 84” GREY BROWN MEDIUM COMPACT SILTY SAND
LEDGE > 84”, ROOTS TO 32”, LIGHT MOTTLING AT 32”,
NO WATER

DT – 113
0 – 4” TOPSOIL
4 – 18” ORANGE BROWN FINE SANDY LOAM
18 – 27” YELLOW BROWN FINE SANDY LOAM
27 – 84” GREY BROWN MEDIUM COMPACT SILTY SAND
LEDGE > 84”, ROOTS TO 27”, LIGHT MOTTLING AT 27”,
NO WATER

DT – 114
0 – 3” TOPSOIL
3 – 18” ORANGE BROWN FINE SANDY LOAM
18 – 25” YELLOW BROWN FINE SANDY LOAM
25 – 81” GREY BROWN MEDIUM COMPACT SILTY SAND
LEDGE > 81”, ROOTS TO 25”, LIGHT MOTTLING AT 25”,
NO WATER

DT – 115

0 – 6”	TOPSOIL
6 – 21”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
21 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 84”, ROOTS TO 21”, MOTTLING AT 21”, NO WATER

DT – 116

0 – 6”	TOPSOIL
6 – 25”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
25 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 84”, ROOTS TO 25”, MOTTLING AT 25”, NO WATER

DT – 117

0 – 4”	TOPSOIL
4 – 14”	ORANGE BROWN FINE SANDY LOAM
14 – 23”	YELLOW BROWN FINE SANDY LOAM
23 – 81”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 81”, ROOTS TO 23”, MOTTLING AT 23’, NO WATER

DT – 118

0 – 5”	TOPSOIL
5 – 21”	YELLOW BROWN FINE SANDY LOAM
21 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 84”, ROOTS TO 21”, MOTTLING AT 21”, NO WATER

DT – 119

0 – 7”	TOPSOIL
7 – 21”	YELLOW BROWN FINE SANDY LOAM
21 – 84”	GREY BROWN MEDIUM COMPACT SAND AND SILT LEDGE > 84”, ROOTS TO 21”, MOTTINGH AT 21”

DT – 120

0 – 5”	TOPSOIL
5 – 20”	YELLOW BROWN FINE SANDY LOAM
20 – 81”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 81”, ROOTS TO 20”, MOTTLING AT 20”, NO WATER

DT – 121

0 – 6”	TOPSOIL
6 – 21”	YELLOW BROWN FINE SANDY LOAM
21 – 84”	GREY BROWN MEDIUM COMPACT SILTY SAND LEDGE > 84”, ROOTS TO 21”, MOTTLING AT 21”

DT – 122

0 – 7”	TOPSOIL
7 – 27”	YELLOW BROWN FINE SANDY LOAM
27 – 33”	GREY BROWN LIGHTLY COMPACT SAND AND GRAVEL
33 – 84”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL, SOME SILT
	LEDGE > 84”, ROOTS TO 33”, MOTTLING AT 33”

DT – 123

0 – 6”	TOPSOIL
6 – 26”	YELLOW BROWN FINE SANDY LOAM
26 – 31”	GREY BROWN LIGHTLY COMPACT SAND & GRAVEL
31 – 72”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL, SOME SILT
	LEDGE > 72”, ROOTS TO 31”, MOTTLING AT 31”

DT – 124

0 – 7”	TOPSOIL
7 – 23”	ORANGE BROWN FINE SANDY LOAM
23 – 31”	GREY BROWN LIGHTLY COMPACT SAND & GRAVEL
31 – 80”	GREY BROWN MEDIUM COMPACT SAND & GRAVEL, SOME SILT
	LEDGE > 80”, ROOTS TO 31”, MOTTLING AT 31”

DT – 133

0 – 6”	TOPSOIL
6 – 24”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
24 – 78”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 78”, ROOTS TO 24”, MOTTLING AT 24”

DT – 134

0 – 6”	TOPSOIL
6 – 23”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
23 – 73”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 73”, ROOTS TO 23”, MOTTLING AT 23”

DT – 135

0 – 9”	TOPSOIL
9 – 23”	YELLOW BROWN FINE SAND & SILT LOAM
23 – 78”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 78”, ROOTS TO 23”, MOTTLING AT 23”

DT – 136

0 – 8”	TOPSOIL
8 – 25”	YELLOW BROWN FINE SAND & SILT LOAM
25 – 81”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 81”, ROOTS TO 25”, MOTTLING AT 25”

DT – 137

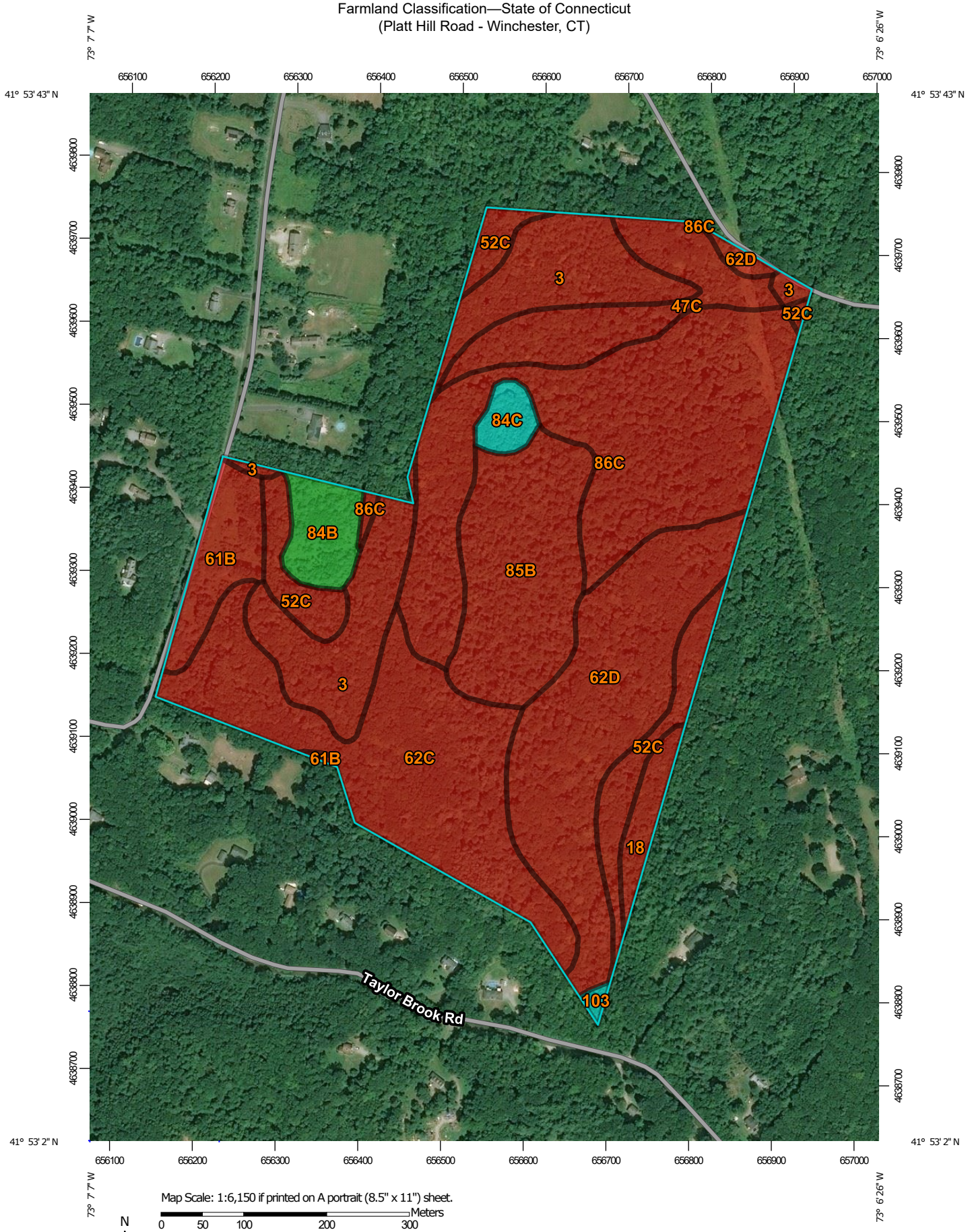
0 – 5”	TOPSOIL
5 – 24”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
24 – 77”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 77”, ROOTS TO 24”, MOTTLING AT 24”

DT – 138

0 – 6”	TOPSOIL
6 – 23”	YELLOW BROWN FINE SANDY LOAM, SOME SILT
23 – 73”	GREY BROWN COMPACT SILTY SAND, SOME GRAVEL
	LEDGE > 73”, ROOTS TO 23”, MOTTLING AT 23”

APPENDIX “B”
ASSESSMENT OF PRIME FARMLAND SOILS
NATURAL RESOURCE CONSERVATION SERVICE

Farmland Classification—State of Connecticut
(Platt Hill Road - Winchester, CT)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

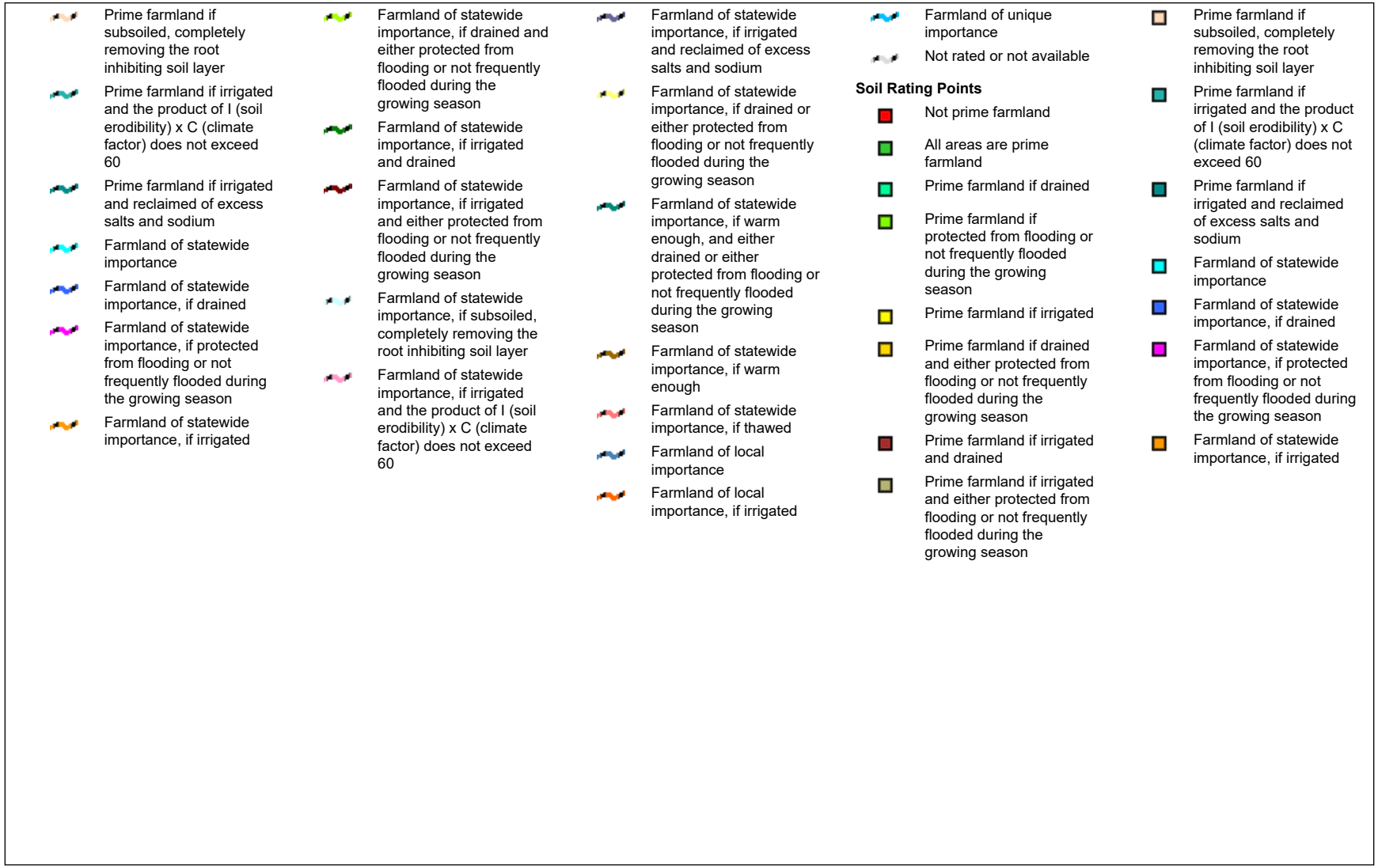
Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season


Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated
Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated and drained
Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if warm enough
Farmland of statewide importance, if thawed
Farmland of local importance
Farmland of local importance, if irrigated
Farmland of unique importance
Not rated or not available
Soil Rating Points
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated

- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 19, Sep 13, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 23, 2018—Sep 17, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	Not prime farmland	12.4	12.4%
18	Catden and Freetown soils, 0 to 2 percent slopes	Not prime farmland	1.7	1.6%
47C	Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony	Not prime farmland	6.4	6.4%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	Not prime farmland	6.3	6.3%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	Not prime farmland	3.6	3.6%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	Not prime farmland	17.0	17.0%
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	Not prime farmland	16.0	16.0%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	All areas are prime farmland	2.7	2.7%
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	Farmland of statewide importance	1.2	1.2%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	Not prime farmland	10.7	10.7%
86C	Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony	Not prime farmland	21.9	21.8%
103	Rippowam fine sandy loam	Farmland of statewide importance	0.2	0.2%
Totals for Area of Interest			**100.2**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The majority of soil attributes are associated with a component of a map unit, and such an attribute has to be aggregated to the map unit level before a thematic map can be rendered. Map units, however, also have their own attributes. An attribute of a map unit does not have to be aggregated in order to render a corresponding thematic map. Therefore, the "aggregation method" for any attribute of a map unit is referred to as "No Aggregation Necessary".

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.