

# **Storm Water Pollution Prevention Plan**

*(SWPPP)*

**for**

## **ELLIS TRACT SOLAR PV ARRAY SITE**

**at**

**Stevenson Road  
Town of Dryden  
Tompkins County, New York 13053**

**June 2017**



**Prepared By:**



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## I. Introduction

Pursuant to Section 402 of the Clean Water Act (“CWA”), storm water discharges from certain construction activities to waters of the United States are unlawful, unless authorized by a National Pollutant Discharge Elimination System (NPDES) permit or by a state permit program. New York’s State Pollutant Discharge Elimination System (SPDES) is a NPDES approved program with permits issued in accordance with the Environmental Conservation Law (ECL). Discharges of pollutants to all “Waters of New York State,” such as groundwater, are also unlawful unless they are authorized by a SPDES permit.

Section 402 of the CWA requires permits for storm water discharges from construction activities that will result in disturbance of one or more acres of total land. Thus, the work associated with the Ellis Tract Solar Array is subject to the SPDES regulations for storm water discharges from construction activities.

Part III.C of the SPDES General Permit for Stormwater Discharge from Construction Activity, GP-0-15-002 (General Permit), states that construction activities that disturb more than 1 acre of land, creates minimal impervious surface and does not alter hydrology from pre-to-post development conditions, are required to prepare a Stormwater Pollution Prevention Plan (SWPPP) that only includes erosion and sediment control practices.

The proposed project primarily involves construction of a ground mounted Solar Array with reestablishment of vegetative cover and minimal change in hydrology from pre-to-post development conditions. Therefore, the SWPPP for this project only includes erosion and sediment control practices; post-construction stormwater management practices are not required. However, the Town of Dryden Engineer requested a hydrologic analysis be made to compare the site discharges from existing to proposed conditions. This analysis will be presented in this SWPPP.

## II. Project Location and Scope of Work

- a. *Location of Project:* This project is split up into a north plant (four 2MWac and one 1MWac ground mounted solar PV arrays), and a south plant (four 2MWac and one 1MWac ground mounted solarPV arrays (west).

The north plant is bounded by Mount Pleasant Road on the northeast, Turkey Hill Road on the east, Stevenson Road on the south, and undeveloped land on the west. The coordinates of the center of this plant are as follows:

<i>Approximate Coordinate Position @ the North Plant</i>	
<i>Latitude</i>	<i>N 42° 26' 56"</i>
<i>Longitude</i>	<i>W 76° 26' 4"</i>

***Table 1 – North Plant Project Location Table***

The south plant is split into two separate arrays, one on the west and another on the east. The array on the west is bounded by Dodge Road on the west, undeveloped land on the north and east, and residential on the south. The coordinates of the center of this plant are as follows:



<i>Approximate Coordinate Position @ the Southwest Array</i>	
<i>Latitude</i>	<i>N 42° 26' 21"</i>
<i>Longitude</i>	<i>W 76° 26' 23"</i>

***Table 2 – Southwest Array Project Location Table***

The array on the east is bounded by Turkey Hill Road on the east, undeveloped land on the north and east, and residential on the south. The coordinates of the center of this plant are as follows:

<i>Approximate Coordinate Position @ the Southeast Array</i>	
<i>Latitude</i>	<i>N 42° 26' 6"</i>
<i>Longitude</i>	<i>W 76° 25' 51"</i>

***Table 3 – Southeast Array Project Location Table***

All three arrays propose modifications to existing lot lines. The USGS map indicating the location of the project can be found in Appendix A.

- b. *Scope of Work:* The proposed improvements for the new Solar Array include:
- Placement of stabilized construction entrances on Stevenson Road, Dodge Road, and Turkey Hill Road.
  - Construction of gravel access roads for each array.
  - Installation of a ground-mounted system for solar panels and installing PV panels
  - Installation of buried electrical cabling
  - Installation of power inverters on concrete base slabs
  - Installation of underground conductors and connection to the existing electrical grid
  - Restoration of grass vegetation on the entire site
- c. *Application Information:* The notice of intent (NOI) for this project will be submitted electronically but a hard copy will be provided in Appendix B. A copy of the notice of termination (NOT) will also be provided in Appendix B. The Owner's and contractor's certification for stormwater discharges associated with construction activity are included in Appendix C.

Contact information for the owner:

SUN8 PDC LLC  
C/O Distributed Sun LLC  
Mr. Jeff Weiss  
Manager of SUN8  
601 13<sup>th</sup> St. NW  
Suite 450 South  
Washington, DC 20005  
(202) 536-5766

### **III. Stormwater Management Objectives**

To maintain the quality and quantity of off-site stormwater during and after construction the following stormwater management objectives have been incorporated:

- a. On-site construction activities will use Best Management Practices (BMPs) to control the

erosion of on-site soil and sediment through control measures indicated in the erosion and sediment control plan and discussed below in Section IV. All erosion and sediment control measures will be installed and maintained in accordance with the New York State Guidelines for Urban Erosion and Sediment Control, 2016 Edition.

b. Construction activities will include the stabilizations of disturbed soils through a combination of temporary BMPs including temporary seeding/mulching along excavated areas and dust control to mitigate airborne sediment to nearby residential properties.

c. During construction, sediment control will be provided using a variety of approved measures including silt fence as well as an appropriate staging, topsoil stockpile, concrete washout area, and culvert inlet protection.

d. The Owner will be required to provide a NYSDEC qualified inspector to perform inspections of the site erosion and sediment control measures per the New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-15-002, Part IV.C.2-6.

#### **IV. Pre-Development Site Conditions**

##### **A. Existing Soils:**

A review of the soil conditions of the site reveals the soils are a mix of alluvial soils including gravelly loams, silt loams and channery silt loams. The topography of the site is moderately sloped with average slopes ranging from 3 to 15 percent with a few steeper sections. There are several wetland areas within the property, and areas of prime farmland soils on the site. The proposed PV arrays will not be built within the delineated wetland boundaries.

The NRCS Soil Map showing the soil types and locations found at the project site can be found in Appendix D.

<b>Soil Symbol</b>	<b>Soil Name</b>	<b>Hydrologic Group (HSG)</b>
DgB	Darien gravelly silt loam, 2 to 8 percent slopes	C/D
EbC	Erie channery silt loam, 8 to 15 percent slopes	D
CdC	Chenango gravelly loam, 5 to 15 percent slopes	A
RkB	Honeoye loam, 20 to 30 percent slopes	B
LaC3	Lakemont silty clay loam, 0 to 3 percent slopes	D
LaB	Ontario, Lansing, and Honeoye soils, 30 to 60 percent slopes	B
LaC	Langford channery silt loam, 8 to 15 percent slopes	D
kA	Rhinebeck silt loam, 0 to 2 percent slopes	C/D

EbB	Erie channery silt loam, 3 to 8 percent slopes	D
NaB	Niagara silt loam, 2 to 6 percent slopes	C/D
BvA	Braceville gravelly silt loam, 0 to 5 percent slopes	C/D
Ws	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	B/D
Ca	Canandaigua and Lamson soils	C/D

***Table 4 – Soil Types***

Per this survey, the soils at the project site are mixed. Much of the site is poorly drained. In fact, 10 out of the 13 soils found within the three arrays have an HSG of D indicated poorly drained soils.

## **B. Description of Existing Drainage Areas and Pre-Construction Hydrologic Analysis**

This section determines the existing surface conditions and discharges for the proposed developed area. This project is split up into a north plant north plant (four 2MWac and one 1MWac ground mounted solar PV arrays), and a south plant (four 2MWac and one 1MWac ground mounted solar PV arrays (west). All areas have been delineated on two “Pre- Development Drainage Area Maps’ found in Appendix E.

### *North Plant:*

To envelope all the north development, we analyzed a 95.13-acre area. Offsite flows were not included in the analysis because no work was proposed for those areas and the discharges would remain unchanged.

This 95-acre area slopes from east to west at a slope of 5-10%. The area is generally open and has an average Curve Number (CN) of 78. The total pre-development discharges can be found in Table Five below. This area was split up into nine distinct watersheds, A to I, and for purposes of this review, the discharges for those watersheds were combined to give a total discharge from the site. This is because grades will not change from pre-to-post development and it will give an apples- to-apples comparison.

Watershed A is 2.32 acres of area and is primarily meadow, non-grazed in soils with an HSG of D. It is in the northeast corner of the area being reviewed. As discussed in the previous section, much of the soils on the site are “D” soils so our analysis assumed “D” soils for each watershed. Slopes in this watershed fall in the range of 4-6% which yields a time of concentration of 19.4-minutes, while the curve number is 78. The easternmost portion of this area includes part of a wetland.

Watershed B is 16.6 acres of area and is primarily meadow, non-grazed in soils with an HSG of D. It is in in the northern portion of the area being reviewed. Slopes in this watershed fall in the range of 1-5% which yields a time of concentration of 35.6-minutes, while the curve number is 78. The easternmost portion of this area is bounded by a wetland.

Watershed C is 1.93 acres of area and is primarily wooded in soils with an HSG of D. It is in the northwest corner of the area being reviewed. Slopes in this watershed fall in the range of 3-10% which yields a time of concentration of 17.4-minutes, while the curve number is 77.

Watershed D is 20.00 acres of area and is primarily meadow, non-grazed in soils with an HSG of D. A small portion also contains a wooded area in soils with an HSG of D. It is in the center of the area being reviewed. Slopes in this watershed fall in the range of 1-6% which yields a time of concentration of 52.8-minutes (the largest of this area), while the curve number is 78. The easternmost portion of this area is bounded by a wetland.

Watershed E is 21.20 acres of area and is primarily meadow, non-grazed in soils with an HSG of D. A small portion also contains a wooded area in soils with an HSG of D and a small pond. It is in the center of the area being reviewed. Slopes in this watershed fall in the range of 1-5% which yields a time of concentration of 38.7-minutes, while the curve number is 78. The easternmost portion of this area is bounded by a wetland.

Watershed F is 6.11 acres of area and is primarily meadow, non-grazed in soils with an HSG of D. It is in the south-center of the area being reviewed. The water flows through two separate natural V-Channels. Slopes in this watershed fall in the range of 7-8% which yields a time of concentration of 36.7-minutes, while the curve number is 78.

Watershed G is 8.51 acres of area and is primarily meadow, non-grazed in soils with an HSG of D. It is toward the south of the area being reviewed. Slopes in this watershed fall in the range of 5-6% which yields a time of concentration of 29.3-minutes, while the curve number is 78.

Watershed H is 17.83 acres of area and is primarily meadow, non-grazed in soils with an HSG of D. It is the southernmost watershed of the area being reviewed. The south side of this watershed is bounded by Stevenson Road. Slopes in this watershed fall in the range of 4-16% which yields a time of concentration of 28.5-minutes, while the curve number is 78.

Watershed I is 0.84 acres of area and is primarily meadow, non-grazed in soils with an HSG of D. It is in the southeast corner of the area being reviewed. The south side of this watershed is bounded by Stevenson Road. Slopes in this watershed fall in the range of 7-8% which yields a time of concentration of 12.3-minutes, while the curve number is 78.

The following is a summary of the hydrologic analysis of the North Plant development. The analysis was conducted using HydroCAD, v10.00 and the output can be found in Appendix F.

Watershed	Curve Number	Total Area (acres)	Time of Concentration - T <sub>c</sub> (minutes)	Peak Discharge (c.f. / sec.)			
				1 Yr.	10 Yr.	25 Yr.	100 Yr.
A	78	2.32	19.4	1.13	3.71	5.46	9.18
B	78	16.60	35.6	5.32	18.03	26.65	45.15
C	77	1.93	17.4	0.91	3.13	4.64	7.88
D	78	20.00	52.8	4.82	16.38	24.26	41.31
E	78	21.20	38.7	6.39	21.73	32.13	54.48
F	78	6.11	36.7	1.92	6.50	9.61	16.29
G	78	8.51	29.3	3.14	10.55	15.57	26.31
H	78	17.83	28.5	6.70	22.51	33.19	56.18
I	78	0.84	12.3	0.53	1.70	2.48	4.13
<b>Total/Avg.</b>	<b>78</b>	<b>95.34</b>	<b>52.8 (max.)</b>	<b>30.86</b>	<b>104.24</b>	<b>153.99</b>	<b>260.91</b>

**Table 5 – Pre-Developed Conditions (NORTH PLANT)**

*South Plant:*

To envelope the two south developments, we analyzed a single 52.2-acre area (west) and another single 65.8-acre area (east). Offsite flows were not included in the analysis because no work

was proposed for those areas and the discharges would remain unchanged.

*South Plant (West Array):*

This 52-acre area slopes from the south to north at a slope of 3-7%. The area is generally open and has an average Curve Number (CN) of 79. The total pre-development discharges can be found in Table Six below. This area was split up into two distinct watersheds, and for purposes of this review, the discharges for those watersheds were combined to give a total discharge from the site. This is because grades will not change from pre-to-post development and it will give an apples-to-apples comparison.

Watershed A is 2.05 acres of area and is primarily meadow, non-grazed in soils with an HSG of D. It is in the southwest corner of the area being reviewed. Slopes in this watershed fall in the range of 1-2% which yields a time of concentration of 27.2-minutes, while the curve number is 78. A NYSEG 115kV utility runs through the center of this watershed and includes an easement. The western portion of this watershed is bounded by Dodge Road.

Watershed B is 50.11 acres of area and is primarily pasture, grassland, range in soils with an HSG of D. It comprises much of the area being reviewed. Slopes in this watershed fall in the range of 3-7% which yields a time of concentration of 47.5-minutes, while the curve number is 80. The western portion of this watershed is bounded by Dodge Road.

The following is a summary of the hydrologic analysis of the South Plant (West Array) development. The analysis was conducted using HydroCAD, v10.00 and the output can be found in Appendix F.

Watershed	Curve Number	Total Area (acres)	Time of Concentration - T <sub>c</sub> (minutes)	Peak Discharge (c.f. / sec.)			
				1 Yr.	10 Yr.	25 Yr.	100 Yr.
A (West)	78	2.05	27.2	0.80	2.67	3.94	6.65
B (West)	80	50.11	47.5	15.92	49.14	71.09	117.72
<b>Total/Avg.</b>	<b>79</b>	<b>52.16</b>	<b>47.5 (max.)</b>	<b>16.72</b>	<b>51.81</b>	<b>75.03</b>	<b>124.37</b>

***Table 6 – Pre-Developed Conditions (SOUTH PLANT, WEST ARRAY)***

*South Plant (East Array):*

This 65.8-acre area slopes from south to north at a slope of 3-7%. The area generally has a woods/grass combination and has an average Curve Number (CN) of 79. The total pre-development discharges can be found in Table Seven below. This area was split up into four distinct watersheds, and for purposes of this review, the discharges for those watersheds were combined to give a total discharge from the site. This is because grades will not change from pre-to-post development and it will give an apples-to-apples comparison.

Watershed C is 0.19 acres of area and is primarily a woods/grass mix in soils with an HSG of D. It is on the west side of the area being reviewed. Slopes in this small watershed fall in the range of 6-7% which yields a time of concentration of 6.0-minutes, while the curve number is 79.

Watershed D is 17.26 acres of area and is primarily a woods/grass mix in soils with an HSG of D. It is on the west side of the area being reviewed. The water flows through a single natural V-Channel. Slopes in this watershed fall in the range of 4-7% which yields a time of concentration of 24.1-minutes, while the curve number is 79. The westernmost portion of this area is adjacent to a wetland.

Watershed E is 24.55 acres of area and is primarily a woods/grass mix in soils with an HSG of D. It is in the center of the area being reviewed. Slopes in this watershed fall in the range of 3-7% which yields a time of concentration of 23.6-minutes, while the curve number is 79. The area does contain a small wetland near the north of the area.

Watershed F is 23.79 acres of area and is primarily a woods/grass mix in soils with an HSG of D. It is on the east side of the area being reviewed. Slopes in this watershed fall in the range of 3-4% which yields a time of concentration of 30.4-minutes, while the curve number is 79. The area does contain a sizeable wetland near the center of the area. The east side of the area is bounded by Turkey Hill Road.

The following is a summary of the hydrologic analysis of the South Plant (East Array) development. The analysis was conducted using HydroCAD, v10.00 and the output can be found in Appendix F.

Watershed	Curve Number	Total Area (acres)	Time of Concentration - T <sub>c</sub> (minutes)	Peak Discharge (c.f. / sec.)			
				1 Yr.	10 Yr.	25 Yr.	100 Yr.
C (East)	79	0.19	6.0	0.15	0.44	0.64	1.05
D (East)	79	17.26	24.1	7.15	22.83	33.30	55.71
E (East)	79	24.55	23.6	10.47	33.45	48.77	81.37
F (East)	79	23.79	30.4	9.44	30.30	44.22	73.86
<b>Total/Avg.</b>	<b>79</b>	<b>65.79</b>	<b>30.4 (max.)</b>	<b>27.21</b>	<b>87.02</b>	<b>126.93</b>	<b>211.99</b>

**Table 7 – Pre-Developed Conditions (SOUTH PLANT, EAST ARRAY)**

#### **C. Environmentally Sensitive Areas:**

The map in Appendix G highlights the environmentally sensitive areas in and around the project site. The project is located within several wetlands and the proposed plan to mitigate impact on those wetlands are to use a timber mat wherever a delineated wetland will be crossed. There is proposed clearing in some of the wetlands and that clearing will be managed by chainsaw. Some areas have been identified as habitat for the Northern Long Eared Bat (NLEB). These areas will not be cleared until after August 31<sup>st</sup>.

#### **D. TMDL Identification Requirements:**

This site does not drain to a waterbody on the 303d list of impaired waters.

#### **E. Existing Utilities and Easements**

The site is located within privately owned property. NYSEG power distribution lines run parallel to Stevenson Road, Dodge Road and Turkey Hill Road rights of way (ROW). The Site Plan document displays the existing NYSEG utility lines along with a Point of Common Coupling (PCC), the location where the electricity-generating project will connect with NYSEG. The PCC may be subject to change, pending NYSEG comments on the Coordinated System Interconnection Review (CESIR). The site contains additional easements as described in the title report, and those easements will be laid out by surveyors.

#### **F. Groundwater**

Much of the site has a groundwater table less than two-feet deep (see the report from the NRCS

website in Appendix D). In addition, about half of the site has a restrictive layer (bedrock or dense layers) of three feet or less.

### **G. Floodplain**

The site is in Zone C of the FEMA Federal Insurance Rate Map (FIRM) Panel in Appendix H. Zone C is outside of the 500-year floodplain, therefore there are no flooding concerns with this development.

### **H. Archeological Review**

The review letter from the NYS OHP will be provided in Appendix I.

### **I. MS4 Review**

This project site is located within a Municipal Separate Storm Sewer System (MS4). The MS4 Acceptance Form will be completed and submitted with the eNOI. It is also found in Appendix B for reference.

## **V. Post-Development Site Conditions**

### **A. Duration of Construction Activity**

Construction of the project is expected to begin June 2017 and be complete November 2017.

### **B. Disturbed Area**

The disturbed area for the project is approximately 33.0 acres, most of which involves the removal of trees and stumps.

### **C. Proposed Impervious Areas**

The proposed project will create approximately 2.06 acres of new impervious surface from the gravel access road and concrete equipment pads. Crusher run material will be used for the access road and a percentage of the surface water is expected to infiltrate.

### **D. Proposed Stormwater Management Plan**

Part III.C of the SPDES General Permit for Stormwater Discharge from Construction Activity, GP-0-15-002 (General Permit), states that construction activities that disturb more than one acre of land, creates minimal impervious surface and does not alter hydrology from pre-to-post development conditions, are required to prepare a Stormwater Pollution Prevention Plan (SWPPP) that only includes erosion and sediment control practices.

This project is split up into a north plant north plant (four 2MWac and one 1MWac ground mounted solar PV arrays), and a south plant (four 2MWac and one 1MWac ground mounted solar PV arrays (west). Installation of the solar panels will follow the natural contour of the land and no major earth work (cut and fill) is planned. Approximately 9,000 feet of underground electric lines will be installed by open trenching. All disturbed areas will be vegetated with a dense growing grass treatment.

The project includes installation of a 12-foot wide gravel roads to provide access to the inverter pad, PV panels and to maintain access to adjoining fields. The road cross section will consist of 12-inches of washed #2 stone placed on filter fabric. This design allows rainfall to infiltrate through the stone and into the ground, although for calculation purposes, the gravel road will be analyzed as impervious.

Ten 15-foot by 20-foot concrete inverter pads will also constructed on the site. Each pad will be constructed on a crushed stone base with a 2-foot wide washed #2 stone infiltration border around the concrete pad.

As previously discussed, there will be no change in land grades by a cut or fill method. In addition, the gravel access roads are designed and constructed in such a way that allows much of the water to infiltrate through the stone. See drawing DRN-07 for details. However, for analysis purposes, the road was treated as impervious. The only strictly impervious area being proposed are the ten inverter pads, which total 3,000 square feet. For these reasons, we summarize the proposed development meets the description outlined in Part III.C of the SPDES General Permit (GP-0-15- 002). This proposed development will disturb more than one acre of land, and will create minimal impervious surface and will not alter hydrology from pre-to-post development conditions. Therefore, we are required to prepare a SWPPP that only includes erosion and sediment control practices. However, the Town of Dryden Engineer requested a hydrologic analysis be performed to compare the site discharges from pre-to-post conditions due to the magnitude of the project. The analysis of the pre-conditions was presented IV. B. of this report and the presentation of the post-conditions can be found below.

#### **E. Post-Construction Hydrologic Analysis**

This section determines the proposed surface conditions and discharges for the developed area. This project is split up into a north plant north plant (four 2MWac and one 1MWac ground mounted solar PV arrays), and a south plant (four 2MWac and one 1MWac ground mounted solar PV arrays (west). All areas have been delineated on two “Post-Development Drainage Area Maps’ found in Appendix J.

The areas from pre-development to post-development will not change because there will be no grading. The Curve Numbers (CN) will change slightly. For example, trees being removed will be replaced with a dense vegetative cover. In addition, the inverter pads and stone access roads will change the ground cover a bit. Though the stone access road is not considered a true impervious area, we modeled it as such to show that the curve numbers go unchanged from pre-to-post development.

In the North Plant, Watersheds A, C, and I remain unchanged as there is no proposed development in those areas. Watershed B adds a minimal amount of impervious area but the CN and Time of Concentration (TOC) remain the same so the discharges remain the same. In Watershed D, the wooded area is replaced with a dense meadow/grass/un-grazed area while a small portion of impervious area is added. The CN remains the same but the TOC is reduced because of the removal of the wooded area. Therefore, the discharges increase minimally.

Watershed E doesn’t remove any trees but adds 0.297 acres of impervious, which raises the weighted CN from 78 to 79 and increases the discharges slightly. Watershed F doesn’t remove any trees but adds 0.137 acres of impervious, which doesn’t impact the CN number. Therefore, the discharges go unchanged. Watershed G doesn’t remove any trees but adds 0.05 acres of impervious, which doesn’t impact the CN number. Therefore, the discharges go unchanged. Watershed H doesn’t remove any trees but adds 0.25 acres of impervious, which doesn’t impact the CN number. Therefore, the discharges go unchanged.



In the South Plant, West Array, Watershed A remains unchanged as there is no proposed development in that area. Watershed B adds a minimal amount of impervious area and the CN is reduced from 80 to 78 because the land cover will change to a dense meadow/grass/un-grazed area. The Time of Concentration (TOC) remains the same but the discharges decrease because of the decreased CN.

In the South Plant, East Array, Watershed C remains unchanged as there is no proposed development in that area. In Watersheds D, E, and F, the wooded area is replaced with a dense meadow/grass/un-grazed area while a small portion of impervious area is added in each.

To summarize the changes, adding the impervious inverter pads and modeling the stone road as an impervious area does nothing to the discharge values from pre-development to post-development. The major changes lie within the removal of trees. The CN is decreased because the proposed ground cover is a dense meadow/grass/un-grazed area which has a lower CN on D Soils (78) than the woods/grass mix on D Soils (79). In these areas, the TOC decreases but the discharges from pre-to-post decrease. The primary driver for this is the reduction in the weighted CN.

The changes in land cover are presented in the Post-Developed Drainage Area Map in Appendix J and the Post-Developed Drainage Analysis report from HydroCAD in Appendix K. The summary of the results compared to pre-development conditions are summarized below in Tables 8-10.

Pre-Development Watershed	Post-Development Watershed	1 Year			10 Year			25 Year			100 Year		
		Pre (Q)	Post (Q)	% Change	Pre (Q)	Post (Q)	% Change	Pre (Q)	Post (Q)	% Change	Pre (Q)	Post (Q)	% Change
A	A	1.13	1.13	0.0%	3.71	3.71	0.0%	5.46	5.46	0.0%	9.18	9.18	0.0%
B	B	5.32	5.32	0.0%	18.03	18.03	0.0%	26.65	26.65	0.0%	45.15	45.15	0.0%
C	C	0.91	0.91	0.0%	3.13	3.13	0.0%	4.64	4.64	0.0%	7.88	7.88	0.0%
D	D	4.82	5.25	8.9%	16.38	17.90	9.3%	24.26	26.50	9.2%	41.31	45.00	8.9%
E	E	6.39	7.08	10.8%	21.73	22.89	5.3%	32.13	33.47	4.2%	54.48	56.04	2.9%
F	F	1.92	1.92	0.0%	6.50	6.50	0.0%	9.61	9.61	0.0%	16.29	16.29	0.0%
G	G	3.14	3.14	0.0%	10.55	10.55	0.0%	15.57	15.57	0.0%	26.31	26.31	0.0%
H	H	6.70	6.70	0.0%	22.51	22.51	0.0%	33.19	33.19	0.0%	56.18	56.18	0.0%
I	I	0.53	0.53	0.0%	1.70	1.70	0.0%	2.48	2.48	0.0%	4.13	4.13	0.0%
	<b>SUM</b>	<b>30.86</b>	<b>31.98</b>	<b>3.6%</b>	<b>104.24</b>	<b>106.92</b>	<b>2.6%</b>	<b>153.99</b>	<b>157.57</b>	<b>2.3%</b>	<b>260.91</b>	<b>266.16</b>	<b>2.0%</b>

**Table 8 – Summary of Pre-Developed versus Post-Developed Conditions (NORTH PLANT)**

Pre-Development Watershed	Post-Development Watershed	1 Year			10 Year			25 Year			100 Year		
		Pre (Q)	Post (Q)	% Change	Pre (Q)	Post (Q)	% Change	Pre (Q)	Post (Q)	% Change	Pre (Q)	Post (Q)	% Change
A (West)	A (West)	0.80	0.80	0.0%	2.67	2.67	0.0%	3.94	3.94	0.0%	6.65	6.65	0.0%
B (West)	B (West)	15.92	13.02	(22.2%)	49.14	44.34	(10.8%)	71.09	65.62	(8.3%)	117.72	111.30	(5.8%)
	<b>SUM</b>	<b>16.72</b>	<b>13.82</b>	<b>(21.0%)</b>	<b>51.81</b>	<b>47.01</b>	<b>(10.2%)</b>	<b>75.03</b>	<b>69.56</b>	<b>(7.9%)</b>	<b>124.37</b>	<b>117.95</b>	<b>(5.4%)</b>

**Table 9 – Summary of Pre-Developed versus Post-Developed Conditions (SOUTH PLANT, WEST ARRAY)**

Pre-Development Watershed	Post-Development Watershed	1 Year			10 Year			25 Year			100 Year		
		Pre (Q)	Post (Q)	% Change	Pre (Q)	Post (Q)	% Change	Pre (Q)	Post (Q)	% Change	Pre (Q)	Post (Q)	% Change
C (East)	C (East)	0.15	0.15	0.0%	0.44	0.44	0.0%	0.64	0.64	0.0%	1.05	1.05	0.0%

D (East)	D (East)	7.15	6.46	(10.7%)	22.83	21.69	(5.3%)	33.30	31.99	(4.1%)	55.71	54.18	(2.8%)
E (East)	E (East)	10.47	9.46	(10.7%)	33.45	31.79	(5.2%)	48.77	46.86	(4.1%)	81.37	79.15	(2.8%)
F (East)	F (East)	9.44	8.52	(10.8%)	30.30	28.79	(5.2%)	44.22	42.47	(4.1%)	73.86	71.82	(2.8%)
	<b>SUM</b>	<b>27.21</b>	<b>24.59</b>	<b>(10.7%)</b>	<b>87.02</b>	<b>82.71</b>	<b>(5.2%)</b>	<b>126.93</b>	<b>121.96</b>	<b>(4.1%)</b>	<b>211.99</b>	<b>206.20</b>	<b>(2.8%)</b>

**Table 10 – Summary of Pre-Developed versus Post-Developed Conditions (SOUTH PLANT, EAST ARRAY)**

Though the discharges increased slightly in the North Plant, the discharges, combined, for the entire site decrease because of the decreased discharges in the South Plant.

## **VI. Soil Restoration**

Per the NYSDEC Stormwater Management Design Manual a soil restoration plan is required across areas of development where soils have been disturbed and will be vegetated to reinstate the original properties and porosity of the soil.

The panels are impervious but the length of each surface is 77 inches and the ground under each panel is to be maintained as a grassed pervious surface. The very short impervious disconnection drains onto the pervious vegetated surface which is equal to or greater than the length of the impervious surface. There is no site grading proposed under the panel area.

Trees will be removed by a mixture of a chainsaw (in wetland areas), a feller buncher, bulldozer, and backhoe. The stumps will be removed and ground up by the same method as the trees. The voids left by the stumps will be backfilled with material stockpiled onsite.

Vegetation will be established with normal tillage equipment and seeded and mulched. Panel construction will be done using low-ground-pressure equipment. Based on this, we do not anticipate a need for top soil restoration. If there are areas of concentrated traffic resulting in soil compaction the vegetative restoration will include soil restoration.

## **VII. Construction Phasing**

The Contractor is required to submit to the Engineer for approval, a construction/progress schedule showing the order in which the Contractor proposes to carry on the work, the date on which the work on the project will start, the major items of work, the critical features and the completion dates for each task. The Contractor's work schedule and methods shall be consistent with the SWPPP. Once approved, the progress schedule shall become a part of the SWPPP.

The following list is a *suggested standard text* for the recommended sequence of major construction activities for the project:

1. Pre-construction meeting
2. Construct stabilized construction entrance.
3. Delineate disturbed areas and areas to remain undisturbed(wetlands)
4. Protect areas with orange construction fence
5. Install silt fence
6. Setup perimeter controls with limited clearing
7. Install crusher run driveway
8. Construction utilities
9. Continue with full scale clearing
10. Temporarily stabilize all disturbed areas

11. Construct solar array
12. Perform soil restoration
13. Perform final stabilization
14. Remove all temporary erosion and sediment controls once 80% stabilization has been achieved.

## **VIII. Erosion and Sediment Control Plan**

### **A. Scope**

Erosion and sediment control measures to be employed by the project have been prepared in accordance with the current version of the New York State Standards and Specifications for Erosion and Sediment Control (NYSSSESC). All contractors and subcontractors shall comply with all applicable requirements and conditions of the SPDES General Permit, NYSSSESC and this SWPPP.

### **B. Temporary Erosion Control Measures**

The following temporary erosion and sedimentation control measures will be used on this project during construction (location, material specifications, dimensions and installation details are provided in the contract documents):

- Stabilized Construction Entrances: Will be installed to minimize the tracking of debris and mud off the project site. Location of entrance(s) shall be where shown on the plans or approved in the field by the Qualified Inspector.
- Silt Fence: Will be installed at the down gradient site perimeter where shown on plans (or approved in the field by the qualified inspector) to intercept sediment laden runoff from disturbed soil.
- Temporary Stabilization: Disturbed portions of the site not shown to receive other surface treatments, where construction activities have temporarily ceased, must be stabilized with temporary seed or mulch no later than 14 days from the last construction activity. Areas of the site that are to be paved will be temporarily stabilized by applying stone sub-base until final surface treatments can be applied.

### **C. Permanent Erosion Control Measures**

The following permanent erosion and sedimentation control measures will be used to minimize erosion and scour after construction is complete (location, material specifications, dimensions and installation details are provided in the contract documents):

- Permanent Seeding and Mulching: Placed to establish a uniform erosion-resistant perennial vegetative cover where the surface soil is capable of resisting erosion during runoff events. All areas disturbed during construction not shown to receive other surface treatments will be restored with topsoil and seeded to provide a stabilized vegetative cover.
- Seed and mulch shall be placed 30-45 days prior to the first Fall frost. For this area, the first frost is typically October 21<sup>st</sup>. Therefore, for this project, the seed and mulch shall be placed around September 10<sup>th</sup>, 2017. You can generally expect seedlings to emerge within seven to 21 days. It will take another three to four weeks of growth before grass is long enough to mow. In this case, mowing will not be required.

- If for any reason work and soil disturbance extends beyond October 21<sup>st</sup>, the following should be executed to plan for winter stabilization:
  - Stabilization as follows should be completed within a day of establishing the grade that is final or that otherwise will exist for more than 5 days:
    - All proposed vegetated areas having a slope of less than 15% which do not exhibit a minimum of 85% vegetative growth by October 21st, or which are disturbed after October 21st, should be seeded and covered with three to four tons of hay or straw mulch per acre secured with anchored netting, or two inches of erosion control mix.
    - All proposed vegetated areas having a slope of greater than 15% which do not exhibit a minimum of 85% vegetative growth by October 21st, or which are disturbed after October 21st, should be seeded and covered with a properly installed and anchored erosion control blanket or with a minimum 4-inch thickness of erosion control mix, unless otherwise specified by the manufacturer. Note that compost blankets should not exceed two inches in thickness or they may overheat.
    - Installation of anchored hay mulch or erosion control mix should not occur over snow of greater than one inch in depth.
    - All mulch applied during winter should be anchored (e.g., by netting, tracking, wood cellulose fiber).
    - Stockpiles of soil materials should be mulched for over winter protection with hay or straw at twice the normal rate or with a four-inch layer of erosion control mix. Mulching should be done within 24 hours of stocking, and re-established prior to any rainfall or snowfall. No soil stockpile should be placed (even covered with mulch) within 100 feet from any wetland or other water resource area.
    - Frozen materials, (e.g., frost layer that is removed during winter construction), should be stockpiled separately and in a location, that is away from any area needing to be protected. Stockpiles of frozen material can melt in the spring and become 4-3. Winter Weather Stabilization & Construction Practices unworkable and difficult to transport due to the high moisture content in the soil.
    - Installation of erosion control blankets should not occur over snow of greater than one inch in depth or on frozen ground.

#### **D. Maintenance and Inspection**

All erosion and sediment control practice must be maintained in accordance with the Contract Drawings and Specifications. The Contractor is responsible for providing post rainfall-event inspections of erosion and sediment control practices. The Qualified Inspector will perform weekly inspections, on behalf of the Owner, of all installed practices and examine:

- Silt fences for depth of sediment, tears, and to ensure fabric is securely attached to construction fence
- Temporary and permanent seeding for bare spots and unhealthy growth.
- Stabilized construction entrances for tracking of sediment off the project site.

The Qualified Inspector will prepare an inspection report after every inspection and note whether any additional practices are required, and note any corrective actions required (refer to Part IV. C of the SPDES General Permit for all Qualified Inspector Inspection Requirements).

The qualified inspector will notify the owner or operator and appropriate contractor or subcontractor of any corrective actions, within 24 hours of the completed inspection. The contractor or subcontractor must complete the corrective actions within 24 hours of this notification.

#### **E. Diverting of Flows**

There are no planned flow diversions from up gradient areas.

#### **F. Industrial and Non-Stormwater Discharges**

There are no industrial discharges at the site.

#### **G. Litter Prevention & Material Storage**

The Contractor and subcontractors must implement management practices to reduce the risk of contaminated storm runoff. The Contractor must provide training regarding waste management practices and procedures to all onsite employees and subcontractors.

The Contractor must arrange for appropriate waste management services. Trash disposal and recycling, proper material handling, and daily cleanup at the site will reduce the potential for contaminated stormwater runoff.

Toilet facilities must be well maintained with regular inspections, service, and disposal. Facilities must be located away from storm drain inlets and waterways.

The Contractor must establish material storage and staging areas with cover and containment as necessary. Building materials such as paint, solvents, pesticides, fuels, and oils must be stored indoors or under cover when possible. Regular inspection of the storage containers are the responsibility of the Contractor.

Concrete washout areas must be located as far from storm drains and watercourses as possible. Contractor must inspect washout areas daily during use to detect leaks or tears. Materials from the washout area must be disposed of properly.

Contractors must totally consume paints and coating materials or return unused portions back to their facilities. Equipment contaminated with water-based paints/coating may be washed/rinsed with water and soap (if necessary) with the rinse and wash water released, with copious amounts of water, to an approved sanitary sewer access location. Contractor must containerize solvents or other residues from cleaning of equipment contaminated with solvent-based paint/coatings for proper recycling or disposal to an authorized/regulatory permitted off-site facility.

Contractor must ensure no tracking of sediment, soil, mud or other materials onto roadways/paved surfaces. Contractor must sweep surfaces promptly, no later than the end of the workday, when such occurrences occur.

The Contractor must provide a site-specific spill prevention and response plan, which addresses the following:

- Reducing chance of spills
- Stopping the source of spills
- Containing and cleaning up spills
- Disposing of materials contaminated by spills
- Training personnel responsible for spill prevention/response
- Material handling procedures
- Material storage requirements

Potential sources of sediment to stormwater runoff include:

- Clearing and grubbing operations
- Grading and site excavation operations
- Vehicle tracking
- Topsoil stripping and stockpiling
- Landscaping operations

Potential pollutants and sources, other than sediment, to stormwater runoff include:

- Combined Staging Area—small fueling activities, minor equipment maintenance, sanitary facilities, and hazardous waste storage.
- Materials Storage Area—general building materials, solvents, adhesives, paving materials, paints, aggregates, trash, etc.
- Construction Activity—paving, curb/gutter installation, utility trenching, concrete pouring, and building construction
- Concrete Washout Area

For all potential construction site pollutants, see the following table:

Material/Chemical	Physical Description	Stormwater Pollutants	Location
Fertilizer	Liquid or solid grains	Nitrogen, phosphorous	Newly seeded areas
Cleaning solvents	Colorless, blue, or yellow-green liquid	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	No equipment cleaning allowed in project limits
Concrete	White solid/grey liquid	Limestone, sand, pH, chromium	Equipment pads
Curing compounds	Creamy white liquid	Naphtha	Equipment pads
Hydraulic oil/fluids	Brown oily petroleum hydrocarbon	Mineral oil	Leaks or broken hoses from equipment
Gasoline	Colorless, pale brown or pink petroleum hydrocarbon	Benzene, ethyl benzene, toluene, xylene, MTBE	Secondary containment / staging area
Diesel Fuel	Clear, blue-green to yellow liquid	Petroleum distillate, oil & grease, naphthalene, xylenes	Secondary containment / staging area
Kerosene	Pale yellow liquid petroleum hydrocarbon	Coal oil, petroleum distillates	Secondary containment / staging area
Antifreeze/coolant	Clear green/yellow	Ethylene glycol,	Leaks or broken hoses

	liquid	propylene glycol, heavy metals (copper, lead, zinc)	from equipment
Sanitary toilets	Various colored liquid	Bacteria, parasites, and viruses	Staging area
<b>Construction Materials</b>			
Granular fill	Various colored solids	Sediment	Stockpile / fill areas
Subbase course	Gray/brown solid	Sediment, dust	Stockpile
Topsoil	Brown solid	Sediment	Stockpile
Mulch	Various colored solid	Sediment, debris	Staging area
Seed	Brown/yellow solid	Nutrients, debris	Staging area
Joint Sealant	Light gray viscous solid	Polyurethane	Staging area

***Table 11 – Potential Construction Site Pollutants***

The Erosion Control Plans are included in Appendix L-1 and the Erosion Control Specifications are in Appendix L-2.

## **IX. SWPPP Implementation and Inspection**

SUN8 PDC LLC will act as the owner of the entire project with a qualified consultant responsible for the SWPPP inspections. The qualified consultant shall provide certifications during construction activities and a permanent certification upon completion of the project.

Typical items of inspection will be:

- a) Placement of mulch and seeding.
- b) Silt fence and other erosion and sediment control structures.
- c) Visible signs of erosion.
- d) Identify potential pollutants entering or exiting site such as turbidity in receiving or existing waters and signs of mud or dirt transported from the site onto public roads.
- e) Dust being generated from a dry, disturbed site.
- f) Ensure phasing plan is followed to maximize the water quality of the surrounding area.

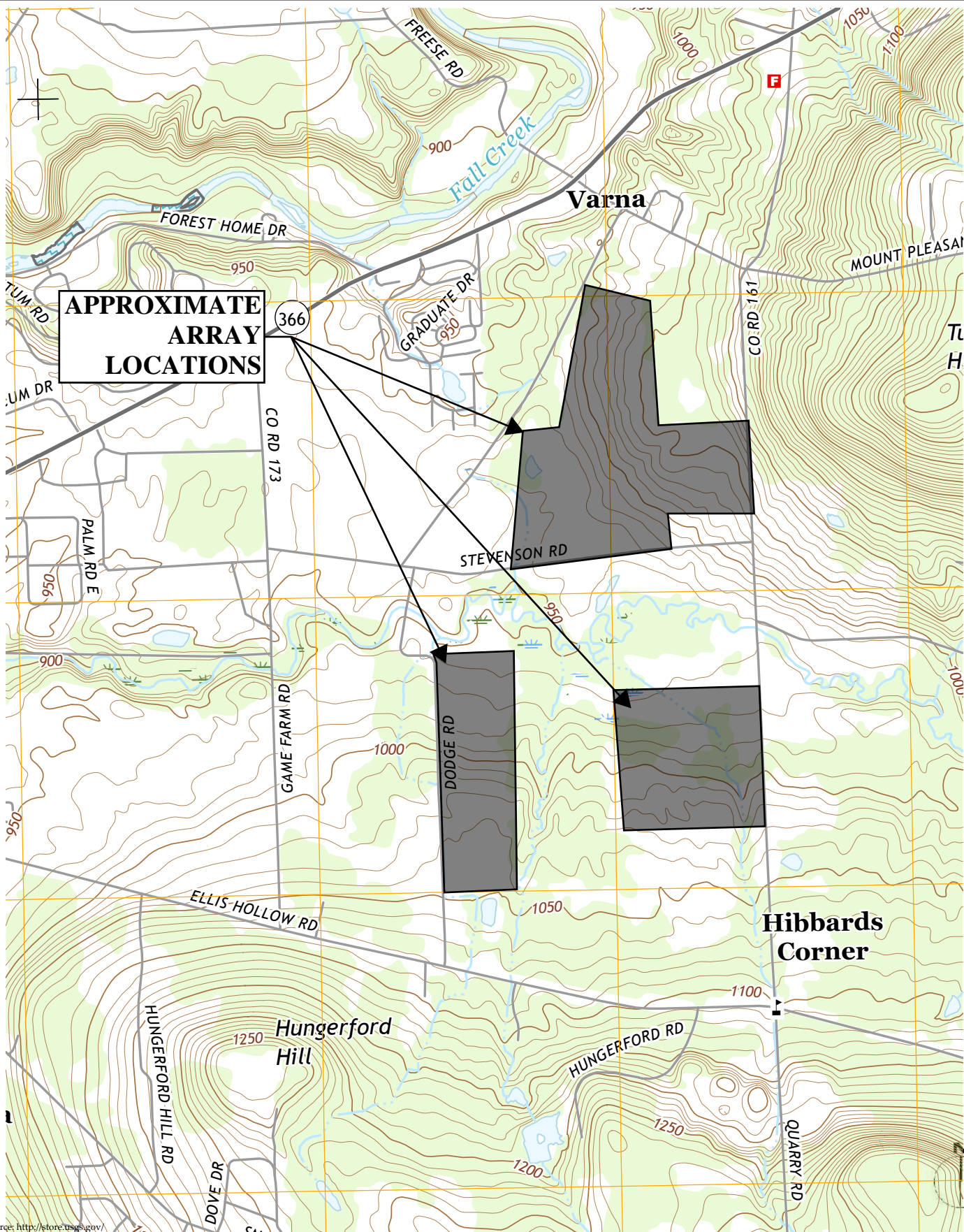
Unless otherwise notified by the Department, the qualified inspector shall conduct site inspections for construction sites where soil disturbance activities are on-going, at least once every seven (7) calendar days or within 24 hours after a rainfall.

A construction site logbook with inspection forms are included in Appendix M and shall be updated and amend

## **APPENDIX A**

### **USGS Map**





Source: <http://store.usgs.gov/>



**MASER ENGINEERING**  
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607-377-7990 | 112 North Main Street, Horseheads, NY 14845  
[maser@maser-engineering.net](mailto:maser@maser-engineering.net) | [www.maser-engineering.net](http://www.maser-engineering.net)

## USGS Regional Map

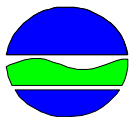
**ELLIS TRACT SOLAR PV ARRAY**  
Town of Dryden, NY

Fig.1

## **APPENDIX B-1**

### **Notice of Intent (NOI)**

## NOTICE OF INTENT



**New York State Department of Environmental Conservation**

## Division of Water

**625 Broadway, 4th Floor**

**Albany, New York 12233-3505**

NYR [ ] [ ] [ ] [ ] [ ]  
(for DEC use only)

**Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-15-002**

**All sections must be completed unless otherwise noted.** Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

**- IMPORTANT -**

**RETURN THIS FORM TO THE ADDRESS ABOVE**

**OWNER/OPERATOR MUST SIGN FORM**

### Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)

[illegible]

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

[illegible]

Owner/Operator Contact Person First Name

[illegible]

Owner/Operator Mailing Address

[illegible]

City

[illegible]

State

Zip

D	C
---	---

2	0	0	0	5
---	---	---	---	---

-

--	--	--	--

Phone (Owner/Operator)

2	0	2	-	5	3	6	-	5	7	6	6
---	---	---	---	---	---	---	---	---	---	---	---

Fax (Owner/Operator)

--	--	--	--

Email (Owner/Operator)

[illegible][illegible]

FED TAX ID

8 1 - 3 7 8 3 1 9 5 (not required for individuals)

## Project Site Information

Project/Site Name

E L L I S T R A C T S O L A R P V A R R A Y

Street Address (NOT P.O. BOX)

M T P L E A S A N T R O A D

Side of Street

☐ North ☒ South ☐ East ☐ West

City/Town/Village (THAT ISSUES BUILDING PERMIT)

T O W N O F D R Y D E N

State

N Y

Zip

1 3 0 5 3 -

County

T O M P K I N S

DEC Region

7

Name of Nearest Cross Street

T U R K E Y H I L L R O A D

Distance to Nearest Cross Street (Feet)

0

Project In Relation to Cross Street

☐ North ☐ South ☐ East ☒ West

Tax Map Numbers

Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

[www.dec.ny.gov/imsmaps/stormwater/viewer.htm](http://www.dec.ny.gov/imsmaps/stormwater/viewer.htm)

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

3 8 2 1 2 5

Y Coordinates (Northing)

4 7 0 0 6 0 2

2. What is the nature of this construction project?

☒ New Construction☐ Redevelopment with increase in impervious area☐ Redevelopment with no increase in impervious area

3. Select the predominant land use for both pre and post development conditions.

**SELECT ONLY ONE CHOICE FOR EACH**

**Pre-Development  
Existing Land Use**

- ☐ FOREST  
☒ PASTURE/OPEN LAND  
☐ CULTIVATED LAND  
☐ SINGLE FAMILY HOME  
☐ SINGLE FAMILY SUBDIVISION  
☐ TOWN HOME RESIDENTIAL  
☐ MULTIFAMILY RESIDENTIAL  
☐ INSTITUTIONAL/SCHOOL  
☐ INDUSTRIAL  
☐ COMMERCIAL  
☐ ROAD/HIGHWAY  
☐ RECREATIONAL/SPORTS FIELD  
☐ BIKE PATH/TRAIL  
☐ LINEAR UTILITY  
☐ PARKING LOT  
☐ OTHER

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**Post-Development  
Future Land Use**

- ☐ SINGLE FAMILY HOME  
☐ SINGLE FAMILY SUBDIVISION  
☐ TOWN HOME RESIDENTIAL  
☐ MULTIFAMILY RESIDENTIAL  
☐ INSTITUTIONAL/SCHOOL  
☐ INDUSTRIAL  
☐ COMMERCIAL  
☐ MUNICIPAL  
☐ ROAD/HIGHWAY  
☐ RECREATIONAL/SPORTS FIELD  
☐ BIKE PATH/TRAIL  
☐ LINEAR UTILITY (water, sewer, gas, etc.)  
☐ PARKING LOT  
☐ CLEARING/GRADING ONLY  
☐ DEMOLITION, NO REDEVELOPMENT  
☐ WELL DRILLING ACTIVITY \*(Oil, Gas, etc.)  
☒ OTHER

Number of Lots

--	--	--	--

S	O	L	A	R		A	R	R	A	Y									
---	---	---	---	---	--	---	---	---	---	---	--	--	--	--	--	--	--	--	--

**\*Note:** for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

**Total Site  
Area**

		9	5	.	0
--	--	---	---	---	---

**Total Area To  
Be Disturbed**

		3	3	.	0
--	--	---	---	---	---

**Existing Impervious  
Area To Be Disturbed**

			0	.	0
--	--	--	---	---	---

**Future Impervious  
Area Within  
Disturbed Area**

			2	.	1
--	--	--	---	---	---

5. Do you plan to disturb more than 5 acres of soil at any one time? ☒ Yes ☐ No

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

**A**

			%
--	--	--	---

**B**

			%
--	--	--	---

**C**

			%
--	--	--	---

**D**

1	0	0	%
---	---	---	---

7. Is this a phased project? ☐ Yes ☒ No

8. Enter the planned start and end dates of the disturbance activities.

**Start Date**

0	6	/	0	1	/	2	0	1	7
---	---	---	---	---	---	---	---	---	---

**End Date**

1	1	/	3	0	/	2	0	1	7
---	---	---	---	---	---	---	---	---	---

[illegible]

\_\_\_\_\_

9a. Type of waterbody identified in Question 9?

- ☒ Wetland / State Jurisdiction On Site (Answer 9b)

☐ Wetland / State Jurisdiction Off Site

☒ Wetland / Federal Jurisdiction On Site (Answer 9b)

☐ Wetland / Federal Jurisdiction Off Site

☐ Stream / Creek On Site

☐ Stream / Creek Off Site

☐ River On Site

☐ River Off Site

☐ Lake On Site

☐ Lake Off Site

☐ Other Type On Site

☐ Other Type Off Site

9b. How was the wetland identified?

☐ Regulatory Map

☒ Delineated by Consultant

☐ Delineated by Army Corps of Engineers

☐ Other (identify)

9b. How was the wetland identified?

- ☐ Lake On Site
  - ☐ Lake Off Site
  - ☐ Other Type On Site
  - ☐ Other Type Off Site
  - ☐ Regulatory Map
  - ☒ Delineated by Consultant
  - ☐ Delineated by Army Corps of Engineers
  - ☐ Other (identify)

--	--

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-15-002? ☐ Yes ☒ No

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-15-002? ☐ Yes ☒ No

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-15-002? ☐ Yes ☒ No

11. Is this project located in one of the watersheds identified in Appendix C of GP-0-15-002? ☐ Yes ☒ No

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ☐ Yes ☒ No

areas associated with AA and AA-S classified waters? ☐ Yes ☒ No

If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ☐ Yes ☒ No

existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ☐ Yes ☒ No

If Yes, what is the acreage to be disturbed?

[illegible]

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ☐ Yes ☒ No

regulated wetland or the protected 100 foot adjacent area? ☐ Yes ☒ No

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ☒ Yes ☐ No ☐ Unknown

16. What is the name of the municipality/entity that owns the separate storm sewer system?

[illegible]

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ☐ Yes ☒ No ☐ Unknown

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ☐ Yes ☒ No

19. Is this property owned by a state authority, state agency, federal government or local government? ☐ Yes ☒ No

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ☐ Yes ☒ No

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? ☒ Yes ☐ No

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ☐ Yes ☒ No
- If No, skip questions 23 and 27-39.**

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ☐ Yes ☐ No

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ☒ Professional Engineer (P.E.)  
☐ Soil and Water Conservation District (SWCD)  
☐ Registered Landscape Architect (R.L.A.)  
☐ Certified Professional in Erosion and Sediment Control (CPESC)  
☐ Owner/Operator  
☐ Other

[illegible]

SWPPP Preparer

[illegible]

Contact Name (Last, Space, First)

[illegible]

Mailing Address

[illegible]

City

[illegible]

State Zip

N	Y	1	4	8	4	5	-				
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Phone

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Fax

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Email

M	A	S	E	R	@	M	A	S	E	R	-	E	N	G	I	N	E	E	R	I	N	G	.	N	E	T
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[illegible]

## SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-15-002. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name

[illegible]

MI

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**Last Name**

[illegible]

Signature

Man Mose

Date \_\_\_\_\_

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25. Has a construction sequence schedule for the planned management practices been prepared? ☒ Yes ☐ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

## Temporary Structural

- ☐ Check Dams
- ☐ Construction Road Stabilization
- ☒ Dust Control
- ☐ Earth Dike
- ☐ Level Spreader
- ☐ Perimeter Dike/Swale
- ☐ Pipe Slope Drain
- ☐ Portable Sediment Tank
- ☐ Rock Dam
- ☐ Sediment Basin
- ☐ Sediment Traps
- ☒ Silt Fence
- ☒ Stabilized Construction Entrance
- ☒ Storm Drain Inlet Protection
- ☒ Straw/Hay Bale Dike
- ☐ Temporary Access Waterway Crossing
- ☐ Temporary Stormdrain Diversion
- ☐ Temporary Swale
- ☐ Turbidity Curtain
- ☐ Water bars

## Biotechnical

- Brush Matting
- Wattling

## Other

[illegible]

## Vegetative Measures

- ☐ Brush Matting
- ☐ Dune Stabilization
- ☐ Grassed Waterway
- ☒ Mulching
- ☒ Protecting Vegetation
- ☐ Recreation Area Improvement
- ☒ Seeding
- ☐ Sodding
- ☐ Straw/Hay Bale Dike
- ☐ Streambank Protection
- ☐ Temporary Swale
- ☐ Topsoiling
- ☐ Vegetating Waterways

## Permanent Structural

- ☐ Debris Basin
- ☐ Diversion
- ☐ Grade Stabilization Structure
- ☐ Land Grading
- ☐ Lined Waterway (Rock)
- ☐ Paved Channel (Concrete)
- ☐ Paved Flume
- ☐ Retaining Wall
- ☐ Riprap Slope Protection
- ☐ Rock Outlet Protection
- ☐ Streambank Protection

**Post-construction Stormwater Management Practice (SMP) Requirements**

**Important: Completion of Questions 27-39 is not required  
if response to Question 22 is No.**

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- ☐ Preservation of Undisturbed Areas
- ☐ Preservation of Buffers
- ☐ Reduction of Clearing and Grading
- ☐ Locating Development in Less Sensitive Areas
- ☐ Roadway Reduction
- ☐ Sidewalk Reduction
- ☐ Driveway Reduction
- ☐ Cul-de-sac Reduction
- ☐ Building Footprint Reduction
- ☐ Parking Reduction

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

- ☐ All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).
- ☐ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

**Total WQv Required**

.     acre-feet

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

**Note:** Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques  
and Standard Stormwater Management  
Practices (SMPs)

RR Techniques (Area Reduction)	Total Contributing Area (acres)	Total Contributing Impervious Area(acres)
<input type="radio"/> Conservation of Natural Areas (RR-1) ...	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	and/or <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input checked="" type="radio"/> Sheetflow to Riparian Buffers/Filters Strips (RR-2) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	and/or <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Tree Planting/Tree Pit (RR-3) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	and/or <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Disconnection of Rooftop Runoff (RR-4) ..	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	and/or <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<b>RR Techniques (Volume Reduction)</b>		
<input type="radio"/> Vegetated Swale (RR-5) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Rain Garden (RR-6) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Stormwater Planter (RR-7) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Rain Barrel/Cistern (RR-8) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Porous Pavement (RR-9) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Green Roof (RR-10) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<b>Standard SMPs with RRv Capacity</b>		
<input checked="" type="radio"/> Infiltration Trench (I-1) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Infiltration Basin (I-2) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input checked="" type="radio"/> Dry Well (I-3) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Underground Infiltration System (I-4) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Bioretention (F-5) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Dry Swale (O-1) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<b>Standard SMPs</b>		
<input type="radio"/> Micropool Extended Detention (P-1) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Wet Pond (P-2) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Wet Extended Detention (P-3) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Multiple Pond System (P-4) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Pocket Pond (P-5) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Surface Sand Filter (F-1) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Underground Sand Filter (F-2) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Perimeter Sand Filter (F-3) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Organic Filter (F-4) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Shallow Wetland (W-1) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Extended Detention Wetland (W-2) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Pond/Wetland System (W-3) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Pocket Wetland (W-4) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Wet Swale (O-2) .....	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>

## Alternative SMP

- [illegible]

[illegible][illegible]

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

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acre-feet

- ☐ Yes      ☐ No

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 acre-feet

- ☐ Yes    ☐ No

If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

**Note:** Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

- 33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

**WQv Provided**

.  acre-feet

**Note:** For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).

.

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ☐ Yes ☐ No

If Yes, go to question 36.

If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

**CPv Required**

.  acre-feet

**CPv Provided**

.  acre-feet

- 36a. The need to provide channel protection has been waived because:

- ☐ Site discharges directly to tidal waters or a fifth order or larger stream.
- ☐ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

**Total Overbank Flood Control Criteria (Qp)**

**Pre-Development**

.  CFS

**Post-development**

.  CFS

**Total Extreme Flood Control Criteria (Qf)**

**Pre-Development**

.  CFS

**Post-development**

.  CFS

37a. The need to meet the Qp and Qf criteria has been waived because:

- ☐ Site discharges directly to tidal waters or a fifth order or larger stream.
- ☐ Downstream analysis reveals that the Qp and Qf controls are not required

- 37a. The need to meet the Qp and Qf criteria has been waived because:
- ☐ Site discharges directly to tidal waters or a fifth order or larger stream.
  - ☐ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ☐ **Yes** ☐ **No**

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ☐ **Yes** ☐ **No**

If Yes, Identify the entity responsible for the long term  
Operation and Maintenance

[illegible]

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a)  
This space can also be used for other pertinent project information.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ☐ Air Pollution Control
- ☐ Coastal Erosion
- ☐ Hazardous Waste
- ☐ Long Island Wells
- ☐ Mined Land Reclamation
- ☐ Solid Waste
- ☐ Navigable Waters Protection / Article 15
- ☐ Water Quality Certificate
- ☐ Dam Safety
- ☐ Water Supply
- ☐ Freshwater Wetlands/Article 24
- ☐ Tidal Wetlands
- ☐ Wild, Scenic and Recreational Rivers
- ☐ Stream Bed or Bank Protection / Article 15
- ☐ Endangered or Threatened Species(Incidental Take Permit)
- ☐ Individual SPDES

○ SPDES Multi-Sector GP	N	Y	R						
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☐ Other \_\_\_\_\_

☐ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ☐ ☐ ☐ ☐ ☐ ☐

☐ Yes    ☒ No

Weekend Period:					
If Yes, Indicate Size of Impact.	.				

42. Is this project subject to the requirements of a regulated, traditional land use control MS4?  
(If No, skip question 43)

☐ Yes      ☒ No

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI?

☐ Yes    ☐ No

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. 

N	N	D				
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N	Y	R						
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**Owner/Operator Certification**

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

**Print First Name**

W	E	I	S	S															
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**MI**

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**Print Last Name**

J	E	F	F																
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**Owner/Operator Signature**

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**Date**

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## **APPENDIX B-2**

### **Notice of Termination (NOT)**

**New York State Department of Environmental Conservation  
Division of Water  
625 Broadway, 4th Floor  
Albany, New York 12233-3505**

\*(NOTE: Submit completed form to address above)\*

**NOTICE OF TERMINATION** for Storm Water Discharges Authorized  
under the SPDES General Permit for Construction Activity

**Please indicate your permit identification number:** NYR \_\_\_\_ \_

**I. Owner or Operator Information**

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person:

4a. Telephone:

4b. Contact Person E-Mail:

**II. Project Site Information**

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

**III. Reason for Termination**

9a. ☐ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. \*Date final stabilization completed (month/year): \_\_\_\_\_

9b. ☐ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR \_\_\_\_ \_

(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. ☐ Other (Explain on Page 2)

**IV. Final Site Information:**

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? ☐ yes ☐ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? ☐ yes ☐ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

\_\_\_\_\_

**NOTICE OF TERMINATION for Storm Water Discharges Authorized under the  
SPDES General Permit for Construction Activity - continued**

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit?    ☐ yes    ☐ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

- ☐ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.
- ☐ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).
- ☐ For post-construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.
- ☐ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? \_\_\_\_\_  
(acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4?    ☐ yes  
☐ no  
(If Yes, complete section VI - "MS4 Acceptance" statement)

**V. Additional Information/Explanation:**  
(Use this section to answer questions 9c. and 10b., if applicable)

**VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative** (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:

Date:

**NOTICE OF TERMINATION** for Storm Water Discharges Authorized under the  
SPDES General Permit for Construction Activity - continued

**VII. Qualified Inspector Certification - Final Stabilization:**

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

Title/Position:

Signature:

Date:

**VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):**

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

Title/Position:

Signature:

Date:

**IX. Owner or Operator Certification**

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

Title/Position:

Signature:

Date:

(NYS DEC Notice of Termination - January 2015)

## **APPENDIX B-3**

### **MS4 Acceptance Form**



Department of  
Environmental  
Conservation

NYS Department of Environmental Conservation  
Division of Water  
625 Broadway, 4th Floor  
Albany, New York 12233-3505

## MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

**Construction Activities Seeking Authorization Under SPDES General Permit**

\*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

### I. Project Owner/Operator Information

- |                         |                                  |
|-------------------------|----------------------------------|
| 1. Owner/Operator Name: | SUN8 PDC LLC                     |
| 2. Contact Person:      | Jeff Weiss, Manager              |
| 3. Street Address:      | 601 13th St. NW, Suite 450 South |
| 4. City/State/Zip:      | Washington, DC 20005             |

### II. Project Site Information

- |                       |                                 |
|-----------------------|---------------------------------|
| 5. Project/Site Name: | Ellis Tract Solar PV Array Site |
| 6. Street Address:    |                                 |
| 7. City/State/Zip:    | Dryden, New York 13053          |

### III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information

- |   |                               |
|---|-------------------------------|
| 8. SWPPP Reviewed by:                       | TG Miller, PC (Town Engineer) |
| 9. Title/Position:                          |                               |
| 10. Date Final SWPPP Reviewed and Accepted: |                               |

### IV. Regulated MS4 Information

- |   |                        |
|---|------------------------|
| 11. Name of MS4:                            | Town of Dryden         |
| 12. MS4 SPDES Permit Identification Number: | NYR20A 231             |
| 13. Contact Person:                         | David Sprout           |
| 14. Street Address:                         | 93 East Main Street    |
| 15. City/State/Zip:                         | Dryden, New York 13053 |
| 16. Telephone Number:                       | 607-844-8888 X226      |

## **MS4 SWPPP Acceptance Form - continued**

### **V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative**

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s). Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

### **VI. Additional Information**

## **APPENDIX C-1**

### **SWPPP Preparer Certification**





Department of  
Environmental  
Conservation

# SWPPP Preparer Certification Form

*SPDES General Permit for Stormwater Discharges  
From Construction Activity (GP-0-15-002)*

## Project Site Information

### Project/Site Name

ELLIS TRACT SOLAR PV ARRAY - DRYDEN, NY

## Owner/Operator Information

### Owner/Operator (Company Name/Private Owner/Municipality Name)

SUN8 PDC LLC

## Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-15-002. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Marc

First name

MI

Maser

Last Name

A handwritten signature in black ink that reads "Marc Maser".

Signature

05-24-2017

Date

## **APPENDIX C-2**

### **Owner-Operator Certification**



# **Owner/Operator Certification Form**

## **SPDES General Permit For Stormwater Discharges From Construction Activity (GP-0-15-002)**

**Project/Site Name:** ELLIS TRACT SOLAR PV ARRAY - DRYDEN, NY

**eNOI Submission Number:** \_\_\_\_\_

**eNOI Submitted by:** ☐ Owner/Operator ☒ SWPPP Preparer ☐ Other

### **Certification Statement - Owner/Operator**

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Owner/Operator First Name

M.I. Last Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## **APPENDIX C-3**

### **Contractor Certification**

**Contractor Certification Statement**

I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP dated MAY 2017 for the ELLIS TRACT SOLAR PV ARRAY project located *in the Town of Dryden, NY* and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Elements of the SWPPP that are my responsibility include:

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---

The name and title of the trained individual responsible for the SWPPP implementation is:

---

Signature \_\_\_\_\_

Date \_\_\_\_\_

Printed Name & Title \_\_\_\_\_

Company Name \_\_\_\_\_

Address \_\_\_\_\_

---

Phone \_\_\_\_\_

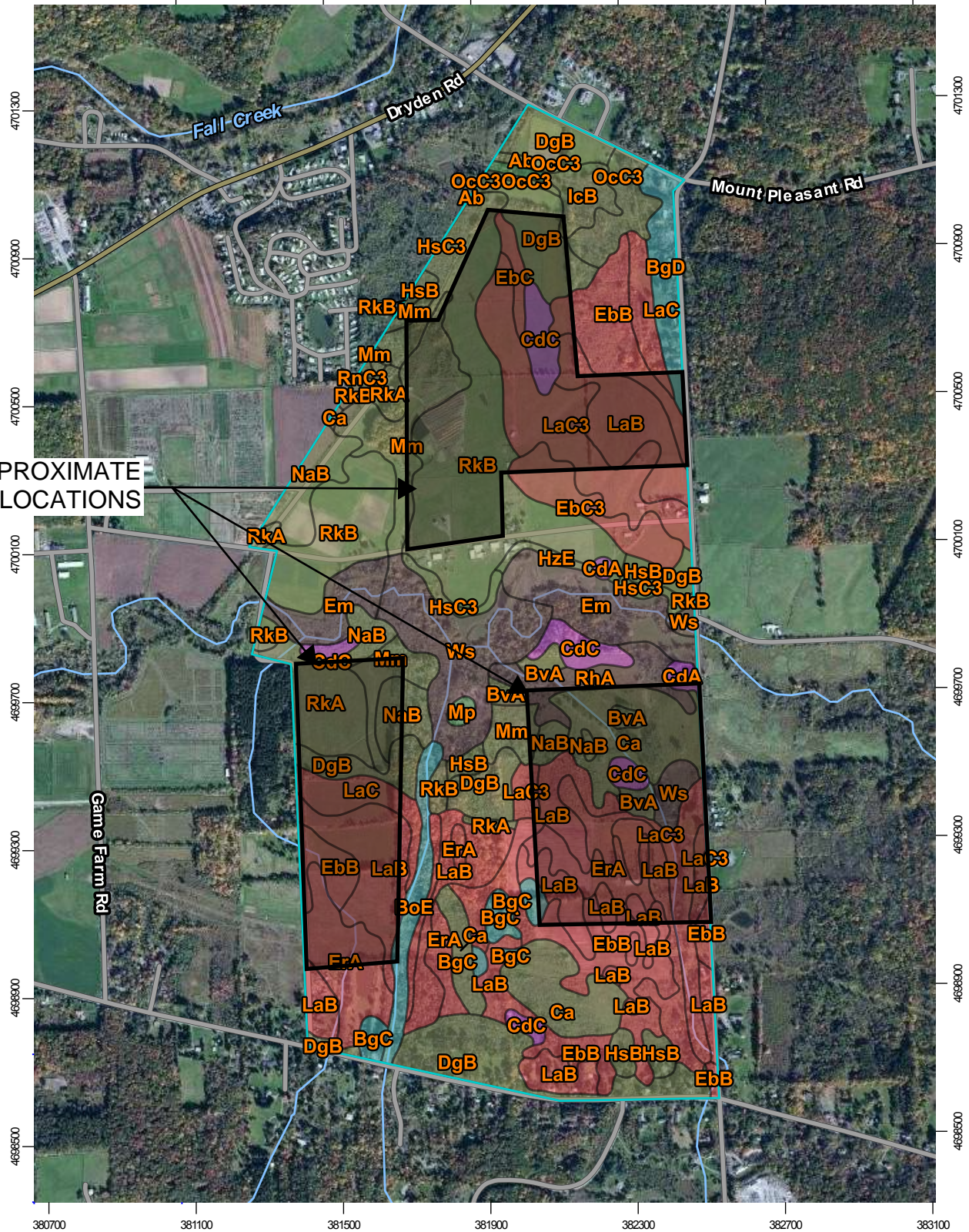
## **APPENDIX D-1**

### **NRCS Soils Map**



## 76° 25' 15" W

42° 27' 26" N




A horizontal scale bar with alternating black and white segments. It is labeled with '0', '200', '400', and '600' at regular intervals, and ends with the word 'Feet'.

6° 25' 15" W

## MAP LEGEND

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Lines

 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available


### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Tompkins County, New York

Survey Area Data: Version 11, Sep 24, 2016

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

Date(s) aerial images were photographed: Jun 2, 2010—Oct 8, 2010

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.



## Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Tompkins County, New York (NY109)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ab	Alluvial land	A/D	1.1	0.2%
BgC	Bath and Valois soils, 5 to 15 percent slopes	C	7.1	1.1%
BgD	Bath and Valois soils, 15 to 25 percent slopes, eroded	C	10.1	1.6%
BoE	Bath and Valois soils, 25 to 35 percent slopes	C	9.0	1.4%
BvA	Braceville gravelly silt loam, 0 to 5 percent slopes	C/D	5.7	0.9%
Ca	Canandaigua and Lamson soils	C/D	36.5	5.8%
CdA	Chenango gravelly loam, 0 to 5 percent slopes	A	2.1	0.3%
CdC	Chenango gravelly loam, 5 to 15 percent slopes	A	14.3	2.3%
DgB	Darien gravelly silt loam, 2 to 8 percent slopes	C/D	52.5	8.3%
EbB	Erie channery silt loam, 3 to 8 percent slopes	D	48.5	7.7%
EbC	Erie channery silt loam, 8 to 15 percent slopes	D	2.9	0.5%
EbC3	Erie channery silt loam, 8 to 15 percent slopes, eroded	D	11.7	1.9%
Em	Eel silt loam	B/D	26.6	4.2%
ErA	Erie-Chippewa channery silt loams, 0 to 3 percent slopes	D	27.2	4.3%
HsB	Hudson silty clay loam, 2 to 6 percent slopes	C/D	8.3	1.3%
HsC3	Hudson silty clay loam, 6 to 12 percent slopes, eroded	C/D	3.5	0.6%
HxE	Hudson and Dunkirk soils, 20 to 45 percent slopes	C/D	1.7	0.3%
IcB	Ilion silty clay loam, 2 to 6 percent slopes	C/D	5.9	0.9%

Hydrologic Soil Group— Summary by Map Unit — Tompkins County, New York (NY109)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
LaB	Langford channery silt loam, 2 to 8 percent slopes	D	86.4	13.7%
LaC	Langford channery silt loam, 8 to 15 percent slopes	D	16.3	2.6%
LaC3	Langford channery silt loam, 8 to 15 percent slopes, eroded	D	44.4	7.1%
Mm	Madalin mucky silty clay loam	C/D	29.9	4.8%
Mp	Muck and Peat	A/D	1.1	0.2%
NaB	Niagara silt loam, 2 to 6 percent slopes	C/D	20.2	3.2%
OcC3	Ovid silty clay loam, 6 to 12 percent slopes eroded	C/D	10.7	1.7%
RhA	Red Hook gravelly silt loam, 0 to 5 percent slopes	B/D	10.7	1.7%
RkA	Rhinebeck silt loam, 0 to 2 percent slopes	C/D	17.7	2.8%
RkB	Rhinebeck silt loam, 2 to 6 percent slopes	C/D	84.3	13.4%
RnC3	Rhinebeck silty clay loam, 6 to 12 percent slopes, eroded	C/D	1.6	0.3%
Ws	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	B/D	31.0	4.9%
<b>Totals for Area of Interest</b>			<b>629.0</b>	<b>100.0%</b>

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

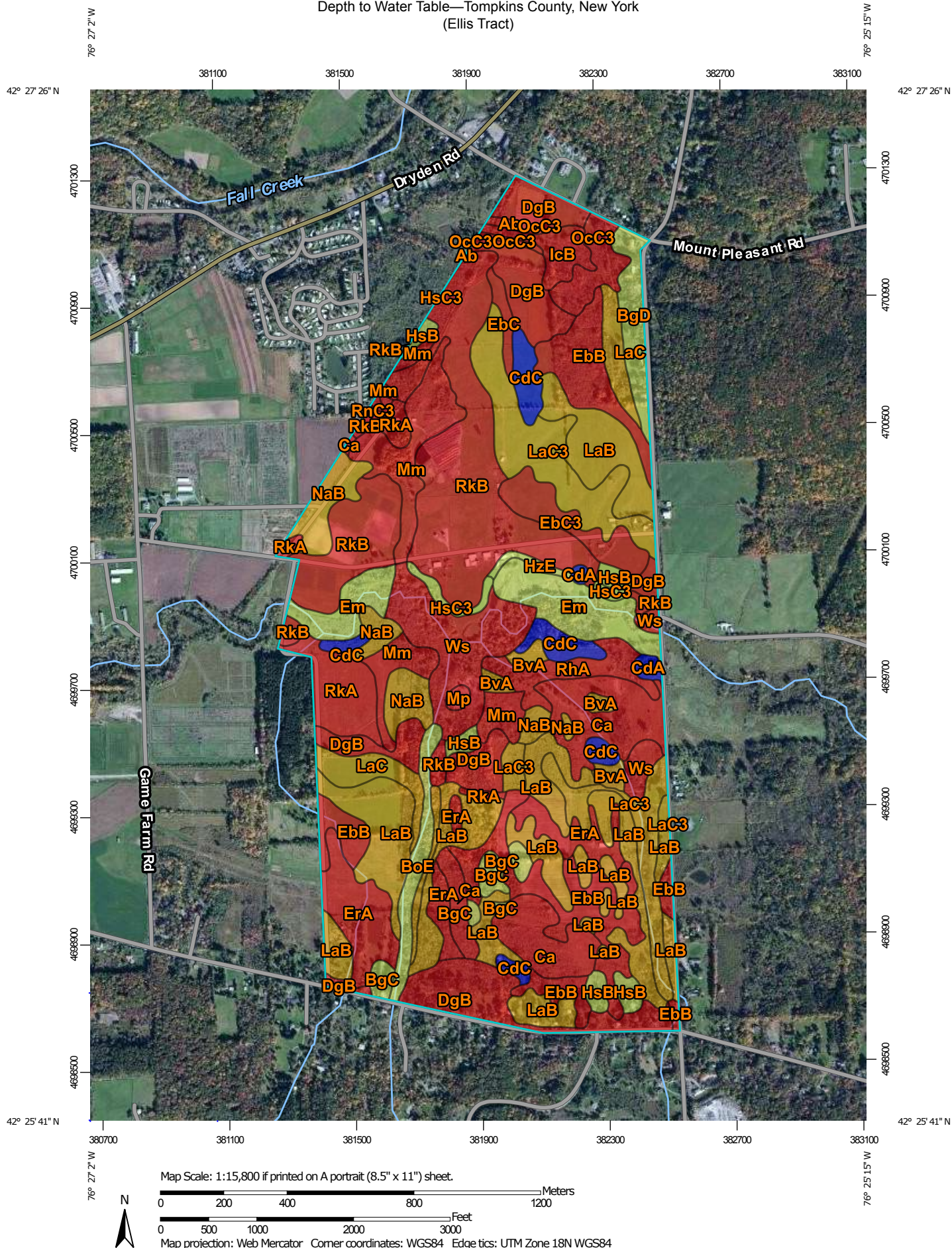
*Tie-break Rule:* Higher

**APPENDIX D-2**

**NRCS Groundwater Map**




# Depth to Water Table—Tompkins County, New York (Ellis Tract)



Depth to Water Table—Tompkins County, New York  
(Ellis Tract)








## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils






#### Soil Rating Polygons


-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200
-  Not rated or not available

#### Soil Rating Lines


-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200
-  Not rated or not available

#### Soil Rating Points






-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200

 Not rated or not available


### Water Features

 Streams and Canals

### Transportation

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

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Tompkins County, New York

Survey Area Data: Version 11, Sep 24, 2016

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

Date(s) aerial images were photographed: Jun 2, 2010—Oct 8, 2010

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.

## Depth to Water Table

Depth to Water Table— Summary by Map Unit — Tompkins County, New York (NY109)				
Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
Ab	Alluvial land	0	1.1	0.2%
BgC	Bath and Valois soils, 5 to 15 percent slopes	69	7.1	1.1%
BgD	Bath and Valois soils, 15 to 25 percent slopes, eroded	64	10.1	1.6%
BoE	Bath and Valois soils, 25 to 35 percent slopes	69	9.0	1.4%
BvA	Braceville gravelly silt loam, 0 to 5 percent slopes	33	5.7	0.9%
Ca	Canandaigua and Lamson soils	0	36.5	5.8%
CdA	Chenango gravelly loam, 0 to 5 percent slopes	>200	2.1	0.3%
CdC	Chenango gravelly loam, 5 to 15 percent slopes	>200	14.3	2.3%
DgB	Darien gravelly silt loam, 2 to 8 percent slopes	23	52.5	8.3%
EbB	Erie channery silt loam, 3 to 8 percent slopes	23	48.5	7.7%
EbC	Erie channery silt loam, 8 to 15 percent slopes	23	2.9	0.5%
EbC3	Erie channery silt loam, 8 to 15 percent slopes, eroded	23	11.7	1.9%
Em	Eel silt loam	54	26.6	4.2%
ErA	Erie-Chippewa channery silt loams, 0 to 3 percent slopes	23	27.2	4.3%
HsB	Hudson silty clay loam, 2 to 6 percent slopes	51	8.3	1.3%
HsC3	Hudson silty clay loam, 6 to 12 percent slopes, eroded	51	3.5	0.6%
HxE	Hudson and Dunkirk soils, 20 to 45 percent slopes	51	1.7	0.3%
IcB	Ilion silty clay loam, 2 to 6 percent slopes	0	5.9	0.9%



Depth to Water Table— Summary by Map Unit — Tompkins County, New York (NY109)				
Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
LaB	Langford channery silt loam, 2 to 8 percent slopes	38	86.4	13.7%
LaC	Langford channery silt loam, 8 to 15 percent slopes	38	16.3	2.6%
LaC3	Langford channery silt loam, 8 to 15 percent slopes, eroded	38	44.4	7.1%
Mm	Madalin mucky silty clay loam	0	29.9	4.8%
Mp	Muck and Peat	0	1.1	0.2%
NaB	Niagara silt loam, 2 to 6 percent slopes	33	20.2	3.2%
OcC3	Ovid silty clay loam, 6 to 12 percent slopes eroded	25	10.7	1.7%
RhA	Red Hook gravelly silt loam, 0 to 5 percent slopes	20	10.7	1.7%
RkA	Rhinebeck silt loam, 0 to 2 percent slopes	25	17.7	2.8%
RkB	Rhinebeck silt loam, 2 to 6 percent slopes	25	84.3	13.4%
RnC3	Rhinebeck silty clay loam, 6 to 12 percent slopes, eroded	25	1.6	0.3%
Ws	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	0	31.0	4.9%
<b>Totals for Area of Interest</b>			<b>629.0</b>	<b>100.0%</b>

## Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

## Rating Options

*Units of Measure:* centimeters



*Aggregation Method:* Dominant Component

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Lower

*Interpret Nulls as Zero:* No

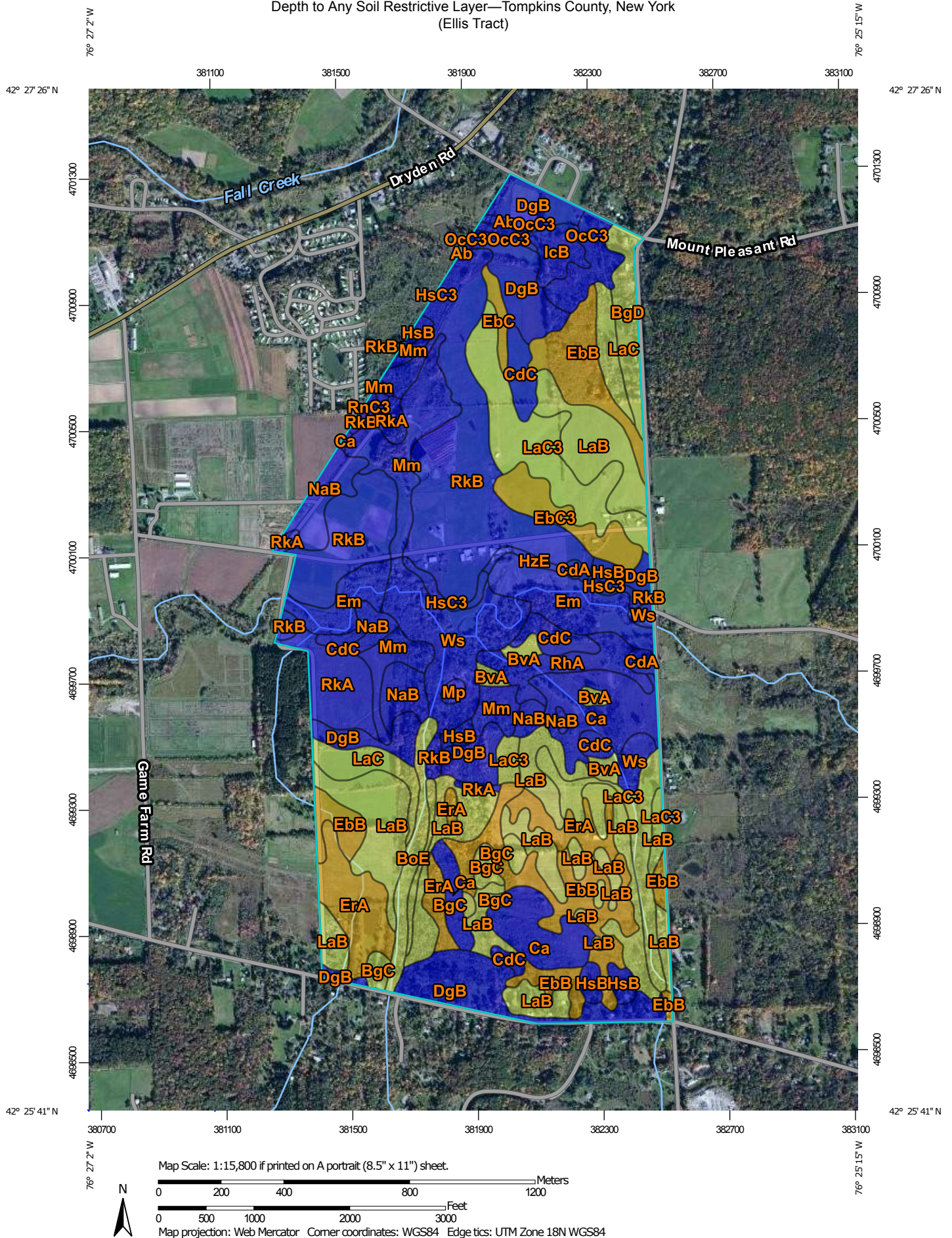
*Beginning Month:* January

*Ending Month:* December

## **APPENDIX D-3**

### **NRCS Depth to Restrictive Layer Map**


Depth to Any Soil Restrictive Layer—Tompkins County, New York  
(Ellis Tract)



Depth to Any Soil Restrictive Layer—Tompkins County, New York  
(Ellis Tract)








## MAP LEGEND

### Area of Interest (AOI)


 Area of Interest (AOI)

### Soils







#### Soil Rating Polygons


-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200
-  Not rated or not available

#### Soil Rating Lines


-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200
-  Not rated or not available

#### Soil Rating Points






-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200

 Not rated or not available


### Water Features

 Streams and Canals

### Transportation

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

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Tompkins County, New York

Survey Area Data: Version 11, Sep 24, 2016

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

Date(s) aerial images were photographed: Jun 2, 2010—Oct 8, 2010

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.



## Depth to Any Soil Restrictive Layer

Depth to Any Soil Restrictive Layer— Summary by Map Unit — Tompkins County, New York (NY109)				
Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
Ab	Alluvial land	>200	1.1	0.2%
BgC	Bath and Valois soils, 5 to 15 percent slopes	74	7.1	1.1%
BgD	Bath and Valois soils, 15 to 25 percent slopes, eroded	69	10.1	1.6%
BoE	Bath and Valois soils, 25 to 35 percent slopes	74	9.0	1.4%
BvA	Braceville gravelly silt loam, 0 to 5 percent slopes	61	5.7	0.9%
Ca	Canandaigua and Lamson soils	>200	36.5	5.8%
CdA	Chenango gravelly loam, 0 to 5 percent slopes	>200	2.1	0.3%
CdC	Chenango gravelly loam, 5 to 15 percent slopes	>200	14.3	2.3%
DgB	Darien gravelly silt loam, 2 to 8 percent slopes	>200	52.5	8.3%
EbB	Erie channery silt loam, 3 to 8 percent slopes	38	48.5	7.7%
EbC	Erie channery silt loam, 8 to 15 percent slopes	38	2.9	0.5%
EbC3	Erie channery silt loam, 8 to 15 percent slopes, eroded	38	11.7	1.9%
Em	Eel silt loam	>200	26.6	4.2%
ErA	Erie-Chippewa channery silt loams, 0 to 3 percent slopes	38	27.2	4.3%
HsB	Hudson silty clay loam, 2 to 6 percent slopes	>200	8.3	1.3%
HsC3	Hudson silty clay loam, 6 to 12 percent slopes, eroded	>200	3.5	0.6%
HxE	Hudson and Dunkirk soils, 20 to 45 percent slopes	>200	1.7	0.3%
IcB	Ilion silty clay loam, 2 to 6 percent slopes	>200	5.9	0.9%

Depth to Any Soil Restrictive Layer— Summary by Map Unit — Tompkins County, New York (NY109)				
Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
LaB	Langford channery silt loam, 2 to 8 percent slopes	56	86.4	13.7%
LaC	Langford channery silt loam, 8 to 15 percent slopes	56	16.3	2.6%
LaC3	Langford channery silt loam, 8 to 15 percent slopes, eroded	56	44.4	7.1%
Mm	Madalin mucky silty clay loam	>200	29.9	4.8%
Mp	Muck and Peat	>200	1.1	0.2%
NaB	Niagara silt loam, 2 to 6 percent slopes	>200	20.2	3.2%
OcC3	Ovid silty clay loam, 6 to 12 percent slopes eroded	>200	10.7	1.7%
RhA	Red Hook gravelly silt loam, 0 to 5 percent slopes	>200	10.7	1.7%
RkA	Rhinebeck silt loam, 0 to 2 percent slopes	>200	17.7	2.8%
RkB	Rhinebeck silt loam, 2 to 6 percent slopes	>200	84.3	13.4%
RnC3	Rhinebeck silty clay loam, 6 to 12 percent slopes, eroded	>200	1.6	0.3%
Ws	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	>200	31.0	4.9%
<b>Totals for Area of Interest</b>			<b>629.0</b>	<b>100.0%</b>

## Description

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

This theme presents the depth to any type of restrictive layer that is described for each map unit. If more than one type of restrictive layer is described for an individual soil type, the depth to the shallowest one is presented. If no restrictive layer is described in a map unit, it is represented by the "> 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

## Rating Options

*Units of Measure:* centimeters

*Aggregation Method:* Dominant Component

*Component Percent Cutoff:* None Specified

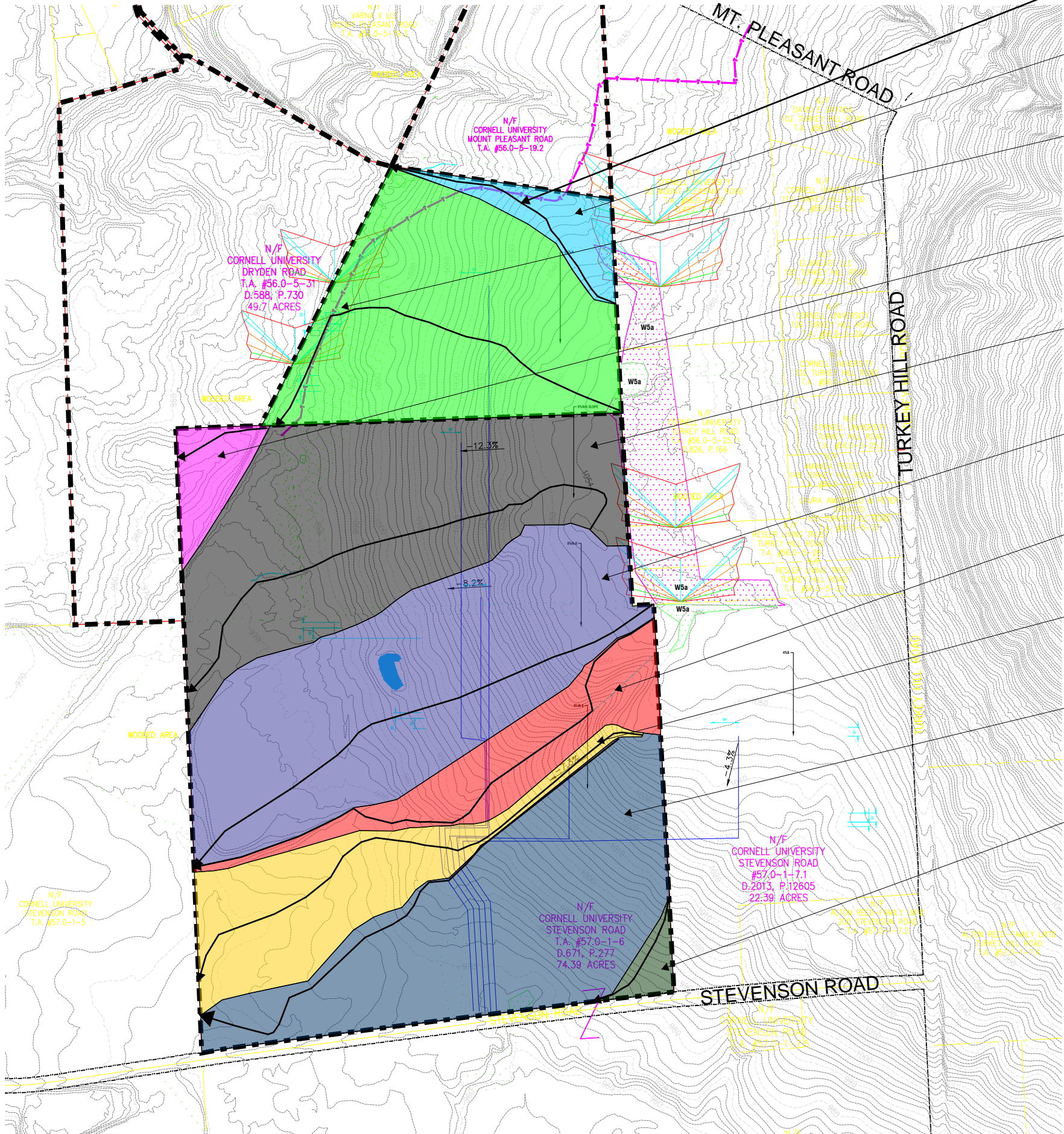
*Tie-break Rule:* Lower

*Interpret Nulls as Zero:* No

## **APPENDIX E**

### **Pre-Developed Drainage Area Maps**





**LEGEND**

**STANDARD SYMBOLS**

- UTILITY POLE
- FENCELINE
- CENTERLINE
- WOODED AREA OUTLINE
- GRUBBING CLEARING LIMIT
- TREE CUTTING LIMIT
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE
- RIGHT OF WAY
- PROPERTY LINE
- PV MODULES
- CHAIN-LINK FENCE
- CONCRETE PAD
- SILT FENCE
- E TRENCH
- ELECTRICAL WIRE
- GRAVEL ACCESS ROAD
- VEGETATIVE SCREEN
- ARRAY NUMBER
- WETLAND

TYPICAL TIME OF  
CONCENTRATION PATH

**WATERSHED A**  
Total Area = 2.32 acres  
Tc = 19.4 min.  
CN = 78  
Q1yr = 1.13 c.f./s.  
Q10yr = 3.71 c.f./s.  
Q25yr = 5.46 c.f./s.  
Q100 yr = 9.18 c.f./s.

**WATERSHED B**  
Total Area = 16.6 acres  
Tc = 35.6 min.  
CN = 78  
Q1yr = 5.32 c.f./s.  
Q10yr = 18.03 c.f./s.  
Q25yr = 26.65 c.f./s.  
Q100 yr = 45.15 c.f./s.

**WATERSHED C**  
Total Area = 1.93 acres  
Tc = 17.4 min.  
CN = 77  
Q1yr = 0.91 c.f./s.  
Q10yr = 3.13 c.f./s.  
Q25yr = 4.64 c.f./s.  
Q100 yr = 7.88 c.f./s.

**WATERSHED D**  
Total Area = 20.0 acres  
Tc = 52.8 min.  
CN = 78  
Q1yr = 4.82 c.f./s.  
Q10yr = 16.38 c.f./s.  
Q25yr = 24.26 c.f./s.  
Q100 yr = 41.31 c.f./s.

**WATERSHED E**  
Total Area = 21.2 acres  
Tc = 38.7 min.  
CN = 78  
Q1yr = 6.39 c.f./s.  
Q10yr = 21.73 c.f./s.  
Q25yr = 32.13 c.f./s.  
Q100 yr = 54.48 c.f./s.

**WATERSHED F**  
Total Area = 6.11 acres  
Tc = 36.7 min.  
CN = 78  
Q1yr = 1.92 c.f./s.  
Q10yr = 6.50 c.f./s.  
Q25yr = 9.61 c.f./s.  
Q100 yr = 16.29 c.f./s.

**WATERSHED G**  
Total Area = 8.51 acres  
Tc = 29.3 min.  
CN = 78  
Q1yr = 3.14 c.f./s.  
Q10yr = 10.55 c.f./s.  
Q25yr = 15.57 c.f./s.  
Q100 yr = 26.31 c.f./s.

**WATERSHED H**  
Total Area = 17.83 acres  
Tc = 28.5 min.  
CN = 78  
Q1yr = 6.70 c.f./s.  
Q10yr = 22.51 c.f./s.  
Q25yr = 33.19 c.f./s.  
Q100 yr = 56.18 c.f./s.

**WATERSHED I**  
Total Area = 0.84 acres  
Tc = 12.3 min.  
CN = 78  
Q1yr = 0.53 c.f./s.  
Q10yr = 1.70 c.f./s.  
Q25yr = 2.48 c.f./s.  
Q100 yr = 4.13 c.f./s.



DRAWN BY: MDM  
CHECKED BY: MDM  
DATE: May 26, 2017  
SCALE: 1" = 400'  
BY: MDM

DESCRIPTION OF REVISION:  
ISSUED FOR CLIENT REVIEW

DATE: 05-26-2017

1 2 3 4 5 6 7 8 9 10 11 12

Unauthorized Alteration Or Addition  
To Plans Bearing A Licensed  
Engineer Or Architect Seal, Is A  
Violation Of Section 7209 Of The  
New York State Education Law.

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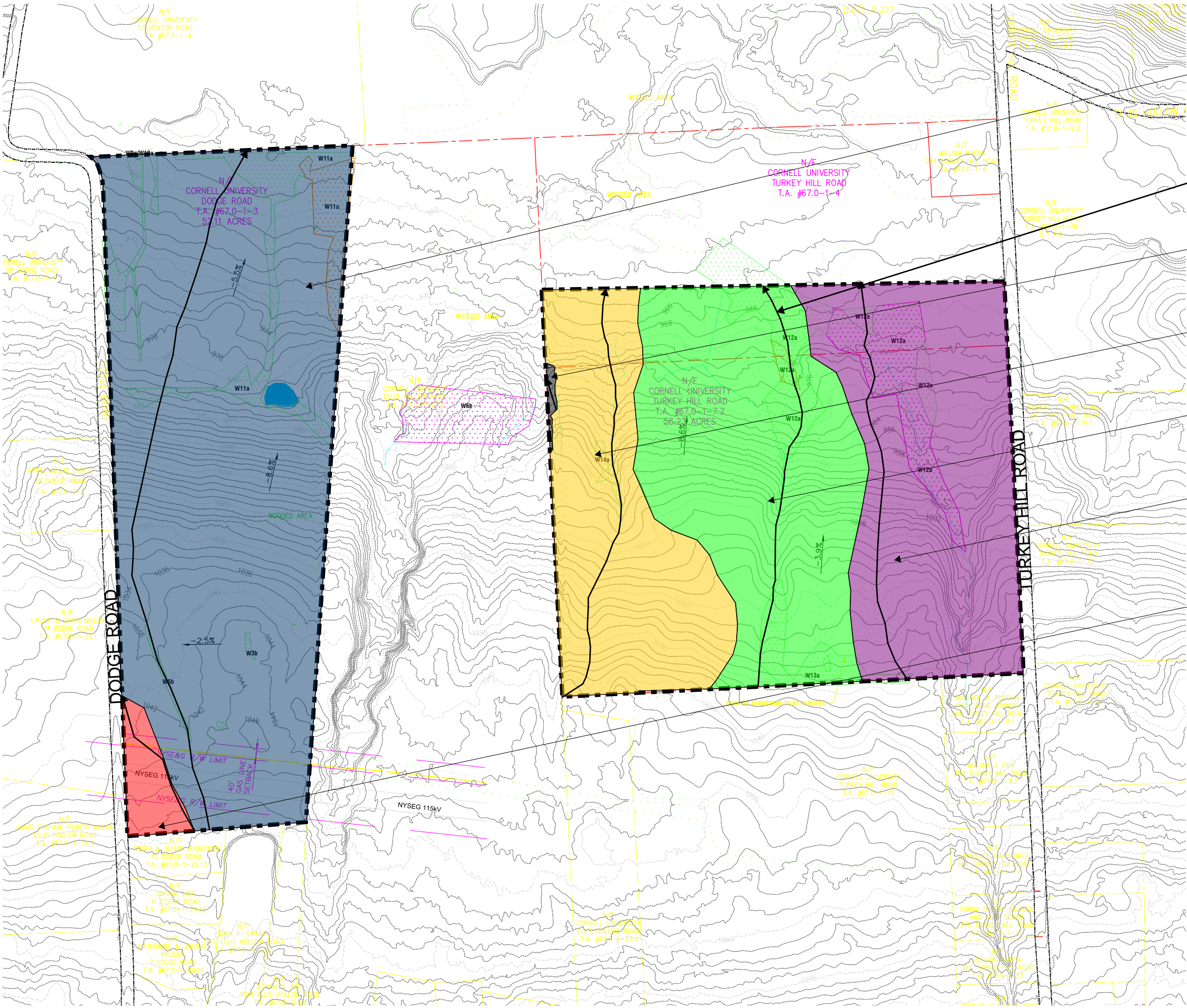
PRE-DEVELOPED DRAINAGE AREA MAP NO. 1 (NORTH)

**ELLIS TRACT SOLAR PV ARRAY SITE**  
SUN8 PDC LLC  
TOWN OF DRYDEN, TOMPKINS COUNTY, NEW YORK

**DRN-01**

PROJECT NO:  
17-008





**WATERSHED B**  
Total Area = 50.11 acres  
Tc = 47.5 min.  
CN = 80  
Q1yr = 15.92 c.f./s.  
Q10yr = 49.14 c.f./s.  
Q25yr = 71.09 c.f./s.  
Q100 yr = 117.72 c.f./s.

**WATERSHED C**  
Total Area = 0.19 acres  
Tc = 6.0 min.  
CN = 79  
Q1yr = 0.15 c.f./s.  
Q10yr = 0.44 c.f./s.  
Q25yr = 0.64 c.f./s.  
Q100 yr = 1.05 c.f./s.

**WATERSHED D**  
Total Area = 17.26 acres  
Tc = 24.1 min.  
CN = 79  
Q1yr = 7.15 c.f./s.  
Q10yr = 22.83 c.f./s.  
Q25yr = 33.30 c.f./s.  
Q100 yr = 55.71 c.f./s.

**WATERSHED E**  
Total Area = 24.55 acres  
Tc = 23.6 min.  
CN = 79  
Q1yr = 10.47 c.f./s.  
Q10yr = 33.45 c.f./s.  
Q25yr = 48.77 c.f./s.  
Q100 yr = 81.37 c.f./s.

**WATERSHED F**  
Total Area = 23.79 acres  
Tc = 30.4 min.  
CN = 79  
Q1yr = 9.44 c.f./s.  
Q10yr = 30.30 c.f./s.  
Q25yr = 44.22 c.f./s.  
Q100 yr = 73.86 c.f./s.

**WATERSHED A**  
Total Area = 2.05 acres  
Tc = 27.2 min.  
CN = 78  
Q1yr = 0.80 c.f./s.  
Q10yr = 2.67 c.f./s.  
Q25yr = 3.94 c.f./s.  
Q100 yr = 6.65 c.f./s.

LEGEND

STANDARD SYMBOLS

- UTILITY POLE
- FENCELINE
- CENTERLINE
- WOODED AREA OUTLINE
- GRUBBING CLEARING LIMIT
- TREE CUTTING LIMIT
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE
- RIGHT OF WAY
- PROPERTY LINE
- PV MODULES
- CHAIN-LINK FENCE
- CONCRETE PAD
- SILT FENCE
- E TRENCH
- ELECTRICAL WIRE
- GRAVEL ACCESS ROAD
- VEGETATIVE SCREEN
- ARRAY NUMBER
- WETLAND



GRAPHIC SCALE

DRAWN BY: MDM  
CHECKED BY: MDM  
DATE: May 26, 2017  
SCALE: 1" = 400'  
BY: MDM

DESCRIPTION OF REVISION:  
DATE: 05-26-2017  
REASON FOR CLIENT REVIEW

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PRE-DEVELOPED DRAINAGE AREA MAP NO. 2 (SOUTH)

**ELLIS TRACT SOLAR PV ARRAY SITE**  
SUN8 PDC LLC

TOWN OF DRYDEN, TOMPKINS COUNTY, NEW YORK

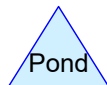
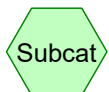
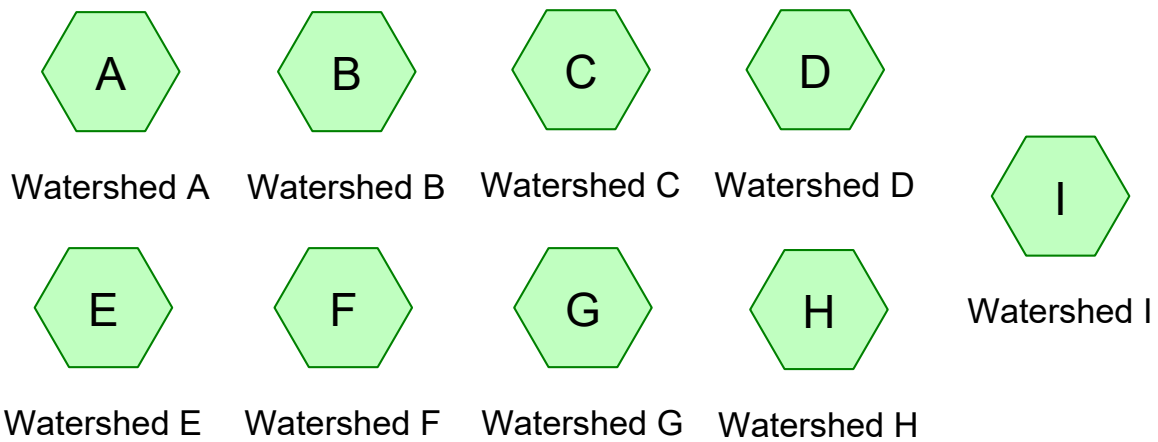
DRN-02

PROJECT NO:  
17-008

## **APPENDIX F**

### **Pre-Developed Drainage Analysis**

# NORTH PLANT PRE-DEVELOPMENT ANALYSIS



## Routing Diagram for Pre-Developed Model

Prepared by Maser Engineering, Printed 5/25/2017

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## Pre-Developed Model

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### Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
90.410	78	Meadow, non-grazed, HSG D (A, B, D, E, F, G, H, I)
0.500	98	Water Surface, HSG D (E)
2.000	79	Woods, Fair, HSG D (D)
2.430	77	Woods, Good, HSG D (C, E)
<b>95.340</b>	<b>78</b>	<b>TOTAL AREA</b>

## Pre-Developed Model

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### Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
95.340	HSG D	A, B, C, D, E, F, G, H, I
0.000	Other	
<b>95.340</b>		<b>TOTAL AREA</b>

## Pre-Developed Model

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### Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	90.410	0.000	90.410	Meadow, non-grazed	A, B, D, E, F, G, H, I
0.000	0.000	0.000	0.500	0.000	0.500	Water Surface	E
0.000	0.000	0.000	2.000	0.000	2.000	Woods, Fair	D
0.000	0.000	0.000	2.430	0.000	2.430	Woods, Good	C, E
<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>95.340</b>	<b>0.000</b>	<b>95.340</b>	<b>TOTAL AREA</b>	

## Pre-Developed Model

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Type II 24-hr 1 Year Rainfall=2.01"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

### Subcatchment A: Watershed A

Runoff Area=2.320 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=962' Tc=19.4 min CN=78 Runoff=1.13 cfs 0.095 af

### Subcatchment B: Watershed B

Runoff Area=16.600 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=1,518' Tc=35.6 min CN=78 Runoff=5.32 cfs 0.678 af

### Subcatchment C: Watershed C

Runoff Area=1.930 ac 0.00% Impervious Runoff Depth=0.45"  
Flow Length=345' Tc=17.4 min CN=77 Runoff=0.91 cfs 0.073 af

### Subcatchment D: Watershed D

Runoff Area=20.000 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=1,902' Tc=52.8 min CN=78 Runoff=4.82 cfs 0.817 af

### Subcatchment E: Watershed E

Runoff Area=21.200 ac 2.36% Impervious Runoff Depth=0.49"  
Flow Length=1,874' Tc=38.7 min CN=78 Runoff=6.39 cfs 0.866 af

### Subcatchment F: Watershed F

Runoff Area=6.110 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=1,943' Tc=36.7 min CN=78 Runoff=1.92 cfs 0.250 af

### Subcatchment G: Watershed G

Runoff Area=8.510 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=1,884' Tc=29.3 min CN=78 Runoff=3.14 cfs 0.348 af

### Subcatchment H: Watershed H

Runoff Area=17.830 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=1,882' Tc=28.5 min CN=78 Runoff=6.70 cfs 0.728 af

### Subcatchment I: Watershed I

Runoff Area=0.840 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=463' Tc=12.3 min CN=78 Runoff=0.53 cfs 0.034 af

**Total Runoff Area = 95.340 ac Runoff Volume = 3.887 af Average Runoff Depth = 0.49"**  
**99.48% Pervious = 94.840 ac 0.52% Impervious = 0.500 ac**



## Pre-Developed Model

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Type II 24-hr 1 Year Rainfall=2.01"

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### Summary for Subcatchment A: Watershed A

Runoff = 1.13 cfs @ 12.15 hrs, Volume= 0.095 af, Depth= 0.49"

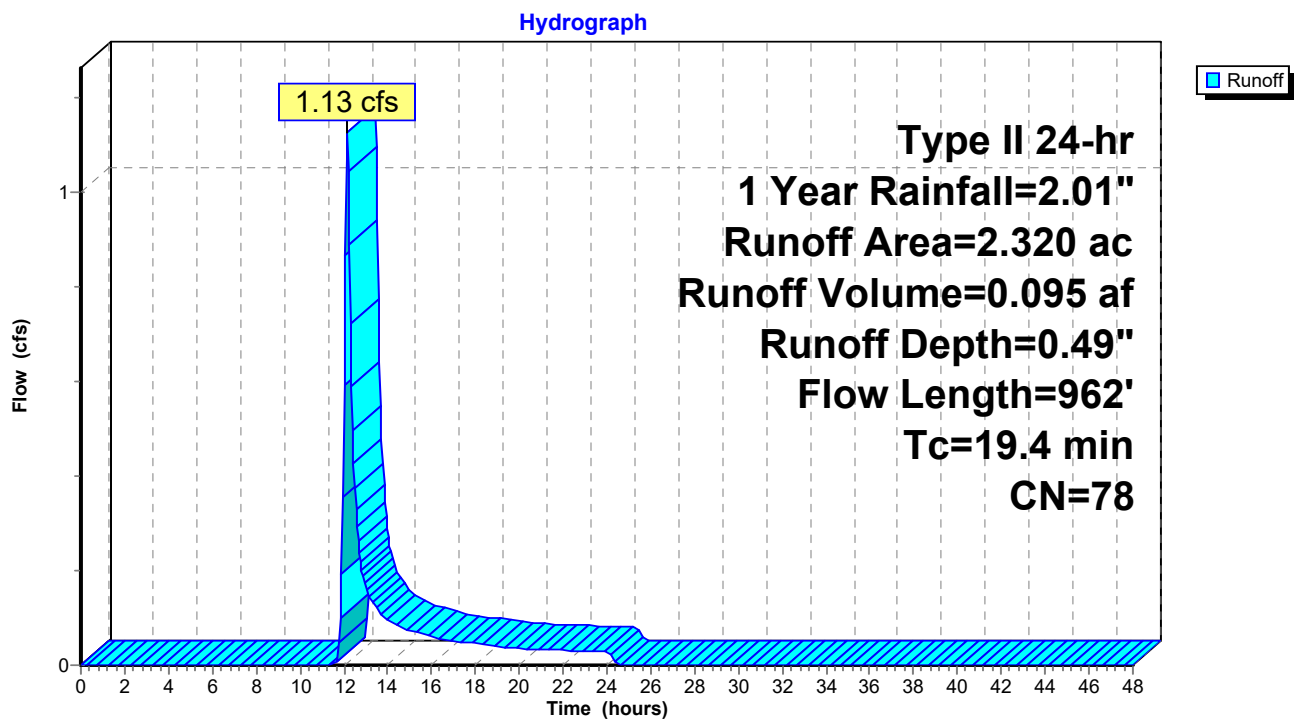
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

Area (ac)	CN	Description
2.320	78	Meadow, non-grazed, HSG D
2.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0450	0.15		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
8.2	862	0.0626	1.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
19.4	962	Total			

### Subcatchment A: Watershed A



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Type II 24-hr 1 Year Rainfall=2.01"

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### Summary for Subcatchment B: Watershed B

Runoff = 5.32 cfs @ 12.36 hrs, Volume= 0.678 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

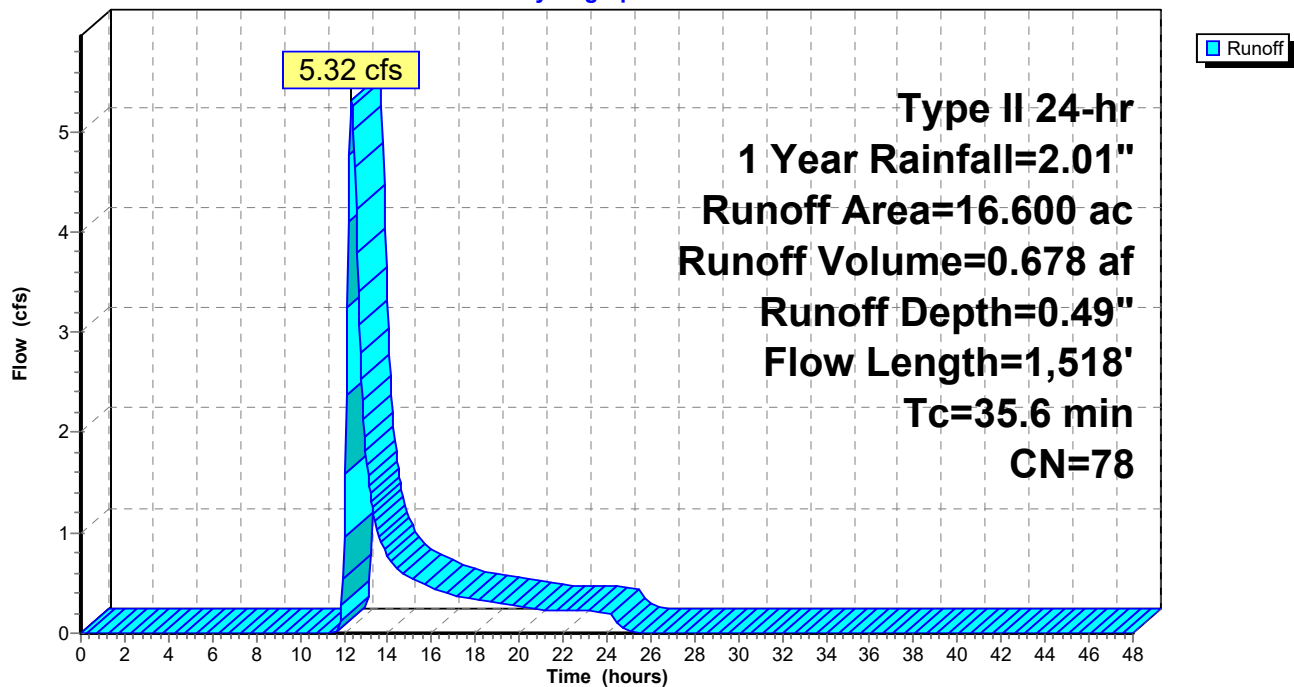
Area (ac)	CN	Description
16.600	78	Meadow, non-grazed, HSG D
16.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
15.1	1,418	0.0497	1.56		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
35.6	1,518	Total			

### Subcatchment B: Watershed B

Hydrograph



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Type II 24-hr 1 Year Rainfall=2.01"

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### Summary for Subcatchment C: Watershed C

Runoff = 0.91 cfs @ 12.12 hrs, Volume= 0.073 af, Depth= 0.45"

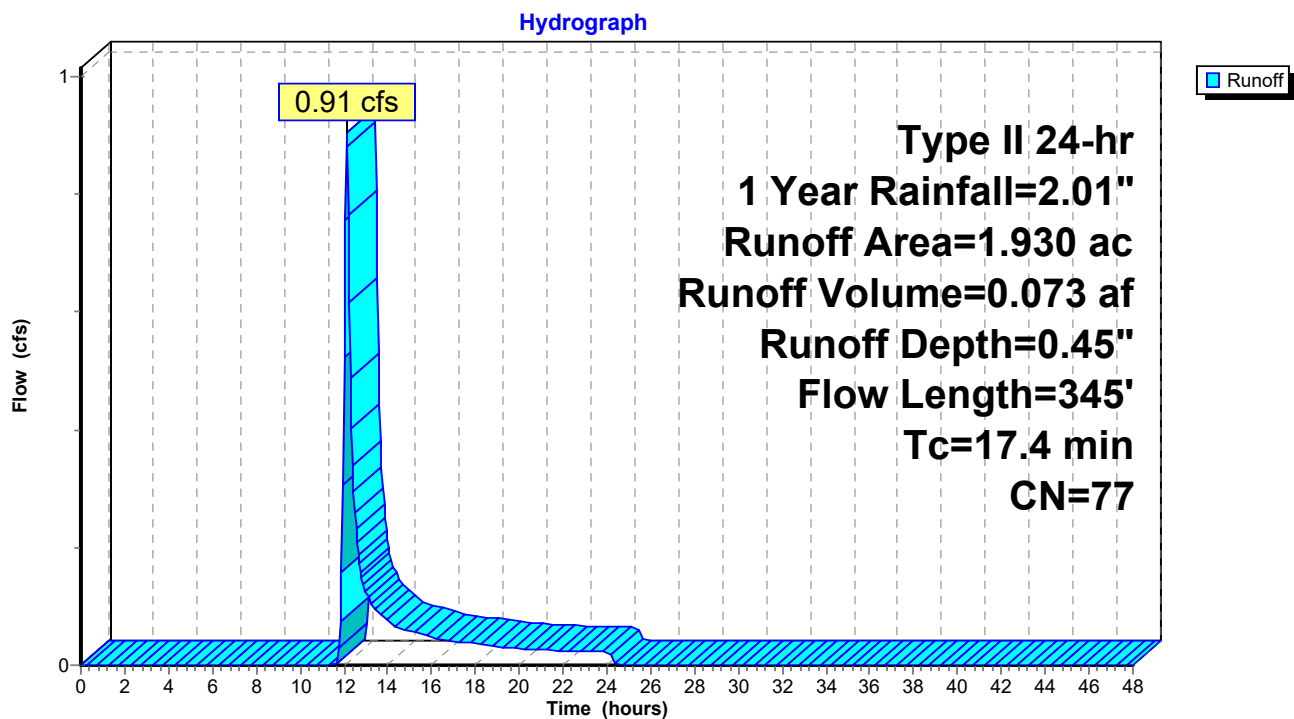
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

Area (ac)	CN	Description
1.930	77	Woods, Good, HSG D
1.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 2.70"
5.1	245	0.0253	0.80		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
17.4	345	Total			

### Subcatchment C: Watershed C



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Type II 24-hr 1 Year Rainfall=2.01"

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### Summary for Subcatchment D: Watershed D

Runoff = 4.82 cfs @ 12.60 hrs, Volume= 0.817 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

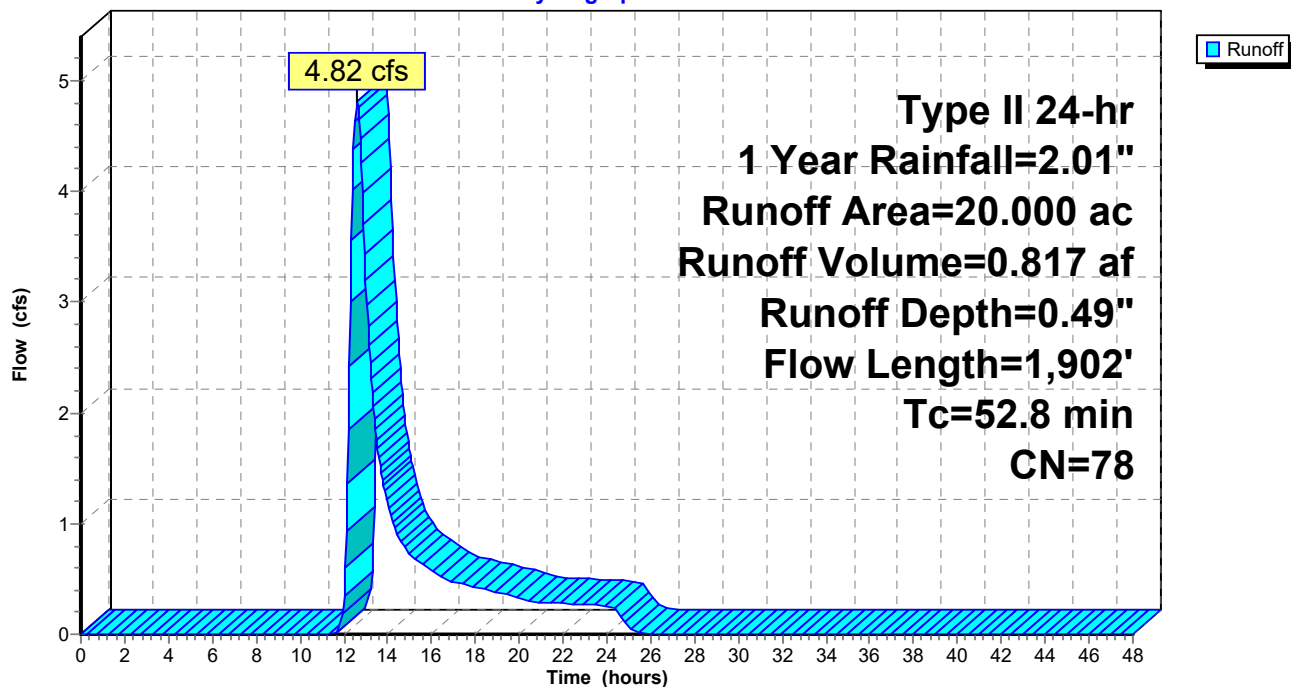
Area (ac)	CN	Description
18.000	78	Meadow, non-grazed, HSG D
2.000	79	Woods, Fair, HSG D
20.000	78	Weighted Average
20.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	1,190	0.0588	1.70		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
20.6	612	0.0098	0.49		<b>Shallow Concentrated Flow, C-D</b> Woodland Kv= 5.0 fps
52.8	1,902	Total			

### Subcatchment D: Watershed D

Hydrograph



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### Summary for Subcatchment E: Watershed E

Runoff = 6.39 cfs @ 12.40 hrs, Volume= 0.866 af, Depth= 0.49"

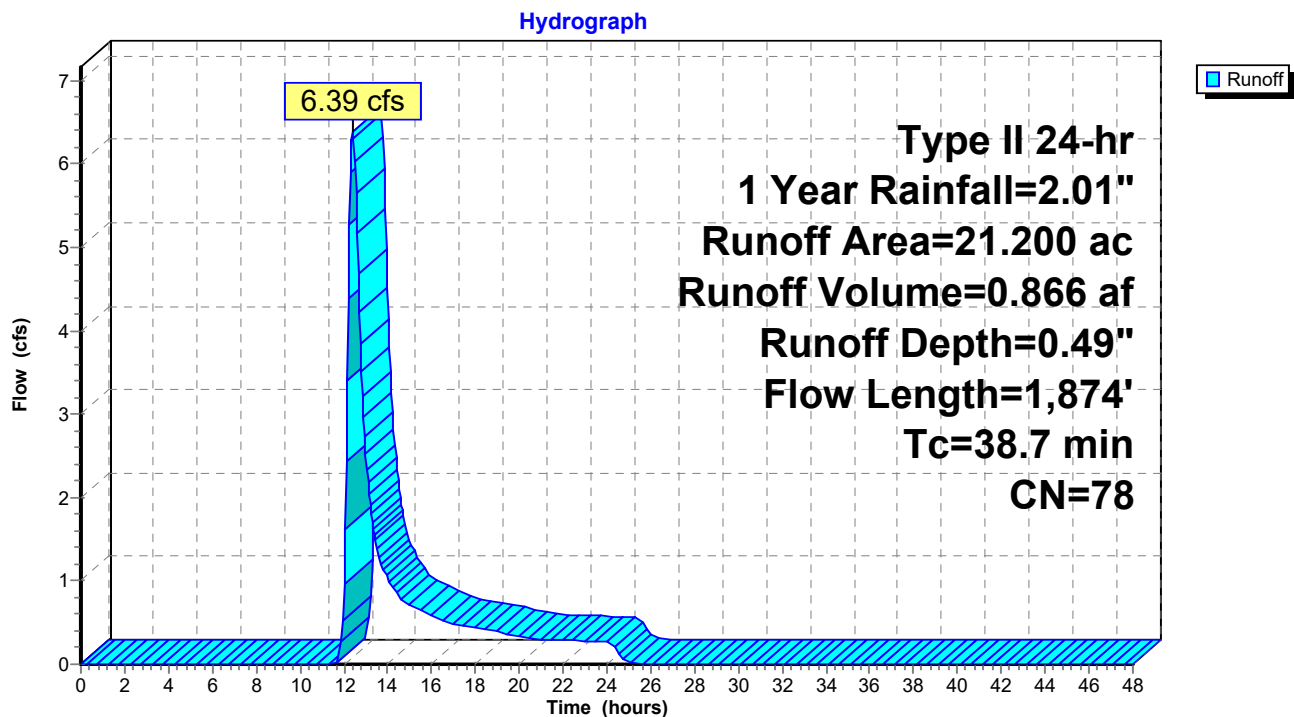
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

Area (ac)	CN	Description
20.200	78	Meadow, non-grazed, HSG D
0.500	98	Water Surface, HSG D
0.500	77	Woods, Good, HSG D
21.200	78	Weighted Average
20.700		97.64% Pervious Area
0.500		2.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.2	1,774	0.0541	1.63		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
38.7	1,874	Total			

### Subcatchment E: Watershed E



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Type II 24-hr 1 Year Rainfall=2.01"

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### Summary for Subcatchment F: Watershed F

Runoff = 1.92 cfs @ 12.37 hrs, Volume= 0.250 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

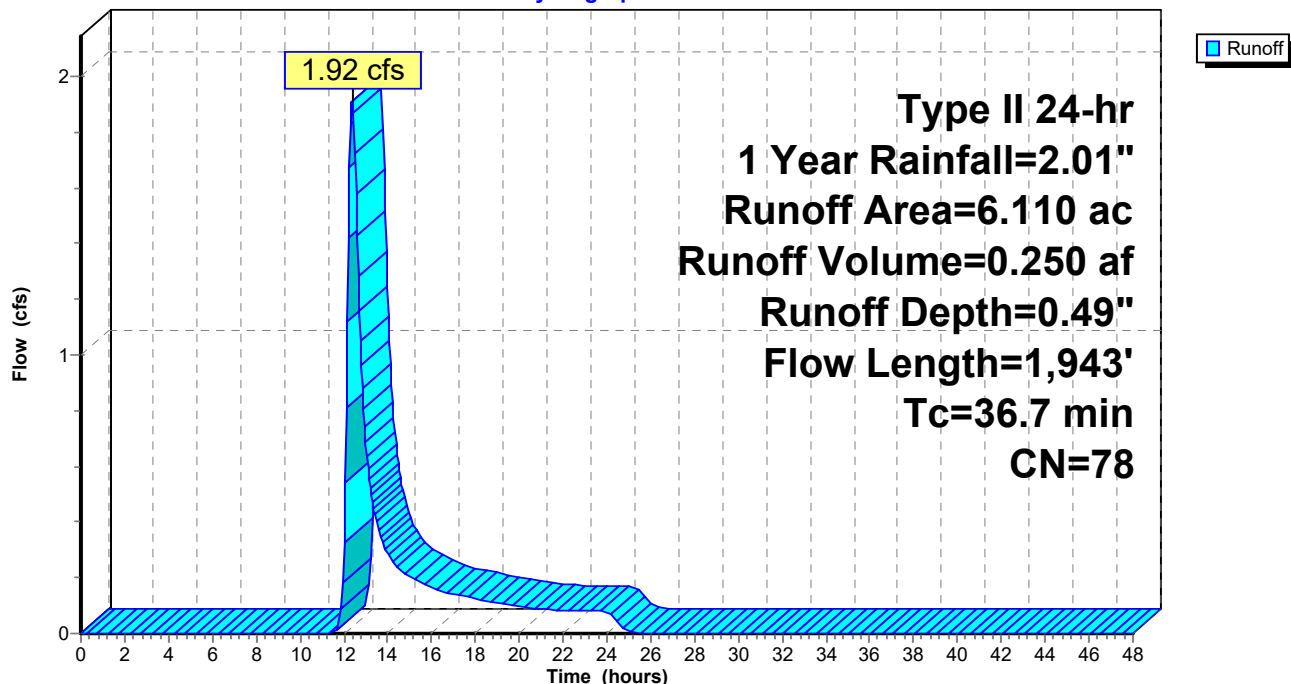
Area (ac)	CN	Description
6.110	78	Meadow, non-grazed, HSG D
6.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0080	0.07		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.2	360	0.0720	1.88		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.6	360	0.0800	3.84	1.15	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.030 Earth, grassed & winding
5.5	543	0.0552	1.64		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
4.0	580	0.0103	2.42	2.18	<b>Trap/Vee/Rect Channel Flow, E-F</b> Bot.W=0.00' D=1.00' Z= 0.9 '/' Top.W=1.80' n= 0.030 Earth, grassed & winding
36.7	1,943	Total			

### Subcatchment F: Watershed F

Hydrograph



## Pre-Developed Model

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Type II 24-hr 1 Year Rainfall=2.01"

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### Summary for Subcatchment G: Watershed G

Runoff = 3.14 cfs @ 12.27 hrs, Volume= 0.348 af, Depth= 0.49"

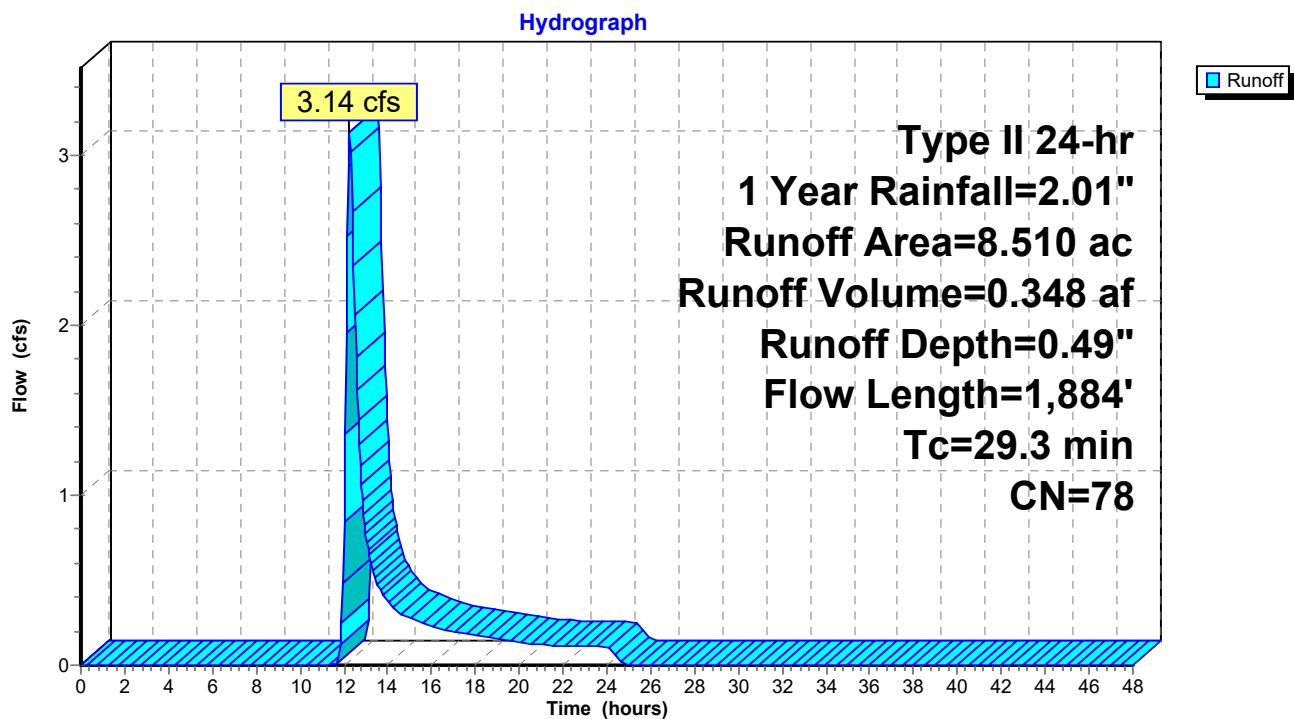
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

Area (ac)	CN	Description
8.510	78	Meadow, non-grazed, HSG D
8.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
19.3	1,784	0.0482	1.54		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
29.3	1,884	Total			

### Subcatchment G: Watershed G



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Type II 24-hr 1 Year Rainfall=2.01"

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### Summary for Subcatchment H: Watershed H

Runoff = 6.70 cfs @ 12.26 hrs, Volume= 0.728 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

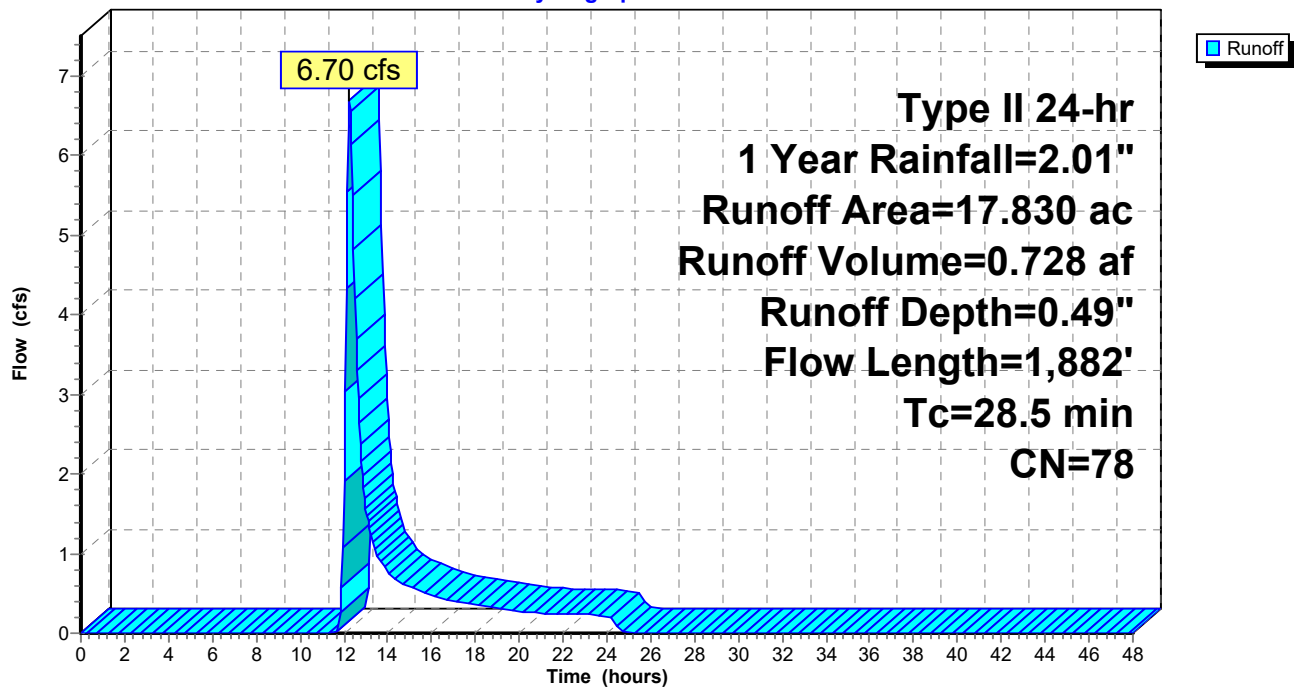
Area (ac)	CN	Description
17.830	78	Meadow, non-grazed, HSG D
17.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
21.7	1,782	0.0382	1.37		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
28.5	1,882	Total			

### Subcatchment H: Watershed H

Hydrograph





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### Summary for Subcatchment I: Watershed I

Runoff = 0.53 cfs @ 12.06 hrs, Volume= 0.034 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

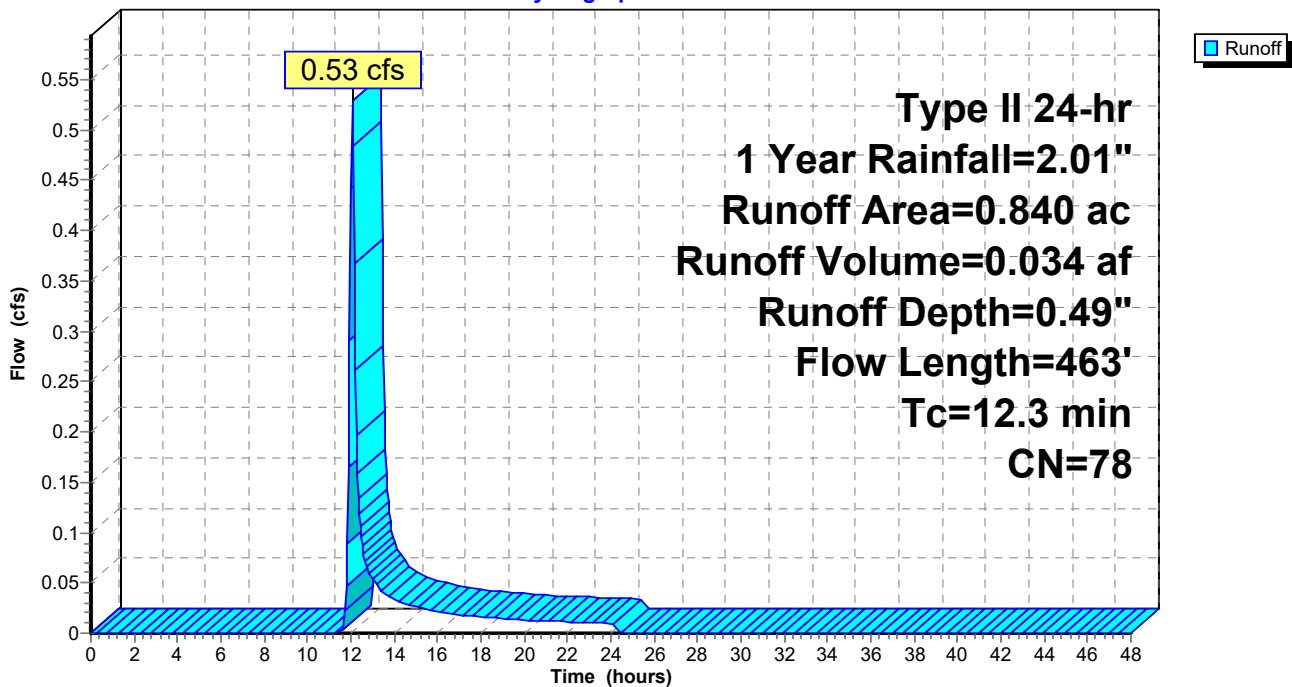
Area (ac)	CN	Description
0.840	78	Meadow, non-grazed, HSG D
0.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0800	0.19		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.4	363	0.0660	1.80		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
12.3	463	Total			

### Subcatchment I: Watershed I

Hydrograph



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Type II 24-hr 10 Year Rainfall=3.43"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

### Subcatchment A: Watershed A

Runoff Area=2.320 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=962' Tc=19.4 min CN=78 Runoff=3.71 cfs 0.279 af

### Subcatchment B: Watershed B

Runoff Area=16.600 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=1,518' Tc=35.6 min CN=78 Runoff=18.03 cfs 1.998 af

### Subcatchment C: Watershed C

Runoff Area=1.930 ac 0.00% Impervious Runoff Depth=1.38"  
Flow Length=345' Tc=17.4 min CN=77 Runoff=3.13 cfs 0.222 af

### Subcatchment D: Watershed D

Runoff Area=20.000 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=1,902' Tc=52.8 min CN=78 Runoff=16.38 cfs 2.407 af

### Subcatchment E: Watershed E

Runoff Area=21.200 ac 2.36% Impervious Runoff Depth=1.44"  
Flow Length=1,874' Tc=38.7 min CN=78 Runoff=21.73 cfs 2.552 af

### Subcatchment F: Watershed F

Runoff Area=6.110 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=1,943' Tc=36.7 min CN=78 Runoff=6.50 cfs 0.735 af

### Subcatchment G: Watershed G

Runoff Area=8.510 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=1,884' Tc=29.3 min CN=78 Runoff=10.55 cfs 1.024 af

### Subcatchment H: Watershed H

Runoff Area=17.830 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=1,882' Tc=28.5 min CN=78 Runoff=22.51 cfs 2.146 af

### Subcatchment I: Watershed I

Runoff Area=0.840 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=463' Tc=12.3 min CN=78 Runoff=1.70 cfs 0.101 af

**Total Runoff Area = 95.340 ac Runoff Volume = 11.465 af Average Runoff Depth = 1.44"**  
**99.48% Pervious = 94.840 ac 0.52% Impervious = 0.500 ac**

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### Summary for Subcatchment A: Watershed A

Runoff = 3.71 cfs @ 12.13 hrs, Volume= 0.279 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

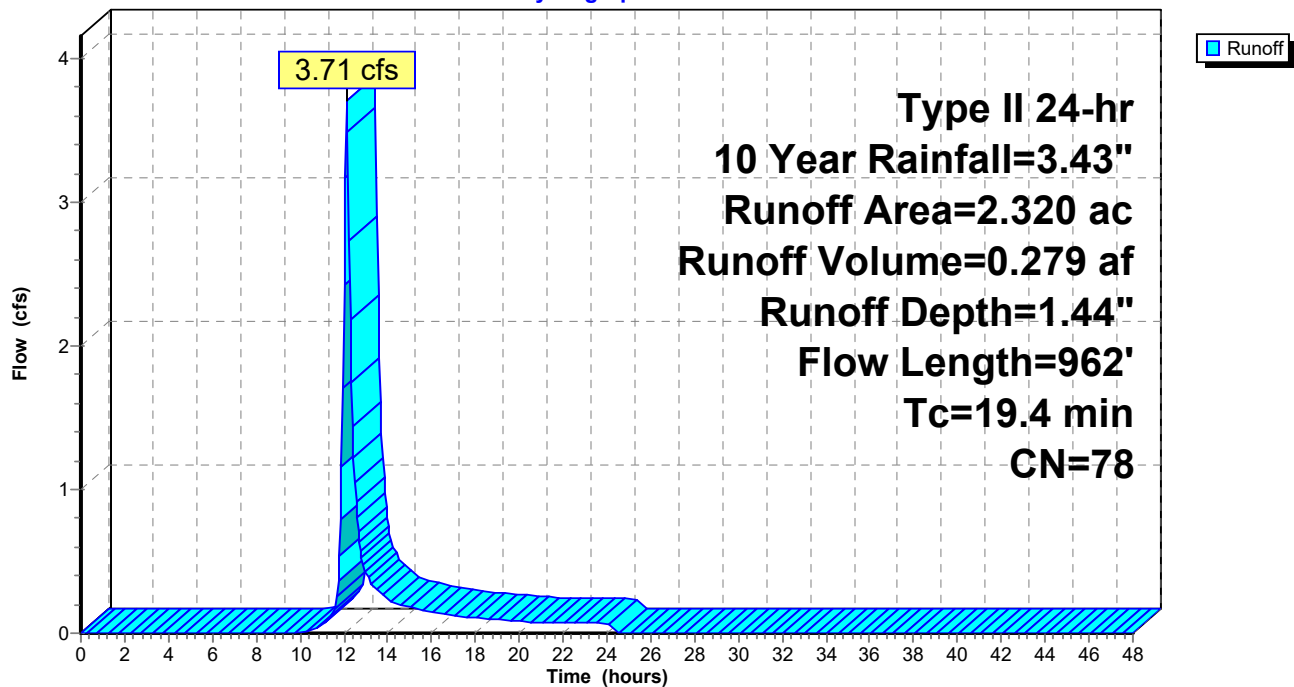
Area (ac)	CN	Description
2.320	78	Meadow, non-grazed, HSG D
2.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0450	0.15		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
8.2	862	0.0626	1.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
19.4	962	Total			

### Subcatchment A: Watershed A

Hydrograph



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Type II 24-hr 10 Year Rainfall=3.43"

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### Summary for Subcatchment B: Watershed B

Runoff = 18.03 cfs @ 12.32 hrs, Volume= 1.998 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

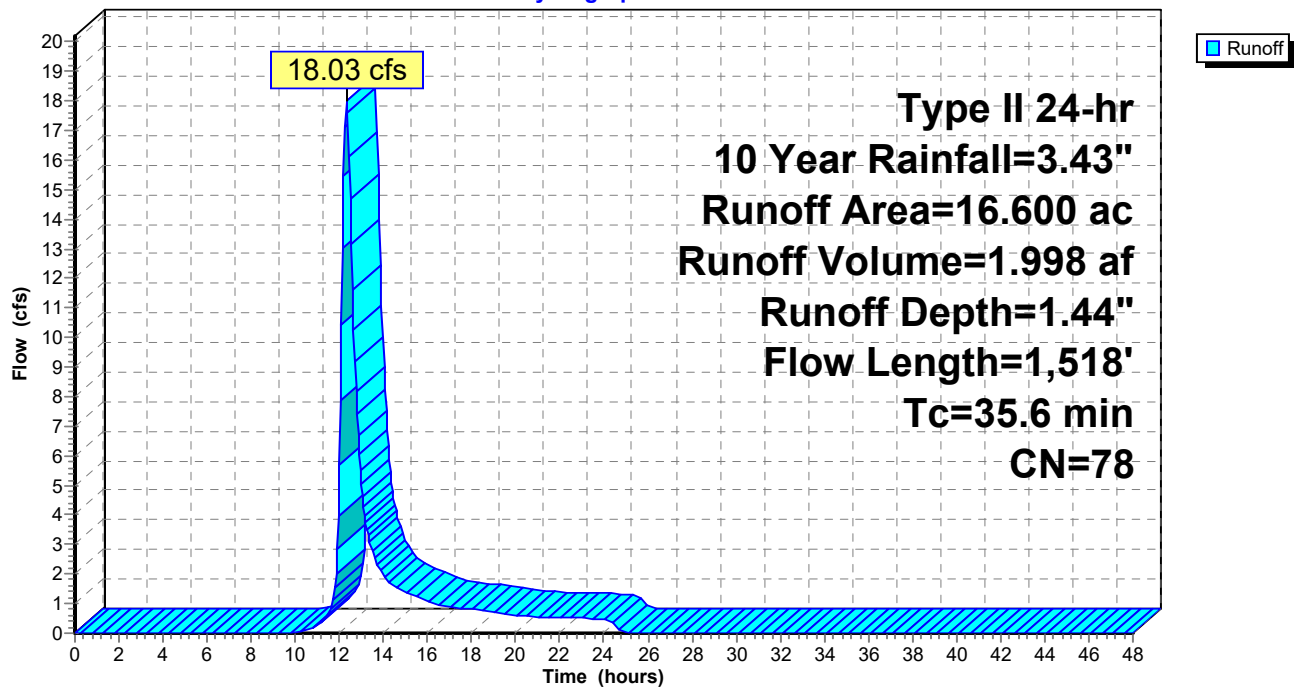
Area (ac)	CN	Description
16.600	78	Meadow, non-grazed, HSG D
16.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
15.1	1,418	0.0497	1.56		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
35.6	1,518	Total			

### Subcatchment B: Watershed B

Hydrograph



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### Summary for Subcatchment C: Watershed C

Runoff = 3.13 cfs @ 12.11 hrs, Volume= 0.222 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

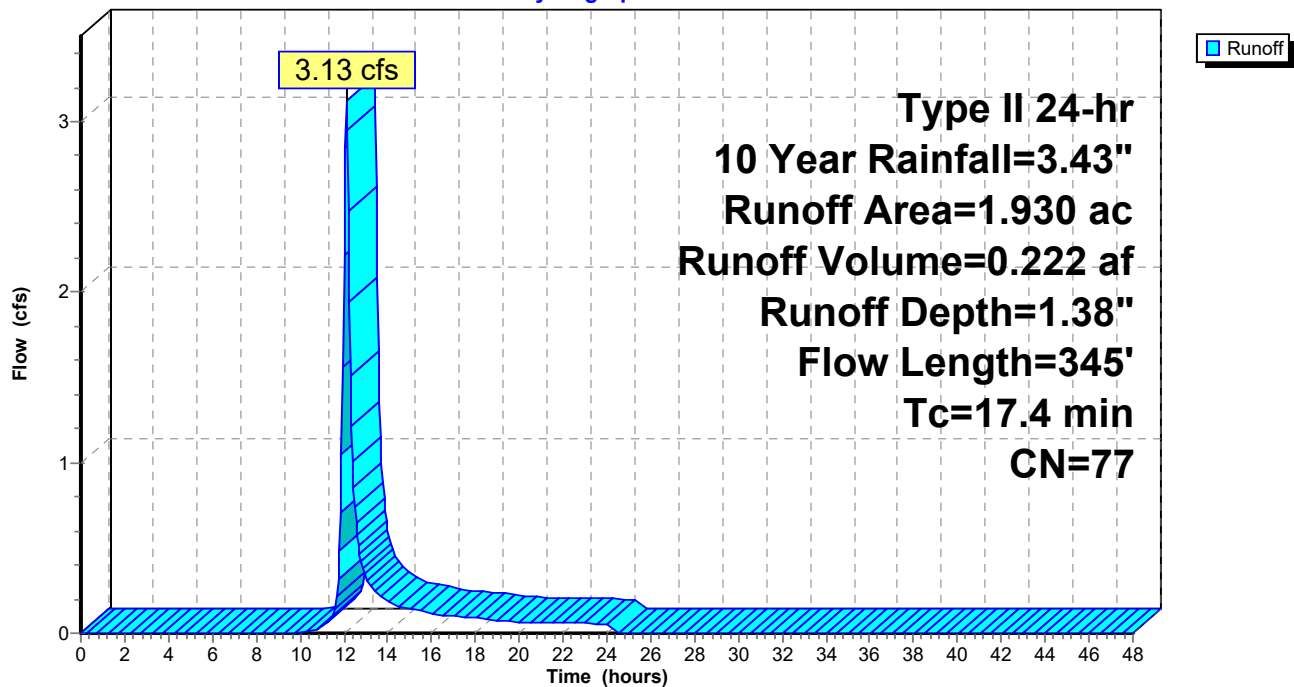
Area (ac)	CN	Description
1.930	77	Woods, Good, HSG D
1.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 2.70"
5.1	245	0.0253	0.80		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
17.4	345	Total			

### Subcatchment C: Watershed C

Hydrograph



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### Summary for Subcatchment D: Watershed D

Runoff = 16.38 cfs @ 12.55 hrs, Volume= 2.407 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

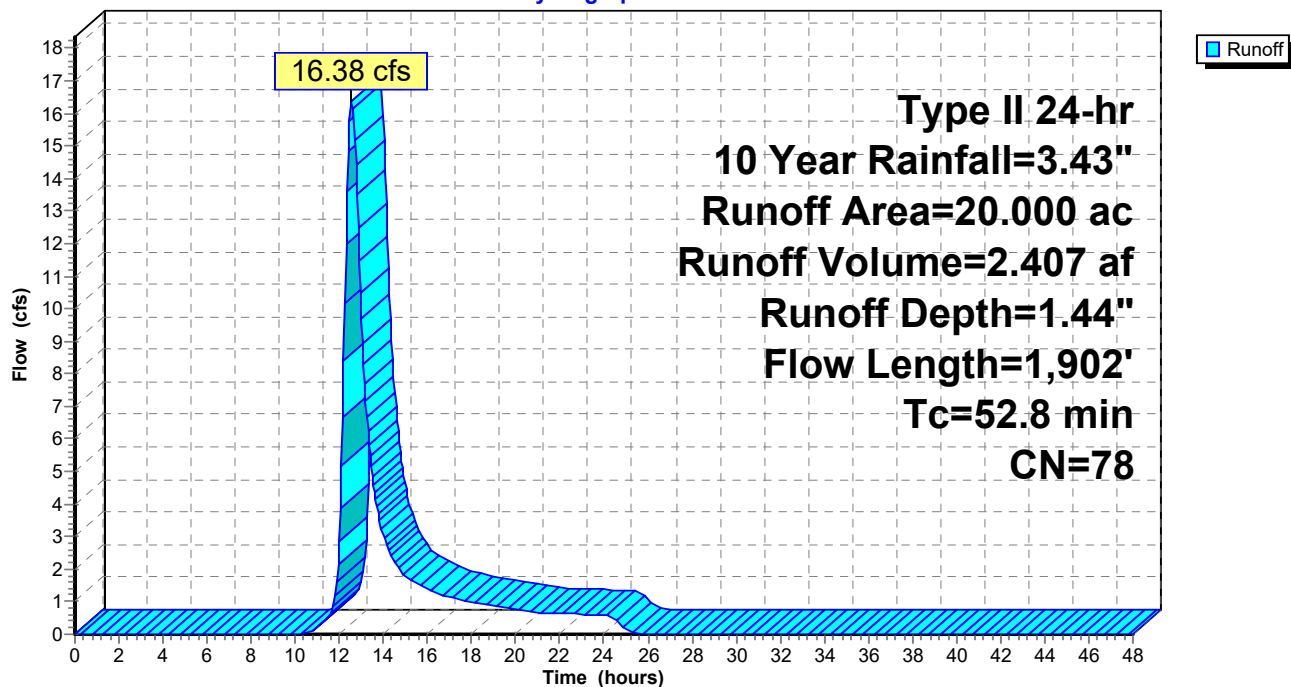
Area (ac)	CN	Description
18.000	78	Meadow, non-grazed, HSG D
2.000	79	Woods, Fair, HSG D
20.000	78	Weighted Average
20.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	1,190	0.0588	1.70		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
20.6	612	0.0098	0.49		<b>Shallow Concentrated Flow, C-D</b> Woodland Kv= 5.0 fps
52.8	1,902	Total			

### Subcatchment D: Watershed D

Hydrograph



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### Summary for Subcatchment E: Watershed E

Runoff = 21.73 cfs @ 12.36 hrs, Volume= 2.552 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

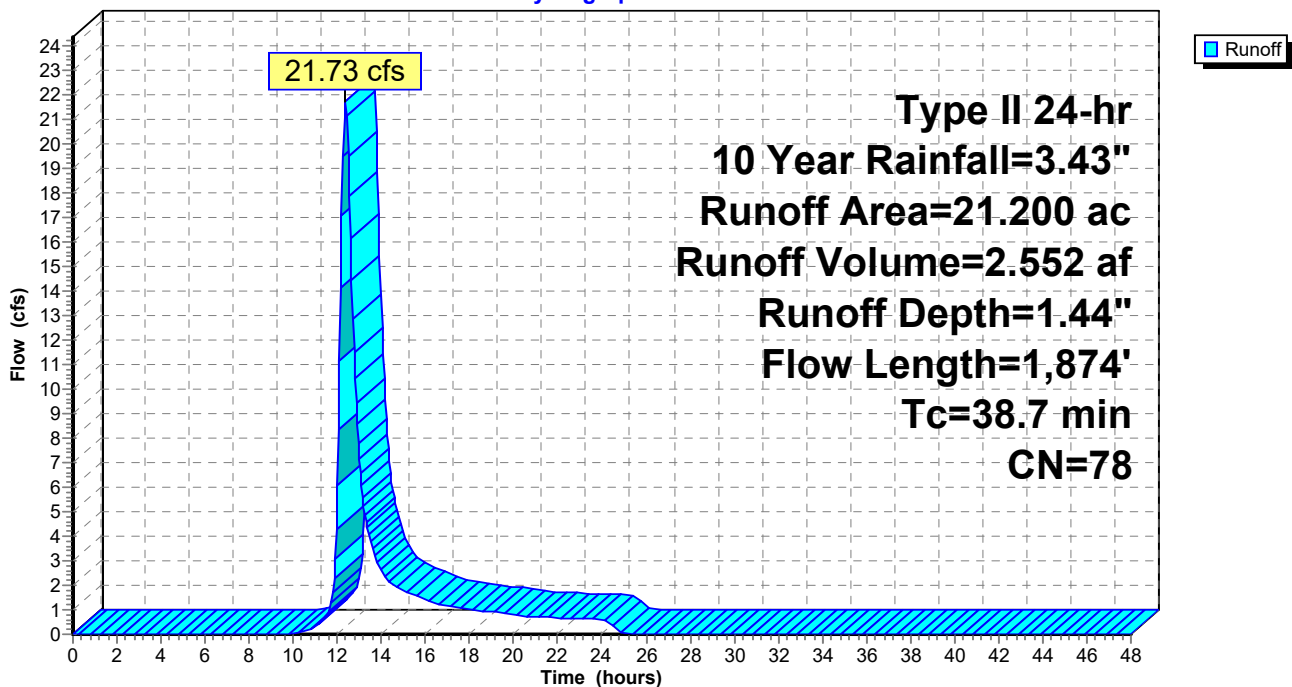
Area (ac)	CN	Description
20.200	78	Meadow, non-grazed, HSG D
0.500	98	Water Surface, HSG D
0.500	77	Woods, Good, HSG D
21.200	78	Weighted Average
20.700		97.64% Pervious Area
0.500		2.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.2	1,774	0.0541	1.63		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
38.7	1,874	Total			

### Subcatchment E: Watershed E

Hydrograph



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### Summary for Subcatchment F: Watershed F

Runoff = 6.50 cfs @ 12.34 hrs, Volume= 0.735 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

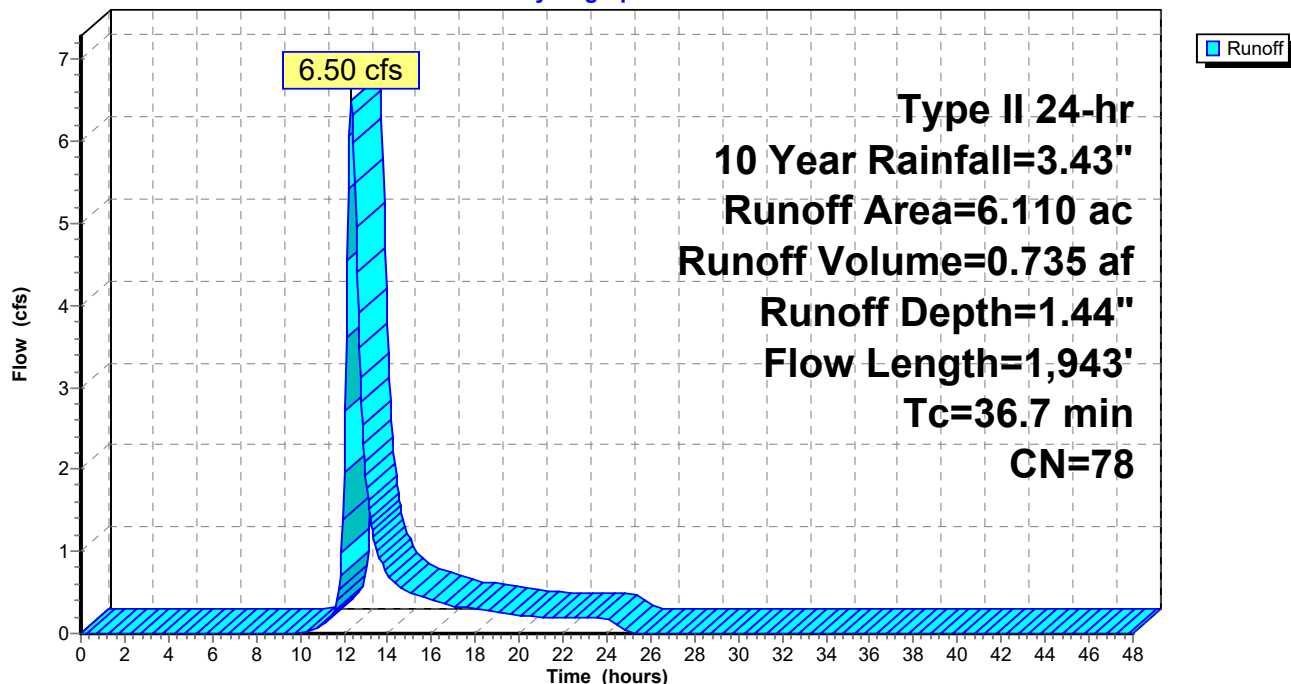
Area (ac)	CN	Description
6.110	78	Meadow, non-grazed, HSG D
6.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0080	0.07		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.2	360	0.0720	1.88		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.6	360	0.0800	3.84	1.15	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.030 Earth, grassed & winding
5.5	543	0.0552	1.64		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
4.0	580	0.0103	2.42	2.18	<b>Trap/Vee/Rect Channel Flow, E-F</b> Bot.W=0.00' D=1.00' Z= 0.9 '/' Top.W=1.80' n= 0.030 Earth, grassed & winding
36.7	1,943	Total			

### Subcatchment F: Watershed F

Hydrograph





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### Summary for Subcatchment G: Watershed G

Runoff = 10.55 cfs @ 12.25 hrs, Volume= 1.024 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

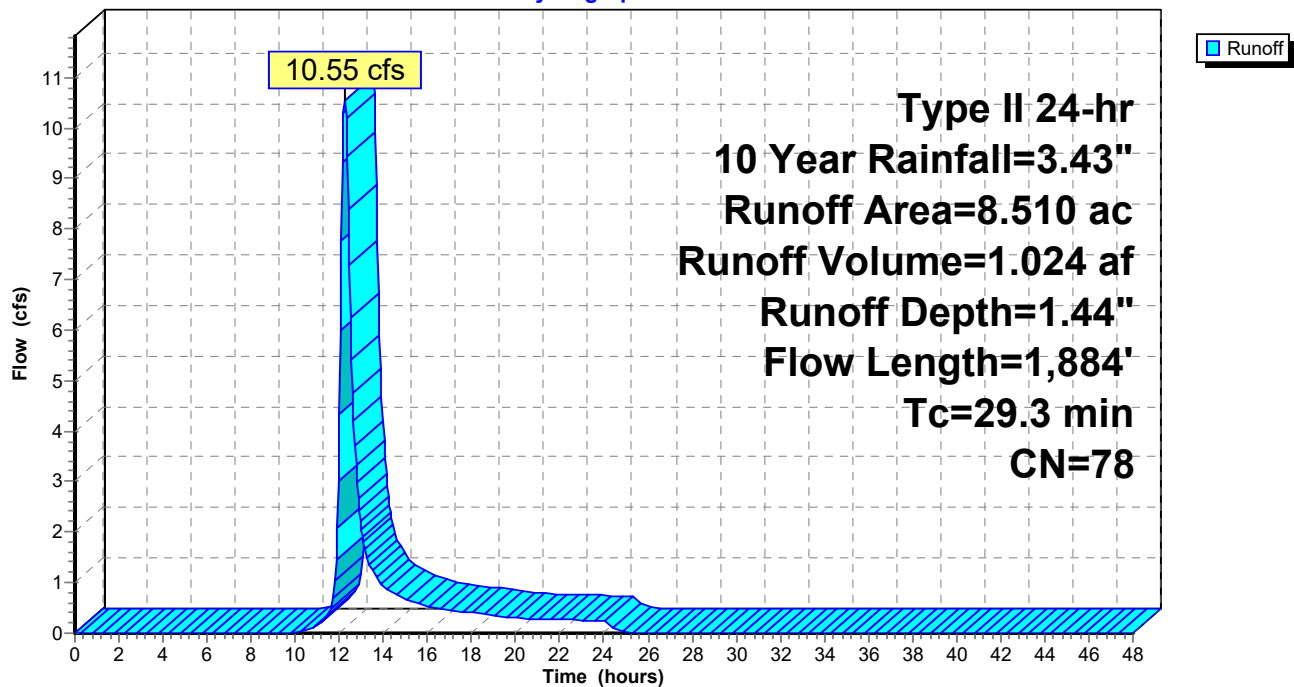
Area (ac)	CN	Description
8.510	78	Meadow, non-grazed, HSG D
8.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
19.3	1,784	0.0482	1.54		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
29.3	1,884	Total			

### Subcatchment G: Watershed G

Hydrograph



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### Summary for Subcatchment H: Watershed H

Runoff = 22.51 cfs @ 12.24 hrs, Volume= 2.146 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

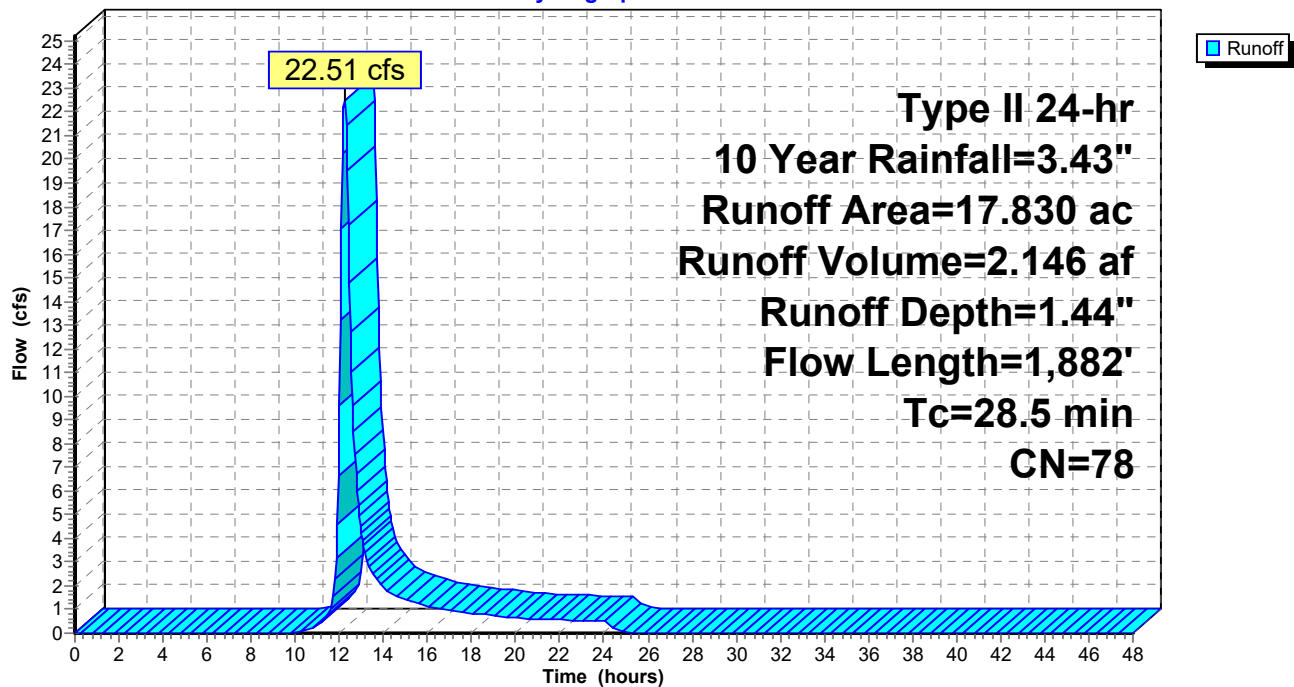
Area (ac)	CN	Description
17.830	78	Meadow, non-grazed, HSG D
17.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
21.7	1,782	0.0382	1.37		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
28.5	1,882	Total			

### Subcatchment H: Watershed H

Hydrograph



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### Summary for Subcatchment I: Watershed I

Runoff = 1.70 cfs @ 12.05 hrs, Volume= 0.101 af, Depth= 1.44"

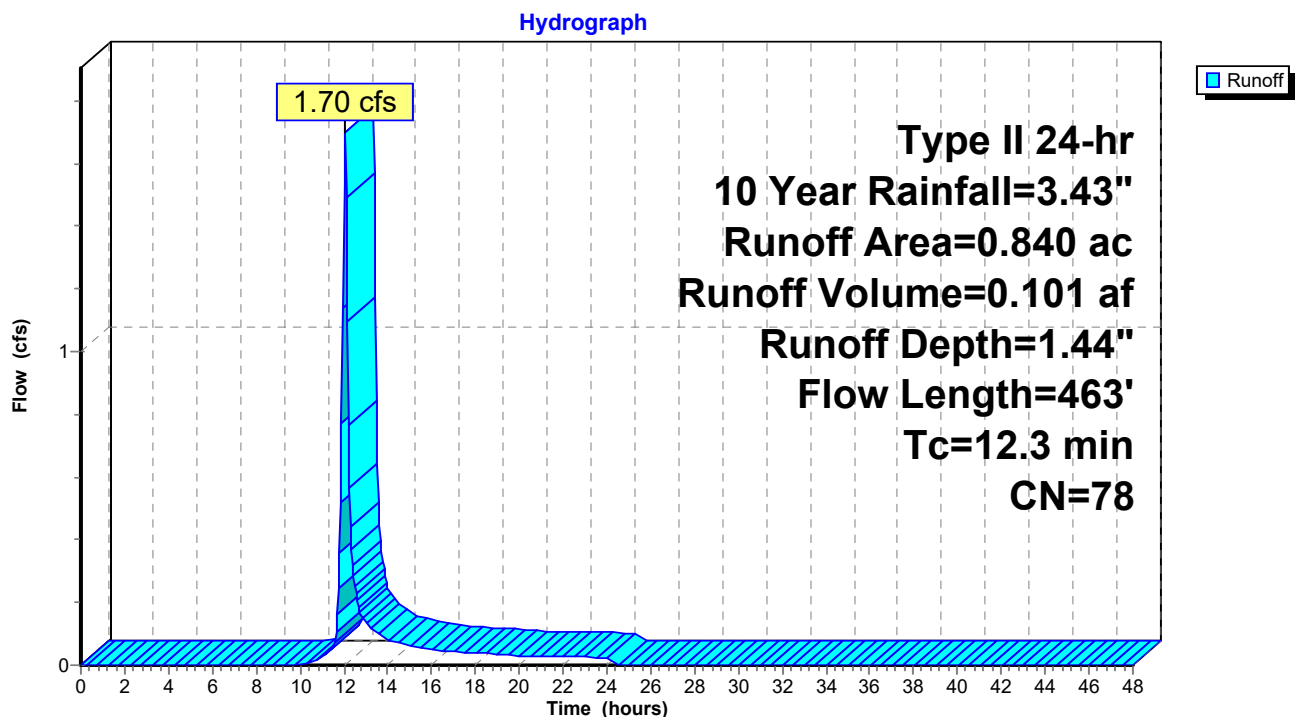
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

Area (ac)	CN	Description
0.840	78	Meadow, non-grazed, HSG D
0.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0800	0.19		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.4	363	0.0660	1.80		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
12.3	463	Total			

### Subcatchment I: Watershed I



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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

### Subcatchment A: Watershed A

Runoff Area=2.320 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=962' Tc=19.4 min CN=78 Runoff=5.46 cfs 0.405 af

### Subcatchment B: Watershed B

Runoff Area=16.600 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=1,518' Tc=35.6 min CN=78 Runoff=26.65 cfs 2.900 af

### Subcatchment C: Watershed C

Runoff Area=1.930 ac 0.00% Impervious Runoff Depth=2.02"  
Flow Length=345' Tc=17.4 min CN=77 Runoff=4.64 cfs 0.324 af

### Subcatchment D: Watershed D

Runoff Area=20.000 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=1,902' Tc=52.8 min CN=78 Runoff=24.26 cfs 3.494 af

### Subcatchment E: Watershed E

Runoff Area=21.200 ac 2.36% Impervious Runoff Depth=2.10"  
Flow Length=1,874' Tc=38.7 min CN=78 Runoff=32.13 cfs 3.703 af

### Subcatchment F: Watershed F

Runoff Area=6.110 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=1,943' Tc=36.7 min CN=78 Runoff=9.61 cfs 1.067 af

### Subcatchment G: Watershed G

Runoff Area=8.510 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=1,884' Tc=29.3 min CN=78 Runoff=15.57 cfs 1.487 af

### Subcatchment H: Watershed H

Runoff Area=17.830 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=1,882' Tc=28.5 min CN=78 Runoff=33.19 cfs 3.115 af

### Subcatchment I: Watershed I

Runoff Area=0.840 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=463' Tc=12.3 min CN=78 Runoff=2.48 cfs 0.147 af

**Total Runoff Area = 95.340 ac Runoff Volume = 16.642 af Average Runoff Depth = 2.09"**  
**99.48% Pervious = 94.840 ac 0.52% Impervious = 0.500 ac**

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### Summary for Subcatchment A: Watershed A

Runoff = 5.46 cfs @ 12.12 hrs, Volume= 0.405 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

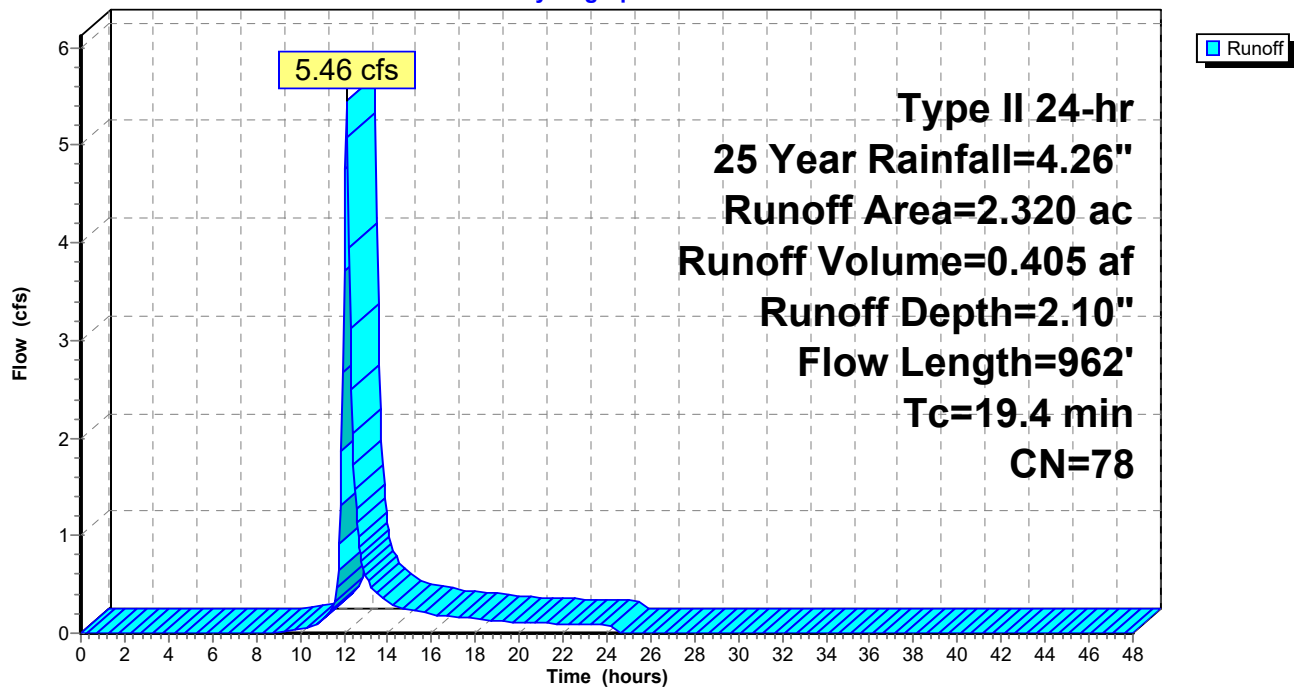
Area (ac)	CN	Description
2.320	78	Meadow, non-grazed, HSG D
2.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0450	0.15		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
8.2	862	0.0626	1.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
19.4	962	Total			

### Subcatchment A: Watershed A

Hydrograph



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Type II 24-hr 25 Year Rainfall=4.26"

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### Summary for Subcatchment B: Watershed B

Runoff = 26.65 cfs @ 12.32 hrs, Volume= 2.900 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

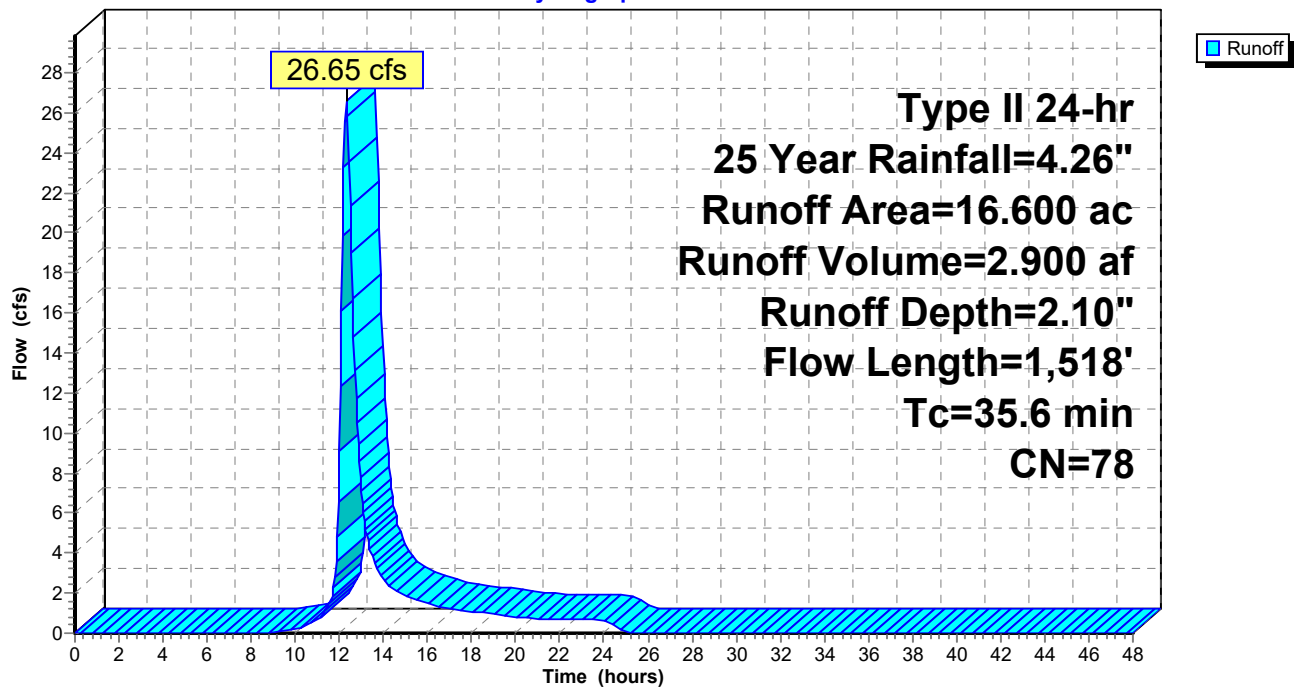
Area (ac)	CN	Description
16.600	78	Meadow, non-grazed, HSG D
16.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
15.1	1,418	0.0497	1.56		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
35.6	1,518	Total			

### Subcatchment B: Watershed B

Hydrograph



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Type II 24-hr 25 Year Rainfall=4.26"

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### Summary for Subcatchment C: Watershed C

Runoff = 4.64 cfs @ 12.10 hrs, Volume= 0.324 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

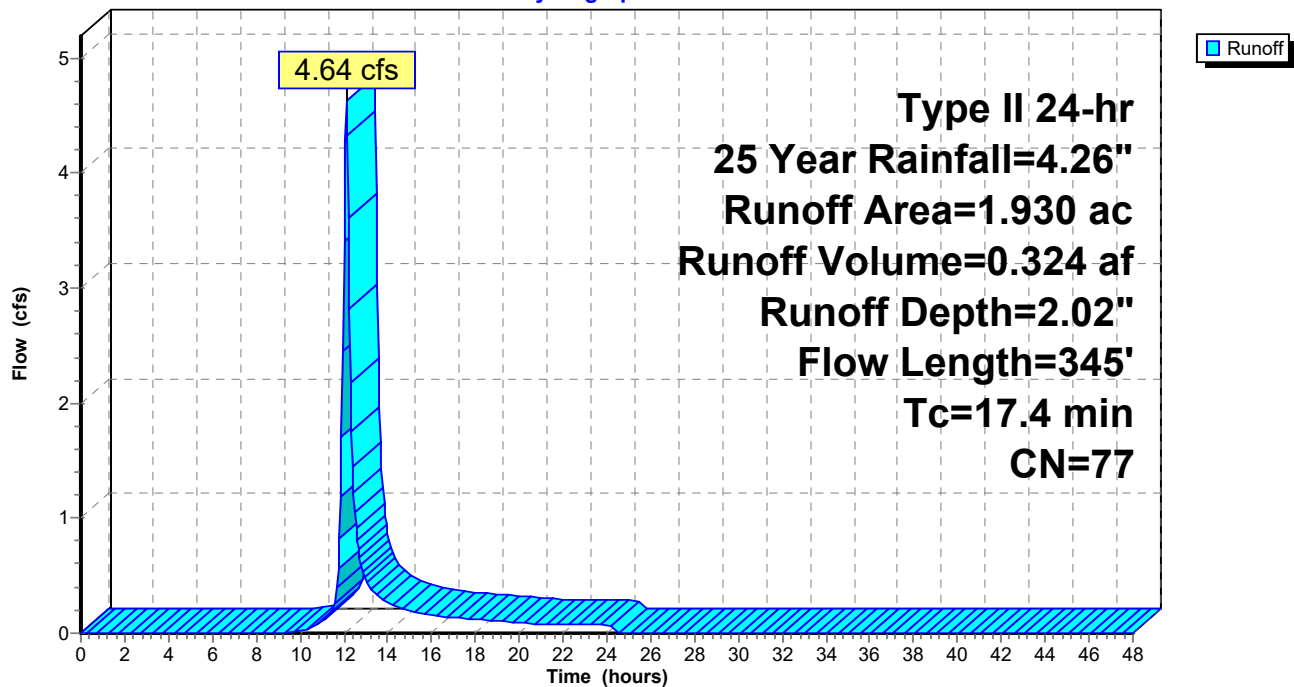
Area (ac)	CN	Description
1.930	77	Woods, Good, HSG D
1.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 2.70"
5.1	245	0.0253	0.80		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
17.4	345	Total			

### Subcatchment C: Watershed C

Hydrograph



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Type II 24-hr 25 Year Rainfall=4.26"

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### Summary for Subcatchment D: Watershed D

Runoff = 24.26 cfs @ 12.53 hrs, Volume= 3.494 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

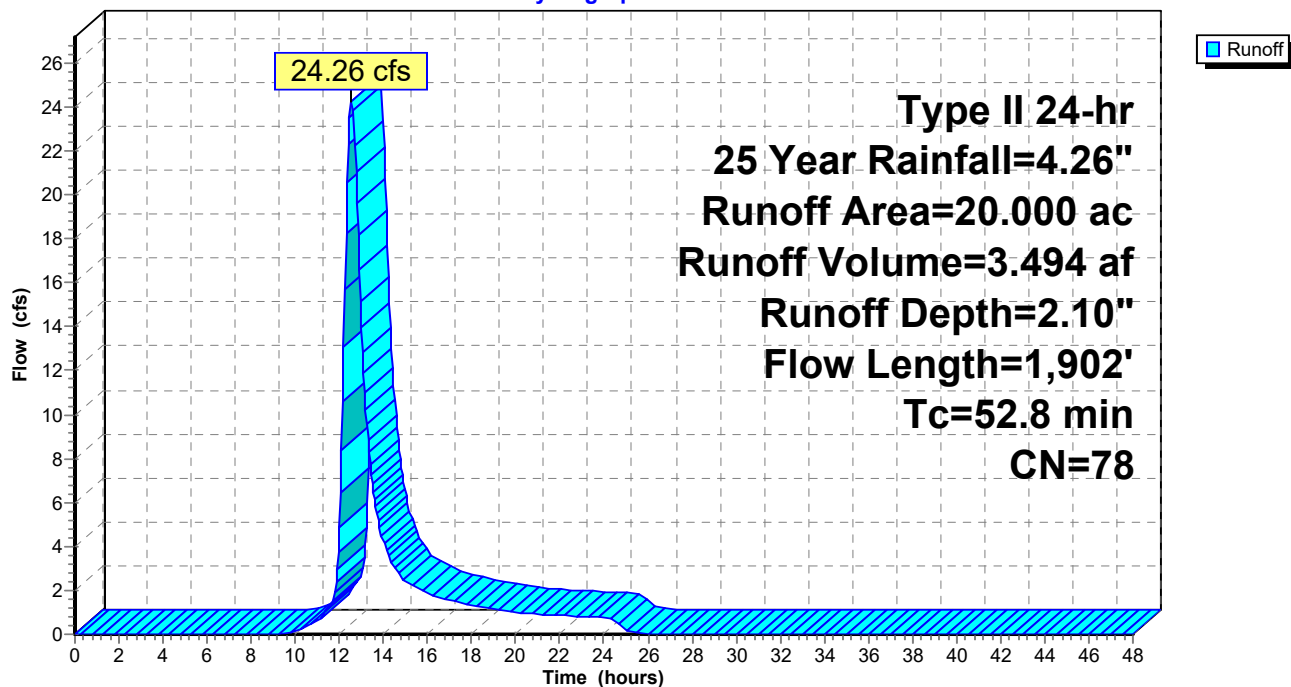
Area (ac)	CN	Description
18.000	78	Meadow, non-grazed, HSG D
2.000	79	Woods, Fair, HSG D
20.000	78	Weighted Average
20.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	1,190	0.0588	1.70		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
20.6	612	0.0098	0.49		<b>Shallow Concentrated Flow, C-D</b> Woodland Kv= 5.0 fps
52.8	1,902	Total			

### Subcatchment D: Watershed D

Hydrograph





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Type II 24-hr 25 Year Rainfall=4.26"

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### Summary for Subcatchment E: Watershed E

Runoff = 32.13 cfs @ 12.36 hrs, Volume= 3.703 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

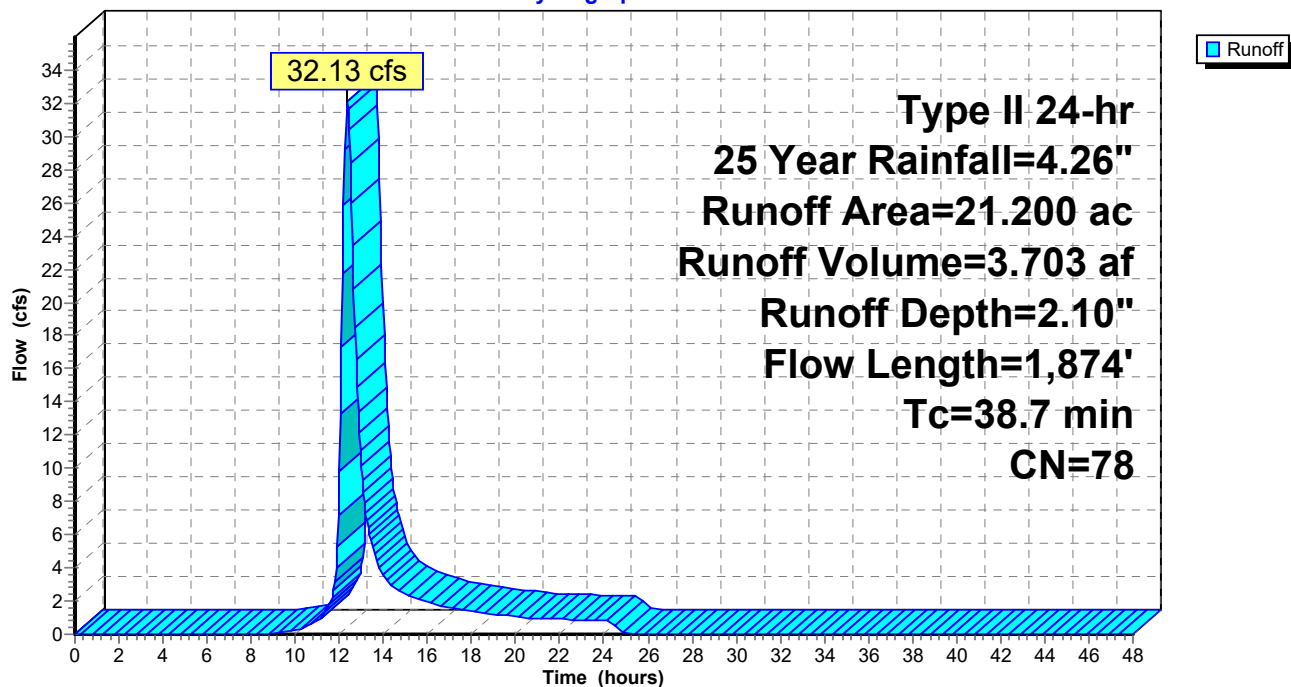
Area (ac)	CN	Description
20.200	78	Meadow, non-grazed, HSG D
0.500	98	Water Surface, HSG D
0.500	77	Woods, Good, HSG D
21.200	78	Weighted Average
20.700		97.64% Pervious Area
0.500		2.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.2	1,774	0.0541	1.63		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
38.7	1,874	Total			

### Subcatchment E: Watershed E

Hydrograph



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### Summary for Subcatchment F: Watershed F

Runoff = 9.61 cfs @ 12.33 hrs, Volume= 1.067 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

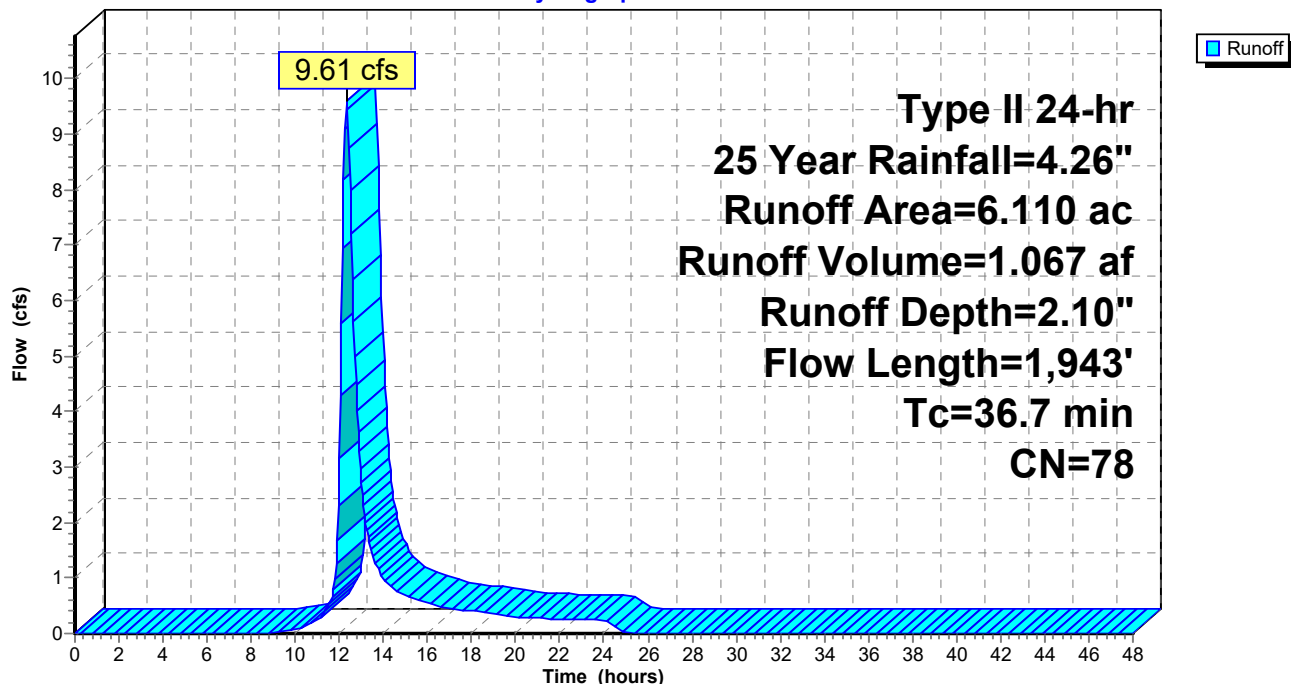
Area (ac)	CN	Description
6.110	78	Meadow, non-grazed, HSG D
6.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0080	0.07		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.2	360	0.0720	1.88		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.6	360	0.0800	3.84	1.15	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.030 Earth, grassed & winding
5.5	543	0.0552	1.64		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
4.0	580	0.0103	2.42	2.18	<b>Trap/Vee/Rect Channel Flow, E-F</b> Bot.W=0.00' D=1.00' Z= 0.9 '/' Top.W=1.80' n= 0.030 Earth, grassed & winding
36.7	1,943	Total			

### Subcatchment F: Watershed F

Hydrograph



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### Summary for Subcatchment G: Watershed G

Runoff = 15.57 cfs @ 12.24 hrs, Volume= 1.487 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

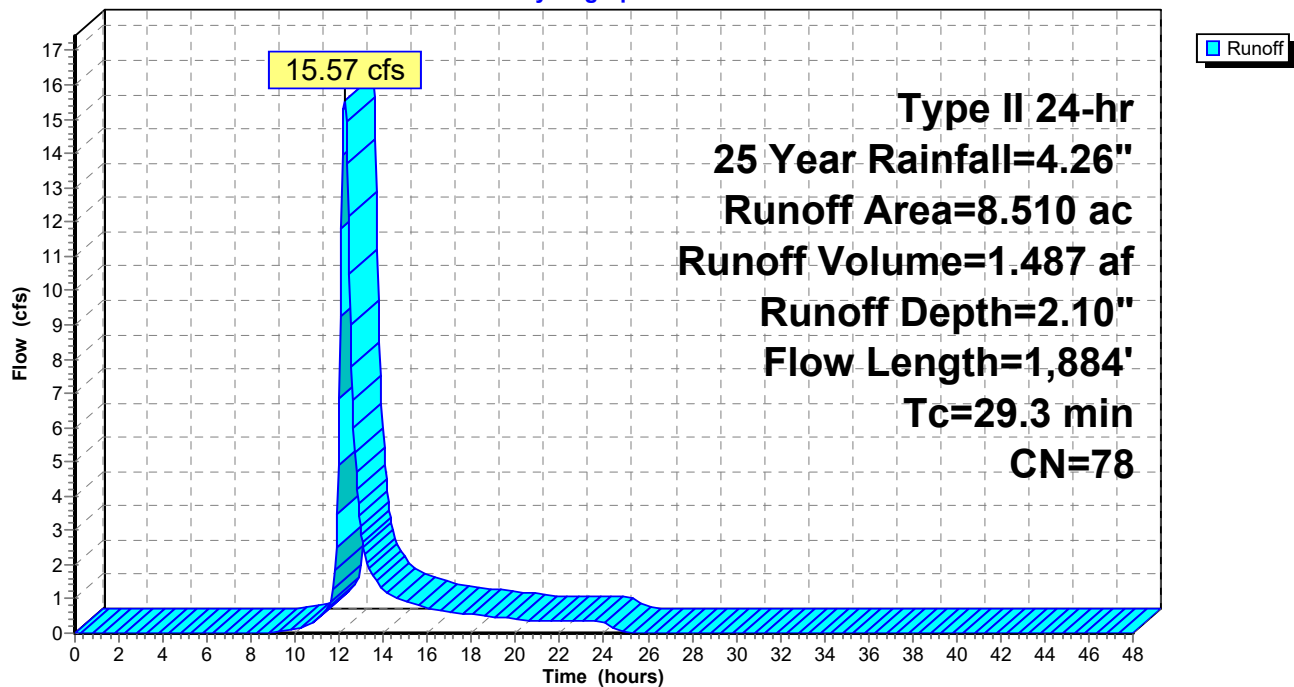
Area (ac)	CN	Description
8.510	78	Meadow, non-grazed, HSG D
8.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
19.3	1,784	0.0482	1.54		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
29.3	1,884	Total			

### Subcatchment G: Watershed G

Hydrograph



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### Summary for Subcatchment H: Watershed H

Runoff = 33.19 cfs @ 12.23 hrs, Volume= 3.115 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

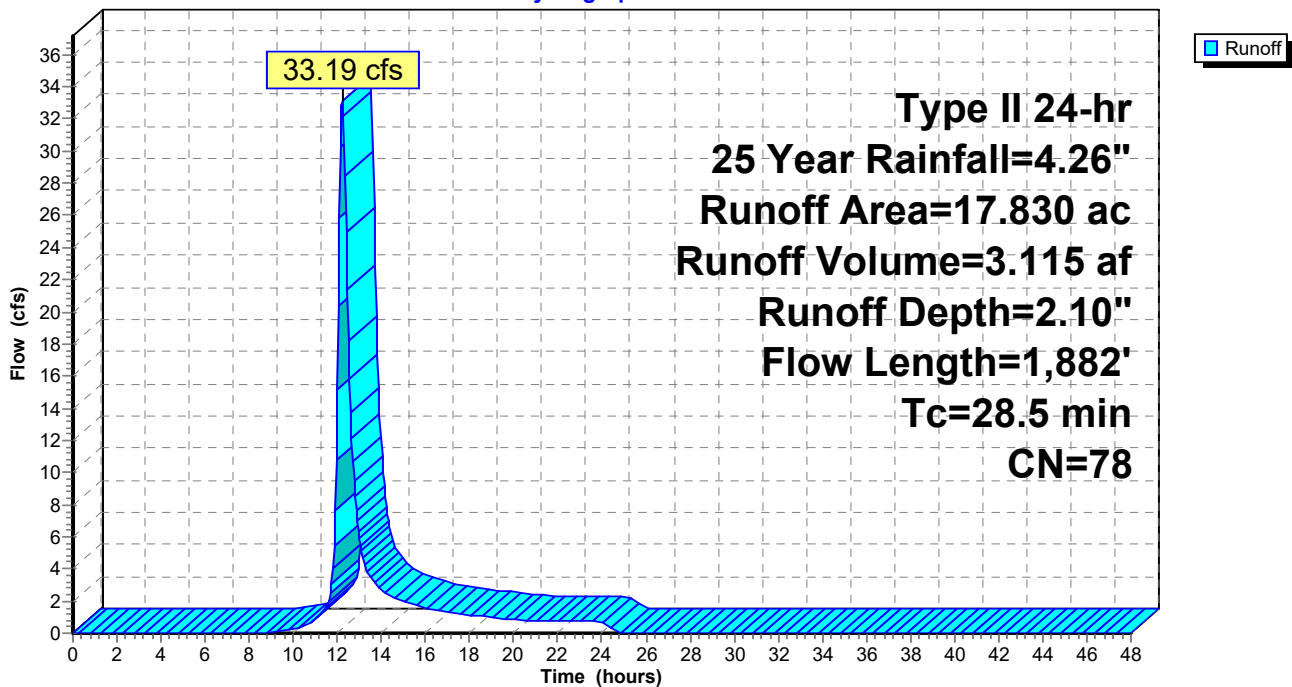
Area (ac)	CN	Description
17.830	78	Meadow, non-grazed, HSG D
17.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
21.7	1,782	0.0382	1.37		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
28.5	1,882	Total			

### Subcatchment H: Watershed H

Hydrograph



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### Summary for Subcatchment I: Watershed I

Runoff = 2.48 cfs @ 12.04 hrs, Volume= 0.147 af, Depth= 2.10"

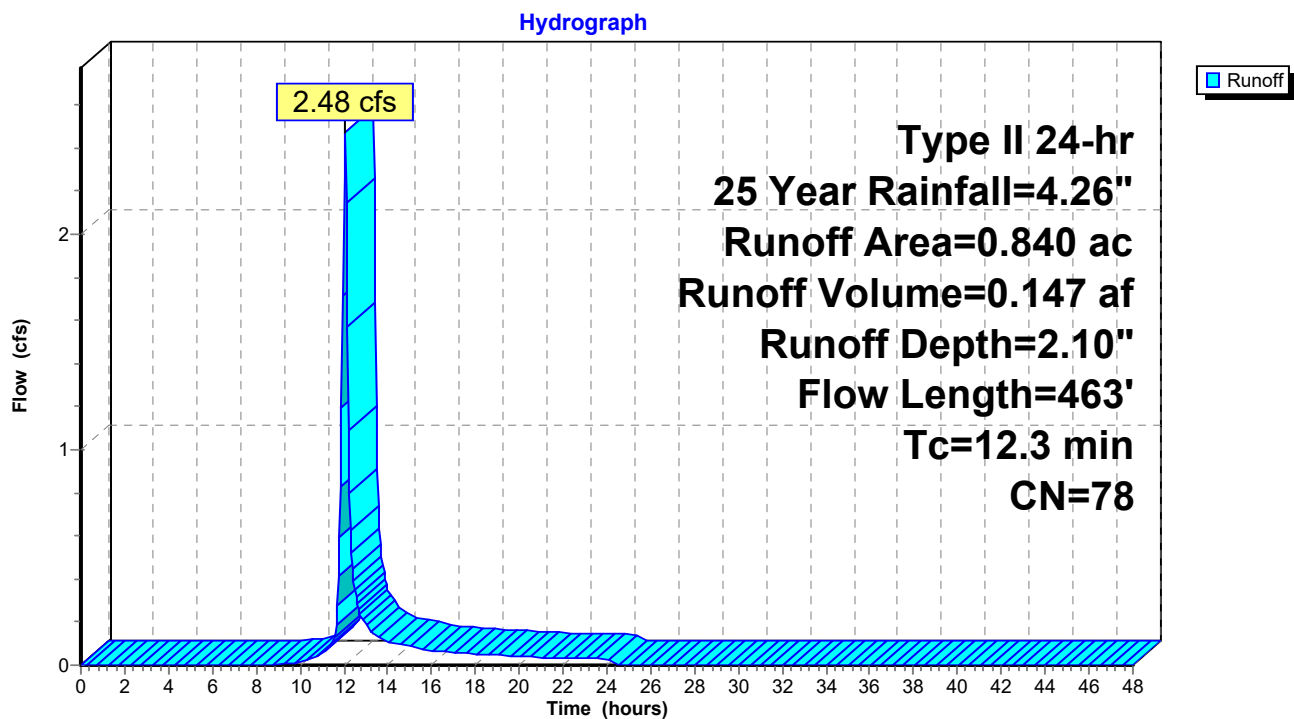
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

Area (ac)	CN	Description
0.840	78	Meadow, non-grazed, HSG D
0.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0800	0.19		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.4	363	0.0660	1.80		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
12.3	463	Total			

### Subcatchment I: Watershed I



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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

### Subcatchment A: Watershed A

Runoff Area=2.320 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=962' Tc=19.4 min CN=78 Runoff=9.18 cfs 0.680 af

### Subcatchment B: Watershed B

Runoff Area=16.600 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=1,518' Tc=35.6 min CN=78 Runoff=45.15 cfs 4.865 af

### Subcatchment C: Watershed C

Runoff Area=1.930 ac 0.00% Impervious Runoff Depth=3.42"  
Flow Length=345' Tc=17.4 min CN=77 Runoff=7.88 cfs 0.550 af

### Subcatchment D: Watershed D

Runoff Area=20.000 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=1,902' Tc=52.8 min CN=78 Runoff=41.31 cfs 5.862 af

### Subcatchment E: Watershed E

Runoff Area=21.200 ac 2.36% Impervious Runoff Depth=3.52"  
Flow Length=1,874' Tc=38.7 min CN=78 Runoff=54.48 cfs 6.214 af

### Subcatchment F: Watershed F

Runoff Area=6.110 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=1,943' Tc=36.7 min CN=78 Runoff=16.29 cfs 1.791 af

### Subcatchment G: Watershed G

Runoff Area=8.510 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=1,884' Tc=29.3 min CN=78 Runoff=26.31 cfs 2.494 af

### Subcatchment H: Watershed H

Runoff Area=17.830 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=1,882' Tc=28.5 min CN=78 Runoff=56.18 cfs 5.226 af

### Subcatchment I: Watershed I

Runoff Area=0.840 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=463' Tc=12.3 min CN=78 Runoff=4.13 cfs 0.246 af

**Total Runoff Area = 95.340 ac Runoff Volume = 27.928 af Average Runoff Depth = 3.52"**  
**99.48% Pervious = 94.840 ac 0.52% Impervious = 0.500 ac**

## Pre-Developed Model

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### Summary for Subcatchment A: Watershed A

Runoff = 9.18 cfs @ 12.12 hrs, Volume= 0.680 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

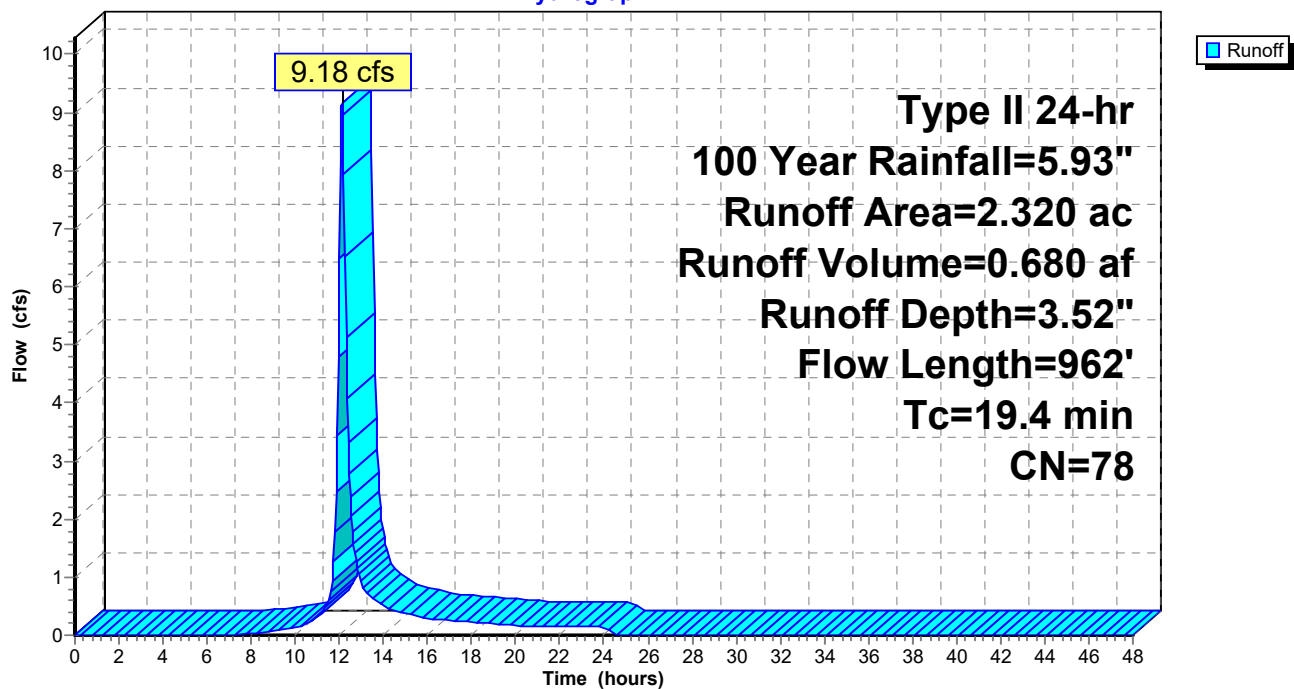
Area (ac)	CN	Description
2.320	78	Meadow, non-grazed, HSG D
2.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0450	0.15		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
8.2	862	0.0626	1.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
19.4	962	Total			

### Subcatchment A: Watershed A

Hydrograph



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### Summary for Subcatchment B: Watershed B

Runoff = 45.15 cfs @ 12.31 hrs, Volume= 4.865 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

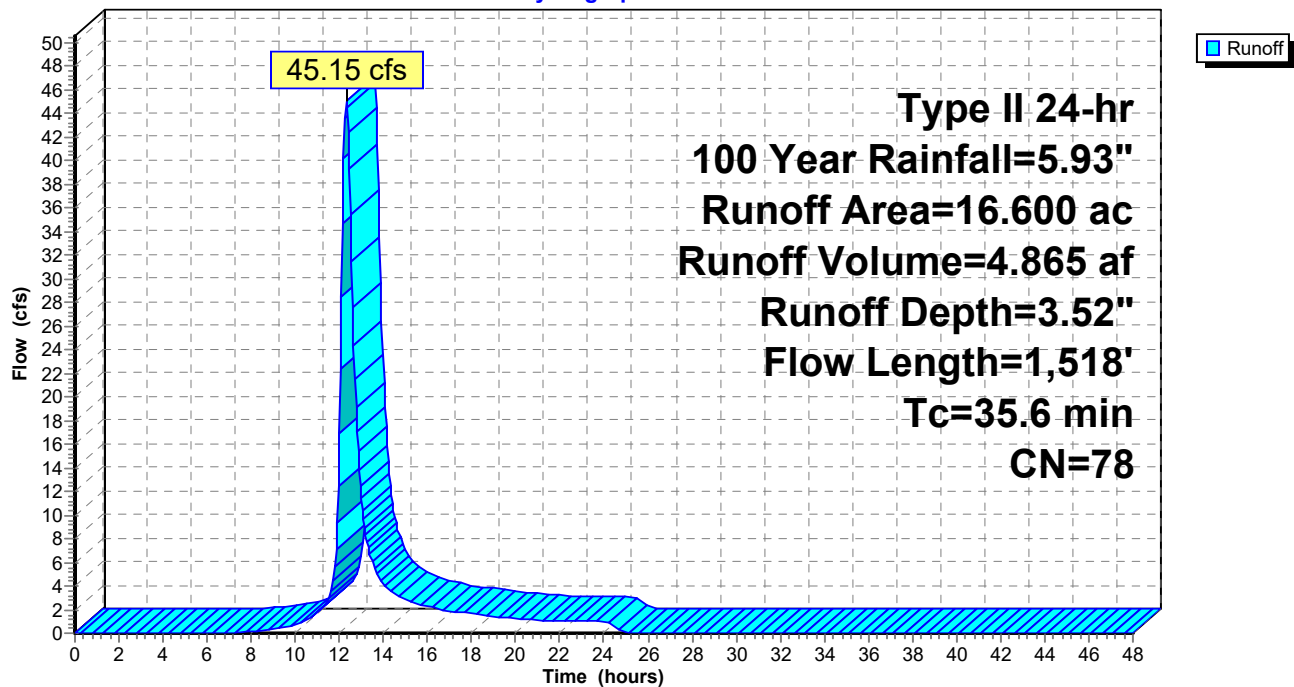
Area (ac)	CN	Description
16.600	78	Meadow, non-grazed, HSG D
16.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
15.1	1,418	0.0497	1.56		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
35.6	1,518	Total			

### Subcatchment B: Watershed B

Hydrograph





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### Summary for Subcatchment C: Watershed C

Runoff = 7.88 cfs @ 12.10 hrs, Volume= 0.550 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

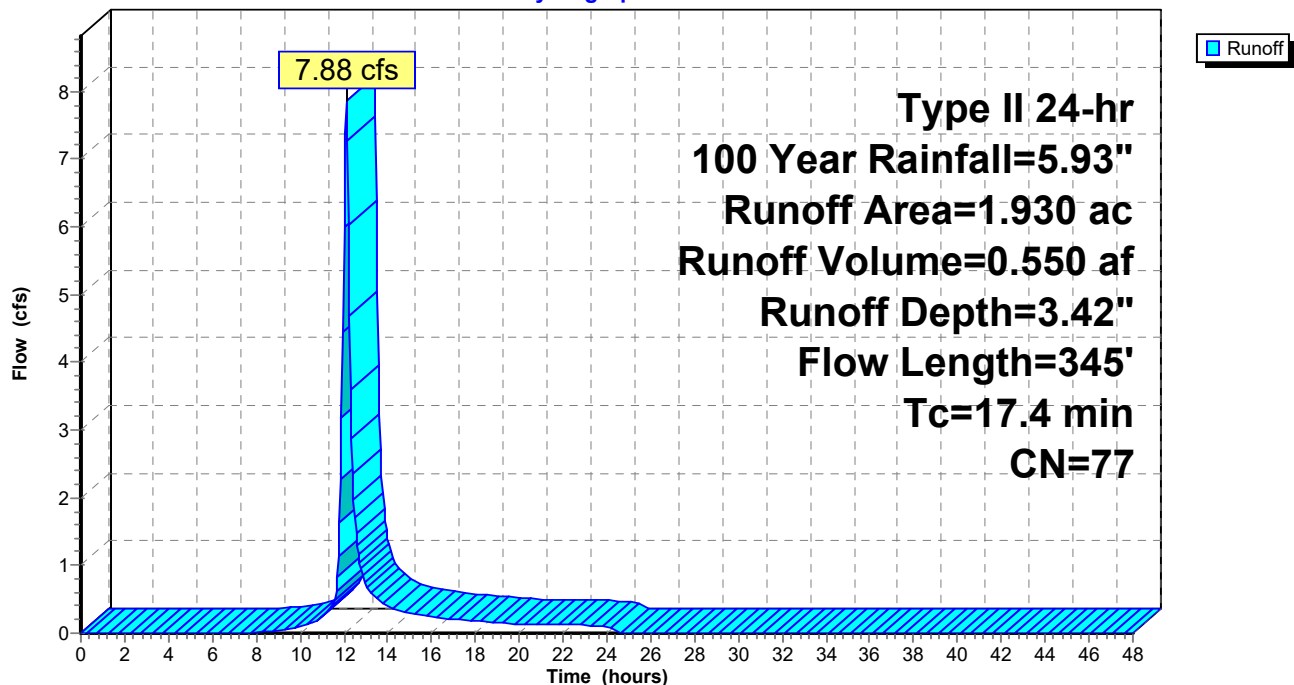
Area (ac)	CN	Description
1.930	77	Woods, Good, HSG D
1.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 2.70"
5.1	245	0.0253	0.80		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
17.4	345	Total			

### Subcatchment C: Watershed C

Hydrograph



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### Summary for Subcatchment D: Watershed D

Runoff = 41.31 cfs @ 12.52 hrs, Volume= 5.862 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

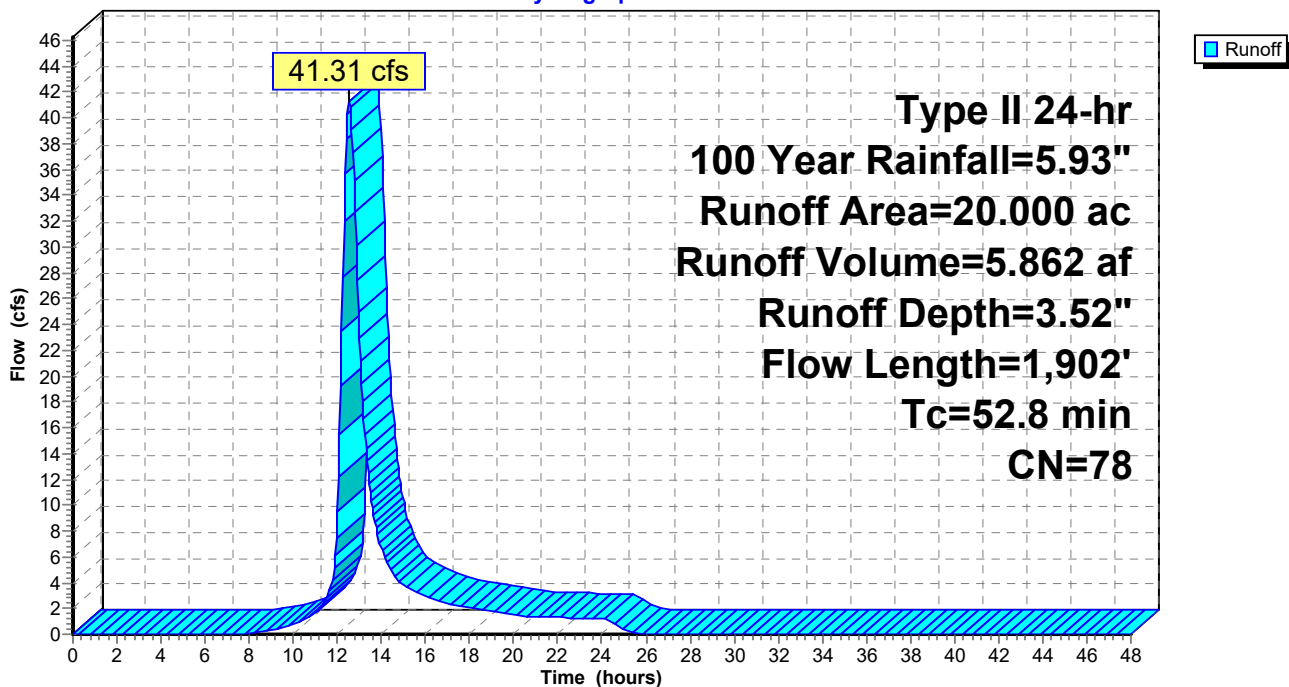
Area (ac)	CN	Description
18.000	78	Meadow, non-grazed, HSG D
2.000	79	Woods, Fair, HSG D
20.000	78	Weighted Average
20.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	1,190	0.0588	1.70		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
20.6	612	0.0098	0.49		<b>Shallow Concentrated Flow, C-D</b> Woodland Kv= 5.0 fps
52.8	1,902	Total			

### Subcatchment D: Watershed D

Hydrograph



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### Summary for Subcatchment E: Watershed E

Runoff = 54.48 cfs @ 12.35 hrs, Volume= 6.214 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

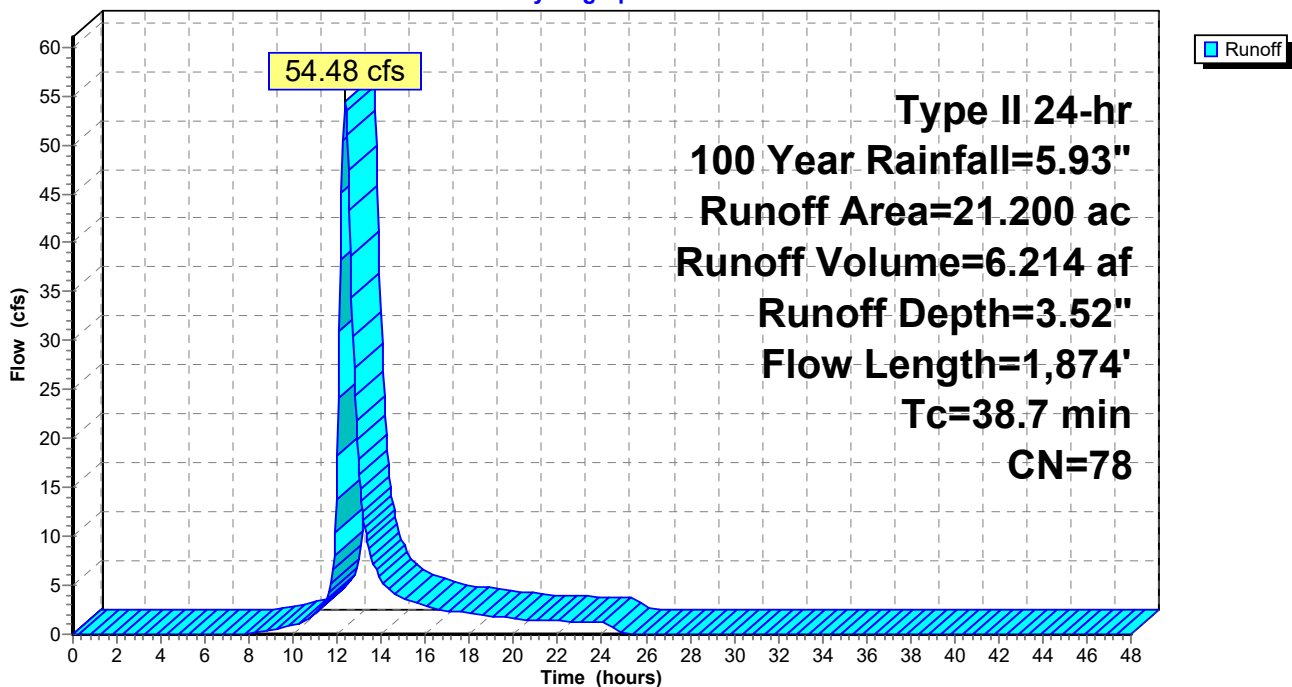
Area (ac)	CN	Description
20.200	78	Meadow, non-grazed, HSG D
0.500	98	Water Surface, HSG D
0.500	77	Woods, Good, HSG D
21.200	78	Weighted Average
20.700		97.64% Pervious Area
0.500		2.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.2	1,774	0.0541	1.63		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
38.7	1,874	Total			

### Subcatchment E: Watershed E

Hydrograph



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### Summary for Subcatchment F: Watershed F

Runoff = 16.29 cfs @ 12.32 hrs, Volume= 1.791 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

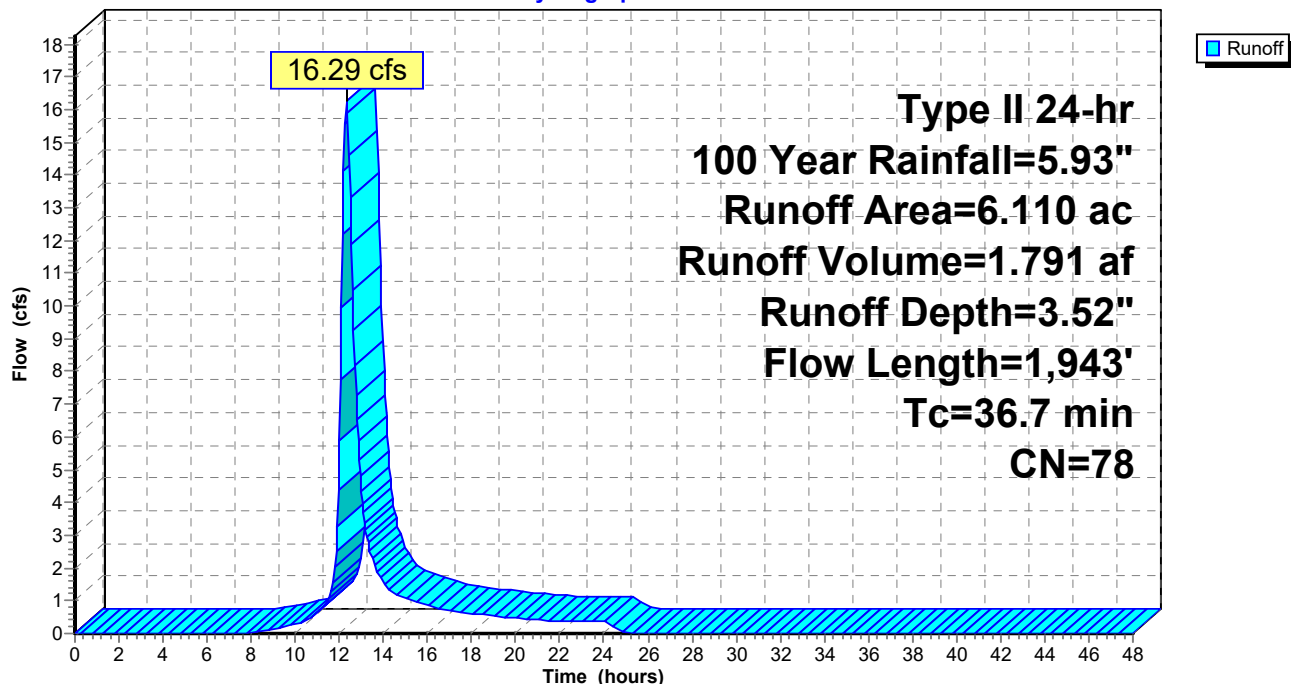
Area (ac)	CN	Description
6.110	78	Meadow, non-grazed, HSG D
6.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0080	0.07		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.2	360	0.0720	1.88		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.6	360	0.0800	3.84	1.15	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.030 Earth, grassed & winding
5.5	543	0.0552	1.64		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
4.0	580	0.0103	2.42	2.18	<b>Trap/Vee/Rect Channel Flow, E-F</b> Bot.W=0.00' D=1.00' Z= 0.9 '/' Top.W=1.80' n= 0.030 Earth, grassed & winding
36.7	1,943	Total			

### Subcatchment F: Watershed F

Hydrograph



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### Summary for Subcatchment G: Watershed G

Runoff = 26.31 cfs @ 12.23 hrs, Volume= 2.494 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

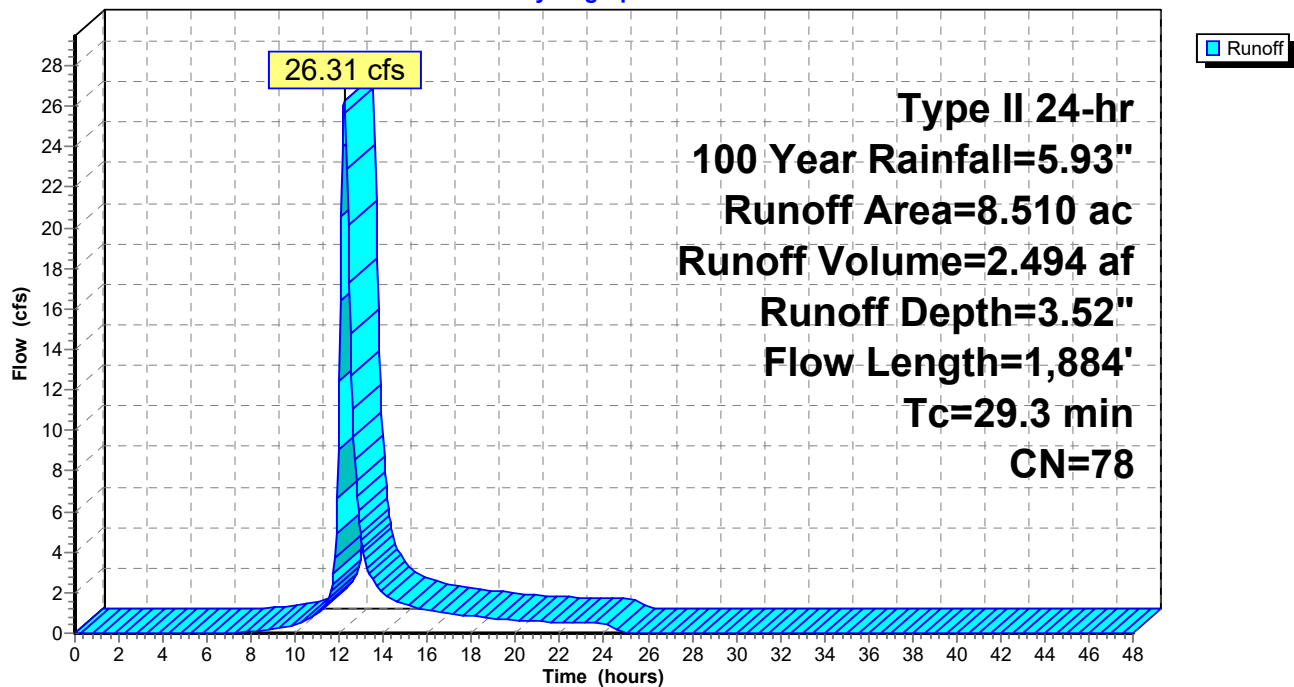
Area (ac)	CN	Description
8.510	78	Meadow, non-grazed, HSG D
8.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
19.3	1,784	0.0482	1.54		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
29.3	1,884	Total			

### Subcatchment G: Watershed G

Hydrograph



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### Summary for Subcatchment H: Watershed H

Runoff = 56.18 cfs @ 12.22 hrs, Volume= 5.226 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

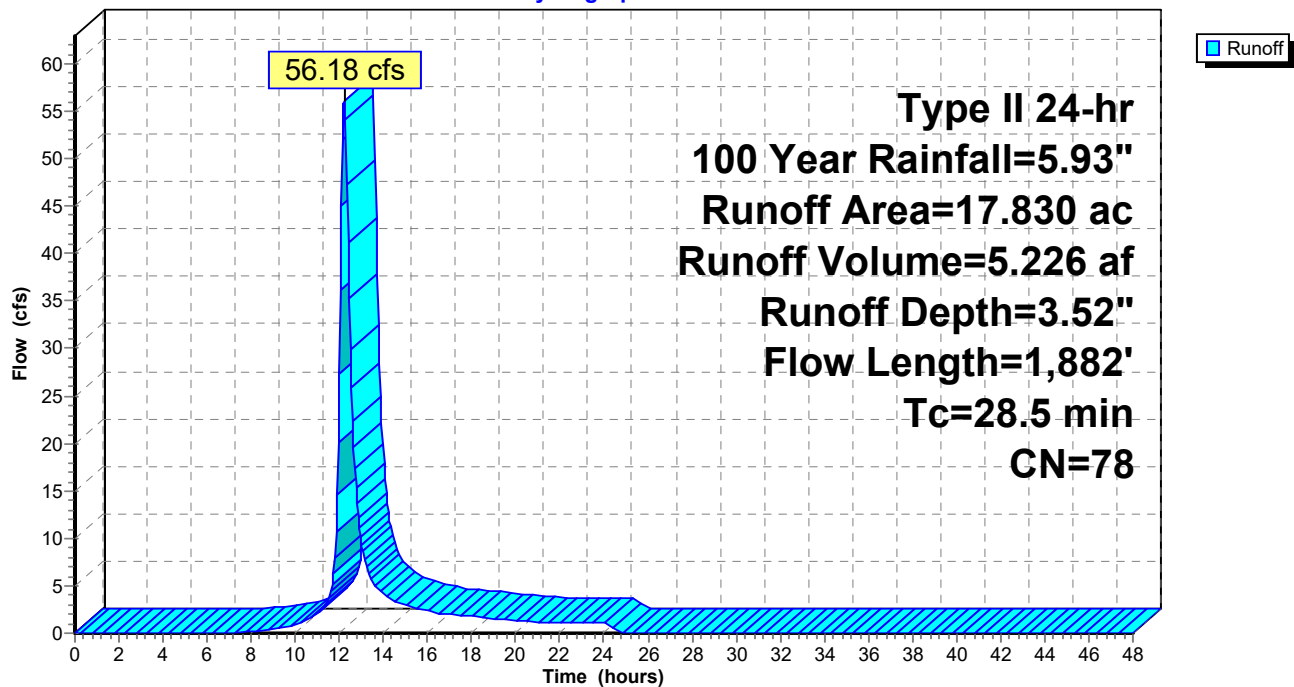
Area (ac)	CN	Description
17.830	78	Meadow, non-grazed, HSG D
17.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
21.7	1,782	0.0382	1.37		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
28.5	1,882	Total			

### Subcatchment H: Watershed H

Hydrograph



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### Summary for Subcatchment I: Watershed I

Runoff = 4.13 cfs @ 12.04 hrs, Volume= 0.246 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

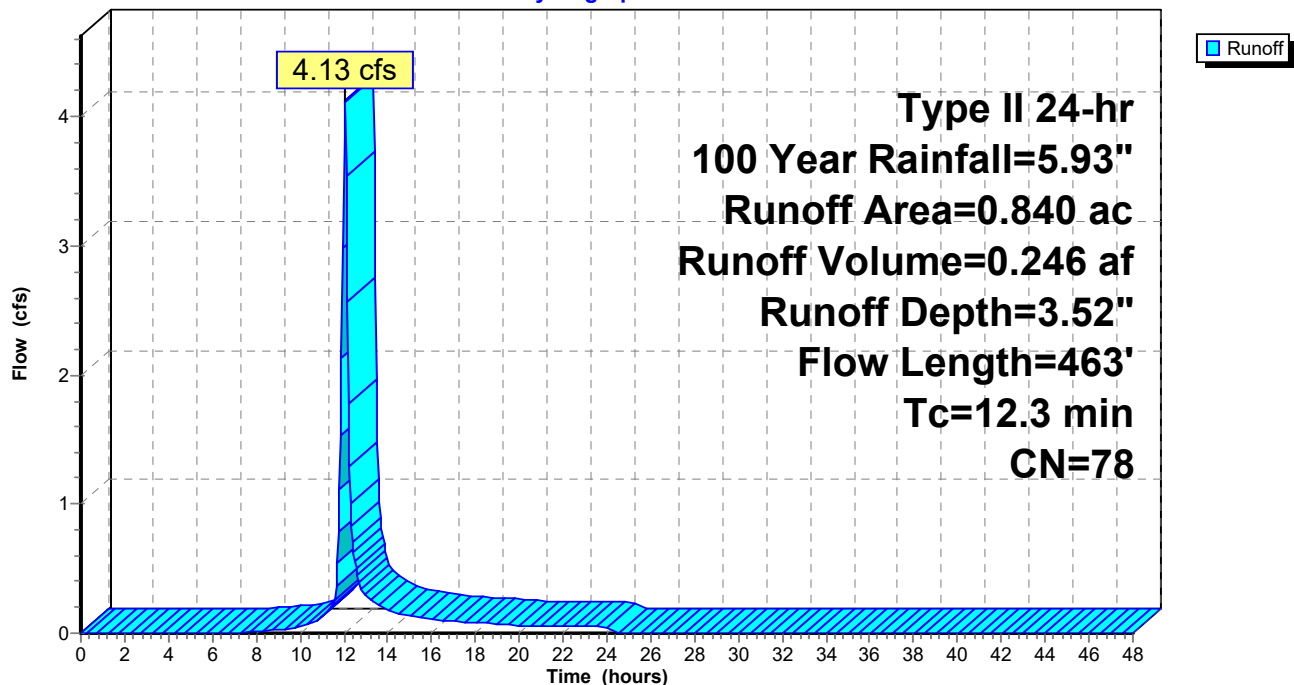
Area (ac)	CN	Description
0.840	78	Meadow, non-grazed, HSG D
0.840		100.00% Pervious Area

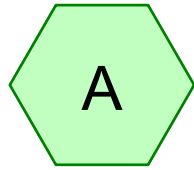
  

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0800	0.19		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.4	363	0.0660	1.80		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
12.3	463	Total			

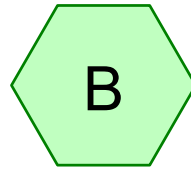
### Subcatchment I: Watershed I

Hydrograph



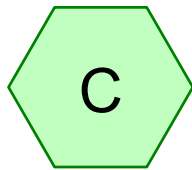


Watershed A (West  
Array)

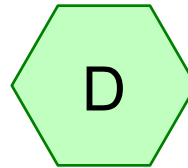


Watershed B (West  
Array)

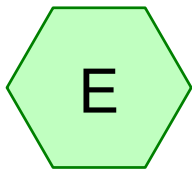
## SOUTH PLANT PRE-DEVELOPMENT ANALYSIS



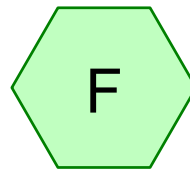
Watershed C (East  
Array)



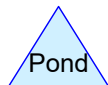
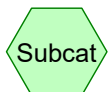
Watershed D (East  
Array)



Watershed E (East  
Array)



Watershed F (East  
Array)



**Routing Diagram for Pre-Developed Model (SOUTH PLANT)**

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## Pre-Developed Model (SOUTH PLANT)

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### Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.050	78	Meadow, non-grazed, HSG D (A)
50.110	80	Pasture/grassland/range, Good, HSG D (B)
65.790	79	Woods/grass comb., Good, HSG D (C, D, E, F)
<b>117.950</b>	<b>79</b>	<b>TOTAL AREA</b>

## Pre-Developed Model (SOUTH PLANT)

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### Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
117.950	HSG D	A, B, C, D, E, F
0.000	Other	
<b>117.950</b>		<b>TOTAL AREA</b>

## Pre-Developed Model (SOUTH PLANT)

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### Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	2.050	0.000	2.050	Meadow, non-grazed	A
0.000	0.000	0.000	50.110	0.000	50.110	Pasture/grassland/range, Good	B
0.000	0.000	0.000	65.790	0.000	65.790	Woods/grass comb., Good	C, D, E, F
<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>117.950</b>	<b>0.000</b>	<b>117.950</b>	<b>TOTAL AREA</b>	

## Pre-Developed Model (SOUTH PLANT)

Type II 24-hr 1 Year Rainfall=2.01"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A (West Array)** Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=623' Tc=27.2 min CN=78 Runoff=0.80 cfs 0.084 af

**Subcatchment B: Watershed B (West Array)** Runoff Area=50.110 ac 0.00% Impervious Runoff Depth=0.57"  
Flow Length=2,811' Tc=47.5 min CN=80 Runoff=15.92 cfs 2.374 af

**Subcatchment C: Watershed C (East Array)** Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=0.53"  
Flow Length=126' Slope=0.0700 '/' Tc=9.6 min CN=79 Runoff=0.15 cfs 0.008 af

**Subcatchment D: Watershed D (East Array)** Runoff Area=17.260 ac 0.00% Impervious Runoff Depth=0.53"  
Flow Length=1,701' Tc=28.7 min CN=79 Runoff=7.15 cfs 0.760 af

**Subcatchment E: Watershed E (East Array)** Runoff Area=24.550 ac 0.00% Impervious Runoff Depth=0.53"  
Flow Length=1,635' Tc=27.5 min CN=79 Runoff=10.47 cfs 1.081 af

**Subcatchment F: Watershed F (East Array)** Runoff Area=23.790 ac 0.00% Impervious Runoff Depth=0.53"  
Flow Length=1,624' Tc=30.4 min CN=79 Runoff=9.44 cfs 1.047 af

**Total Runoff Area = 117.950 ac Runoff Volume = 5.355 af Average Runoff Depth = 0.54"**  
**100.00% Pervious = 117.950 ac 0.00% Impervious = 0.000 ac**

**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment A: Watershed A (West Array)**

Runoff = 0.80 cfs @ 12.24 hrs, Volume= 0.084 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

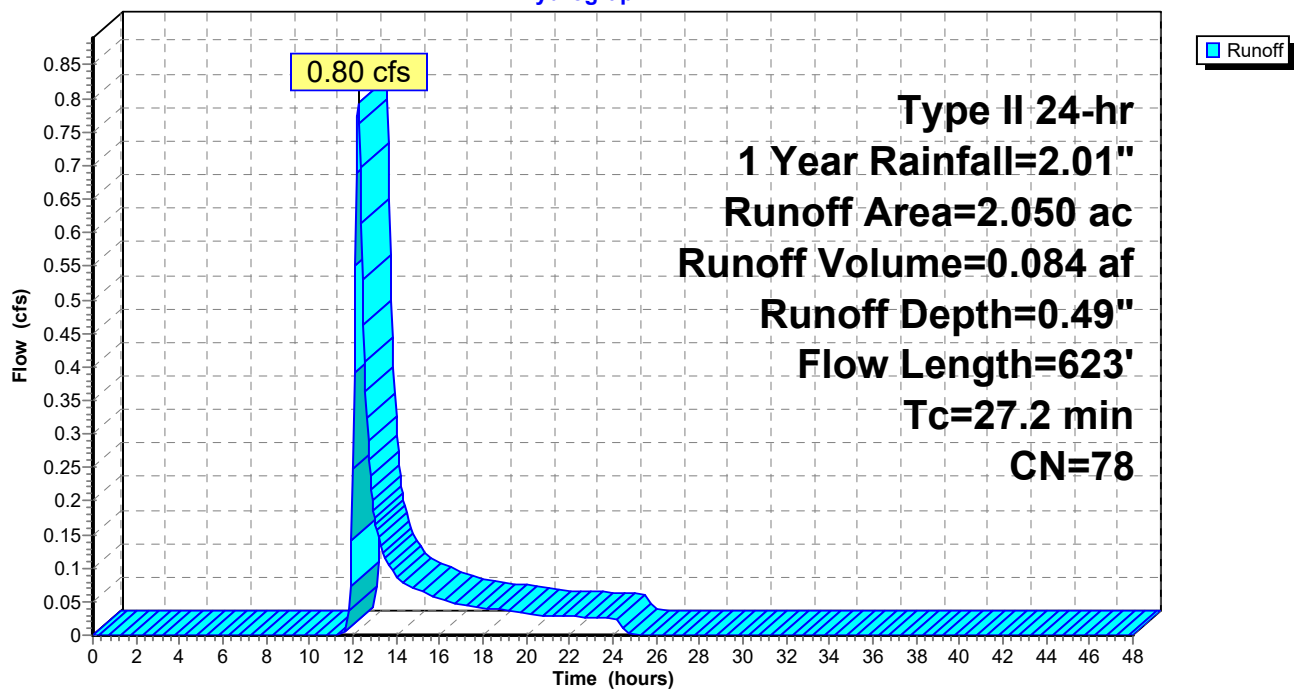
Area (ac)	CN	Description
2.050	78	Meadow, non-grazed, HSG D
2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b>
					Grass: Dense n= 0.240 P2= 2.70"
11.7	523	0.0114	0.75		<b>Shallow Concentrated Flow, B-C</b>
					Short Grass Pasture Kv= 7.0 fps
27.2	623	Total			

**Subcatchment A: Watershed A (West Array)**

Hydrograph



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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment B: Watershed B (West Array)**

Runoff = 15.92 cfs @ 12.51 hrs, Volume= 2.374 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

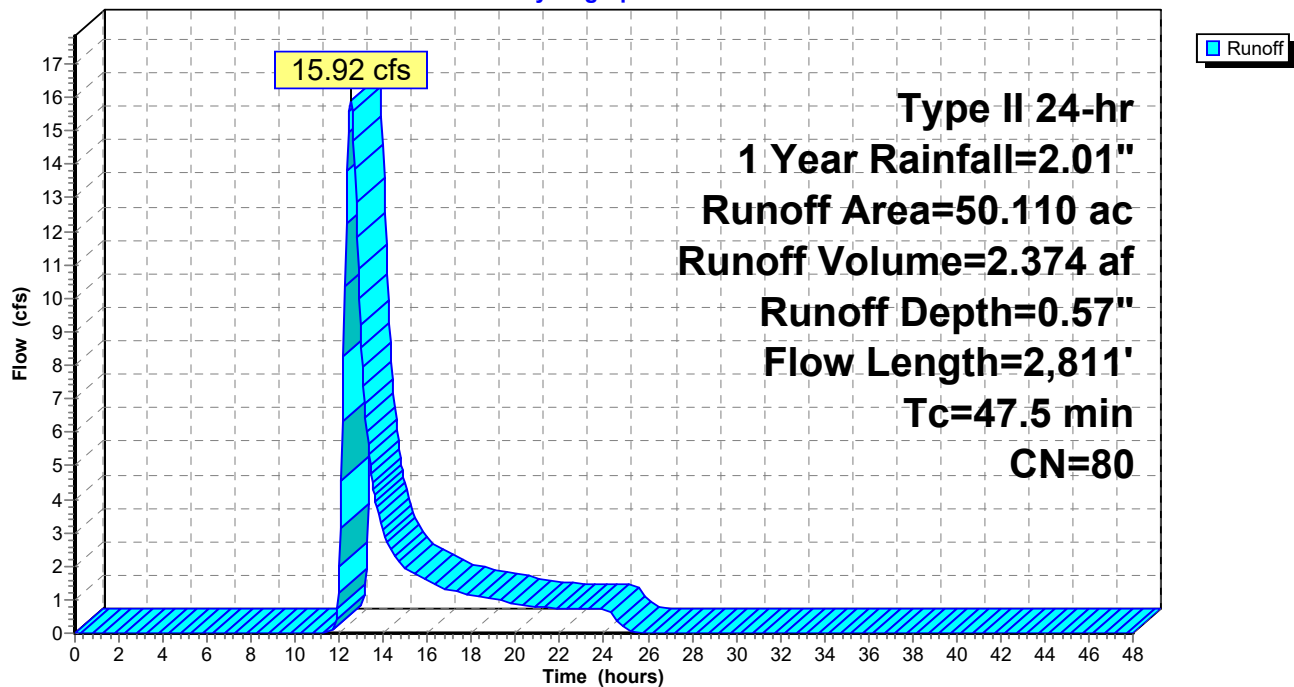
Area (ac)	CN	Description
50.110	80	Pasture/grassland/range, Good, HSG D
50.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
32.0	2,711	0.0406	1.41		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
47.5	2,811	Total			

**Subcatchment B: Watershed B (West Array)**

Hydrograph



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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment C: Watershed C (East Array)**

Runoff = 0.15 cfs @ 12.02 hrs, Volume= 0.008 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

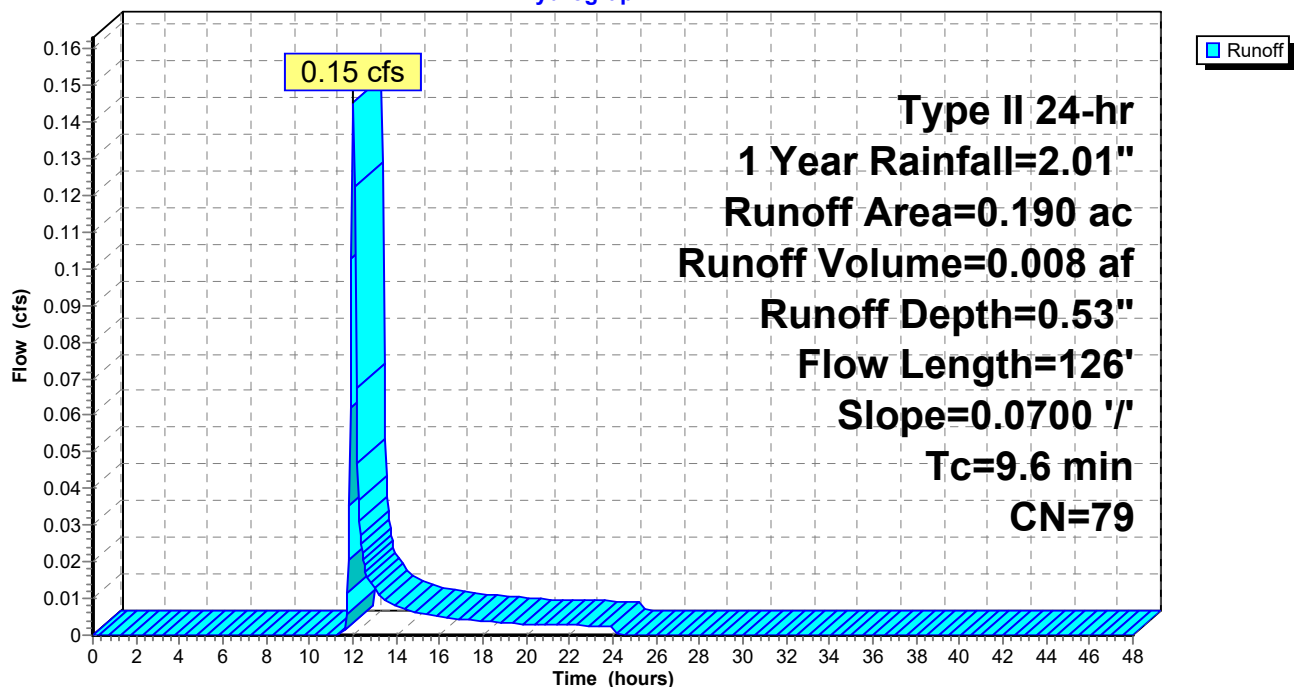
Area (ac)	CN	Description
0.190	79	Woods/grass comb., Good, HSG D
0.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0700	0.18		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
0.2	26	0.0700	1.85		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
9.6	126	Total			

**Subcatchment C: Watershed C (East Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment D: Watershed D (East Array)**

Runoff = 7.15 cfs @ 12.26 hrs, Volume= 0.760 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

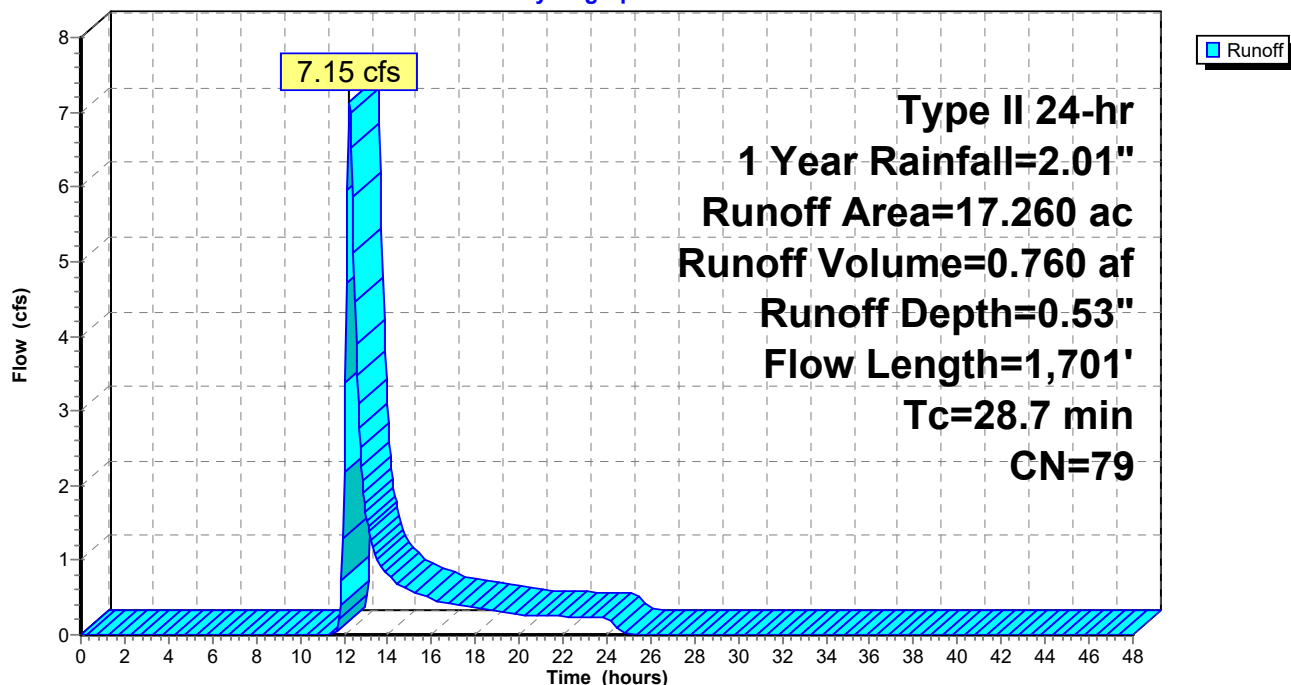
Area (ac)	CN	Description
17.260	79	Woods/grass comb., Good, HSG D
17.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
10.4	898	0.0423	1.44		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.7	321	0.0747	3.18	0.95	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.035 Earth, dense weeds
4.8	382	0.0366	1.34		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
28.7	1,701	Total			

**Subcatchment D: Watershed D (East Array)**

Hydrograph





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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment E: Watershed E (East Array)**

Runoff = 10.47 cfs @ 12.24 hrs, Volume= 1.081 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

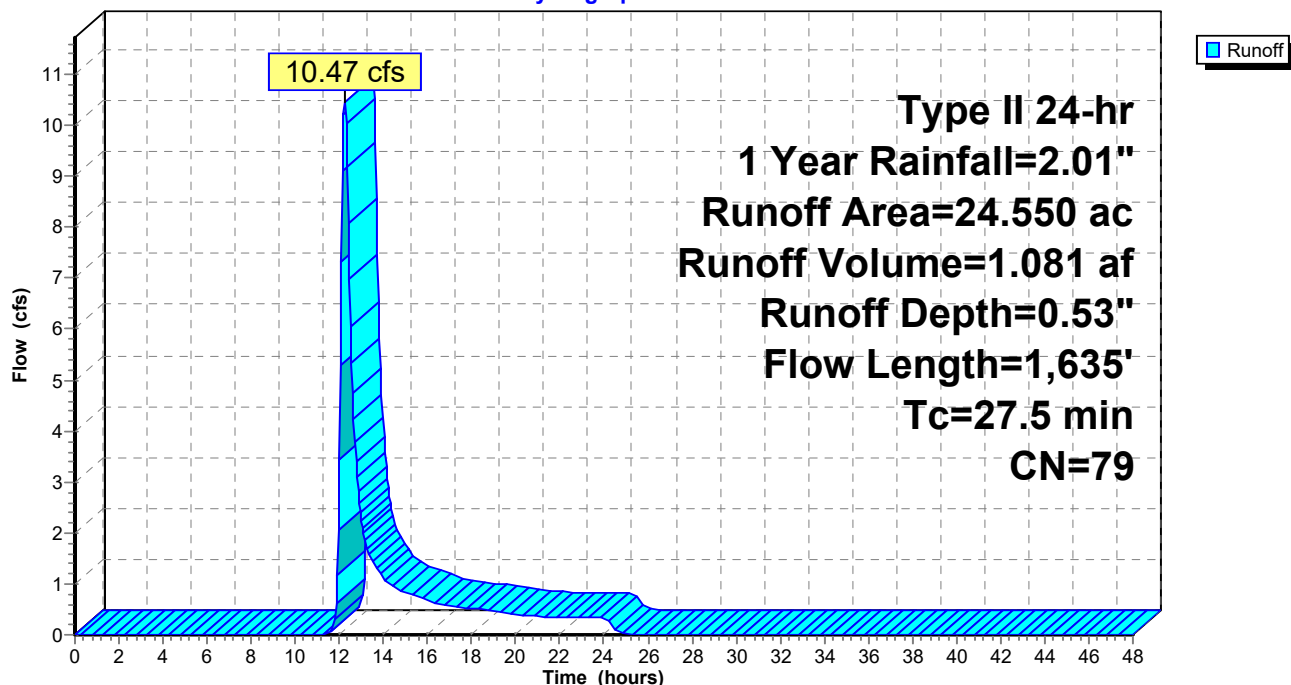
Area (ac)	CN	Description
24.550	79	Woods/grass comb., Good, HSG D
24.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
4.2	335	0.0358	1.32		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
4.1	520	0.0538	2.09	0.42	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.2 ' Top.W=0.40' n= 0.035 Earth, dense weeds
9.2	680	0.0309	1.23		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
27.5	1,635	Total			

**Subcatchment E: Watershed E (East Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment F: Watershed F (East Array)**

Runoff = 9.44 cfs @ 12.28 hrs, Volume= 1.047 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

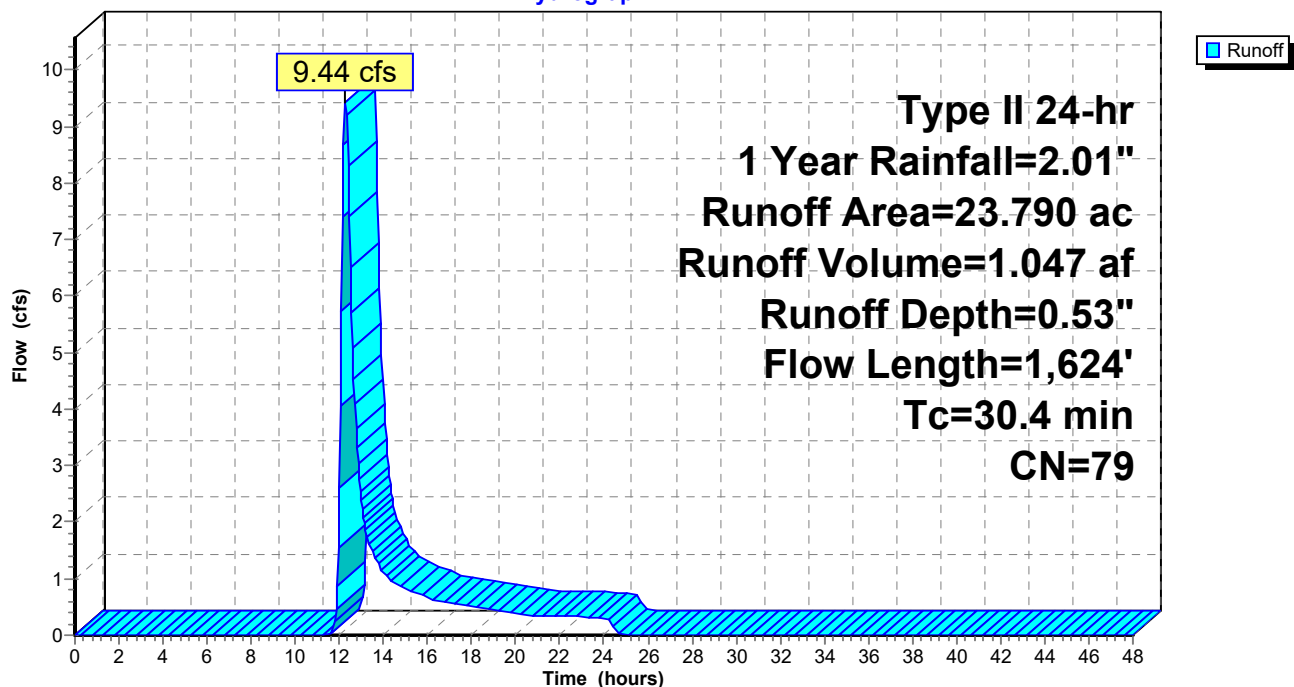
Area (ac)	CN	Description
23.790	79	Woods/grass comb., Good, HSG D
23.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.6	1,524	0.0380	1.36		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
30.4	1,624	Total			

**Subcatchment F: Watershed F (East Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)***Type II 24-hr 10 Year Rainfall=3.43"*

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A (West Array)** Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=623' Tc=27.2 min CN=78 Runoff=2.67 cfs 0.247 af

**Subcatchment B: Watershed B (West Array)** Runoff Area=50.110 ac 0.00% Impervious Runoff Depth=1.58"  
Flow Length=2,811' Tc=47.5 min CN=80 Runoff=49.14 cfs 6.602 af

**Subcatchment C: Watershed C (East Array)** Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=1.51"  
Flow Length=126' Slope=0.0700 '/' Tc=9.6 min CN=79 Runoff=0.44 cfs 0.024 af

**Subcatchment D: Watershed D (East Array)** Runoff Area=17.260 ac 0.00% Impervious Runoff Depth=1.51"  
Flow Length=1,701' Tc=28.7 min CN=79 Runoff=22.83 cfs 2.174 af

**Subcatchment E: Watershed E (East Array)** Runoff Area=24.550 ac 0.00% Impervious Runoff Depth=1.51"  
Flow Length=1,635' Tc=27.5 min CN=79 Runoff=33.45 cfs 3.093 af

**Subcatchment F: Watershed F (East Array)** Runoff Area=23.790 ac 0.00% Impervious Runoff Depth=1.51"  
Flow Length=1,624' Tc=30.4 min CN=79 Runoff=30.30 cfs 2.997 af

**Total Runoff Area = 117.950 ac Runoff Volume = 15.137 af Average Runoff Depth = 1.54"**  
**100.00% Pervious = 117.950 ac 0.00% Impervious = 0.000 ac**

**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment A: Watershed A (West Array)**

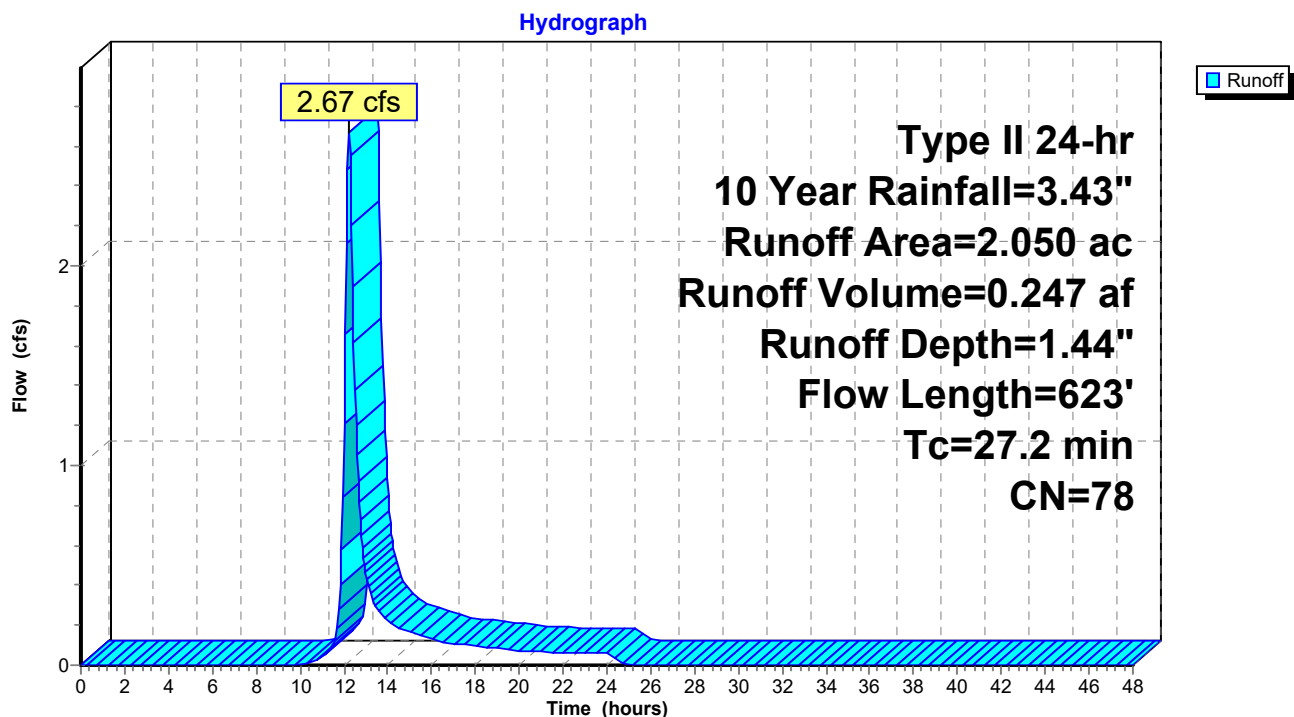
Runoff = 2.67 cfs @ 12.22 hrs, Volume= 0.247 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

Area (ac)	CN	Description
2.050	78	Meadow, non-grazed, HSG D
2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	523	0.0114	0.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
27.2	623	Total			

**Subcatchment A: Watershed A (West Array)**

**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment B: Watershed B (West Array)**

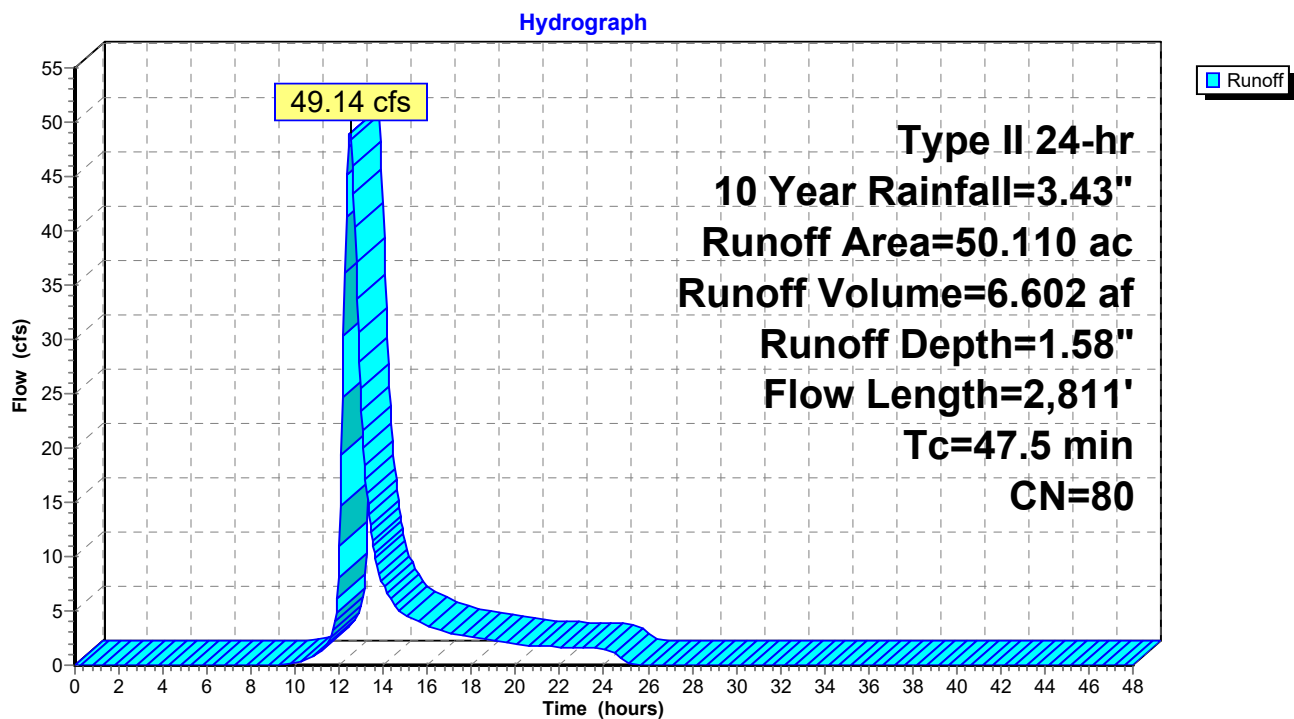
Runoff = 49.14 cfs @ 12.48 hrs, Volume= 6.602 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

Area (ac)	CN	Description
50.110	80	Pasture/grassland/range, Good, HSG D
50.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
32.0	2,711	0.0406	1.41		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
47.5	2,811	Total			

**Subcatchment B: Watershed B (West Array)**

**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment C: Watershed C (East Array)**

Runoff = 0.44 cfs @ 12.01 hrs, Volume= 0.024 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

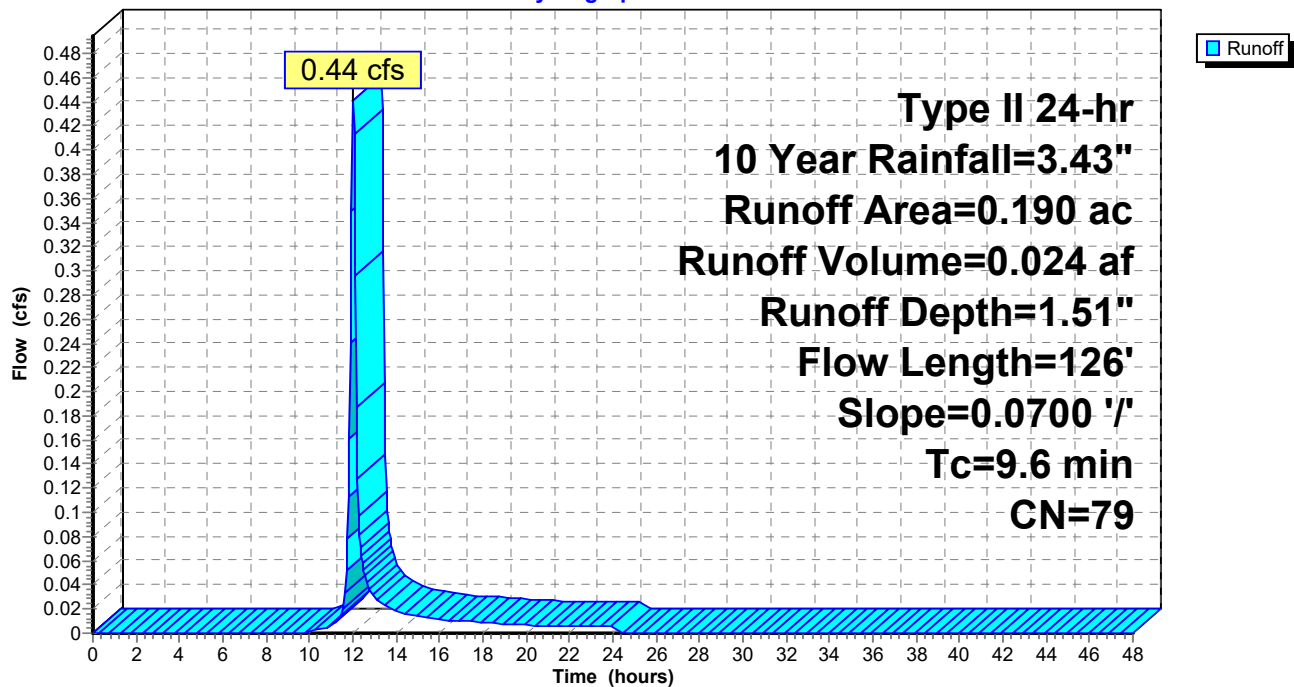
Area (ac)	CN	Description
0.190	79	Woods/grass comb., Good, HSG D
0.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0700	0.18		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
0.2	26	0.0700	1.85		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
9.6	126	Total			

**Subcatchment C: Watershed C (East Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment D: Watershed D (East Array)**

Runoff = 22.83 cfs @ 12.24 hrs, Volume= 2.174 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

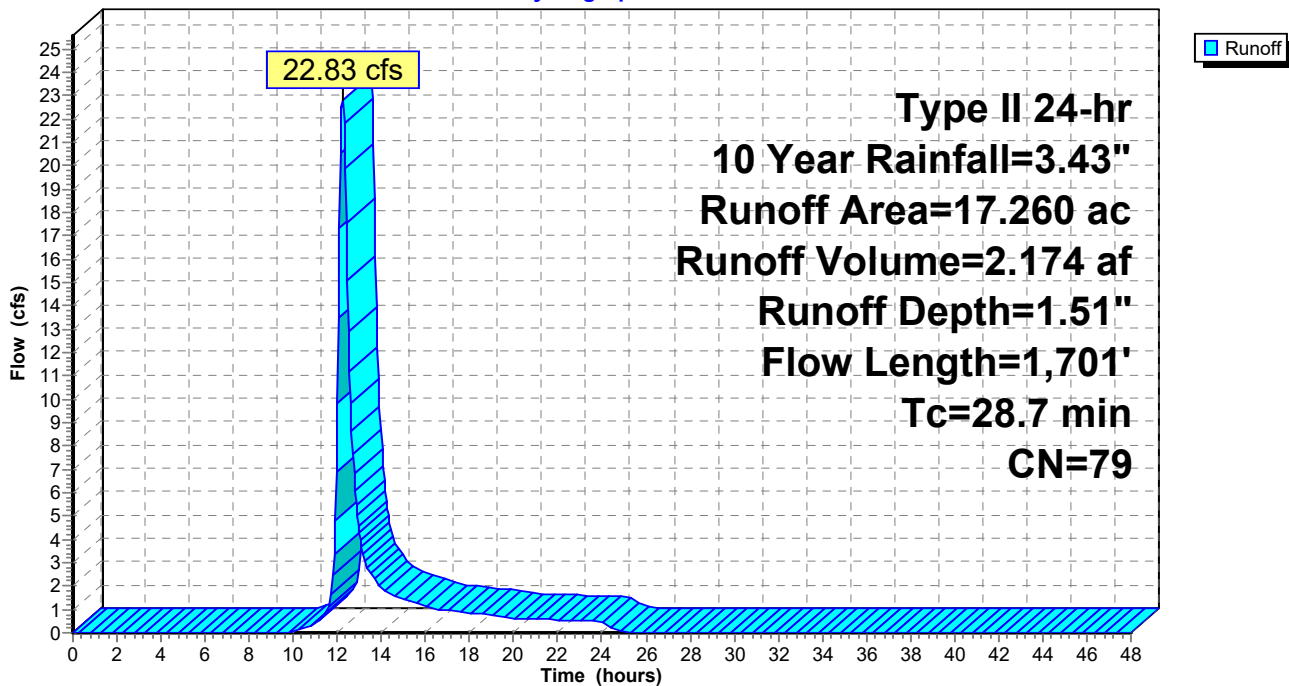
Area (ac)	CN	Description
17.260	79	Woods/grass comb., Good, HSG D
17.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
10.4	898	0.0423	1.44		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.7	321	0.0747	3.18	0.95	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.035 Earth, dense weeds
4.8	382	0.0366	1.34		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
28.7	1,701	Total			

**Subcatchment D: Watershed D (East Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment E: Watershed E (East Array)**

Runoff = 33.45 cfs @ 12.22 hrs, Volume= 3.093 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

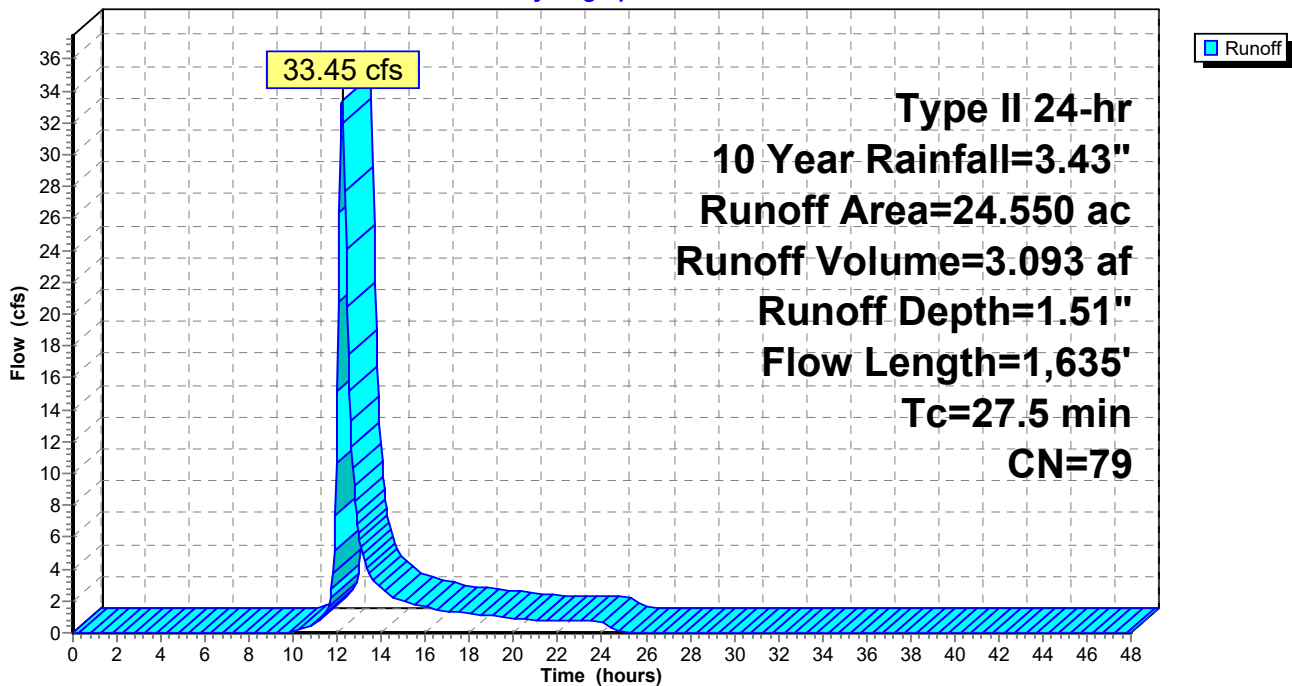
Area (ac)	CN	Description
24.550	79	Woods/grass comb., Good, HSG D
24.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
4.2	335	0.0358	1.32		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
4.1	520	0.0538	2.09	0.42	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.2 '/' Top.W=0.40' n= 0.035 Earth, dense weeds
9.2	680	0.0309	1.23		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
27.5	1,635	Total			

**Subcatchment E: Watershed E (East Array)**

Hydrograph





**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment F: Watershed F (East Array)**

Runoff = 30.30 cfs @ 12.26 hrs, Volume= 2.997 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

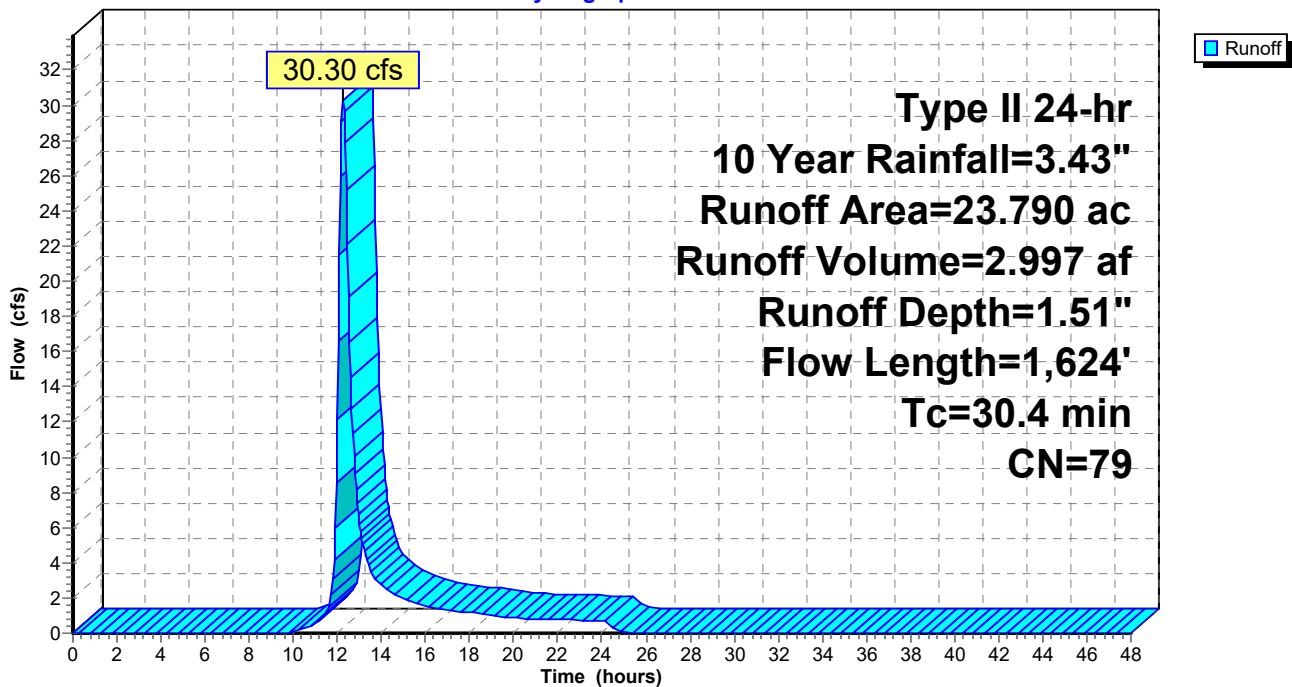
Area (ac)	CN	Description
23.790	79	Woods/grass comb., Good, HSG D
23.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.6	1,524	0.0380	1.36		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
30.4	1,624	Total			

**Subcatchment F: Watershed F (East Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)***Type II 24-hr 25 Year Rainfall=4.26"*

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A (West Array)** Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=623' Tc=27.2 min CN=78 Runoff=3.94 cfs 0.358 af

**Subcatchment B: Watershed B (West Array)** Runoff Area=50.110 ac 0.00% Impervious Runoff Depth=2.26"  
Flow Length=2,811' Tc=47.5 min CN=80 Runoff=71.09 cfs 9.431 af

**Subcatchment C: Watershed C (East Array)** Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=2.18"  
Flow Length=126' Slope=0.0700 '/' Tc=9.6 min CN=79 Runoff=0.64 cfs 0.034 af

**Subcatchment D: Watershed D (East Array)** Runoff Area=17.260 ac 0.00% Impervious Runoff Depth=2.18"  
Flow Length=1,701' Tc=28.7 min CN=79 Runoff=33.30 cfs 3.131 af

**Subcatchment E: Watershed E (East Array)** Runoff Area=24.550 ac 0.00% Impervious Runoff Depth=2.18"  
Flow Length=1,635' Tc=27.5 min CN=79 Runoff=48.77 cfs 4.453 af

**Subcatchment F: Watershed F (East Array)** Runoff Area=23.790 ac 0.00% Impervious Runoff Depth=2.18"  
Flow Length=1,624' Tc=30.4 min CN=79 Runoff=44.22 cfs 4.315 af

**Total Runoff Area = 117.950 ac Runoff Volume = 21.722 af Average Runoff Depth = 2.21"**  
**100.00% Pervious = 117.950 ac 0.00% Impervious = 0.000 ac**

**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment A: Watershed A (West Array)**

Runoff = 3.94 cfs @ 12.22 hrs, Volume= 0.358 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

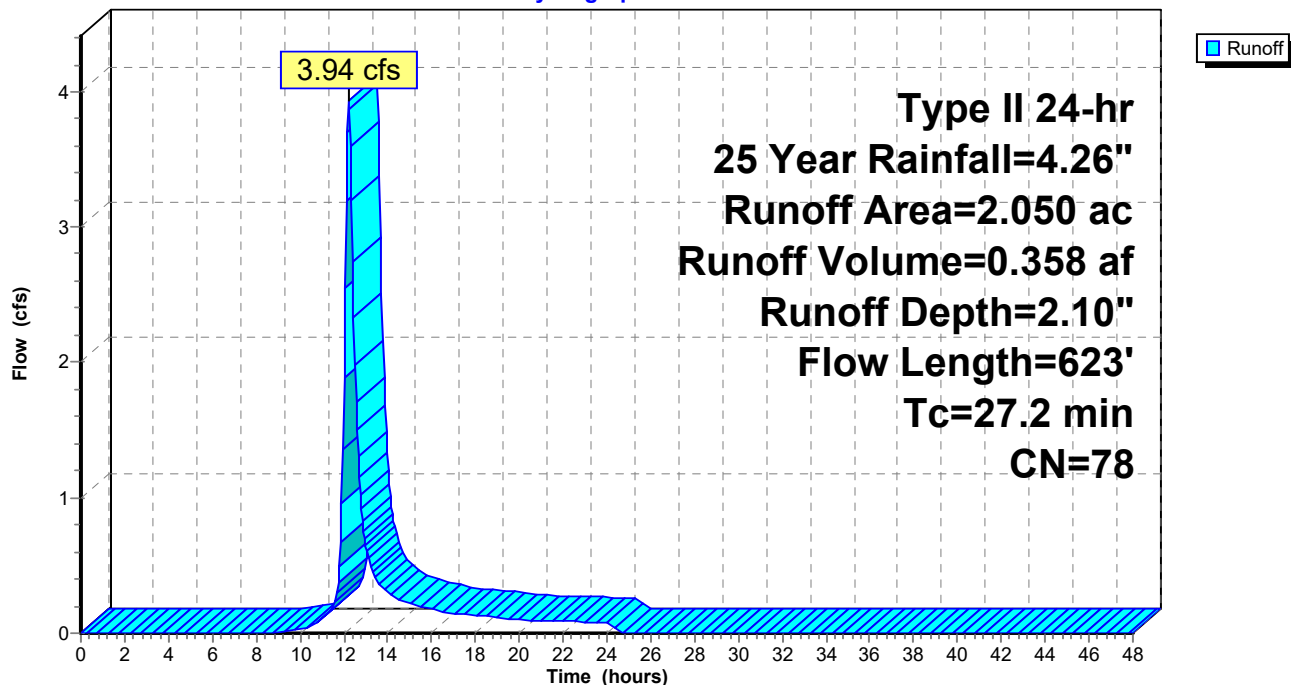
Area (ac)	CN	Description
2.050	78	Meadow, non-grazed, HSG D
2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	523	0.0114	0.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
27.2	623	Total			

**Subcatchment A: Watershed A (West Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment B: Watershed B (West Array)**

Runoff = 71.09 cfs @ 12.47 hrs, Volume= 9.431 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

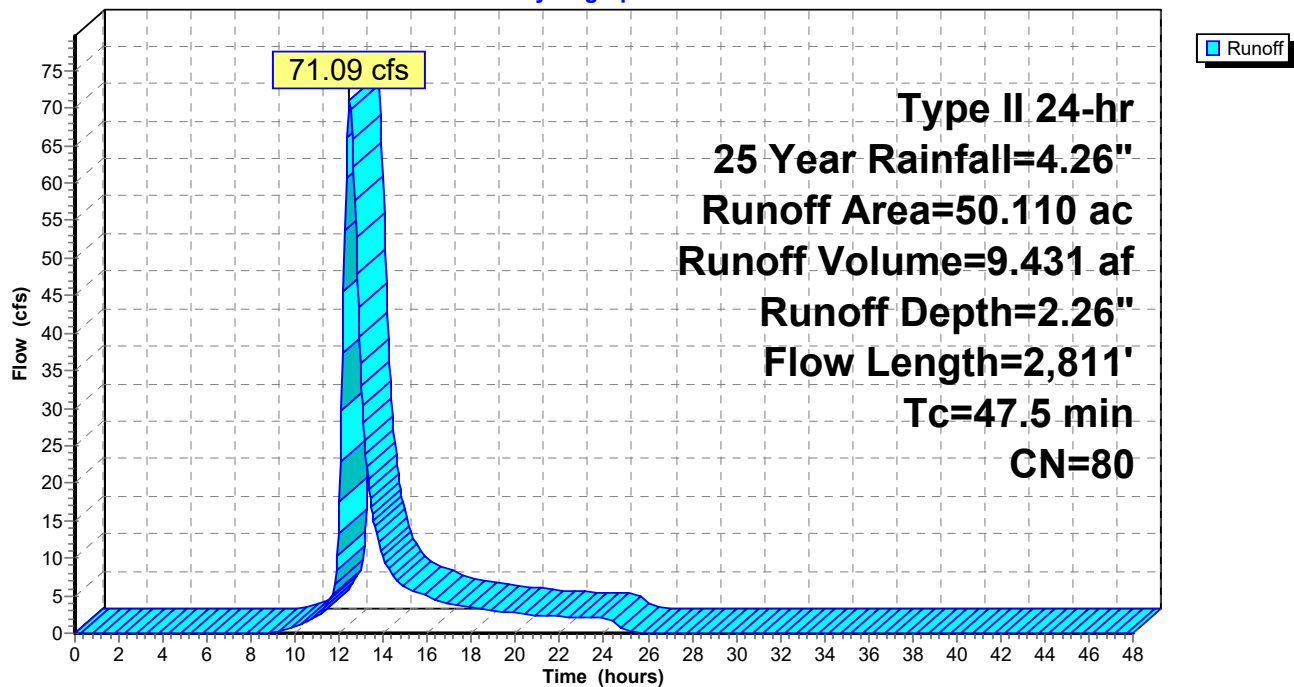
Area (ac)	CN	Description
50.110	80	Pasture/grassland/range, Good, HSG D
50.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
32.0	2,711	0.0406	1.41		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
47.5	2,811	Total			

**Subcatchment B: Watershed B (West Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment C: Watershed C (East Array)**

Runoff = 0.64 cfs @ 12.01 hrs, Volume= 0.034 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

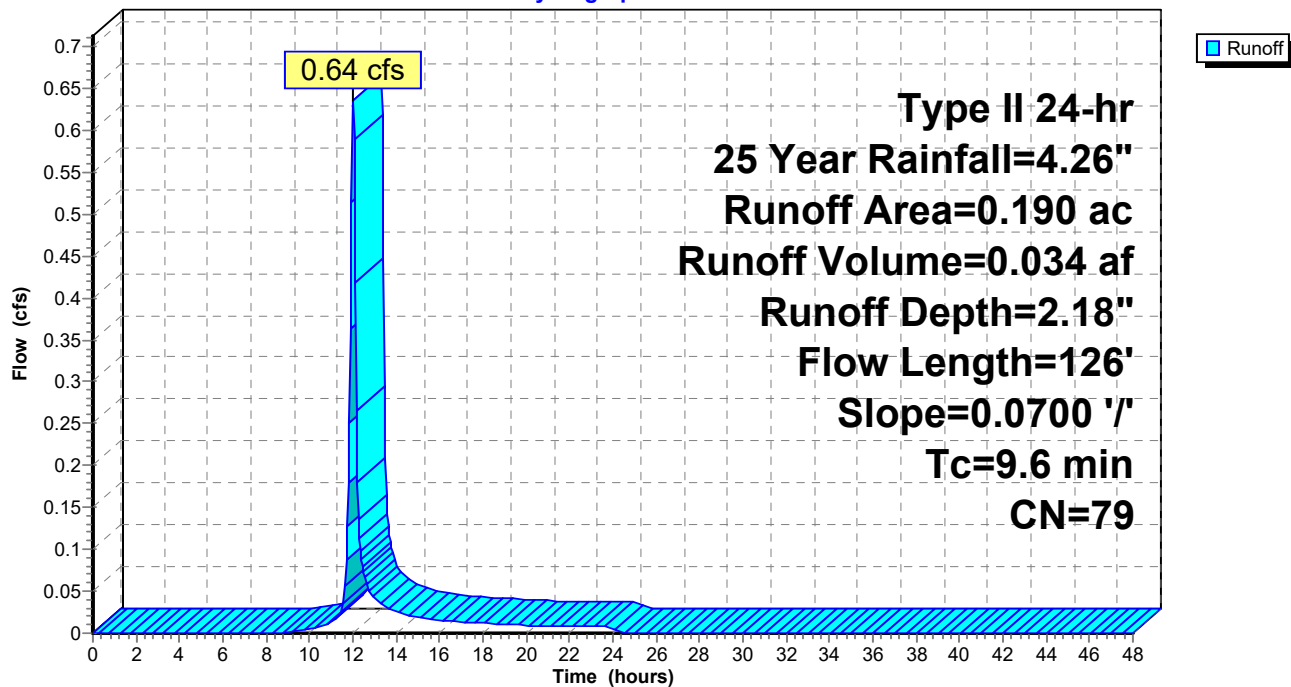
Area (ac)	CN	Description
0.190	79	Woods/grass comb., Good, HSG D
0.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0700	0.18		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
0.2	26	0.0700	1.85		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
9.6	126	Total			

**Subcatchment C: Watershed C (East Array)**

Hydrograph



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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment D: Watershed D (East Array)**

Runoff = 33.30 cfs @ 12.23 hrs, Volume= 3.131 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

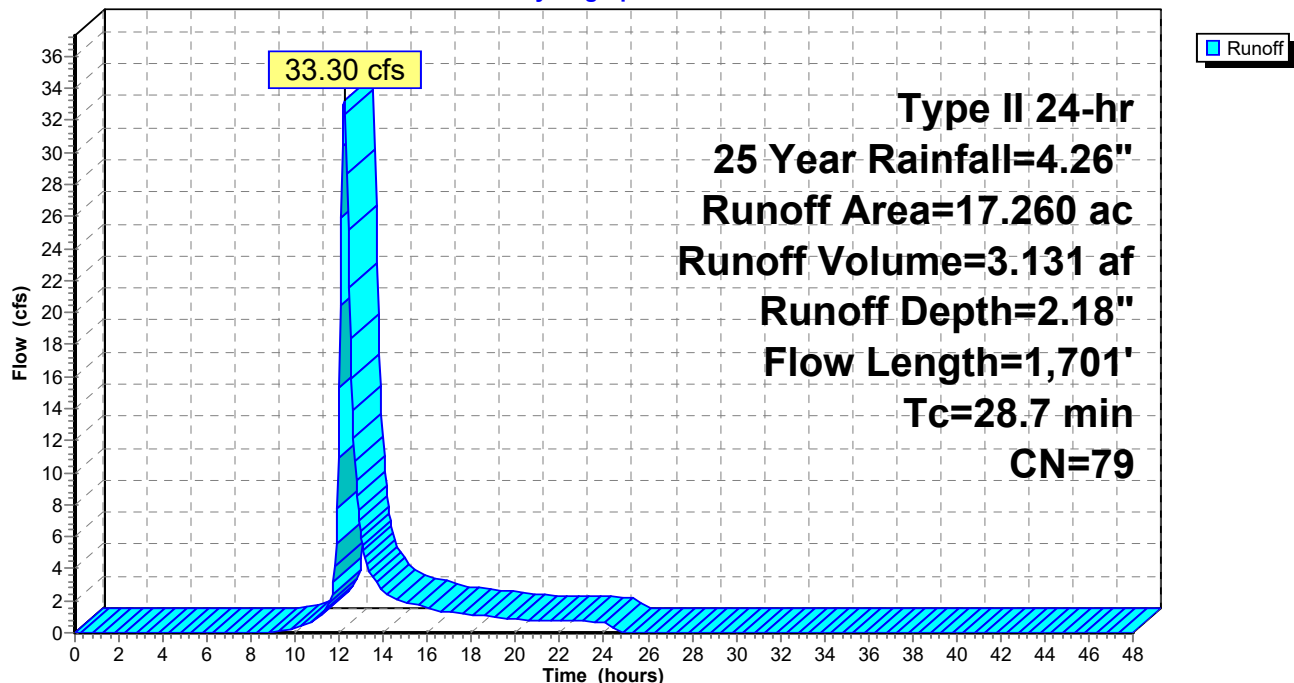
Area (ac)	CN	Description
17.260	79	Woods/grass comb., Good, HSG D
17.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
10.4	898	0.0423	1.44		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.7	321	0.0747	3.18	0.95	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 ' Top.W=0.60' n= 0.035 Earth, dense weeds
4.8	382	0.0366	1.34		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
28.7	1,701	Total			

**Subcatchment D: Watershed D (East Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment E: Watershed E (East Array)**

Runoff = 48.77 cfs @ 12.22 hrs, Volume= 4.453 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

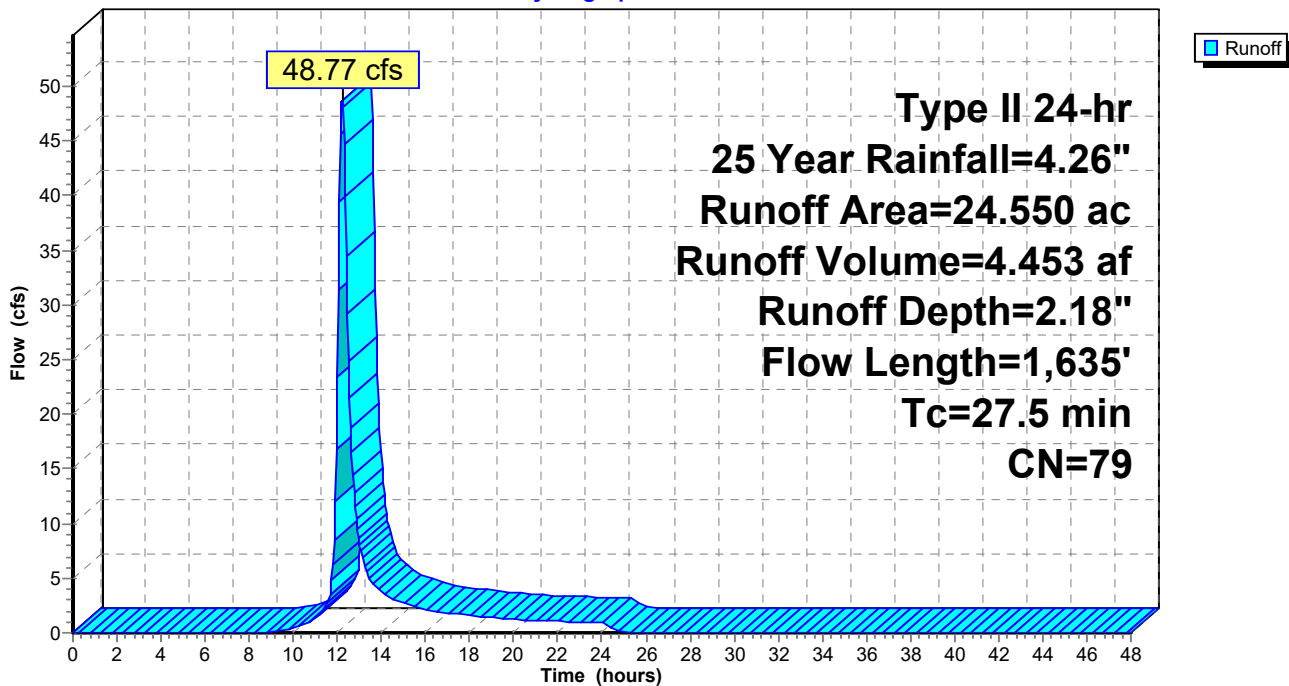
Area (ac)	CN	Description
24.550	79	Woods/grass comb., Good, HSG D
24.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
4.2	335	0.0358	1.32		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
4.1	520	0.0538	2.09	0.42	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.2 '/' Top.W=0.40' n= 0.035 Earth, dense weeds
9.2	680	0.0309	1.23		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
27.5	1,635	Total			

**Subcatchment E: Watershed E (East Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment F: Watershed F (East Array)**

Runoff = 44.22 cfs @ 12.25 hrs, Volume= 4.315 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

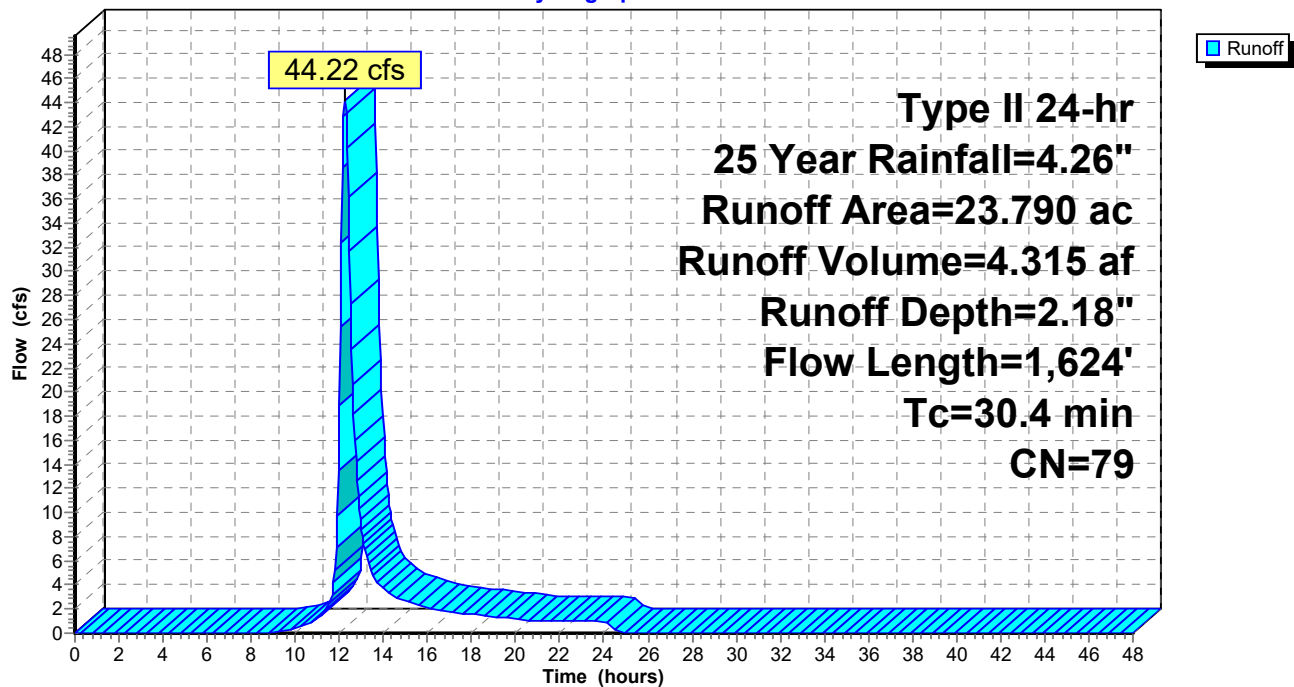
Area (ac)	CN	Description
23.790	79	Woods/grass comb., Good, HSG D
23.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.6	1,524	0.0380	1.36		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
30.4	1,624	Total			

**Subcatchment F: Watershed F (East Array)**

Hydrograph





**Pre-Developed Model (SOUTH PLANT)***Type II 24-hr 100 Year Rainfall=5.93"*

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A (West Array)** Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=623' Tc=27.2 min CN=78 Runoff=6.65 cfs 0.601 af

**Subcatchment B: Watershed B (West Array)** Runoff Area=50.110 ac 0.00% Impervious Runoff Depth=3.72"  
Flow Length=2,811' Tc=47.5 min CN=80 Runoff=117.72 cfs 15.526 af

**Subcatchment C: Watershed C (East Array)** Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=3.62"  
Flow Length=126' Slope=0.0700 '/' Tc=9.6 min CN=79 Runoff=1.05 cfs 0.057 af

**Subcatchment D: Watershed D (East Array)** Runoff Area=17.260 ac 0.00% Impervious Runoff Depth=3.62"  
Flow Length=1,701' Tc=28.7 min CN=79 Runoff=55.71 cfs 5.203 af

**Subcatchment E: Watershed E (East Array)** Runoff Area=24.550 ac 0.00% Impervious Runoff Depth=3.62"  
Flow Length=1,635' Tc=27.5 min CN=79 Runoff=81.37 cfs 7.400 af

**Subcatchment F: Watershed F (East Array)** Runoff Area=23.790 ac 0.00% Impervious Runoff Depth=3.62"  
Flow Length=1,624' Tc=30.4 min CN=79 Runoff=73.86 cfs 7.171 af

**Total Runoff Area = 117.950 ac Runoff Volume = 35.958 af Average Runoff Depth = 3.66"**  
**100.00% Pervious = 117.950 ac 0.00% Impervious = 0.000 ac**

**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment A: Watershed A (West Array)**

Runoff = 6.65 cfs @ 12.21 hrs, Volume= 0.601 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

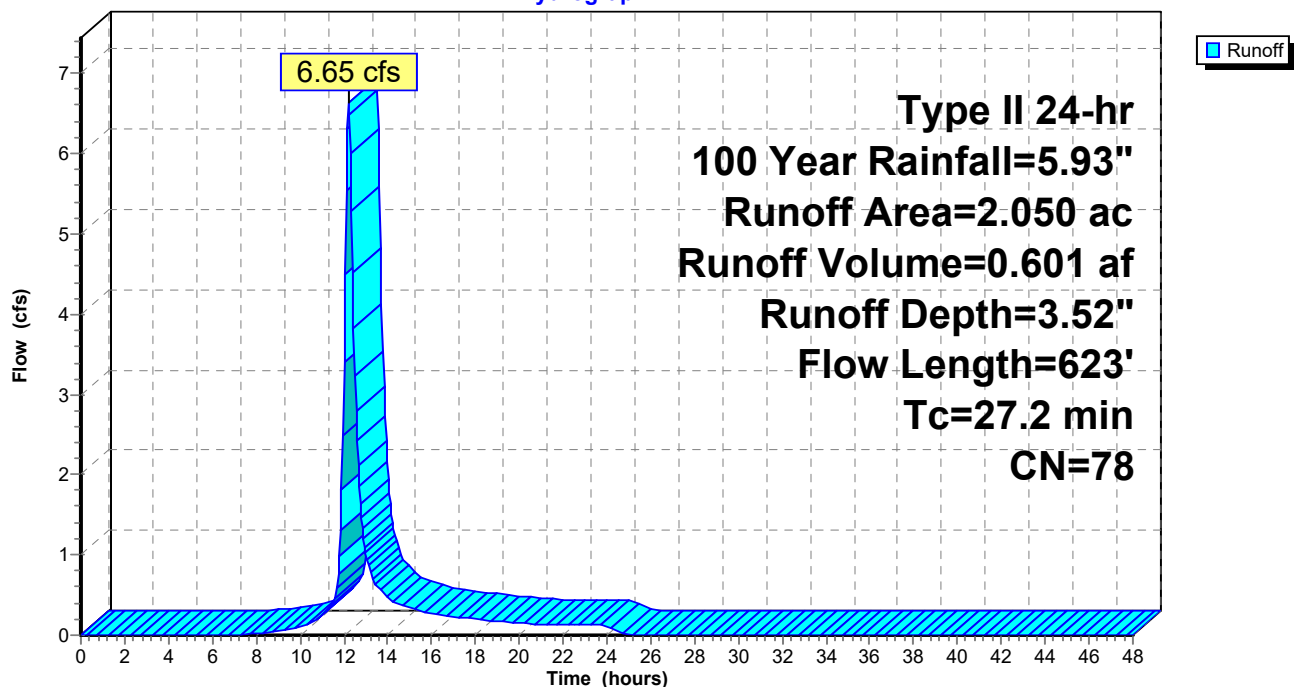
Area (ac)	CN	Description
2.050	78	Meadow, non-grazed, HSG D
2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	523	0.0114	0.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
27.2	623	Total			

**Subcatchment A: Watershed A (West Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment B: Watershed B (West Array)**

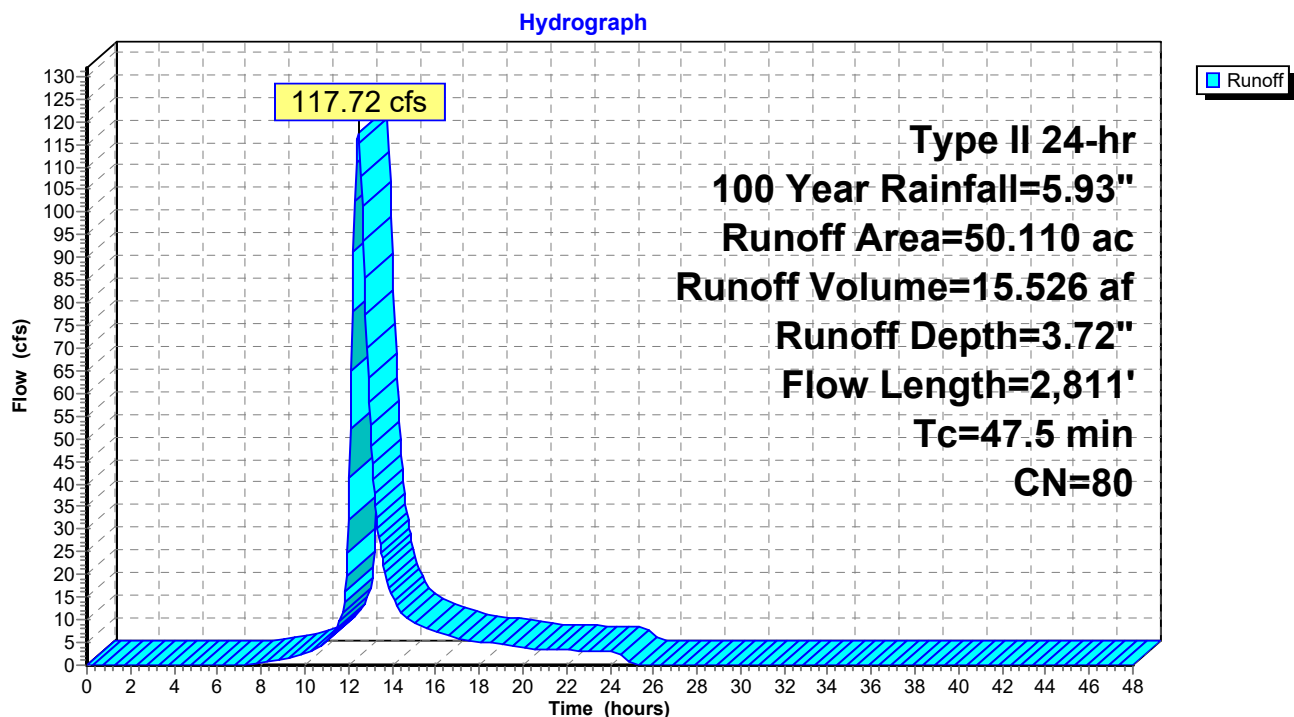
Runoff = 117.72 cfs @ 12.46 hrs, Volume= 15.526 af, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

Area (ac)	CN	Description
50.110	80	Pasture/grassland/range, Good, HSG D
50.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
32.0	2,711	0.0406	1.41		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
47.5	2,811	Total			

**Subcatchment B: Watershed B (West Array)**

**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment C: Watershed C (East Array)**

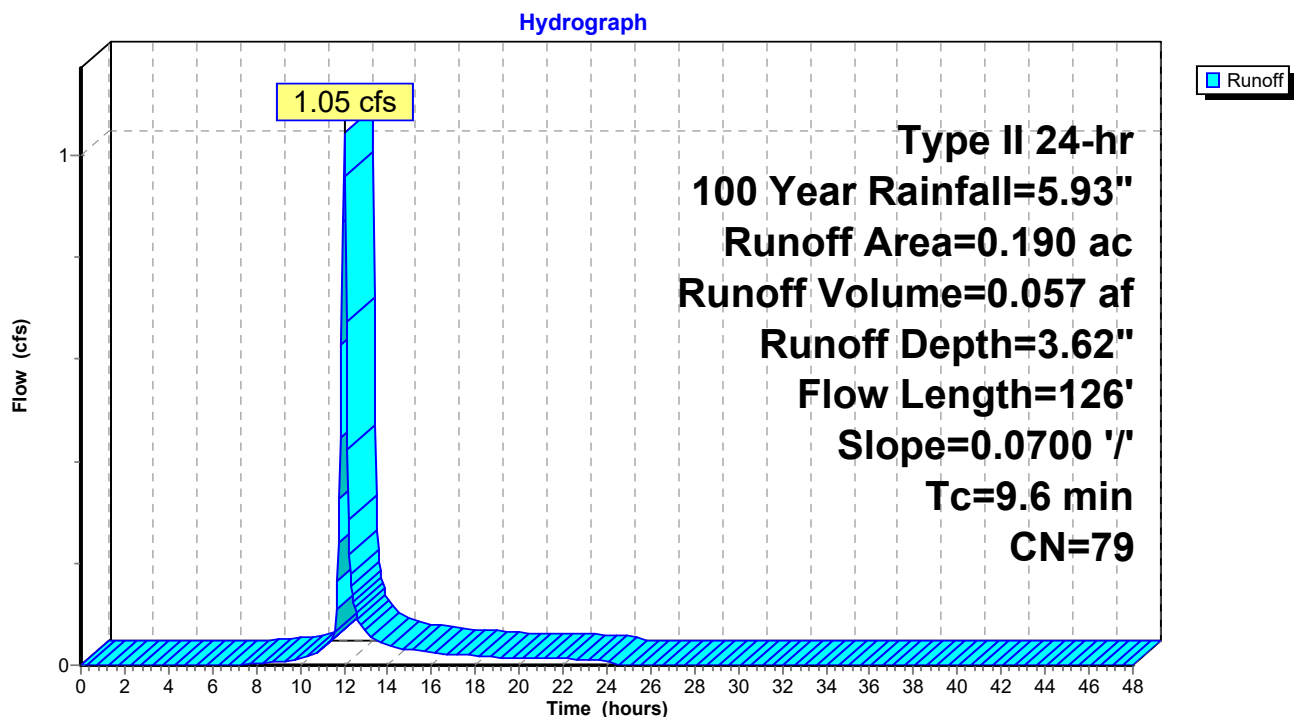
Runoff = 1.05 cfs @ 12.01 hrs, Volume= 0.057 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

Area (ac)	CN	Description
0.190	79	Woods/grass comb., Good, HSG D
0.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0700	0.18		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
0.2	26	0.0700	1.85		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
9.6	126	Total			

**Subcatchment C: Watershed C (East Array)**

**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment D: Watershed D (East Array)**

Runoff = 55.71 cfs @ 12.22 hrs, Volume= 5.203 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

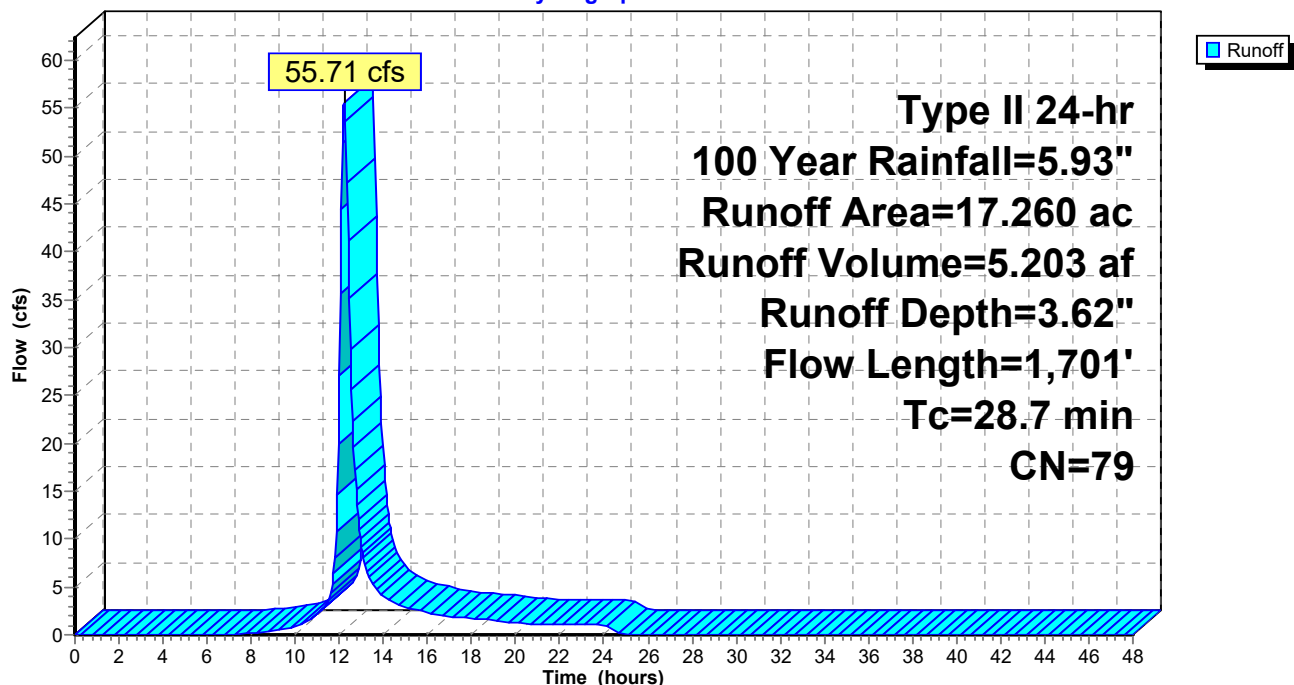
Area (ac)	CN	Description
17.260	79	Woods/grass comb., Good, HSG D
17.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
10.4	898	0.0423	1.44		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.7	321	0.0747	3.18	0.95	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 ' Top.W=0.60' n= 0.035 Earth, dense weeds
4.8	382	0.0366	1.34		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
28.7	1,701	Total			

**Subcatchment D: Watershed D (East Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment E: Watershed E (East Array)**

Runoff = 81.37 cfs @ 12.21 hrs, Volume= 7.400 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

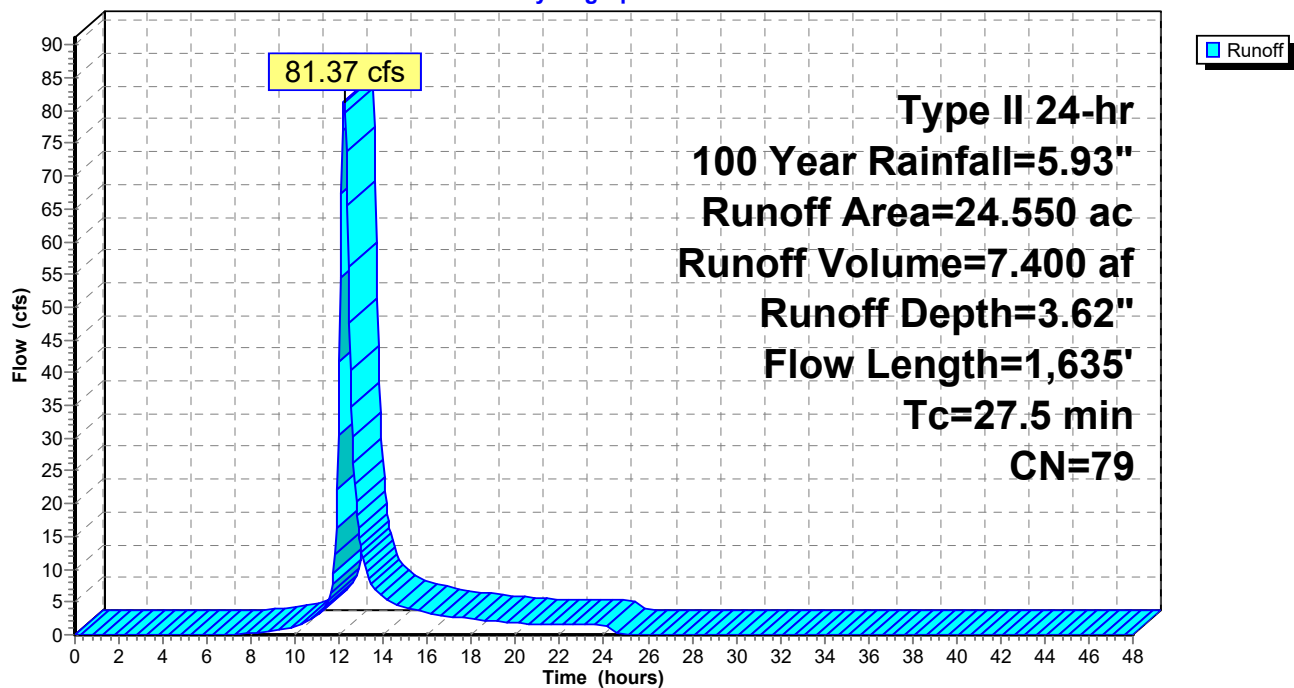
Area (ac)	CN	Description
24.550	79	Woods/grass comb., Good, HSG D
24.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
4.2	335	0.0358	1.32		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
4.1	520	0.0538	2.09	0.42	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.2 '/' Top.W=0.40' n= 0.035 Earth, dense weeds
9.2	680	0.0309	1.23		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
27.5	1,635	Total			

**Subcatchment E: Watershed E (East Array)**

Hydrograph



**Pre-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment F: Watershed F (East Array)**

Runoff = 73.86 cfs @ 12.25 hrs, Volume= 7.171 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

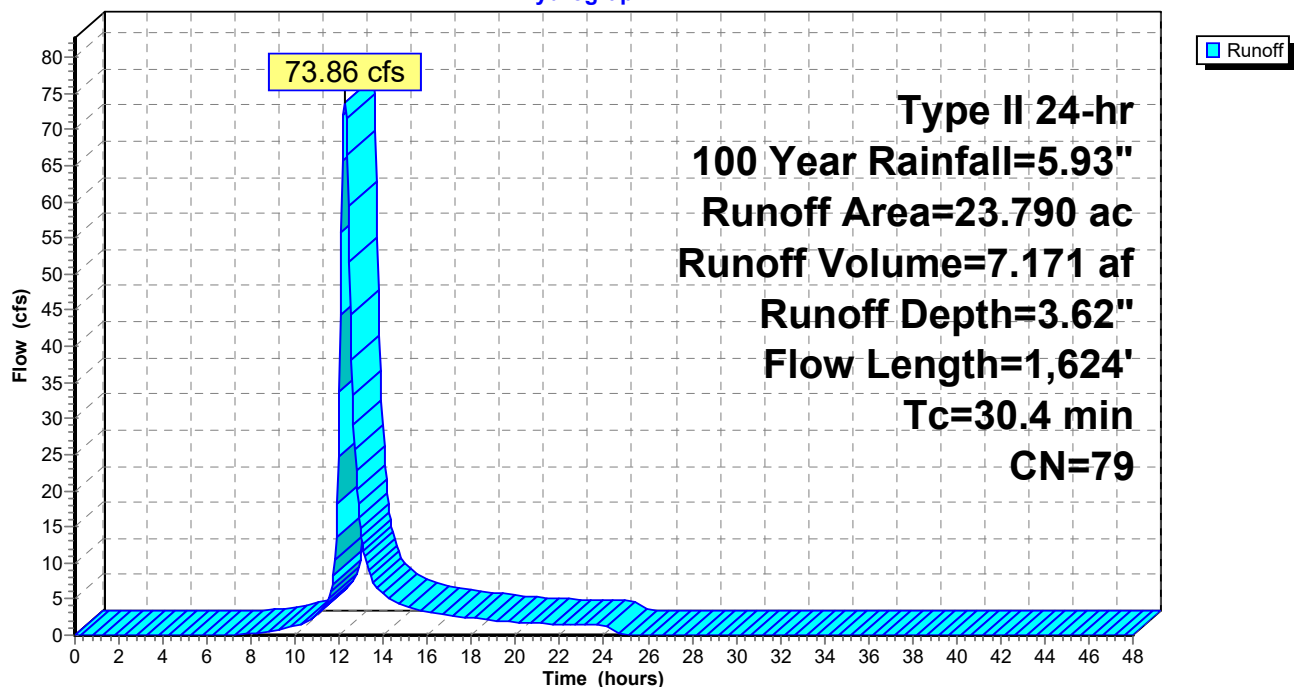
Area (ac)	CN	Description
23.790	79	Woods/grass comb., Good, HSG D
23.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.6	1,524	0.0380	1.36		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
30.4	1,624	Total			

**Subcatchment F: Watershed F (East Array)**

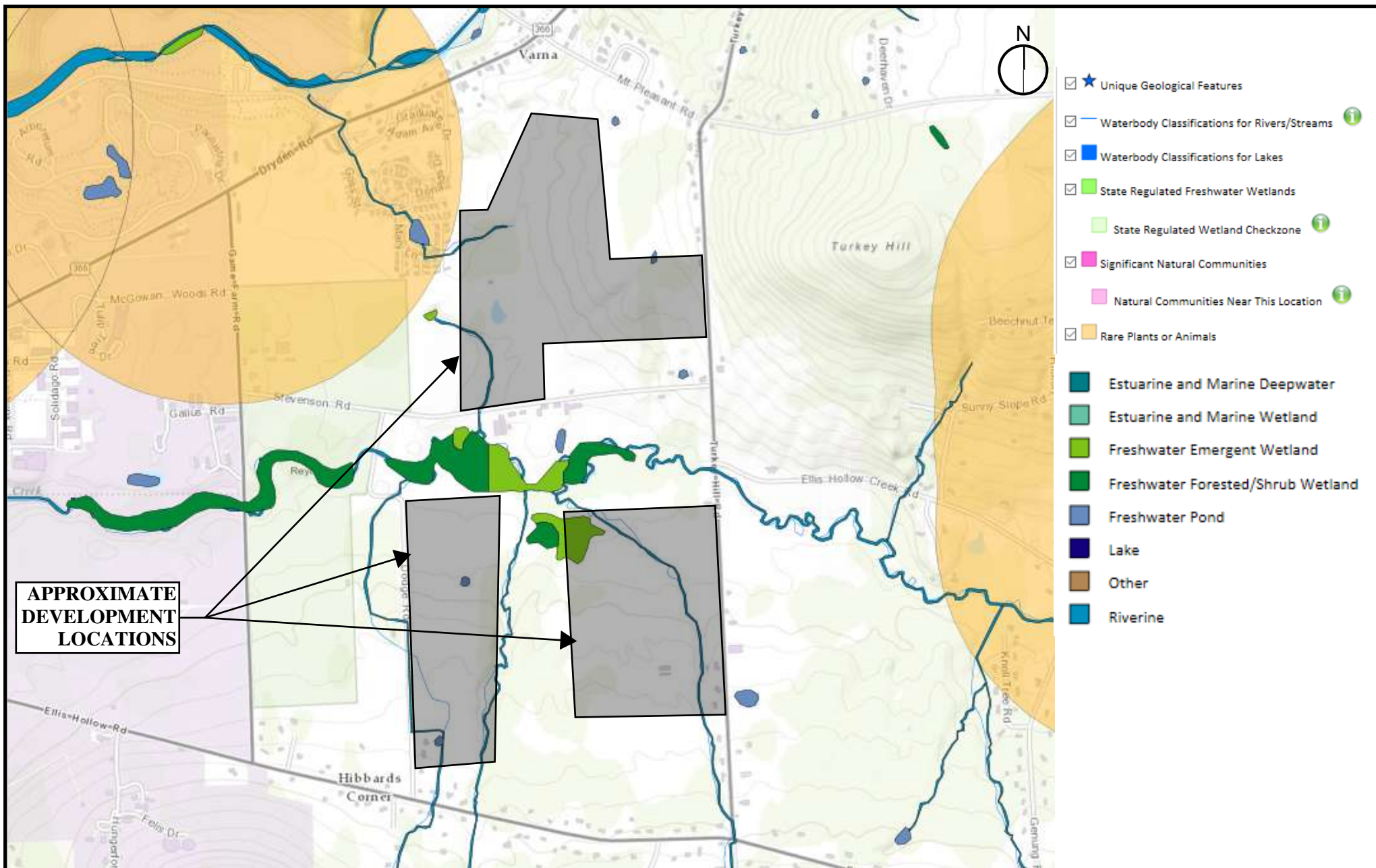
Hydrograph



## **APPENDIX G**

### **NYSDEC Environmental Resource Mapper**





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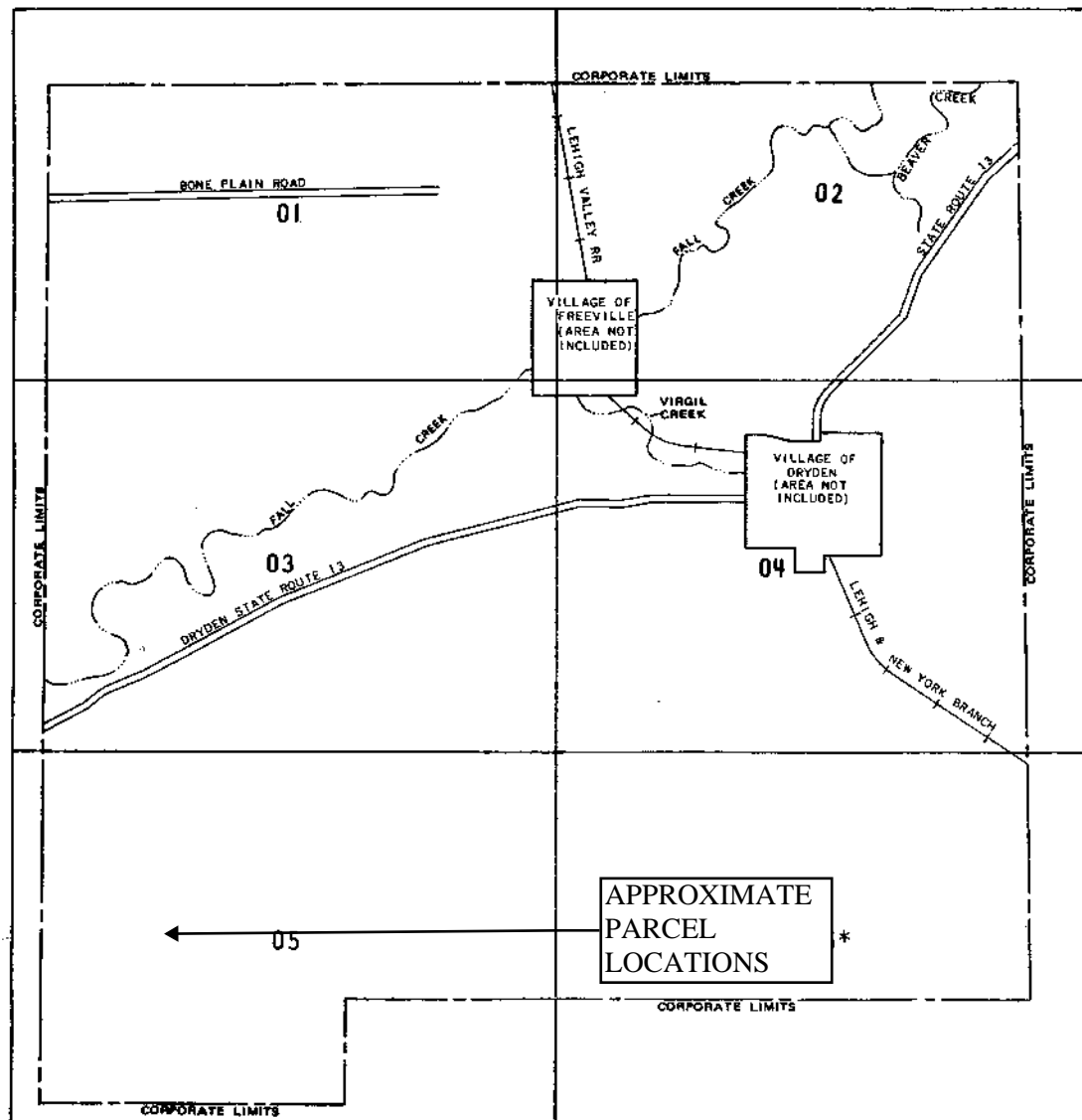
NYSDEC Environmental Resource Mapper

Town of Dryden  
Ellis Tract Solar PV Array

Fig. 2

## **APPENDIX H**

### **FEMA FIRM Panel**



\*PAGE NOT PRINTED - AREA IN ZONE C

# KEY TO SYMBOLS

## ZONE DESIGNATIONS\*

ZONE C
ZONE A
ZONE C

Base Flood Elevation Line with elevation in feet

513

Base Flood Elevation where uniform within zone

(EL 987)

Elevation Reference Mark

RM7x

River Mile

MI 1.6

## \*EXPLANATION OF ZONE DESIGNATIONS

A flood insurance map displays the zone designations for a community according to areas of designated flood hazards. The zone designations used by FEMA are:

Zone	Explanation
A	Areas of 100-year flood, base flood elevations and flood hazard factors not determined
AO	Areas of 100-year shallow flooding, flood depth 1 to 2 feet, product of flood depth (feet) and velocity (feet per second) less than 15
AM	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet, base flood elevations are shown, but no flood hazard factors are determined
A1/A20	Areas of 100-year flood, base flood elevations and flood hazard factors determined
ASB	Areas of 100-year flood to be protected by a flood protection system under construction, base flood elevations and flood hazard factors not determined
B	Areas between limits of 100-year flood and 500-year flood, areas of 100-year shallow flooding where depths less than 1 foot
C	Areas outside 500-year flood
D	Areas of undetermined, but possible, flood hazards
V	Areas of 100-year coastal flood with velocity (wave action), base flood elevations and flood hazard factors not determined
V1-V30	Areas of 100-year coastal flood with velocity (wave action), base flood elevations and flood hazard factor determined

## NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only. It does not necessarily show all areas subject to flooding in the community or all planning features outside special flood hazard areas.

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actual rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

INITIAL IDENTIFICATION: JULY 19, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS: JULY 2, 1976

FLOOD INSURANCE RATE MAP EFFECTIVE: MAY 18, 1985

FLOOD INSURANCE RATE MAP REVISIONS:

federal emergency management agency



**FIRM**  
FLOOD INSURANCE RATE MAP 01-06  
**MAP INDEX**  
**TOWN OF DRYDEN, NY**  
(TOMPKINS CO.)

COMMUNITY NUMBER 360846 B



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FEMA FIRM Panel

Town of Dryden  
Ellis Tract Solar PV Array

Fig. 3

## **APPENDIX I**

### **New York State Office of Historic Preservation Review**



## Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO  
Governor

ROSE HARVEY  
Commissioner

May 31, 2017

Ms. Lucia Woo  
Environmental Planner  
LaBella Associates, DPC  
300 State Street  
Suite 201  
Rochester, NY 14614

Re: USACE  
Ellis Tract Solar Photovoltaic Plant  
Turkey Hill Road at Stevenson Road, Dryden, NY  
17PR02496

Dear Ms. Woo:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York State Environmental Conservation Law Article 8).

We have no concerns regarding the project's potential impacts on historic architectural resources. We have reviewed the report entitled "Phase I archaeological Investigation Report, Ellis Tract Solar Photovoltaic Plant Project, Town of Dryden, Tompkins County, New York" (May 2017). One archaeological site was identified during the investigation: Lamkin Historic site (USN 10903.000323). The report states that the only project-related activity with the area of the site is tree removal (Report Page 37). The report recommends that tree removal in this area be done with hand tools (no heavy machinery). SHPO concurs with that recommendation. It is SHPO's opinion that the project will have No Effect upon cultural resources in or eligible for inclusion in the National Register of Historic Places, under the condition that tree removal in the area of the Lamkin archaeological site is conducted with hand tools to minimize physical impacts to the site.

If project plans change such that impacts to the Lamkin archaeological site cannot be avoided, then SHPO recommends that a Phase II archaeological investigation be conducted to assess the potential eligibility of the site for listing in the National Register of Historic Places.

---

### Division for Historic Preservation

P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • [www.nysparks.com](http://www.nysparks.com)

Ms. Lucia Woo  
May 31, 2017  
Page 2

If further correspondence is required regarding this project, please refer to the SHPO Project Review (PR) number noted above. If you have any questions I can be reached at 518-268-2186.

Sincerely,

A handwritten signature in black ink, appearing to read 'Tim Lloyd', with a stylized flourish at the end.

Tim Lloyd, Ph.D., RPA  
Scientist - Archaeology  
timothy.lloyd@parks.ny.gov

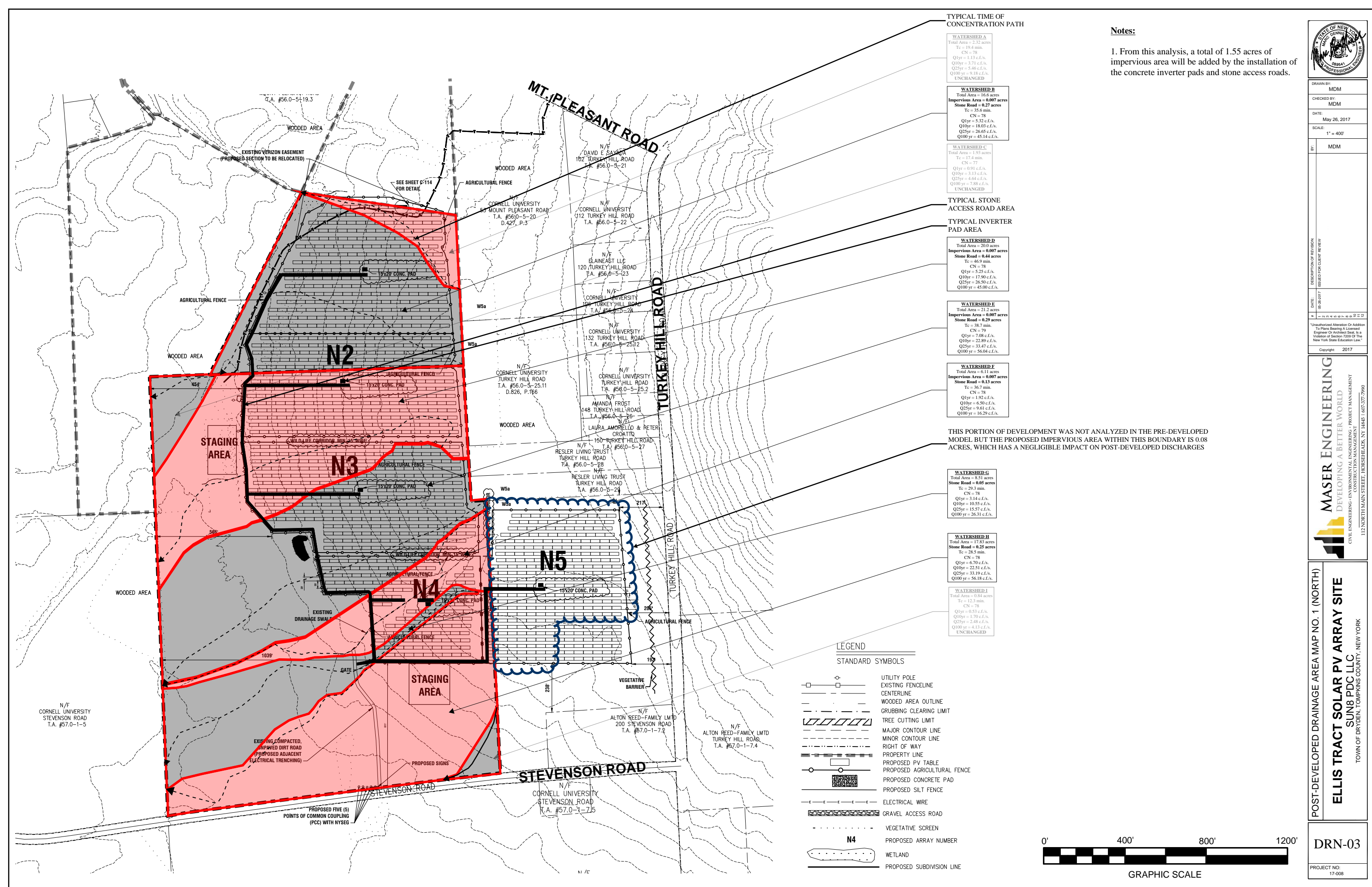
via e-mail only

cc: Davit Sprout (Town of Dryden)  
Rob Peltier (Tetra Tech)

## **APPENDIX J**

### **Post-Developed Drainage Area Maps**





TYPICAL TIME OF CONCENTRATION PATH

**WATERSHED A**  
Total Area = 2.32 acres  
Tc = 19.4 min.  
CN = 78  
Q1yr = 1.13 c.f.s.  
Q10yr = 3.71 c.f.s.  
Q25yr = 5.46 c.f.s.  
Q100 yr = 9.18 c.f.s.  
UNCHANGED

**WATERSHED B**  
Total Area = 16.6 acres  
Impervious Area = 0.007 acres  
Stone Road = 0.27 acres  
Tc = 35.6 min.  
CN = 78  
Q1yr = 5.32 c.f.s.  
Q10yr = 18.03 c.f.s.  
Q25yr = 26.65 c.f.s.  
Q100 yr = 45.14 c.f.s.

**WATERSHED C**  
Total Area = 1.93 acres  
Tc = 17.4 min.  
CN = 77  
Q1yr = 0.91 c.f.s.  
Q10yr = 3.13 c.f.s.  
Q25yr = 4.64 c.f.s.  
Q100 yr = 7.88 c.f.s.  
UNCHANGED

TYPICAL STONE ACCESS ROAD AREA

TYPICAL INVERTER PAD AREA

**WATERSHED D**  
Total Area = 20.0 acres  
Impervious Area = 0.007 acres  
Stone Road = 0.44 acres  
Tc = 46.9 min.  
CN = 78  
Q1yr = 5.25 c.f.s.  
Q10yr = 17.90 c.f.s.  
Q25yr = 26.50 c.f.s.  
Q100 yr = 45.00 c.f.s.

**WATERSHED E**  
Total Area = 21.2 acres  
Impervious Area = 0.007 acres  
Stone Road = 0.29 acres  
Tc = 38.7 min.  
CN = 79  
Q1yr = 7.08 c.f.s.  
Q10yr = 22.89 c.f.s.  
Q25yr = 33.47 c.f.s.  
Q100 yr = 56.04 c.f.s.

**WATERSHED F**  
Total Area = 6.11 acres  
Impervious Area = 0.007 acres  
Stone Road = 0.13 acres  
Tc = 36.7 min.  
CN = 78  
Q1yr = 1.92 c.f.s.  
Q10yr = 6.50 c.f.s.  
Q25yr = 9.61 c.f.s.  
Q100 yr = 16.29 c.f.s.

THIS PORTION OF DEVELOPMENT WAS NOT ANALYZED IN THE PRE-DEVELOPED MODEL BUT THE PROPOSED IMPERVIOUS AREA WITHIN THIS BOUNDARY IS 0.08 ACRES, WHICH HAS A NEGLIGIBLE IMPACT ON POST-DEVELOPED DISCHARGES

**WATERSHED G**  
Total Area = 8.51 acres  
Stone Road = 0.05 acres  
Tc = 29.3 min.  
CN = 78  
Q1yr = 3.14 c.f.s.  
Q10yr = 10.55 c.f.s.  
Q25yr = 15.57 c.f.s.  
Q100 yr = 26.31 c.f.s.

**WATERSHED H**  
Total Area = 17.83 acres  
Stone Road = 0.25 acres  
Tc = 28.5 min.  
CN = 78  
Q1yr = 6.70 c.f.s.  
Q10yr = 22.51 c.f.s.  
Q25yr = 33.19 c.f.s.  
Q100 yr = 56.18 c.f.s.

**WATERSHED I**  
Total Area = 0.94 acres  
Tc = 12.3 min.  
CN = 78  
Q1yr = 0.53 c.f.s.  
Q10yr = 1.70 c.f.s.  
Q25yr = 2.48 c.f.s.  
Q100 yr = 4.13 c.f.s.  
UNCHANGED

LEGEND

STANDARD SYMBOLS

- UTILITY POLE
- EXISTING FENCELINE
- CENTERLINE
- WOODED AREA OUTLINE
- GRUBBING CLEARING LIMIT
- TREE CUTTING LIMIT
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE
- RIGHT OF WAY
- PROPERTY LINE
- PROPOSED PV TABLE
- PROPOSED AGRICULTURAL FENCE
- PROPOSED CONCRETE PAD
- PROPOSED SILT FENCE
- ELECTRICAL WIRE
- GRAVEL ACCESS ROAD
- VEGETATIVE SCREEN
- PROPOSED ARRAY NUMBER
- WETLAND
- PROPOSED SUBDIVISION LINE



Notes:

1. From this analysis, a total of 1.55 acres of impervious area will be added by the installation of the concrete inverter pads and stone access roads.

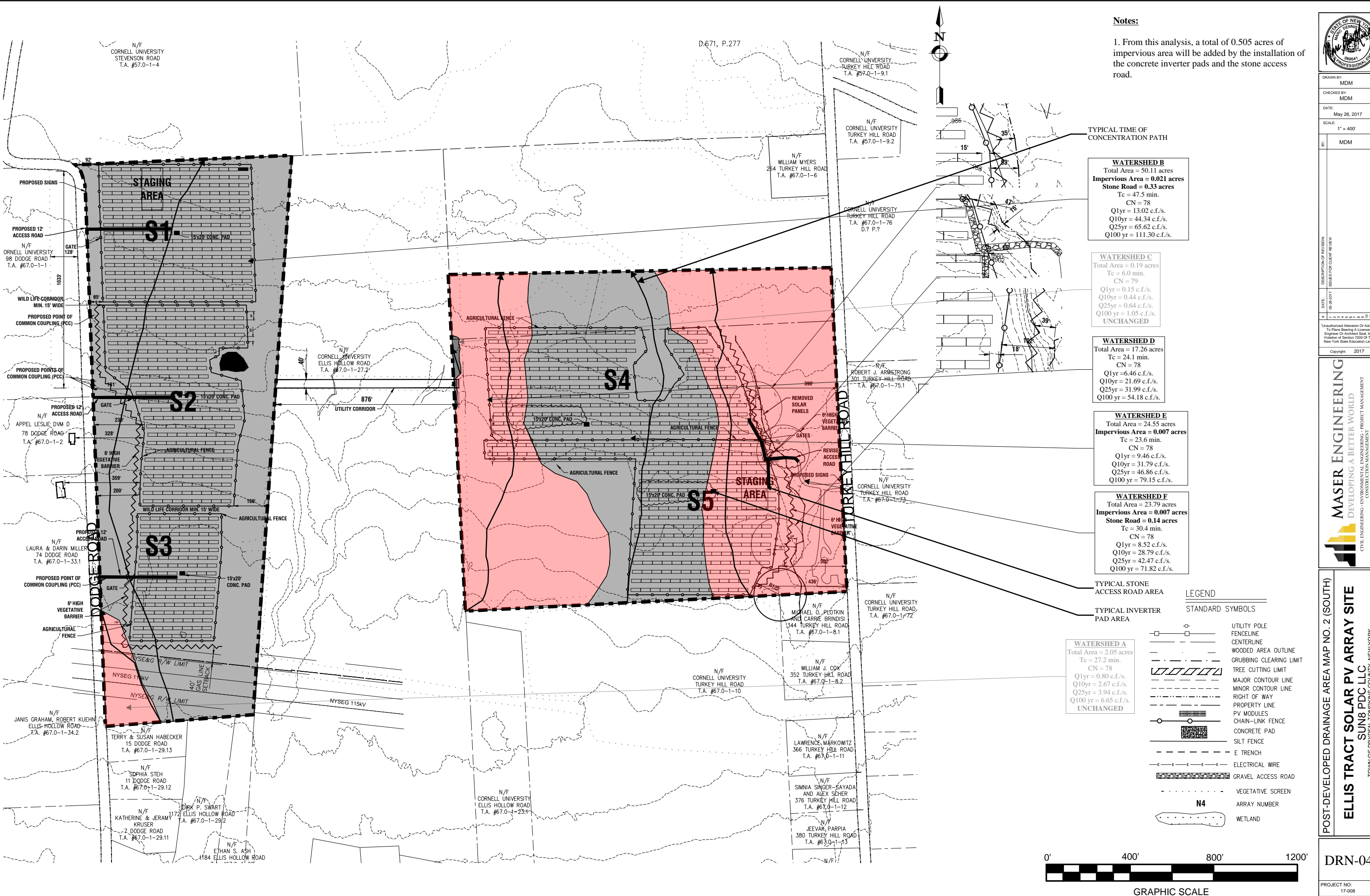
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CHECKED BY: MDM  
DATE: May 26, 2017  
SCALE: 1" = 400'  
BY: MDM  
DESCRIPTION OF REVISION: ISSUED FOR CLIENT REVIEW  
DATE: 05-26-2017  
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POST-DEVELOPED DRAINAGE AREA MAP NO. 1 (NORTH)  
**ELLIS TRACT SOLAR PV ARRAY SITE**  
SUN8 PDC LLC  
TOWN OF DRYDEN, TOMPKINS COUNTY, NEW YORK

DRN-03  
PROJECT NO: 17-008





**Notes:**

1. From this analysis, a total of 0.505 acres of impervious area will be added by the installation of the concrete inverter pads and the stone access road.

**WATERSHED B**  
Total Area = 50.11 acres  
Impervious Area = 0.021 acres  
Stone Road = 0.33 acres  
Tc = 47.5 min.  
CN = 78  
Q1yr = 13.02 c.f./s.  
Q10yr = 44.34 c.f./s.  
Q25yr = 65.62 c.f./s.  
Q100 yr = 111.30 c.f./s.

**WATERSHED C**  
Total Area = 0.19 acres  
Tc = 6.0 min.  
CN = 79  
Q1yr = 0.15 c.f./s.  
Q10yr = 0.44 c.f./s.  
Q25yr = 0.64 c.f./s.  
Q100 yr = 1.05 c.f./s.  
**UNCHANGED**

**WATERSHED D**  
Total Area = 17.26 acres  
Tc = 24.1 min.  
CN = 78  
Q1yr = 6.46 c.f./s.  
Q10yr = 21.69 c.f./s.  
Q25yr = 31.99 c.f./s.  
Q100 yr = 54.18 c.f./s.

**WATERSHED E**  
Total Area = 24.55 acres  
Impervious Area = 0.007 acres  
Tc = 23.6 min.  
CN = 78  
Q1yr = 9.46 c.f./s.  
Q10yr = 31.79 c.f./s.  
Q25yr = 46.86 c.f./s.  
Q100 yr = 79.15 c.f./s.

**WATERSHED F**  
Total Area = 23.79 acres  
Impervious Area = 0.007 acres  
Stone Road = 0.14 acres  
Tc = 30.4 min.  
CN = 78  
Q1yr = 8.52 c.f./s.  
Q10yr = 28.79 c.f./s.  
Q25yr = 42.47 c.f./s.  
Q100 yr = 71.82 c.f./s.

**WATERSHED A**  
Total Area = 2.05 acres  
Tc = 27.2 min.  
CN = 78  
Q1yr = 0.80 c.f./s.  
Q10yr = 2.67 c.f./s.  
Q25yr = 3.94 c.f./s.  
Q100 yr = 6.65 c.f./s.  
**UNCHANGED**

- LEGEND**
- STANDARD SYMBOLS**
- UTILITY POLE
  - FENCELINE
  - CENTERLINE
  - WOODED AREA OUTLINE
  - GRUBBING CLEARING LIMIT
  - TREE CUTTING LIMIT
  - MAJOR CONTOUR LINE
  - MINOR CONTOUR LINE
  - RIGHT OF WAY
  - PROPERTY LINE
  - PV MODULES
  - CHAIN-LINK FENCE
  - CONCRETE PAD
  - SILT FENCE
  - E TRENCH
  - ELECTRICAL WIRE
  - GRAVEL ACCESS ROAD
  - VEGETATIVE SCREEN
  - ARRAY NUMBER
  - WETLAND



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DATE: May 26, 2017  
SCALE: 1" = 400'  
BY: MDM

DESCRIPTION OF REVISION:  
01-26-2017 ISSUED FOR CLIENT REVIEW

\*Unauthorized Alteration Or Addition To Plans Bearing A Licensed Engineer Or Architect Seal, Is A Violation Of Section 7209 Of The New York State Education Law.\*

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POST-DEVELOPED DRAINAGE AREA MAP NO. 2 (SOUTH)

**ELLIS TRACT SOLAR PV ARRAY SITE**

SUN8 PDC LLC

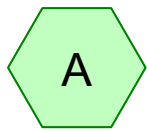
TOWN OF DRYDEN, TOMPKINS COUNTY, NEW YORK

DRN-04

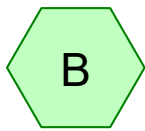
PROJECT NO: 17-008

## **APPENDIX K**

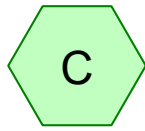
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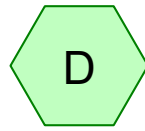
Watershed A



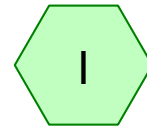
Watershed B



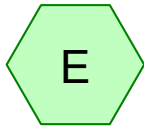
Watershed C



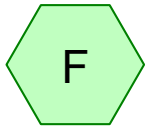
Watershed D



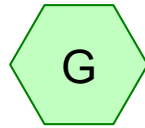
Watershed I



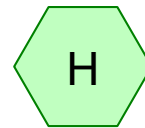
Watershed E



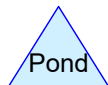
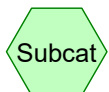
Watershed F



Watershed G



Watershed H



**Routing Diagram for Post-Developed Model (NORTH PLANT)**

Prepared by Maser Engineering, Printed 6/1/2017

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## Post-Developed Model (NORTH PLANT)

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Page 2

### Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
91.452	78	Meadow, non-grazed, HSG D (A, B, D, E, F, G, H, I)
1.458	98	Paved parking, HSG D (B, D, E, F, G, H)
0.500	98	Water Surface, HSG D (E)
1.930	77	Woods, Good, HSG D (C)
<b>95.340</b>	<b>78</b>	<b>TOTAL AREA</b>

## Post-Developed Model (NORTH PLANT)

Prepared by Maser Engineering

Printed 6/1/2017

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Page 3

### Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
95.340	HSG D	A, B, C, D, E, F, G, H, I
0.000	Other	
<b>95.340</b>		<b>TOTAL AREA</b>

## Post-Developed Model (NORTH PLANT)

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Page 4

### Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	91.452	0.000	91.452	Meadow, non-grazed	A, B, D, E, F, G, H, I
0.000	0.000	0.000	1.458	0.000	1.458	Paved parking	B, D, E, F, G, H
0.000	0.000	0.000	0.500	0.000	0.500	Water Surface	E
0.000	0.000	0.000	1.930	0.000	1.930	Woods, Good	C
<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>95.340</b>	<b>0.000</b>	<b>95.340</b>	<b>TOTAL AREA</b>	

**Post-Developed Model (NORTH PLANT)***Type II 24-hr 1 Year Rainfall=2.01"*

Prepared by Maser Engineering

Printed 6/1/2017

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Page 5

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A**

Runoff Area=2.320 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=962' Tc=19.4 min CN=78 Runoff=1.13 cfs 0.095 af

**Subcatchment B: Watershed B**

Runoff Area=16.600 ac 1.67% Impervious Runoff Depth=0.49"  
Flow Length=1,518' Tc=35.6 min CN=78 Runoff=5.32 cfs 0.678 af

**Subcatchment C: Watershed C**

Runoff Area=1.930 ac 0.00% Impervious Runoff Depth=0.45"  
Flow Length=345' Tc=17.4 min CN=77 Runoff=0.91 cfs 0.073 af

**Subcatchment D: Watershed D**

Runoff Area=20.000 ac 2.23% Impervious Runoff Depth=0.49"  
Flow Length=1,902' Tc=46.9 min CN=78 Runoff=5.25 cfs 0.817 af

**Subcatchment E: Watershed E**

Runoff Area=21.200 ac 3.76% Impervious Runoff Depth=0.53"  
Flow Length=1,874' Tc=38.7 min CN=79 Runoff=7.08 cfs 0.933 af

**Subcatchment F: Watershed F**

Runoff Area=6.110 ac 2.24% Impervious Runoff Depth=0.49"  
Flow Length=1,943' Tc=36.7 min CN=78 Runoff=1.92 cfs 0.250 af

**Subcatchment G: Watershed G**

Runoff Area=8.510 ac 0.59% Impervious Runoff Depth=0.49"  
Flow Length=1,884' Tc=29.3 min CN=78 Runoff=3.14 cfs 0.348 af

**Subcatchment H: Watershed H**

Runoff Area=17.830 ac 1.40% Impervious Runoff Depth=0.49"  
Flow Length=1,882' Tc=28.5 min CN=78 Runoff=6.70 cfs 0.728 af

**Subcatchment I: Watershed I**

Runoff Area=0.840 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=463' Tc=12.3 min CN=78 Runoff=0.53 cfs 0.034 af

**Total Runoff Area = 95.340 ac Runoff Volume = 3.955 af Average Runoff Depth = 0.50"**  
**97.95% Pervious = 93.382 ac 2.05% Impervious = 1.958 ac**

## Post-Developed Model (NORTH PLANT)

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Type II 24-hr 1 Year Rainfall=2.01"

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Page 6

### Summary for Subcatchment A: Watershed A

Runoff = 1.13 cfs @ 12.15 hrs, Volume= 0.095 af, Depth= 0.49"

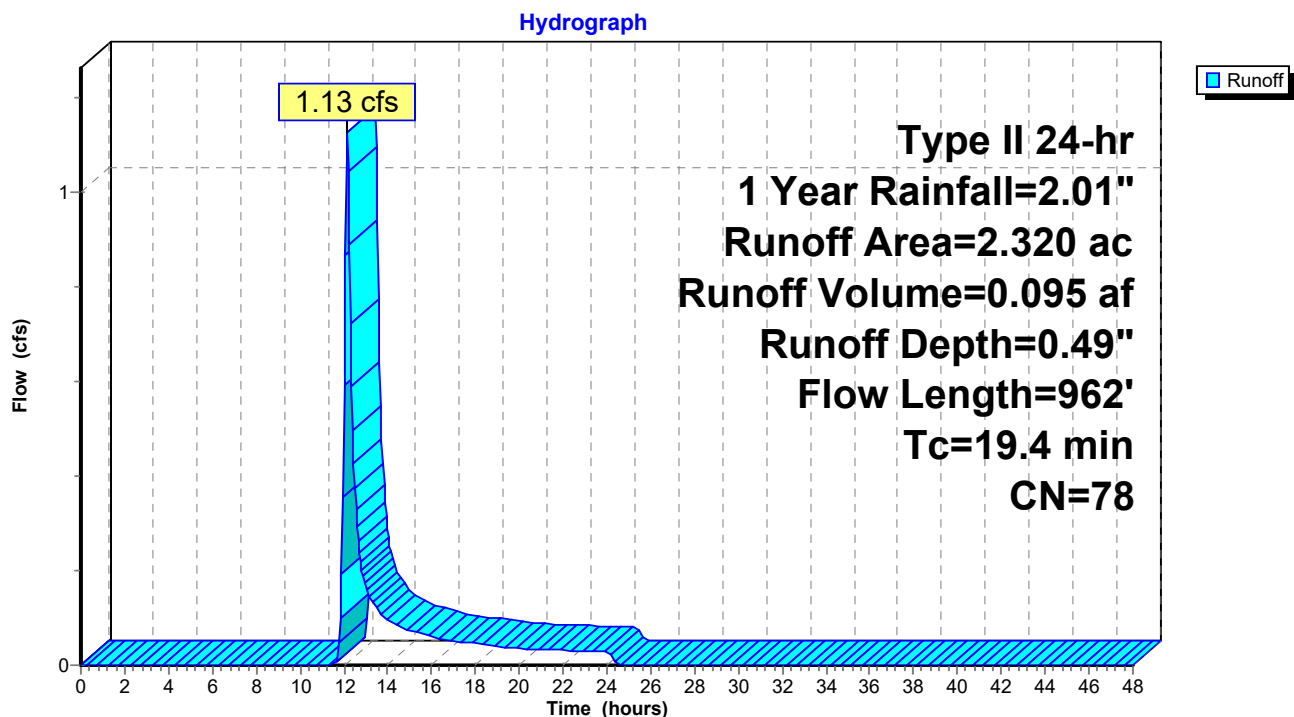
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

Area (ac)	CN	Description
2.320	78	Meadow, non-grazed, HSG D
2.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0450	0.15		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
8.2	862	0.0626	1.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
19.4	962	Total			

### Subcatchment A: Watershed A





**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment B: Watershed B**

Runoff = 5.32 cfs @ 12.36 hrs, Volume= 0.678 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

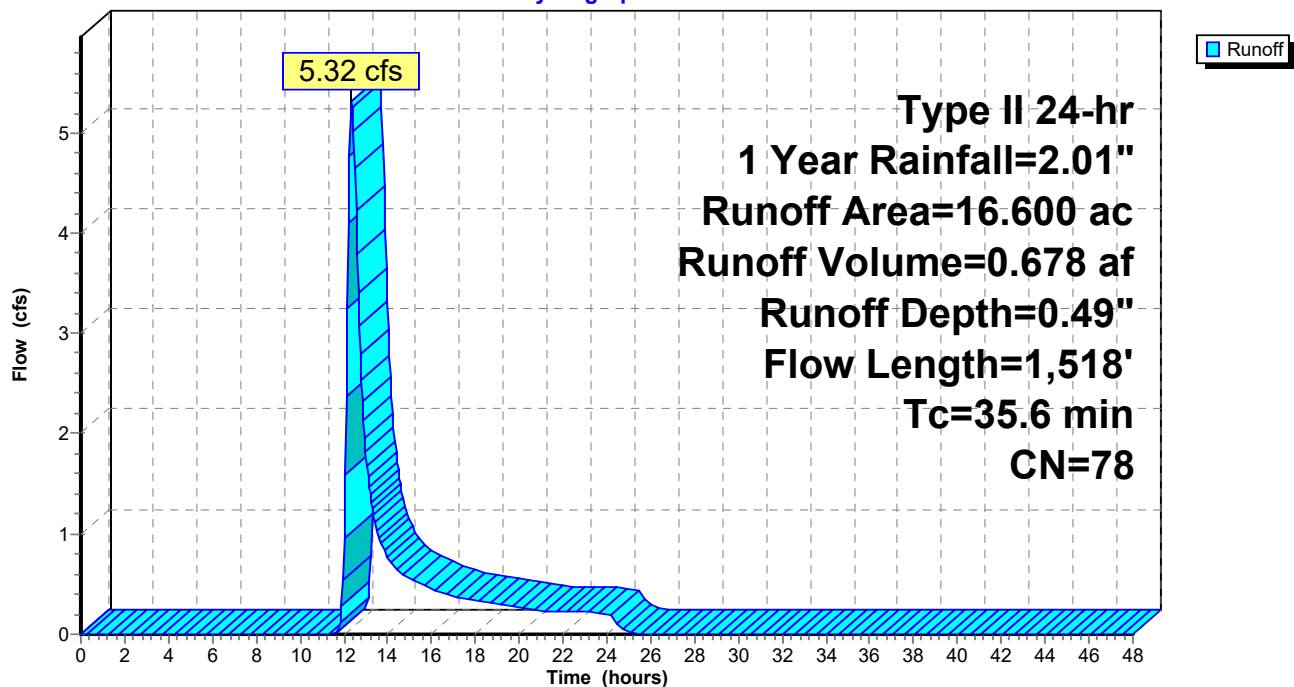
Area (ac)	CN	Description
16.323	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.270	98	Paved parking, HSG D
16.600	78	Weighted Average
16.323		98.33% Pervious Area
0.277		1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
15.1	1,418	0.0497	1.56		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
35.6	1,518	Total			

**Subcatchment B: Watershed B**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment C: Watershed C**

Runoff = 0.91 cfs @ 12.12 hrs, Volume= 0.073 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

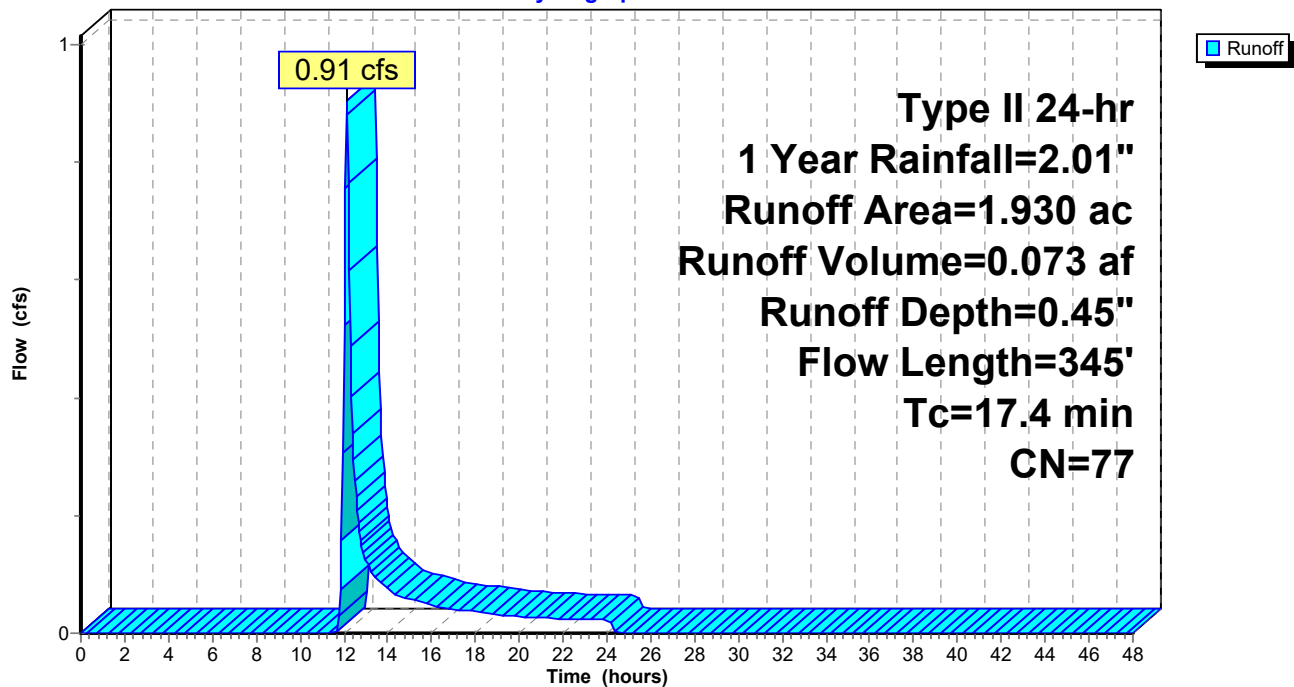
Area (ac)	CN	Description
1.930	77	Woods, Good, HSG D
1.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		<b>Sheet Flow, A-B</b>
					Woods: Light underbrush n= 0.400 P2= 2.70"
5.1	245	0.0253	0.80		<b>Shallow Concentrated Flow, B-C</b>
					Woodland Kv= 5.0 fps
17.4	345	Total			

**Subcatchment C: Watershed C**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment D: Watershed D**

Runoff = 5.25 cfs @ 12.52 hrs, Volume= 0.817 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

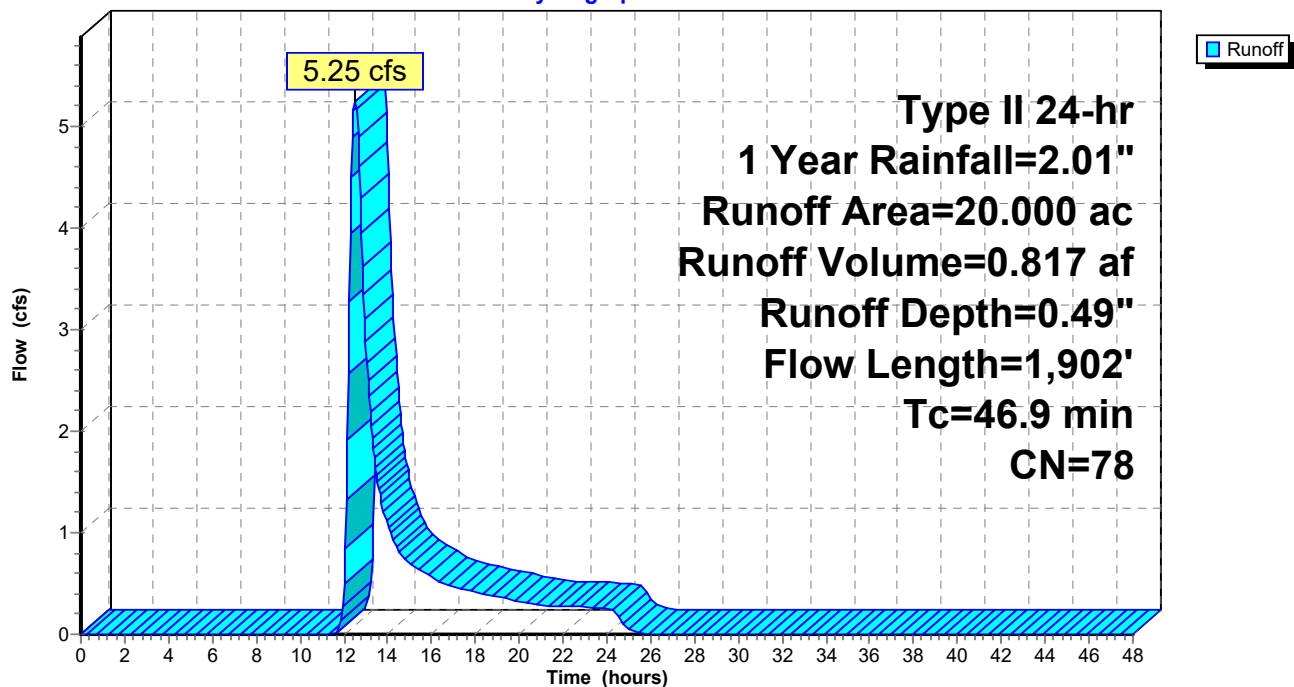
Area (ac)	CN	Description
19.553	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.440	98	Paved parking, HSG D
20.000	78	Weighted Average
19.553		97.76% Pervious Area
0.447		2.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	1,190	0.0588	1.70		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
14.7	612	0.0098	0.69		<b>Shallow Concentrated Flow, C-D</b> Short Grass Pasture Kv= 7.0 fps
46.9	1,902	Total			

**Subcatchment D: Watershed D**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment E: Watershed E**

Runoff = 7.08 cfs @ 12.40 hrs, Volume= 0.933 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

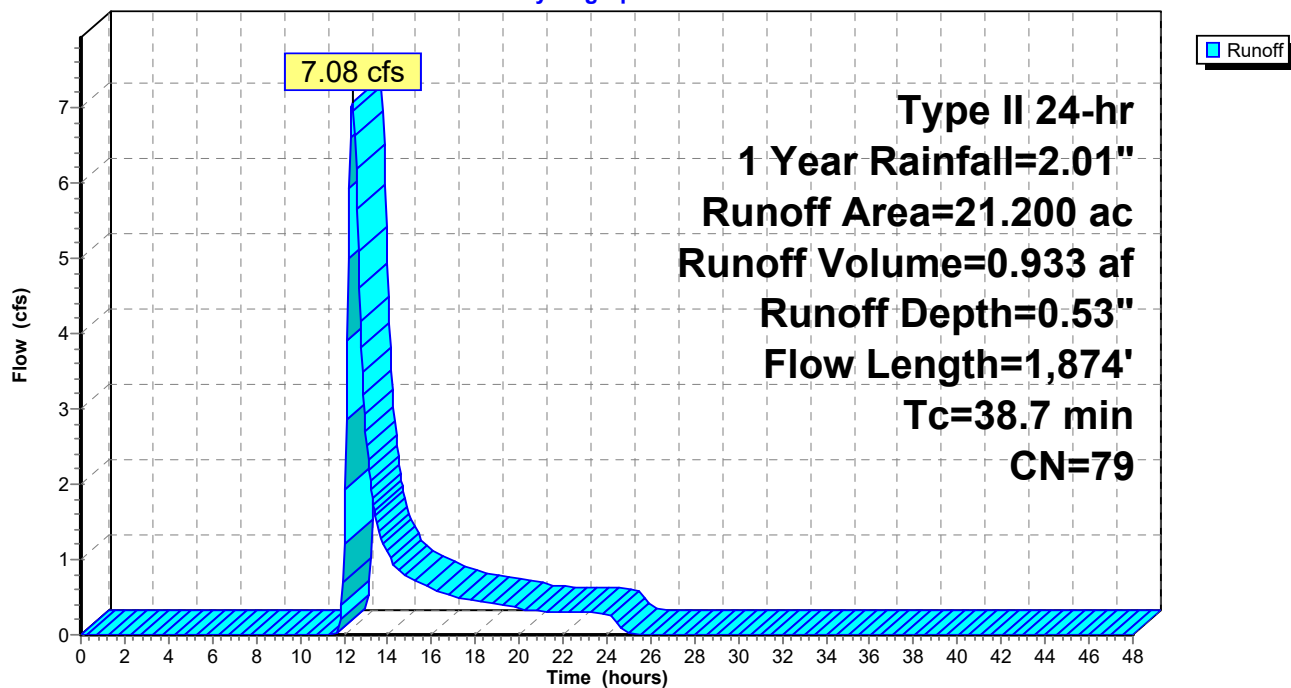
Area (ac)	CN	Description
20.403	78	Meadow, non-grazed, HSG D
0.500	98	Water Surface, HSG D
0.007	98	Paved parking, HSG D
0.290	98	Paved parking, HSG D
21.200	79	Weighted Average
20.403		96.24% Pervious Area
0.797		3.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.2	1,774	0.0541	1.63		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
38.7	1,874	Total			

**Subcatchment E: Watershed E**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment F: Watershed F**

Runoff = 1.92 cfs @ 12.37 hrs, Volume= 0.250 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

Area (ac)	CN	Description
5.973	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.130	98	Paved parking, HSG D
6.110	78	Weighted Average
5.973		97.76% Pervious Area
0.137		2.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0080	0.07		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.2	360	0.0720	1.88		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.6	360	0.0800	3.84	1.15	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.030 Earth, grassed & winding
5.5	543	0.0552	1.64		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
4.0	580	0.0103	2.42	2.18	<b>Trap/Vee/Rect Channel Flow, E-F</b> Bot.W=0.00' D=1.00' Z= 0.9 '/' Top.W=1.80' n= 0.030 Earth, grassed & winding
36.7	1,943	Total			

# Post-Developed Model (NORTH PLANT)

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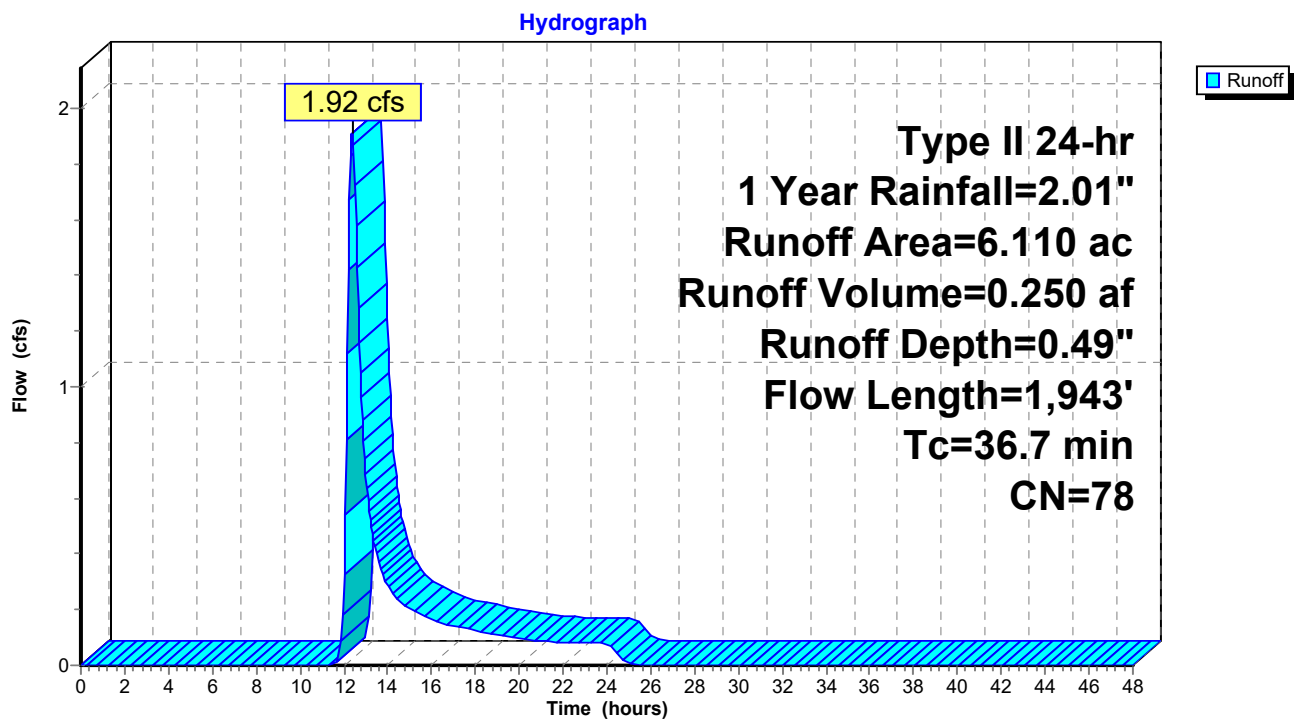
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Type II 24-hr 1 Year Rainfall=2.01"

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## Subcatchment F: Watershed F



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**Summary for Subcatchment G: Watershed G**

Runoff = 3.14 cfs @ 12.27 hrs, Volume= 0.348 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

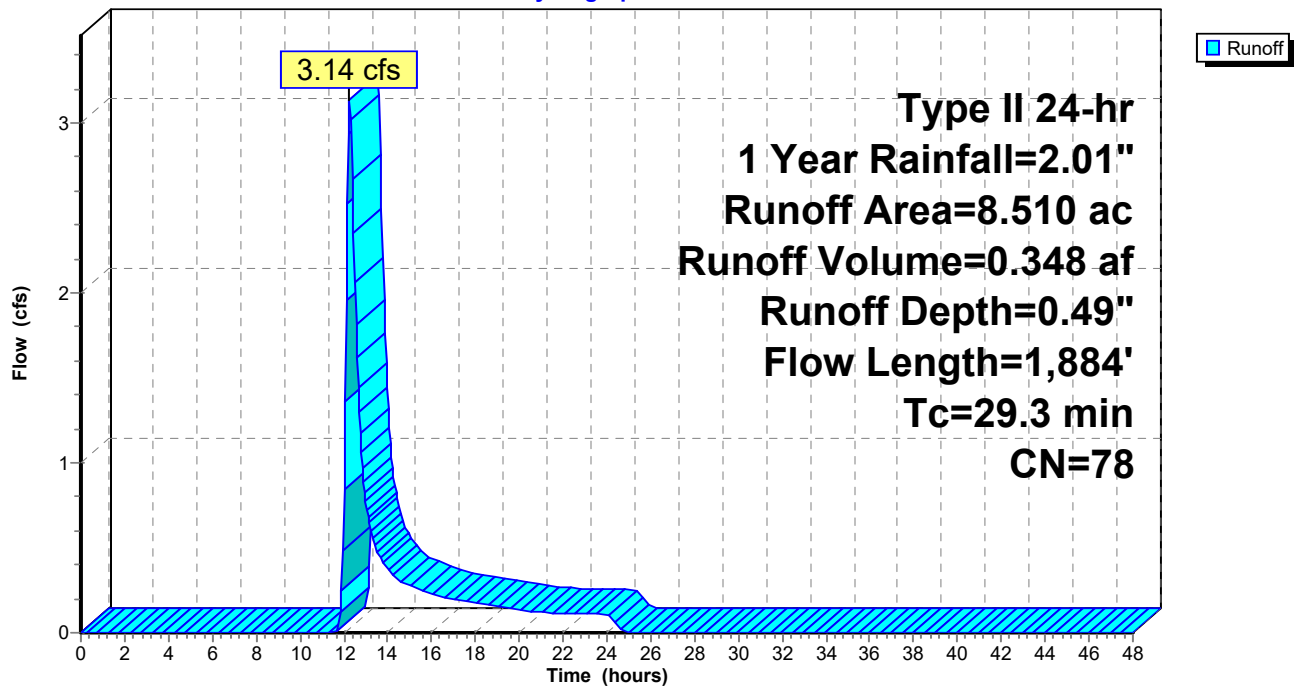
Area (ac)	CN	Description
8.460	78	Meadow, non-grazed, HSG D
0.050	98	Paved parking, HSG D
8.510	78	Weighted Average
8.460		99.41% Pervious Area
0.050		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
19.3	1,784	0.0482	1.54		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
29.3	1,884	Total			

**Subcatchment G: Watershed G**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment H: Watershed H**

Runoff = 6.70 cfs @ 12.26 hrs, Volume= 0.728 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

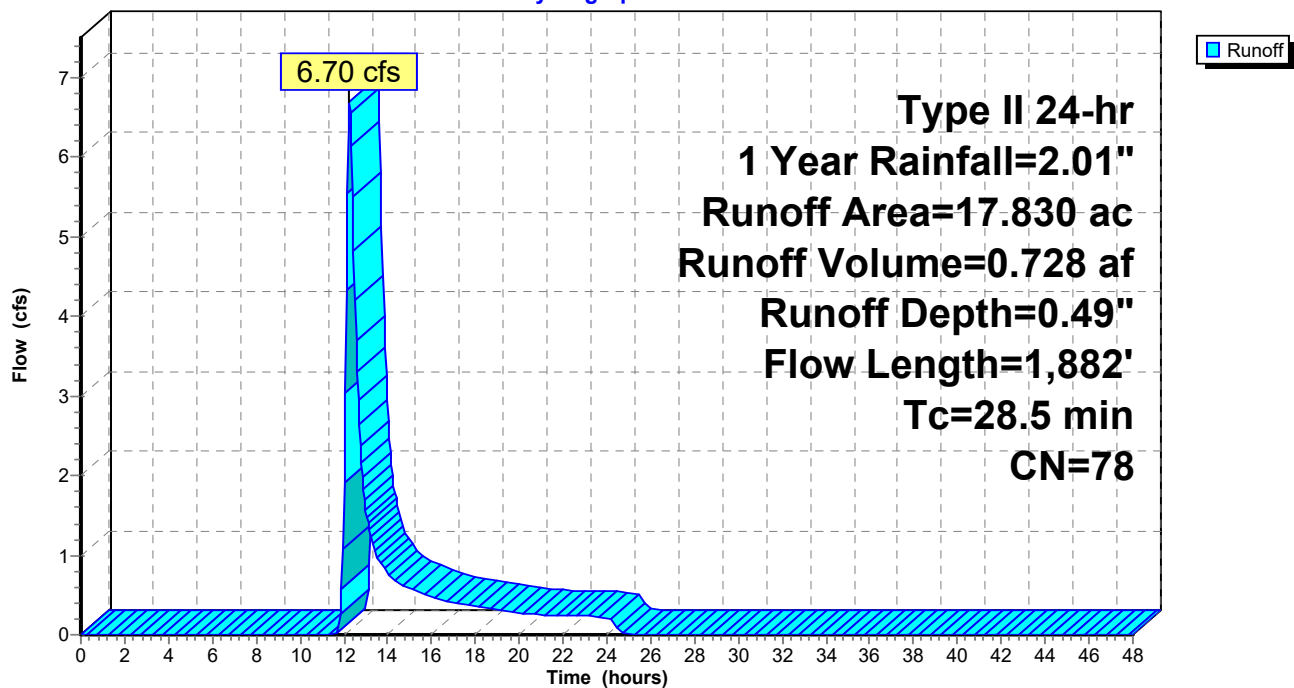
Area (ac)	CN	Description
17.580	78	Meadow, non-grazed, HSG D
0.250	98	Paved parking, HSG D
17.830	78	Weighted Average
17.580		98.60% Pervious Area
0.250		1.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
21.7	1,782	0.0382	1.37		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
28.5	1,882	Total			

**Subcatchment H: Watershed H**

Hydrograph





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**Summary for Subcatchment I: Watershed I**

Runoff = 0.53 cfs @ 12.06 hrs, Volume= 0.034 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

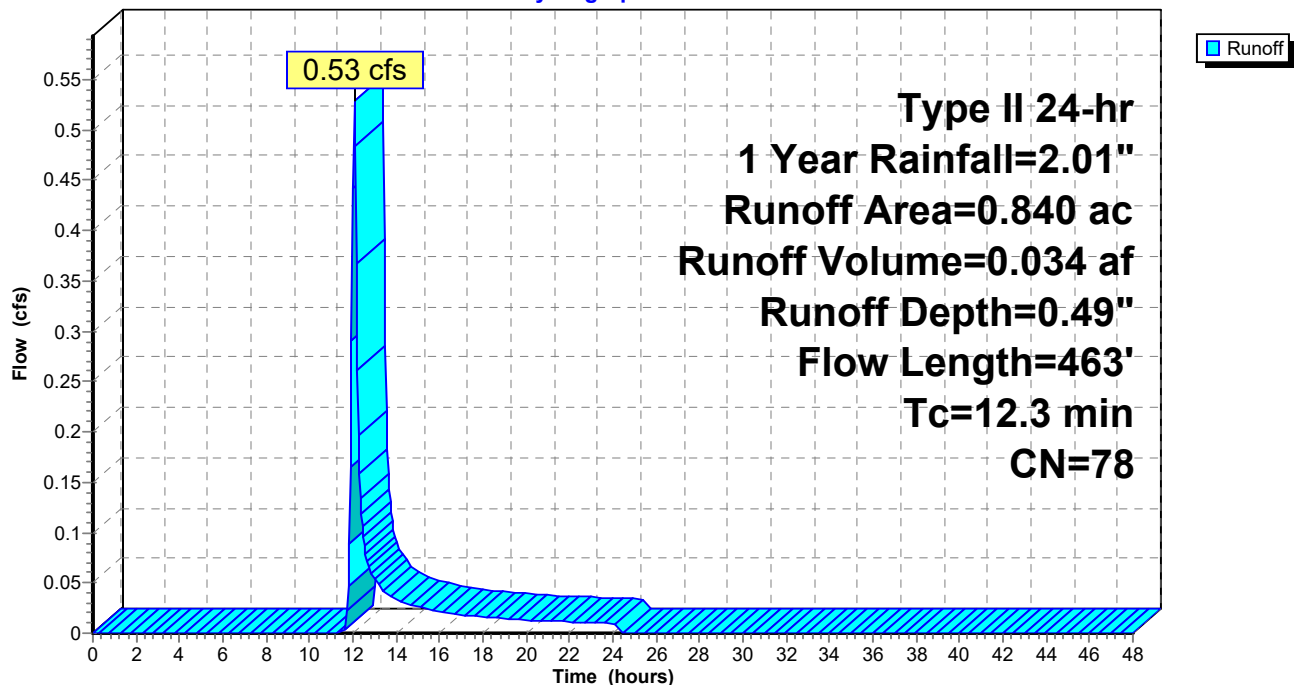
Area (ac)	CN	Description
0.840	78	Meadow, non-grazed, HSG D
0.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0800	0.19		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.4	363	0.0660	1.80		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
12.3	463	Total			

**Subcatchment I: Watershed I**

Hydrograph



**Post-Developed Model (NORTH PLANT)***Type II 24-hr 10 Year Rainfall=3.43"*

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A**

Runoff Area=2.320 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=962' Tc=19.4 min CN=78 Runoff=3.71 cfs 0.279 af

**Subcatchment B: Watershed B**

Runoff Area=16.600 ac 1.67% Impervious Runoff Depth=1.44"  
Flow Length=1,518' Tc=35.6 min CN=78 Runoff=18.03 cfs 1.998 af

**Subcatchment C: Watershed C**

Runoff Area=1.930 ac 0.00% Impervious Runoff Depth=1.38"  
Flow Length=345' Tc=17.4 min CN=77 Runoff=3.13 cfs 0.222 af

**Subcatchment D: Watershed D**

Runoff Area=20.000 ac 2.23% Impervious Runoff Depth=1.44"  
Flow Length=1,902' Tc=46.9 min CN=78 Runoff=17.90 cfs 2.407 af

**Subcatchment E: Watershed E**

Runoff Area=21.200 ac 3.76% Impervious Runoff Depth=1.51"  
Flow Length=1,874' Tc=38.7 min CN=79 Runoff=22.89 cfs 2.671 af

**Subcatchment F: Watershed F**

Runoff Area=6.110 ac 2.24% Impervious Runoff Depth=1.44"  
Flow Length=1,943' Tc=36.7 min CN=78 Runoff=6.50 cfs 0.735 af

**Subcatchment G: Watershed G**

Runoff Area=8.510 ac 0.59% Impervious Runoff Depth=1.44"  
Flow Length=1,884' Tc=29.3 min CN=78 Runoff=10.55 cfs 1.024 af

**Subcatchment H: Watershed H**

Runoff Area=17.830 ac 1.40% Impervious Runoff Depth=1.44"  
Flow Length=1,882' Tc=28.5 min CN=78 Runoff=22.51 cfs 2.146 af

**Subcatchment I: Watershed I**

Runoff Area=0.840 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=463' Tc=12.3 min CN=78 Runoff=1.70 cfs 0.101 af

**Total Runoff Area = 95.340 ac Runoff Volume = 11.584 af Average Runoff Depth = 1.46"**  
**97.95% Pervious = 93.382 ac 2.05% Impervious = 1.958 ac**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment A: Watershed A**

Runoff = 3.71 cfs @ 12.13 hrs, Volume= 0.279 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

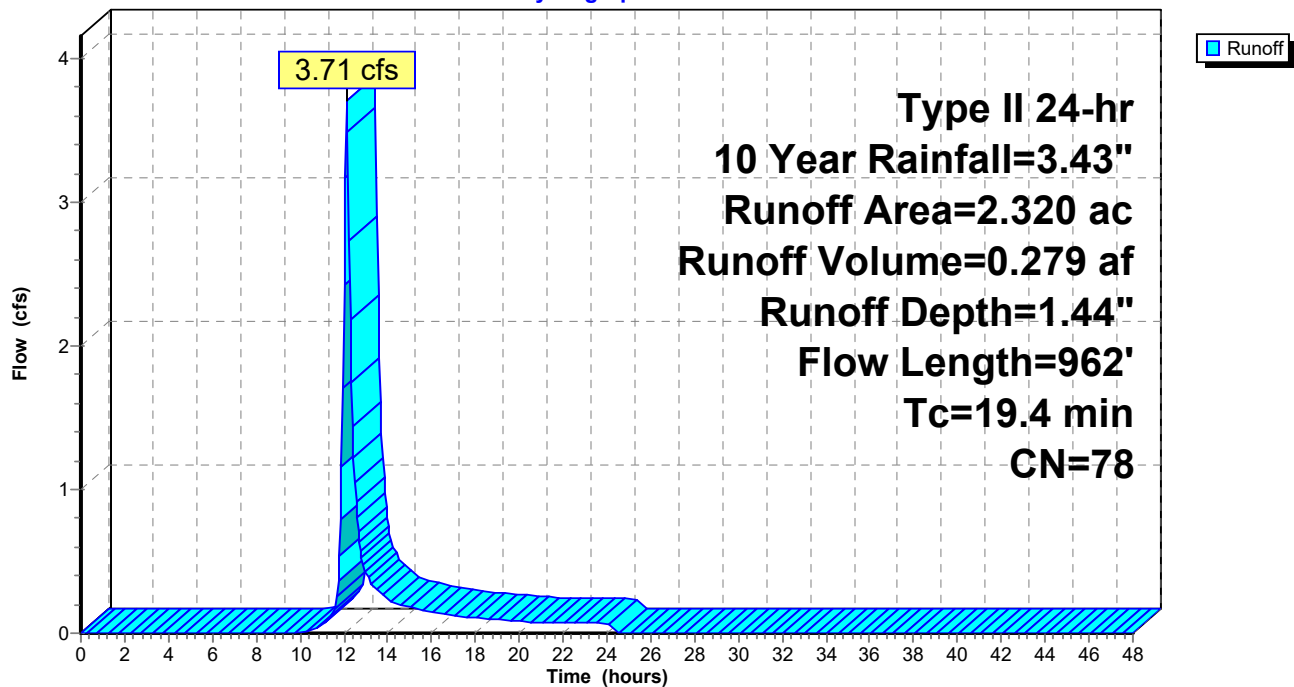
Area (ac)	CN	Description
2.320	78	Meadow, non-grazed, HSG D
2.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0450	0.15		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
8.2	862	0.0626	1.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
19.4	962	Total			

**Subcatchment A: Watershed A**

Hydrograph



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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment B: Watershed B**

Runoff = 18.03 cfs @ 12.32 hrs, Volume= 1.998 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

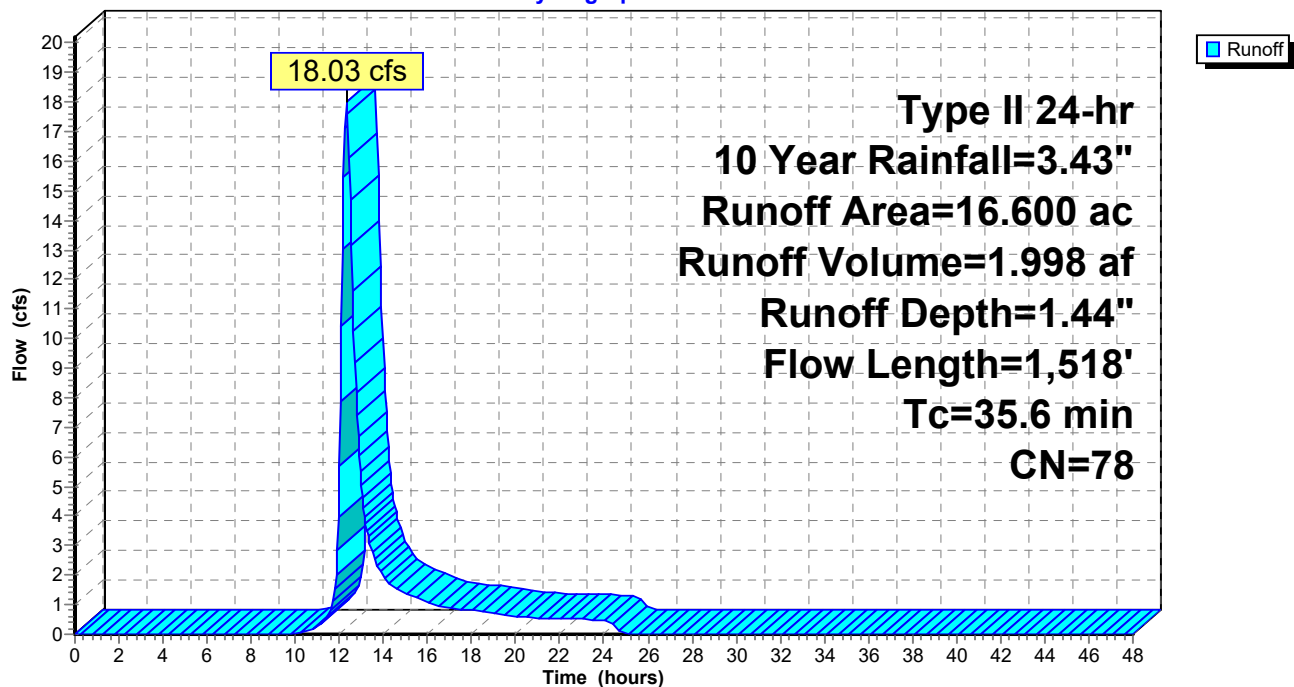
Area (ac)	CN	Description
16.323	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.270	98	Paved parking, HSG D
16.600	78	Weighted Average
16.323		98.33% Pervious Area
0.277		1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
15.1	1,418	0.0497	1.56		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
35.6	1,518	Total			

**Subcatchment B: Watershed B**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment C: Watershed C**

Runoff = 3.13 cfs @ 12.11 hrs, Volume= 0.222 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

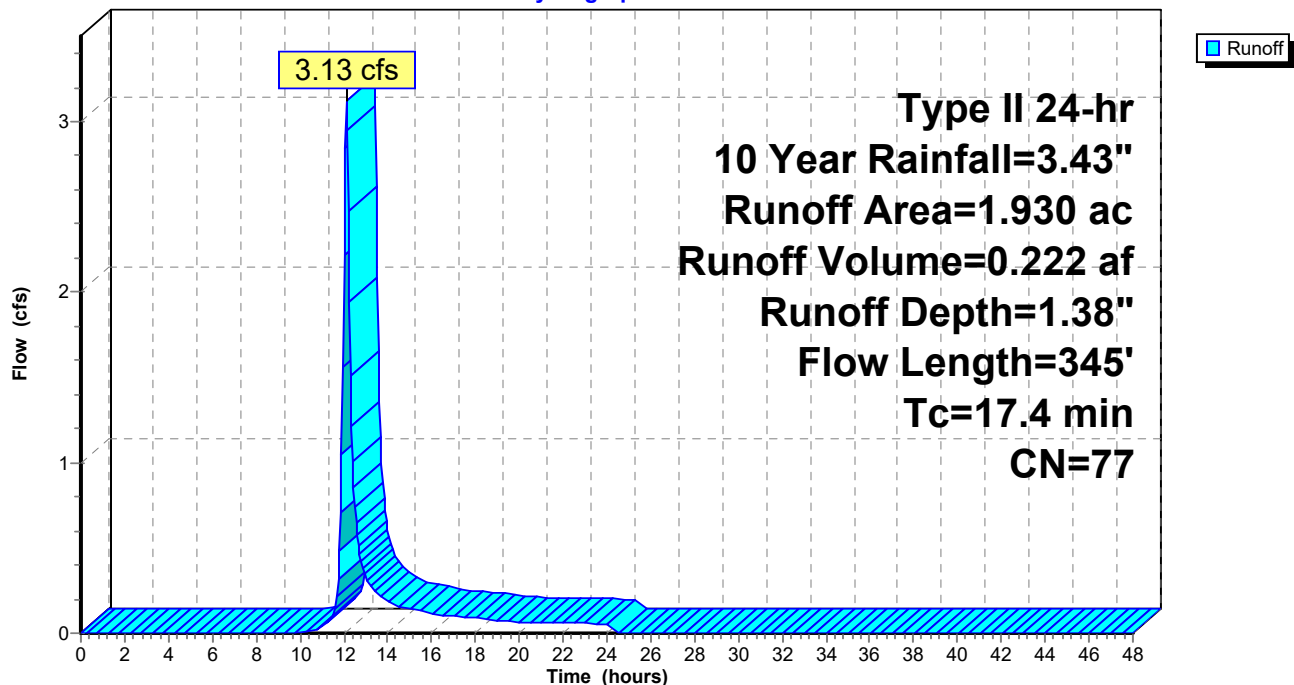
Area (ac)	CN	Description
1.930	77	Woods, Good, HSG D
1.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 2.70"
5.1	245	0.0253	0.80		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
17.4	345	Total			

**Subcatchment C: Watershed C**

Hydrograph



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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment D: Watershed D**

Runoff = 17.90 cfs @ 12.47 hrs, Volume= 2.407 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

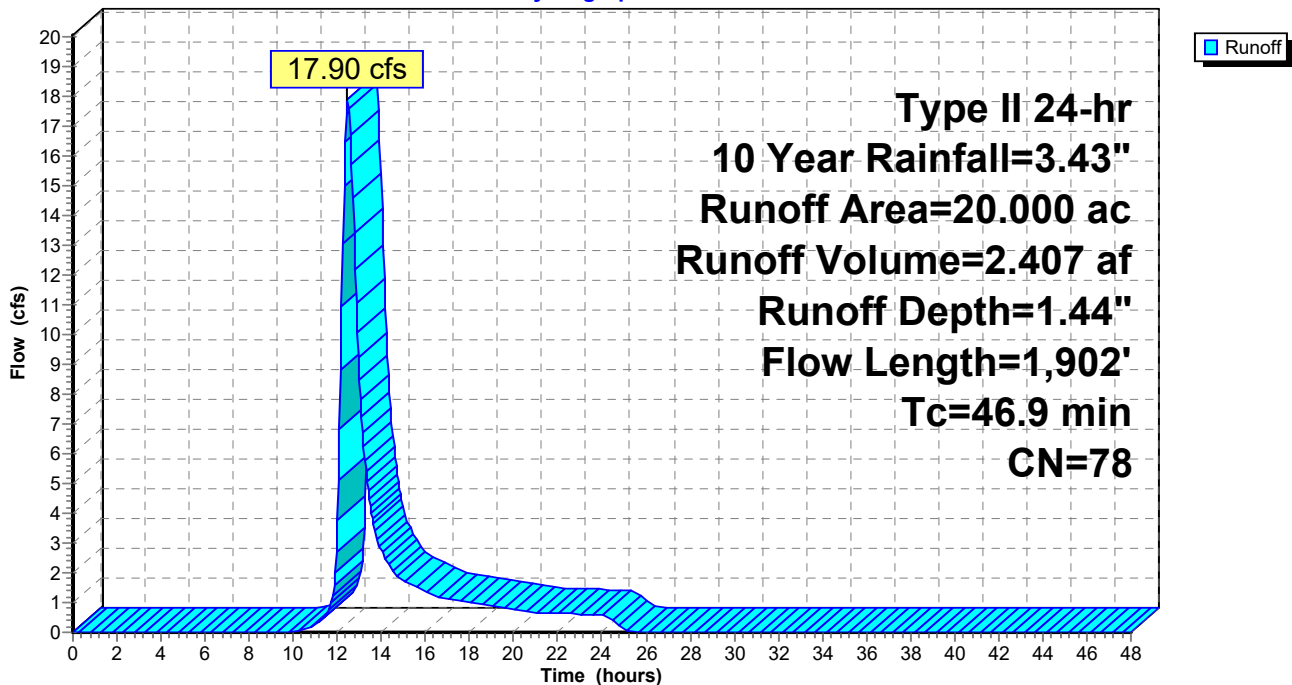
Area (ac)	CN	Description
19.553	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.440	98	Paved parking, HSG D
20.000	78	Weighted Average
19.553		97.76% Pervious Area
0.447		2.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	1,190	0.0588	1.70		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
14.7	612	0.0098	0.69		<b>Shallow Concentrated Flow, C-D</b> Short Grass Pasture Kv= 7.0 fps
46.9	1,902	Total			

**Subcatchment D: Watershed D**

Hydrograph



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**Summary for Subcatchment E: Watershed E**

Runoff = 22.89 cfs @ 12.36 hrs, Volume= 2.671 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

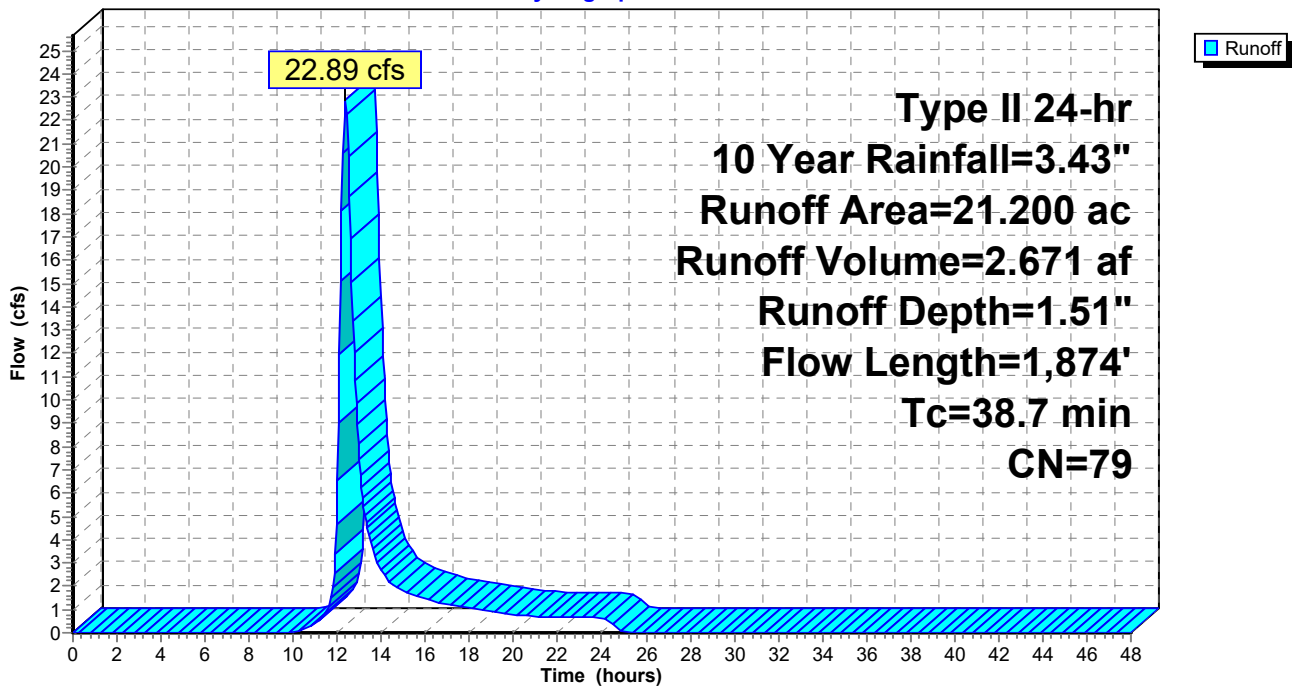
Area (ac)	CN	Description
20.403	78	Meadow, non-grazed, HSG D
0.500	98	Water Surface, HSG D
0.007	98	Paved parking, HSG D
0.290	98	Paved parking, HSG D
21.200	79	Weighted Average
20.403		96.24% Pervious Area
0.797		3.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.2	1,774	0.0541	1.63		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
38.7	1,874	Total			

**Subcatchment E: Watershed E**

Hydrograph



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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment F: Watershed F**

Runoff = 6.50 cfs @ 12.34 hrs, Volume= 0.735 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

Area (ac)	CN	Description
5.973	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.130	98	Paved parking, HSG D
6.110	78	Weighted Average
5.973		97.76% Pervious Area
0.137		2.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0080	0.07		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.2	360	0.0720	1.88		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.6	360	0.0800	3.84	1.15	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.030 Earth, grassed & winding
5.5	543	0.0552	1.64		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
4.0	580	0.0103	2.42	2.18	<b>Trap/Vee/Rect Channel Flow, E-F</b> Bot.W=0.00' D=1.00' Z= 0.9 '/' Top.W=1.80' n= 0.030 Earth, grassed & winding
36.7	1,943	Total			



# Post-Developed Model (NORTH PLANT)

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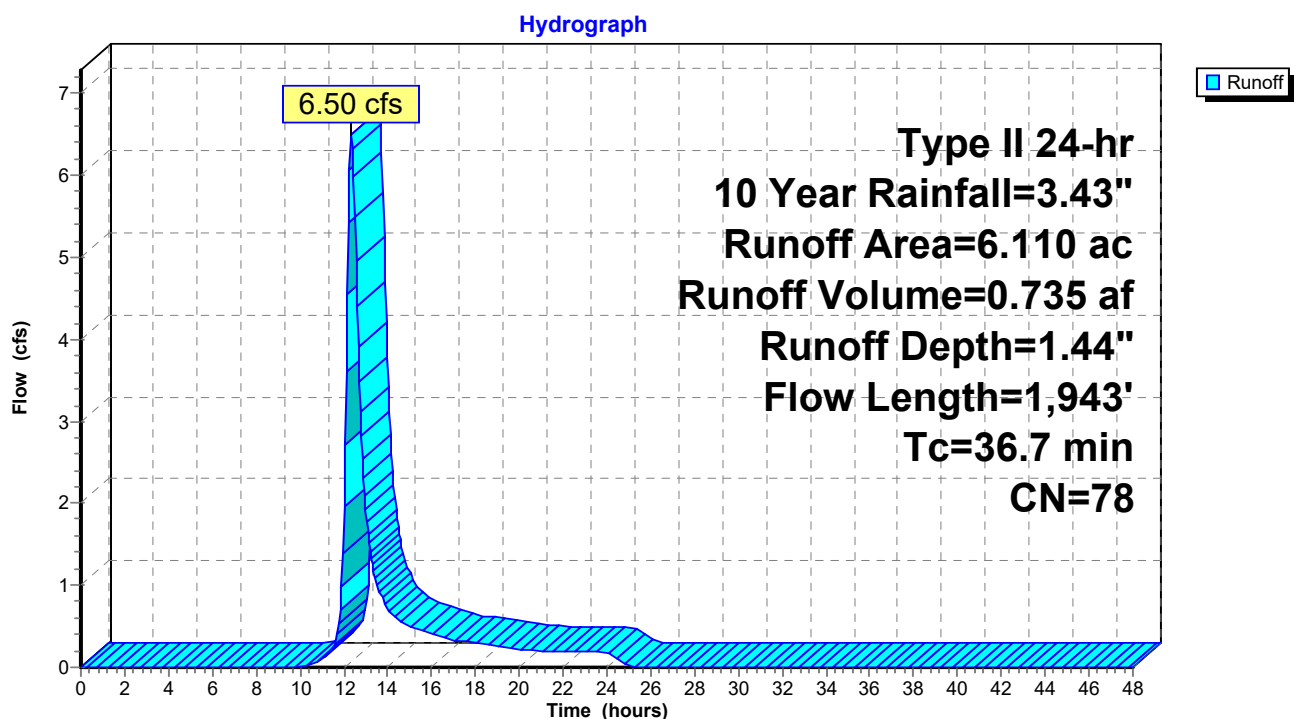
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Type II 24-hr 10 Year Rainfall=3.43"

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## Subcatchment F: Watershed F



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment G: Watershed G**

Runoff = 10.55 cfs @ 12.25 hrs, Volume= 1.024 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

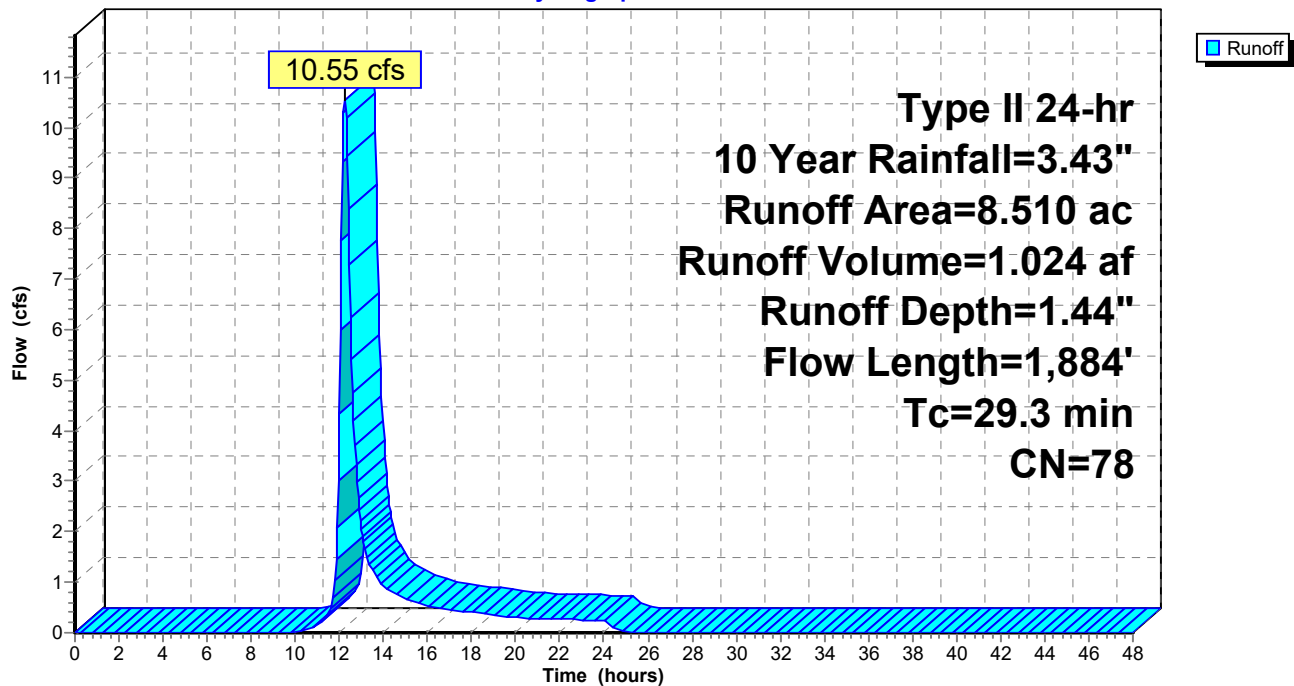
Area (ac)	CN	Description
8.460	78	Meadow, non-grazed, HSG D
0.050	98	Paved parking, HSG D
8.510	78	Weighted Average
8.460		99.41% Pervious Area
0.050		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
19.3	1,784	0.0482	1.54		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
29.3	1,884	Total			

**Subcatchment G: Watershed G**

Hydrograph



## Post-Developed Model (NORTH PLANT)

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Type II 24-hr 10 Year Rainfall=3.43"

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### Summary for Subcatchment H: Watershed H

Runoff = 22.51 cfs @ 12.24 hrs, Volume= 2.146 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

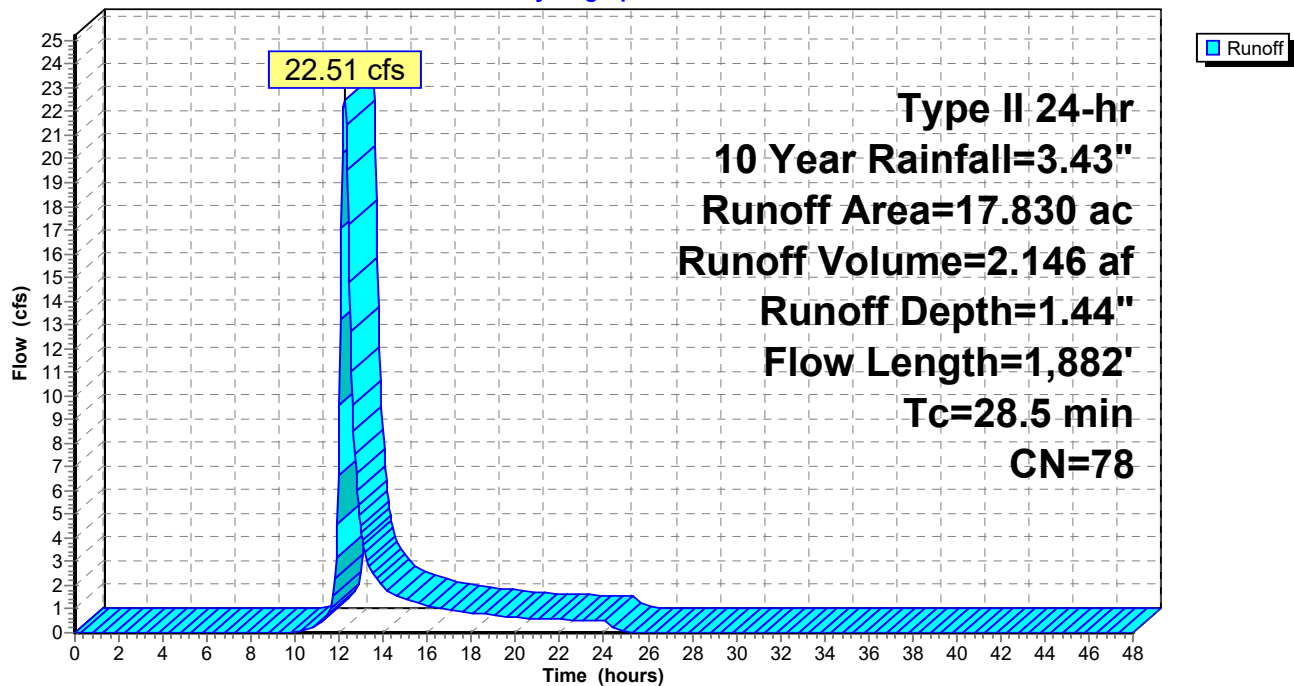
Area (ac)	CN	Description
17.580	78	Meadow, non-grazed, HSG D
0.250	98	Paved parking, HSG D
17.830	78	Weighted Average
17.580		98.60% Pervious Area
0.250		1.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
21.7	1,782	0.0382	1.37		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
28.5	1,882	Total			

### Subcatchment H: Watershed H

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment I: Watershed I**

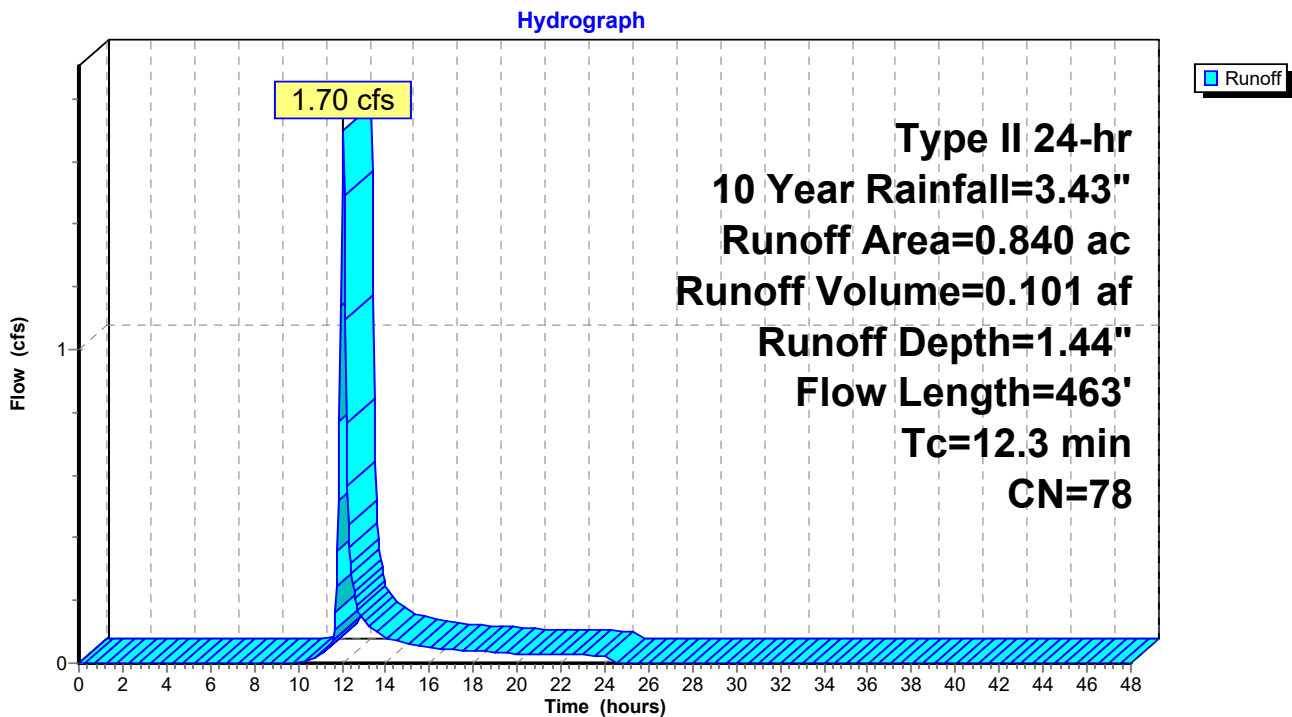
Runoff = 1.70 cfs @ 12.05 hrs, Volume= 0.101 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

Area (ac)	CN	Description
0.840	78	Meadow, non-grazed, HSG D
0.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0800	0.19		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.4	363	0.0660	1.80		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
12.3	463	Total			

**Subcatchment I: Watershed I**

**Post-Developed Model (NORTH PLANT)***Type II 24-hr 25 Year Rainfall=4.26"*

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A**

Runoff Area=2.320 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=962' Tc=19.4 min CN=78 Runoff=5.46 cfs 0.405 af

**Subcatchment B: Watershed B**

Runoff Area=16.600 ac 1.67% Impervious Runoff Depth=2.10"  
Flow Length=1,518' Tc=35.6 min CN=78 Runoff=26.65 cfs 2.900 af

**Subcatchment C: Watershed C**

Runoff Area=1.930 ac 0.00% Impervious Runoff Depth=2.02"  
Flow Length=345' Tc=17.4 min CN=77 Runoff=4.64 cfs 0.324 af

**Subcatchment D: Watershed D**

Runoff Area=20.000 ac 2.23% Impervious Runoff Depth=2.10"  
Flow Length=1,902' Tc=46.9 min CN=78 Runoff=26.50 cfs 3.494 af

**Subcatchment E: Watershed E**

Runoff Area=21.200 ac 3.76% Impervious Runoff Depth=2.18"  
Flow Length=1,874' Tc=38.7 min CN=79 Runoff=33.47 cfs 3.845 af

**Subcatchment F: Watershed F**

Runoff Area=6.110 ac 2.24% Impervious Runoff Depth=2.10"  
Flow Length=1,943' Tc=36.7 min CN=78 Runoff=9.61 cfs 1.067 af

**Subcatchment G: Watershed G**

Runoff Area=8.510 ac 0.59% Impervious Runoff Depth=2.10"  
Flow Length=1,884' Tc=29.3 min CN=78 Runoff=15.57 cfs 1.487 af

**Subcatchment H: Watershed H**

Runoff Area=17.830 ac 1.40% Impervious Runoff Depth=2.10"  
Flow Length=1,882' Tc=28.5 min CN=78 Runoff=33.19 cfs 3.115 af

**Subcatchment I: Watershed I**

Runoff Area=0.840 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=463' Tc=12.3 min CN=78 Runoff=2.48 cfs 0.147 af

**Total Runoff Area = 95.340 ac Runoff Volume = 16.784 af Average Runoff Depth = 2.11"**  
**97.95% Pervious = 93.382 ac 2.05% Impervious = 1.958 ac**

## Post-Developed Model (NORTH PLANT)

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Type II 24-hr 25 Year Rainfall=4.26"

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### Summary for Subcatchment A: Watershed A

Runoff = 5.46 cfs @ 12.12 hrs, Volume= 0.405 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

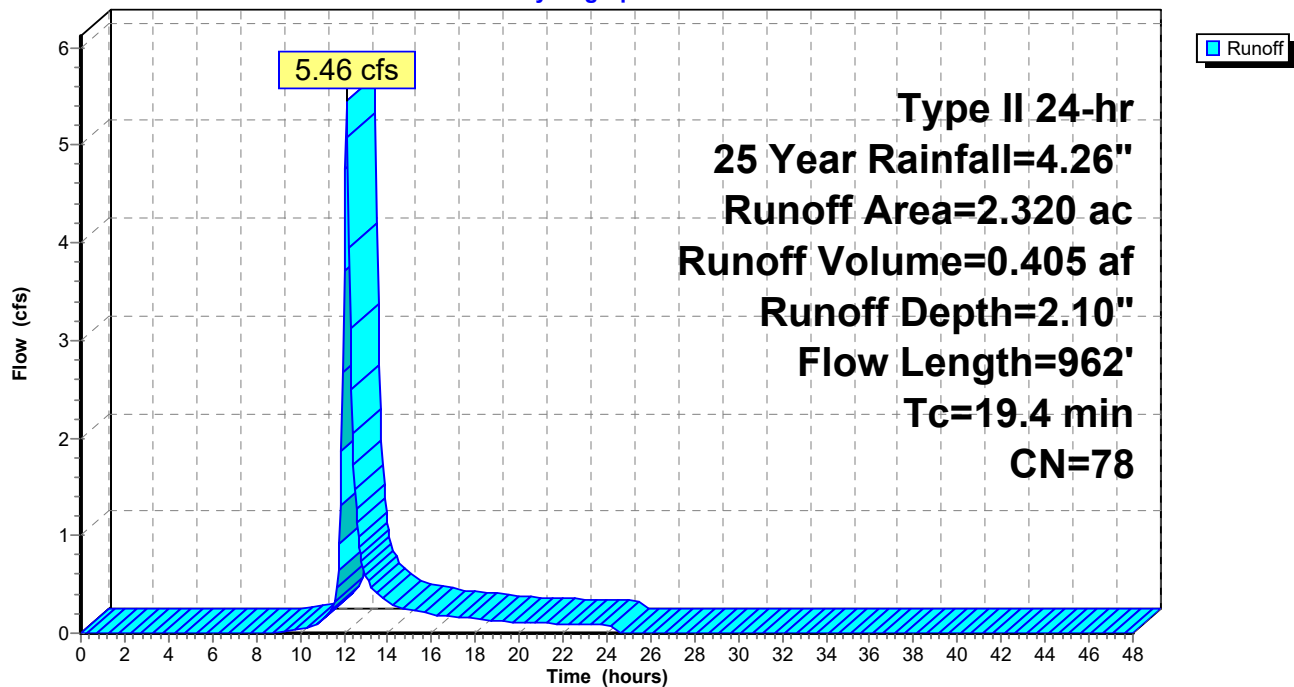
Area (ac)	CN	Description
2.320	78	Meadow, non-grazed, HSG D
2.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0450	0.15		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
8.2	862	0.0626	1.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
19.4	962	Total			

### Subcatchment A: Watershed A

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment B: Watershed B**

Runoff = 26.65 cfs @ 12.32 hrs, Volume= 2.900 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

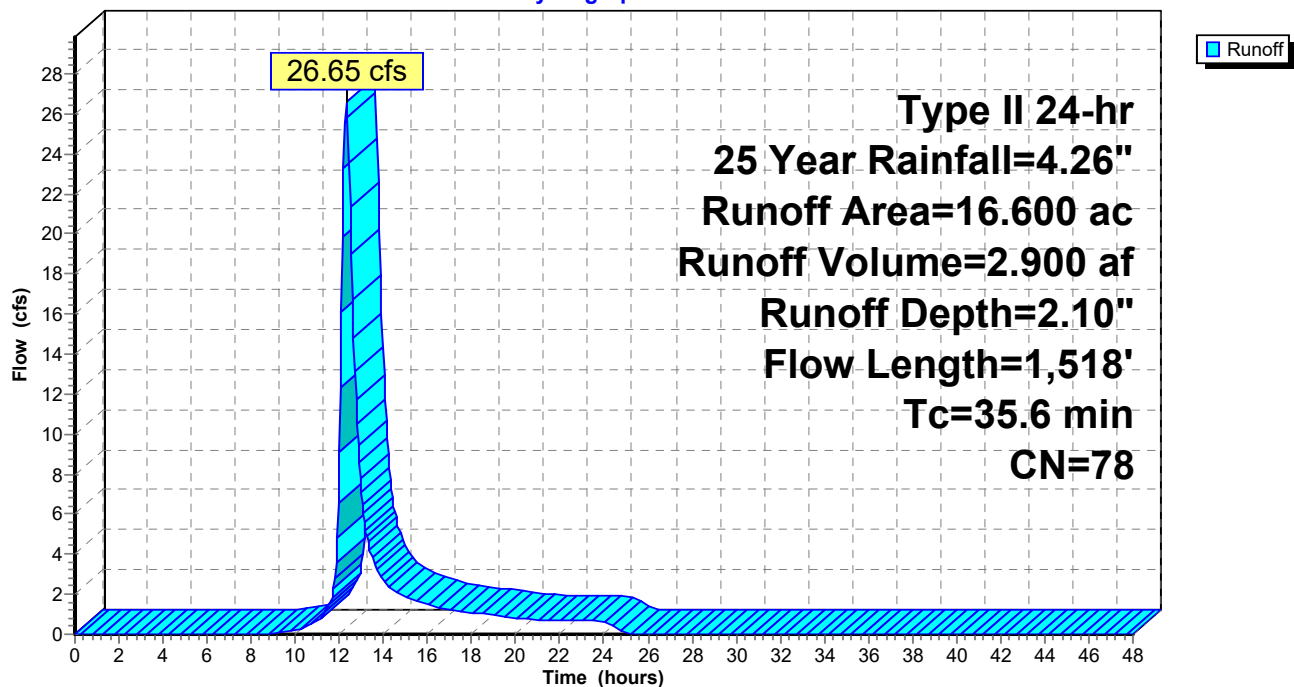
Area (ac)	CN	Description
16.323	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.270	98	Paved parking, HSG D
16.600	78	Weighted Average
16.323		98.33% Pervious Area
0.277		1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
15.1	1,418	0.0497	1.56		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
35.6	1,518	Total			

**Subcatchment B: Watershed B**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment C: Watershed C**

Runoff = 4.64 cfs @ 12.10 hrs, Volume= 0.324 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

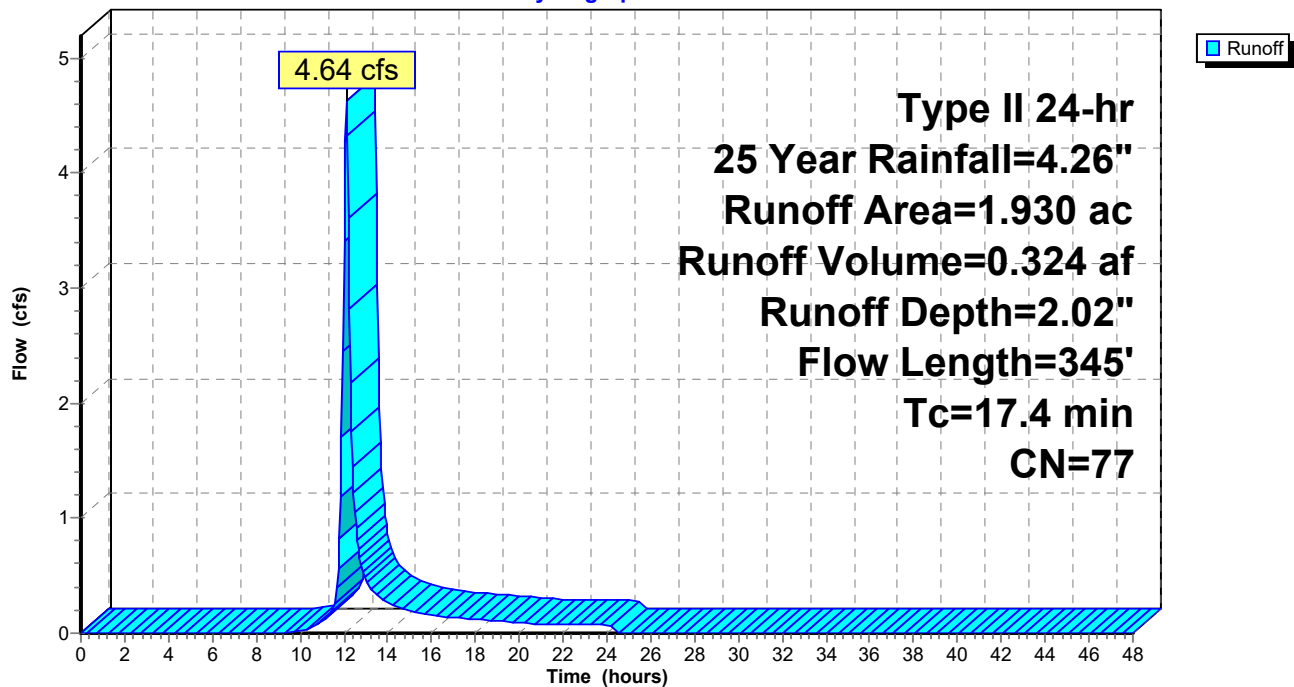
Area (ac)	CN	Description
1.930	77	Woods, Good, HSG D
1.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 2.70"
5.1	245	0.0253	0.80		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
17.4	345	Total			

**Subcatchment C: Watershed C**

Hydrograph





**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment D: Watershed D**

Runoff = 26.50 cfs @ 12.46 hrs, Volume= 3.494 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

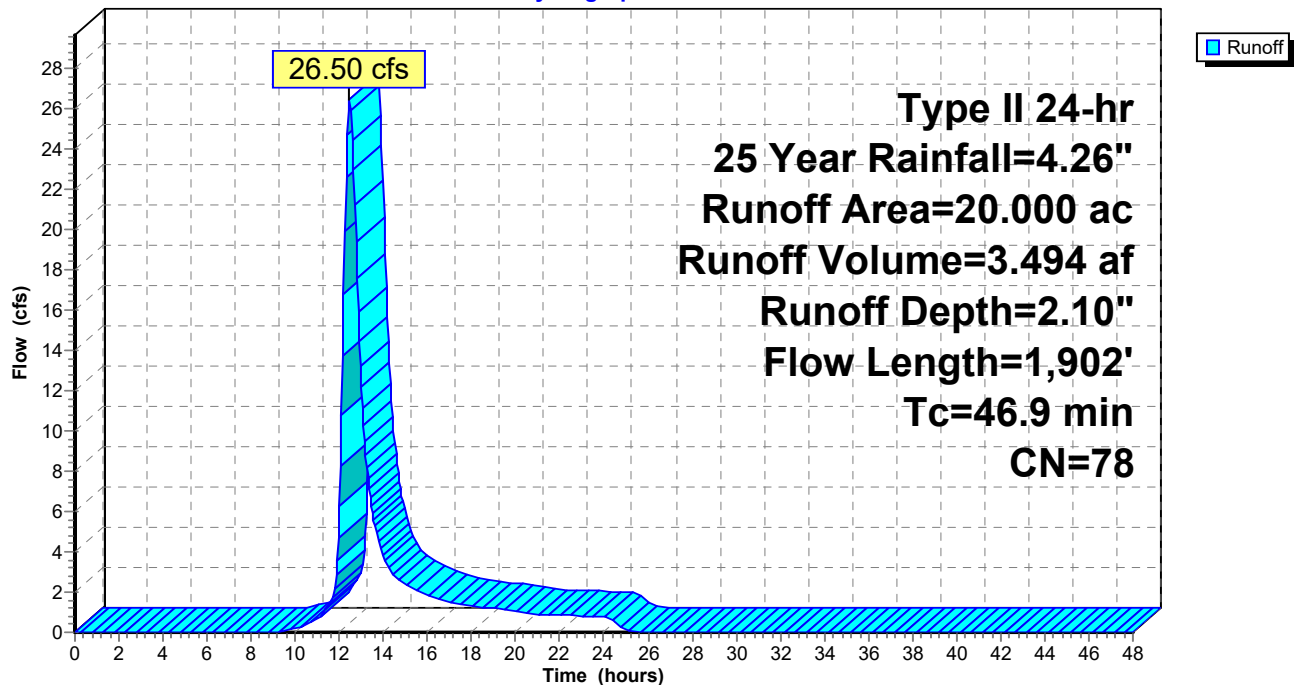
Area (ac)	CN	Description
19.553	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.440	98	Paved parking, HSG D
20.000	78	Weighted Average
19.553		97.76% Pervious Area
0.447		2.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	1,190	0.0588	1.70		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
14.7	612	0.0098	0.69		<b>Shallow Concentrated Flow, C-D</b> Short Grass Pasture Kv= 7.0 fps
46.9	1,902	Total			

**Subcatchment D: Watershed D**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment E: Watershed E**

Runoff = 33.47 cfs @ 12.36 hrs, Volume= 3.845 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

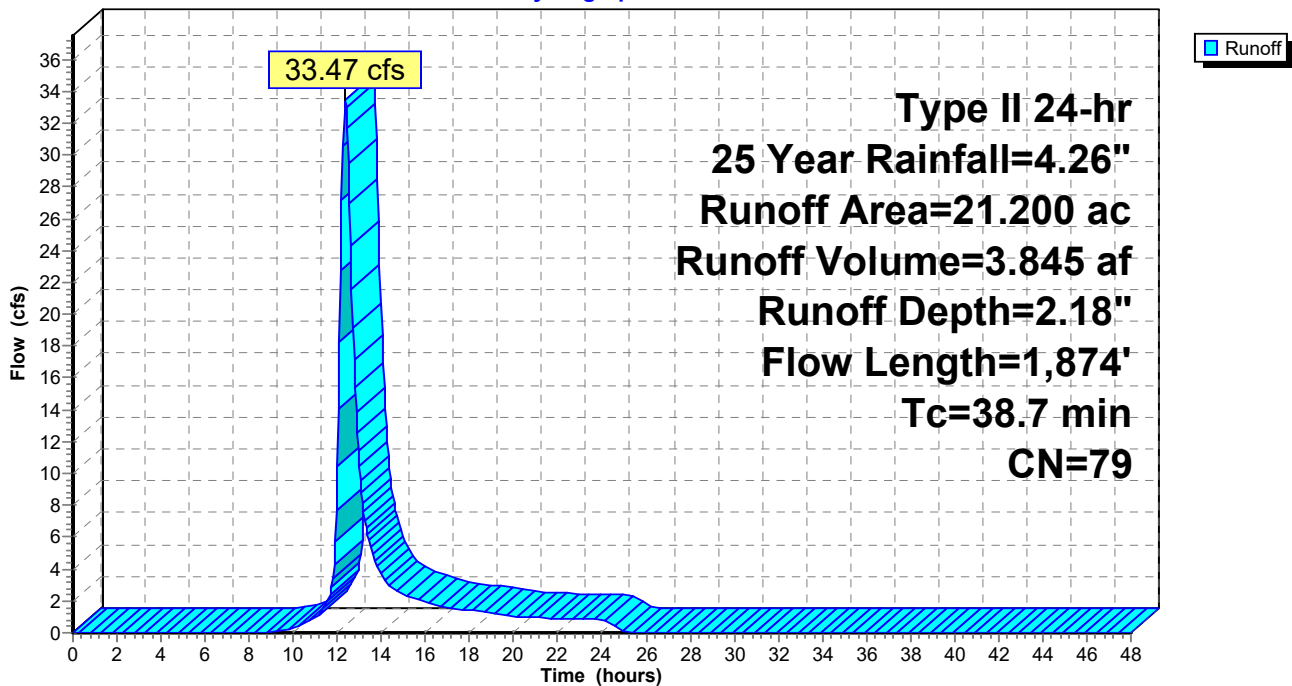
Area (ac)	CN	Description
20.403	78	Meadow, non-grazed, HSG D
0.500	98	Water Surface, HSG D
0.007	98	Paved parking, HSG D
0.290	98	Paved parking, HSG D
21.200	79	Weighted Average
20.403		96.24% Pervious Area
0.797		3.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b>
					Grass: Dense n= 0.240 P2= 2.70"
18.2	1,774	0.0541	1.63		<b>Shallow Concentrated Flow, B-C</b>
					Short Grass Pasture Kv= 7.0 fps
38.7	1,874	Total			

**Subcatchment E: Watershed E**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment F: Watershed F**

Runoff = 9.61 cfs @ 12.33 hrs, Volume= 1.067 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

Area (ac)	CN	Description
5.973	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.130	98	Paved parking, HSG D
6.110	78	Weighted Average
5.973		97.76% Pervious Area
0.137		2.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0080	0.07		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.2	360	0.0720	1.88		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.6	360	0.0800	3.84	1.15	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.030 Earth, grassed & winding
5.5	543	0.0552	1.64		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
4.0	580	0.0103	2.42	2.18	<b>Trap/Vee/Rect Channel Flow, E-F</b> Bot.W=0.00' D=1.00' Z= 0.9 '/' Top.W=1.80' n= 0.030 Earth, grassed & winding
36.7	1,943	Total			

# Post-Developed Model (NORTH PLANT)

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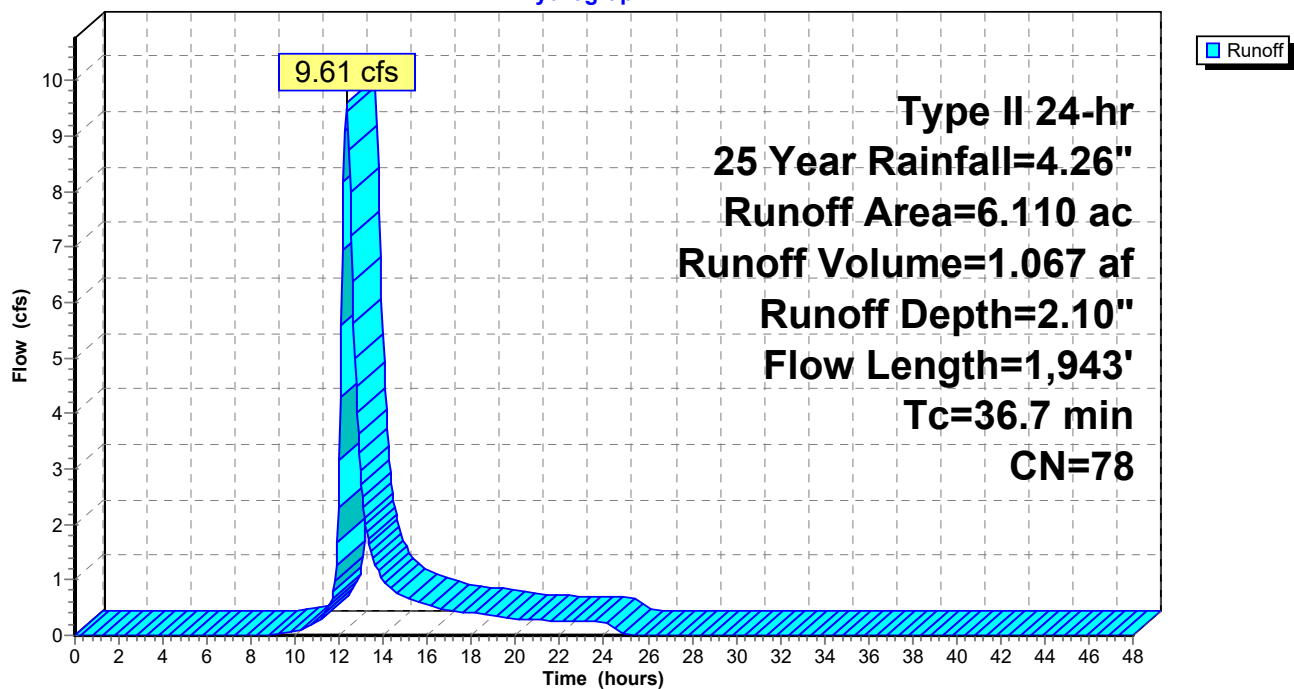
Type II 24-hr 25 Year Rainfall=4.26"

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## Subcatchment F: Watershed F

Hydrograph



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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment G: Watershed G**

Runoff = 15.57 cfs @ 12.24 hrs, Volume= 1.487 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

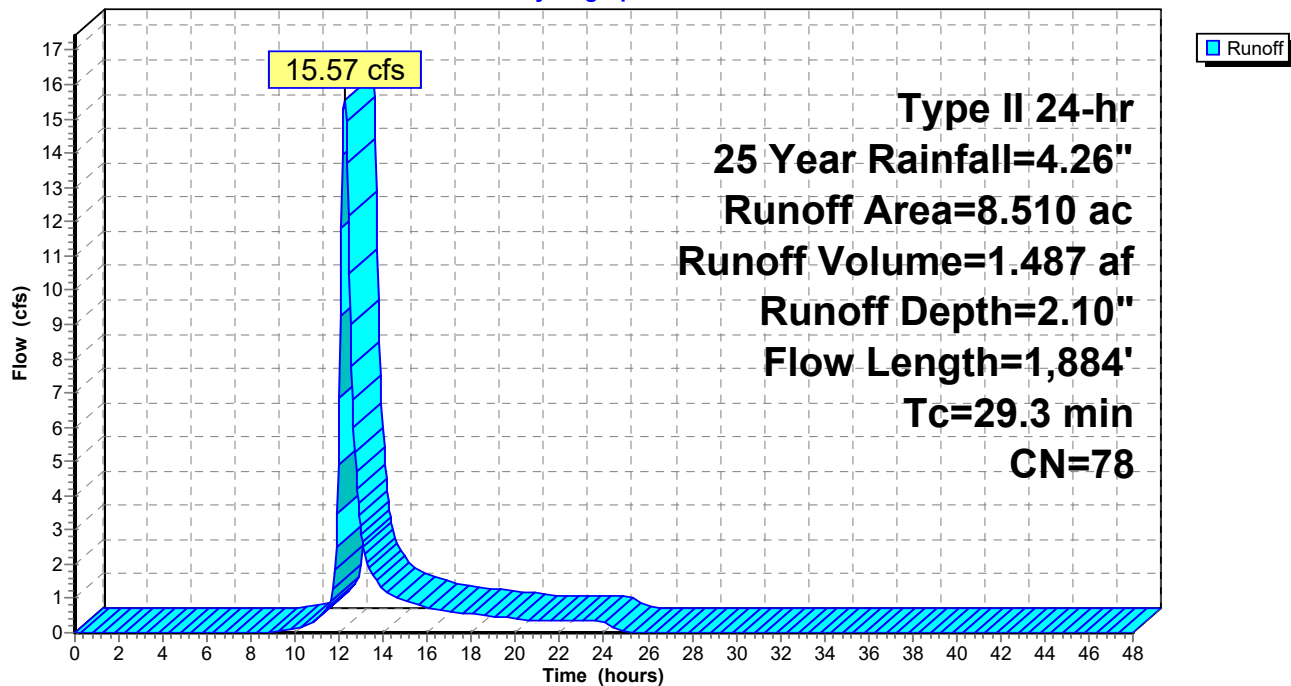
Area (ac)	CN	Description
8.460	78	Meadow, non-grazed, HSG D
0.050	98	Paved parking, HSG D
8.510	78	Weighted Average
8.460		99.41% Pervious Area
0.050		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
19.3	1,784	0.0482	1.54		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
29.3	1,884	Total			

**Subcatchment G: Watershed G**

Hydrograph



## Post-Developed Model (NORTH PLANT)

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Type II 24-hr 25 Year Rainfall=4.26"

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### Summary for Subcatchment H: Watershed H

Runoff = 33.19 cfs @ 12.23 hrs, Volume= 3.115 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

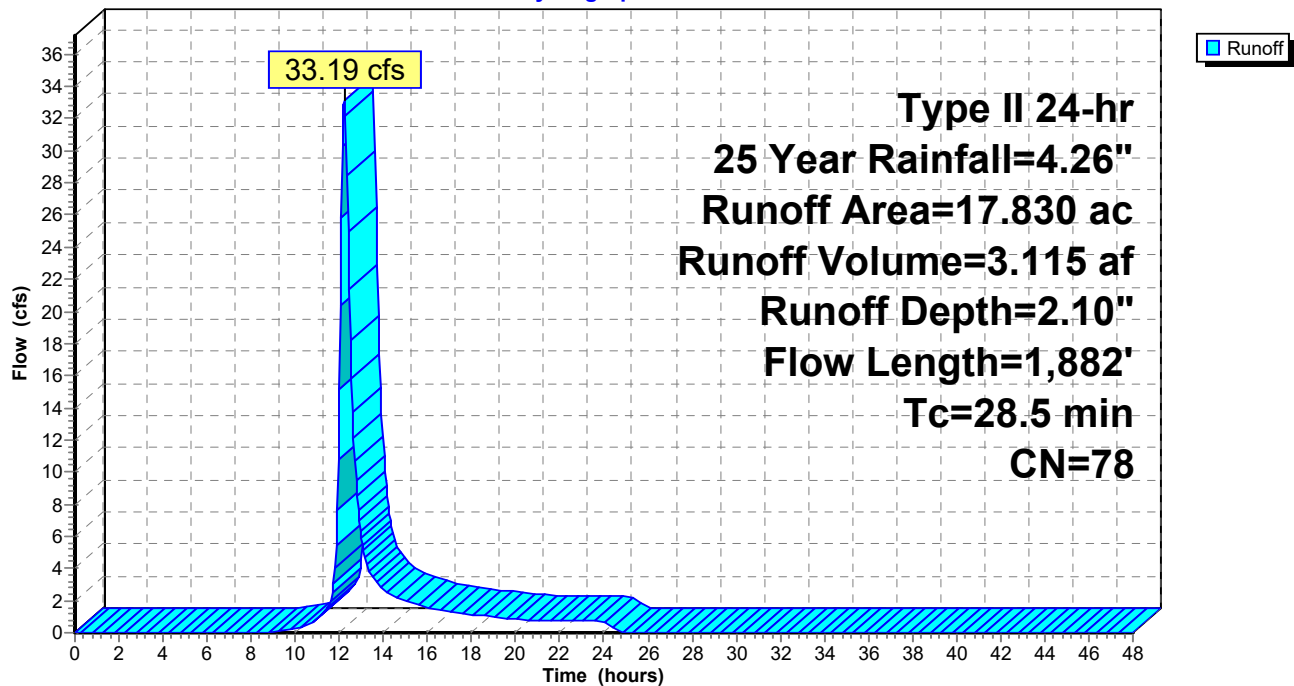
Area (ac)	CN	Description
17.580	78	Meadow, non-grazed, HSG D
0.250	98	Paved parking, HSG D
17.830	78	Weighted Average
17.580		98.60% Pervious Area
0.250		1.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
21.7	1,782	0.0382	1.37		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
28.5	1,882	Total			

### Subcatchment H: Watershed H

Hydrograph



## Post-Developed Model (NORTH PLANT)

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Type II 24-hr 25 Year Rainfall=4.26"

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### Summary for Subcatchment I: Watershed I

Runoff = 2.48 cfs @ 12.04 hrs, Volume= 0.147 af, Depth= 2.10"

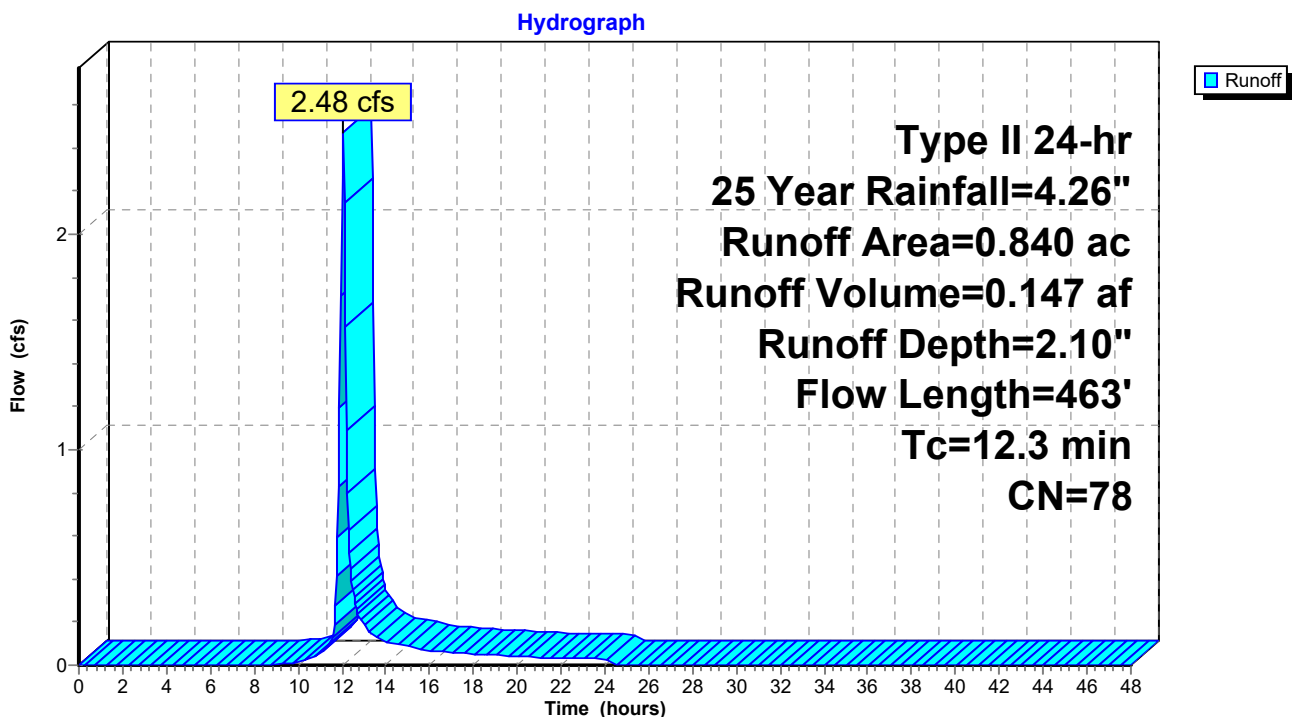
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

Area (ac)	CN	Description
0.840	78	Meadow, non-grazed, HSG D
0.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0800	0.19		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.4	363	0.0660	1.80		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
12.3	463	Total			

### Subcatchment I: Watershed I



**Post-Developed Model (NORTH PLANT)***Type II 24-hr 100 Year Rainfall=5.93"*

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A**

Runoff Area=2.320 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=962' Tc=19.4 min CN=78 Runoff=9.18 cfs 0.680 af

**Subcatchment B: Watershed B**

Runoff Area=16.600 ac 1.67% Impervious Runoff Depth=3.52"  
Flow Length=1,518' Tc=35.6 min CN=78 Runoff=45.15 cfs 4.865 af

**Subcatchment C: Watershed C**

Runoff Area=1.930 ac 0.00% Impervious Runoff Depth=3.42"  
Flow Length=345' Tc=17.4 min CN=77 Runoff=7.88 cfs 0.550 af

**Subcatchment D: Watershed D**

Runoff Area=20.000 ac 2.23% Impervious Runoff Depth=3.52"  
Flow Length=1,902' Tc=46.9 min CN=78 Runoff=45.00 cfs 5.862 af

**Subcatchment E: Watershed E**

Runoff Area=21.200 ac 3.76% Impervious Runoff Depth=3.62"  
Flow Length=1,874' Tc=38.7 min CN=79 Runoff=56.04 cfs 6.390 af

**Subcatchment F: Watershed F**

Runoff Area=6.110 ac 2.24% Impervious Runoff Depth=3.52"  
Flow Length=1,943' Tc=36.7 min CN=78 Runoff=16.29 cfs 1.791 af

**Subcatchment G: Watershed G**

Runoff Area=8.510 ac 0.59% Impervious Runoff Depth=3.52"  
Flow Length=1,884' Tc=29.3 min CN=78 Runoff=26.31 cfs 2.494 af

**Subcatchment H: Watershed H**

Runoff Area=17.830 ac 1.40% Impervious Runoff Depth=3.52"  
Flow Length=1,882' Tc=28.5 min CN=78 Runoff=56.18 cfs 5.226 af

**Subcatchment I: Watershed I**

Runoff Area=0.840 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=463' Tc=12.3 min CN=78 Runoff=4.13 cfs 0.246 af

**Total Runoff Area = 95.340 ac Runoff Volume = 28.105 af Average Runoff Depth = 3.54"**  
**97.95% Pervious = 93.382 ac 2.05% Impervious = 1.958 ac**



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment A: Watershed A**

Runoff = 9.18 cfs @ 12.12 hrs, Volume= 0.680 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

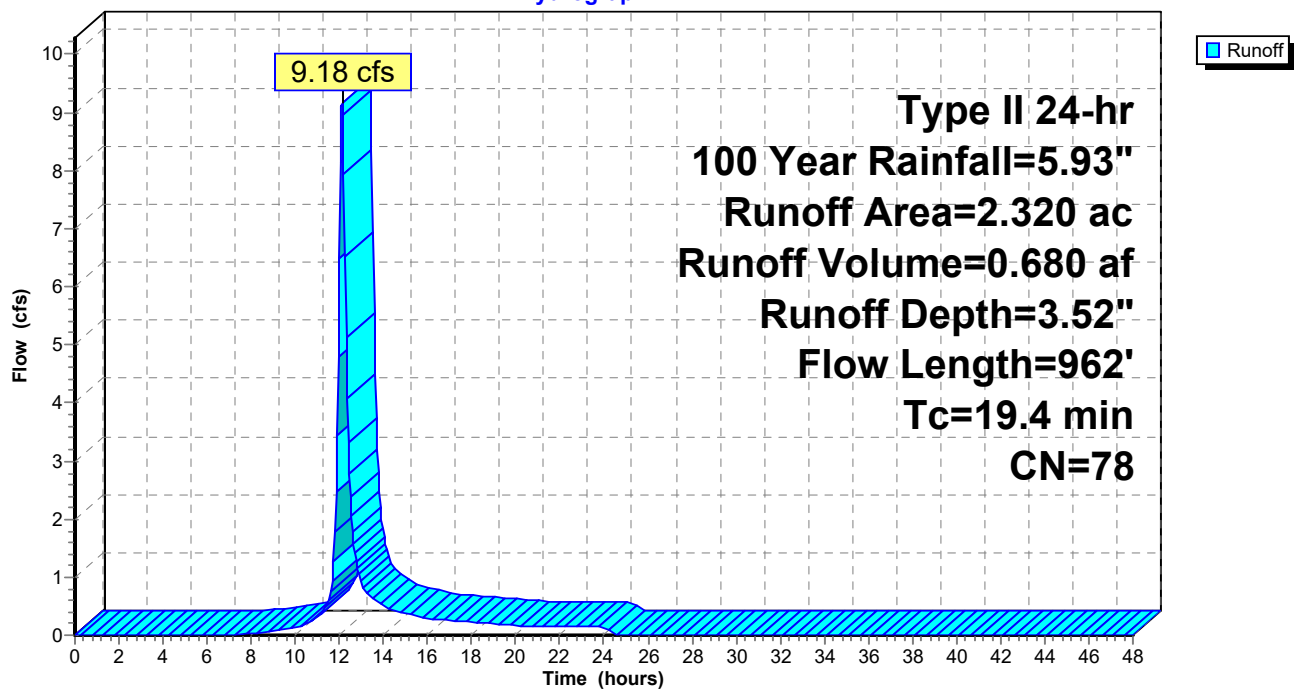
Area (ac)	CN	Description
2.320	78	Meadow, non-grazed, HSG D
2.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0450	0.15		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
8.2	862	0.0626	1.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
19.4	962	Total			

**Subcatchment A: Watershed A**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment B: Watershed B**

Runoff = 45.15 cfs @ 12.31 hrs, Volume= 4.865 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

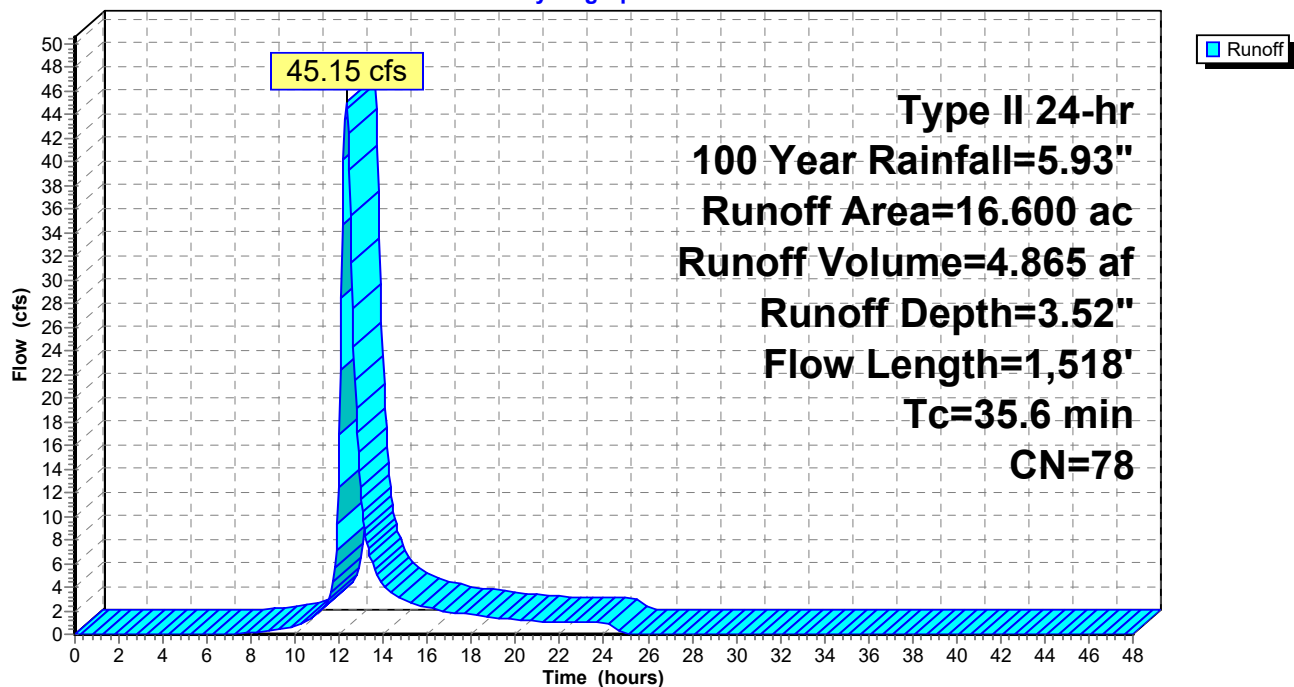
Area (ac)	CN	Description
16.323	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.270	98	Paved parking, HSG D
16.600	78	Weighted Average
16.323		98.33% Pervious Area
0.277		1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
15.1	1,418	0.0497	1.56		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
35.6	1,518	Total			

**Subcatchment B: Watershed B**

Hydrograph



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**Summary for Subcatchment C: Watershed C**

Runoff = 7.88 cfs @ 12.10 hrs, Volume= 0.550 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

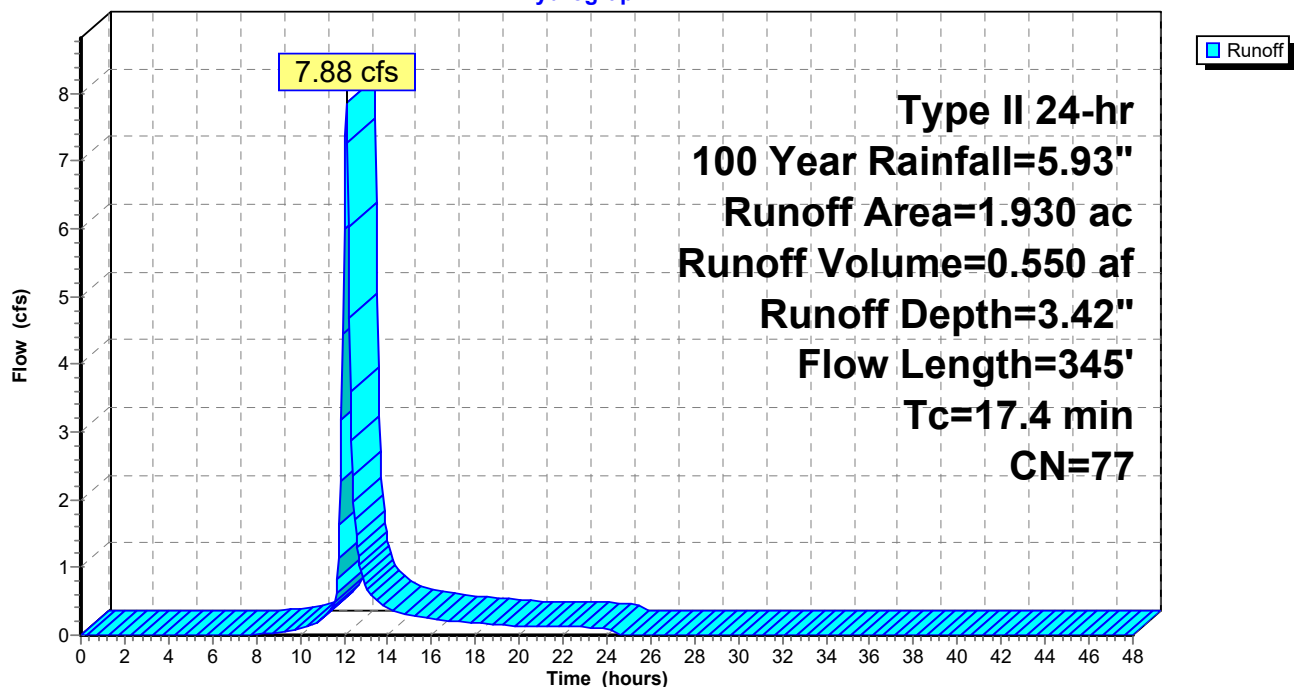
Area (ac)	CN	Description
1.930	77	Woods, Good, HSG D
1.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 2.70"
5.1	245	0.0253	0.80		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
17.4	345	Total			

**Subcatchment C: Watershed C**

Hydrograph



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**Summary for Subcatchment D: Watershed D**

Runoff = 45.00 cfs @ 12.45 hrs, Volume= 5.862 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

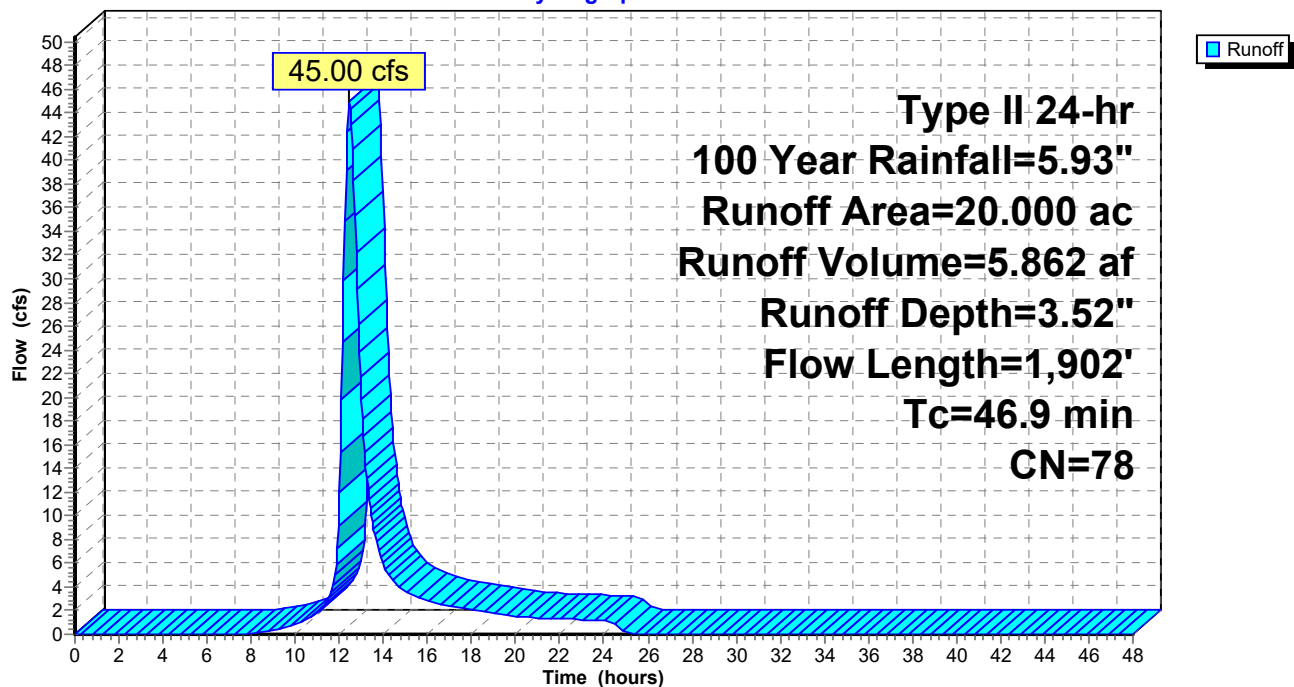
Area (ac)	CN	Description
19.553	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.440	98	Paved parking, HSG D
20.000	78	Weighted Average
19.553		97.76% Pervious Area
0.447		2.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	1,190	0.0588	1.70		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
14.7	612	0.0098	0.69		<b>Shallow Concentrated Flow, C-D</b> Short Grass Pasture Kv= 7.0 fps
46.9	1,902	Total			

**Subcatchment D: Watershed D**

Hydrograph



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**Summary for Subcatchment E: Watershed E**

Runoff = 56.04 cfs @ 12.35 hrs, Volume= 6.390 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

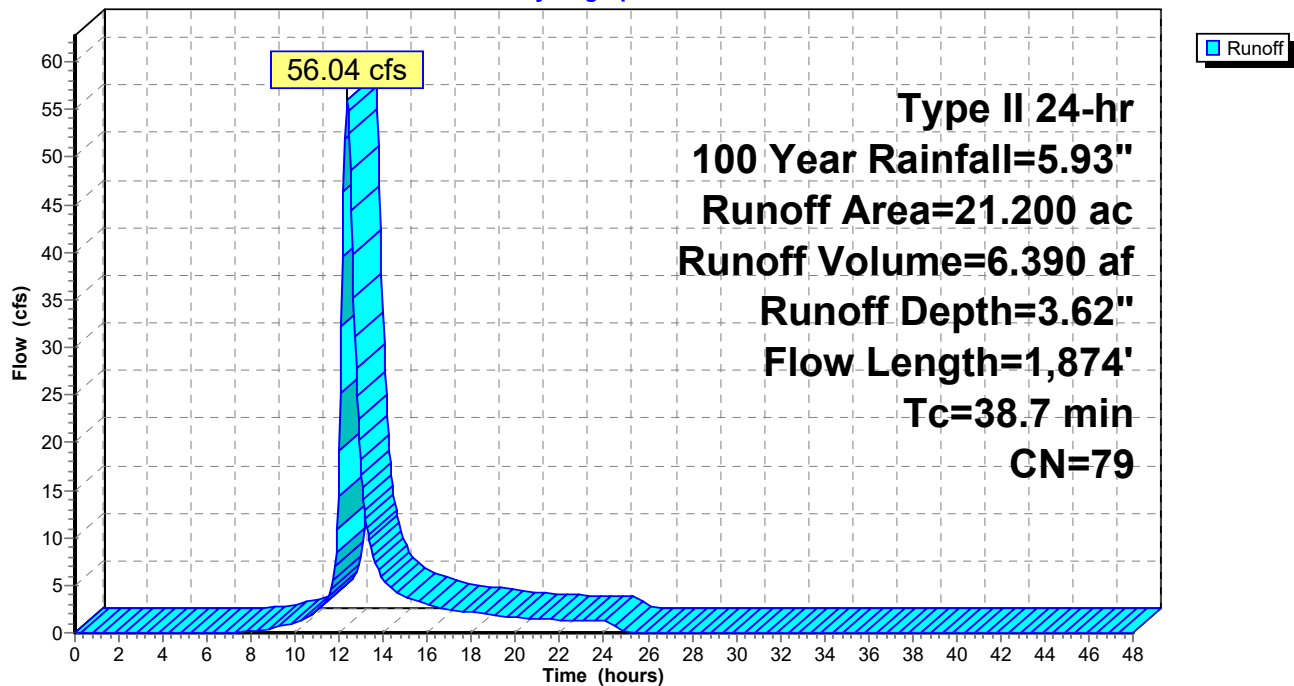
Area (ac)	CN	Description
20.403	78	Meadow, non-grazed, HSG D
0.500	98	Water Surface, HSG D
0.007	98	Paved parking, HSG D
0.290	98	Paved parking, HSG D
21.200	79	Weighted Average
20.403		96.24% Pervious Area
0.797		3.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.2	1,774	0.0541	1.63		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
38.7	1,874	Total			

**Subcatchment E: Watershed E**

Hydrograph



**Post-Developed Model (NORTH PLANT)**

Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment F: Watershed F**

Runoff = 16.29 cfs @ 12.32 hrs, Volume= 1.791 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

Area (ac)	CN	Description
5.973	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
0.130	98	Paved parking, HSG D
6.110	78	Weighted Average
5.973		97.76% Pervious Area
0.137		2.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	100	0.0080	0.07		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.2	360	0.0720	1.88		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.6	360	0.0800	3.84	1.15	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.030 Earth, grassed & winding
5.5	543	0.0552	1.64		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
4.0	580	0.0103	2.42	2.18	<b>Trap/Vee/Rect Channel Flow, E-F</b> Bot.W=0.00' D=1.00' Z= 0.9 '/' Top.W=1.80' n= 0.030 Earth, grassed & winding
36.7	1,943	Total			

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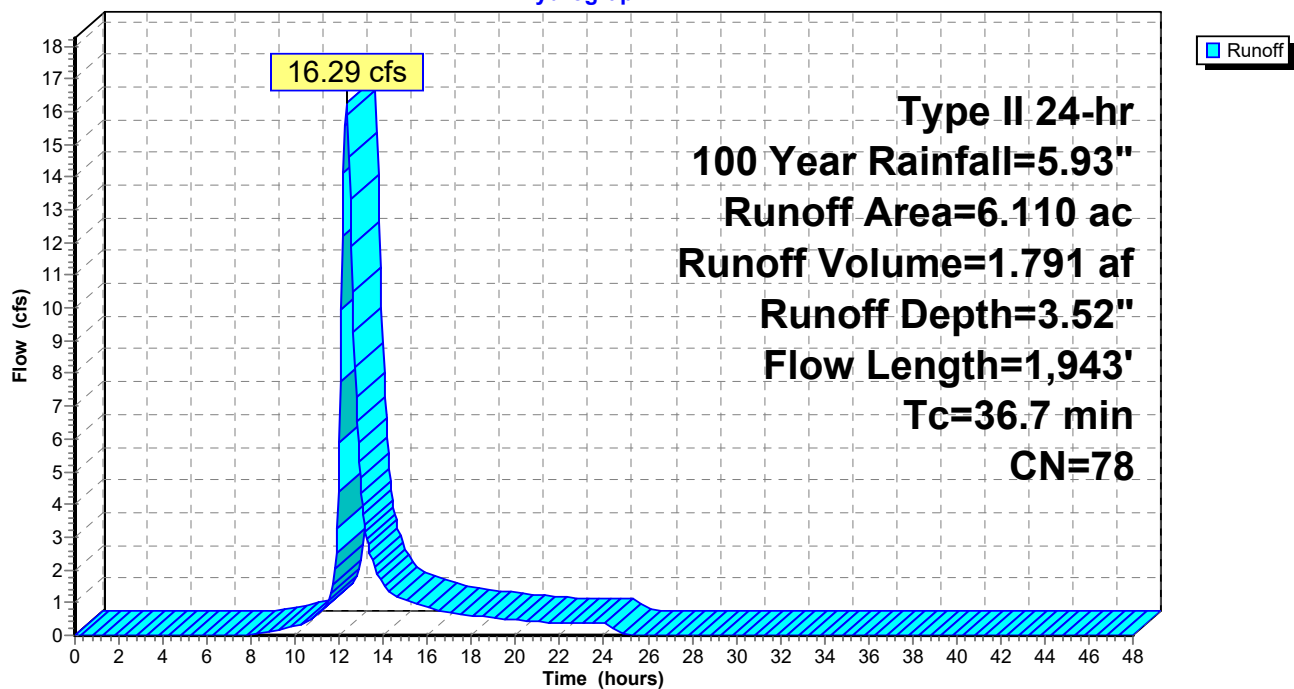
Type II 24-hr 100 Year Rainfall=5.93"

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## Subcatchment F: Watershed F

Hydrograph



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**Summary for Subcatchment G: Watershed G**

Runoff = 26.31 cfs @ 12.23 hrs, Volume= 2.494 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

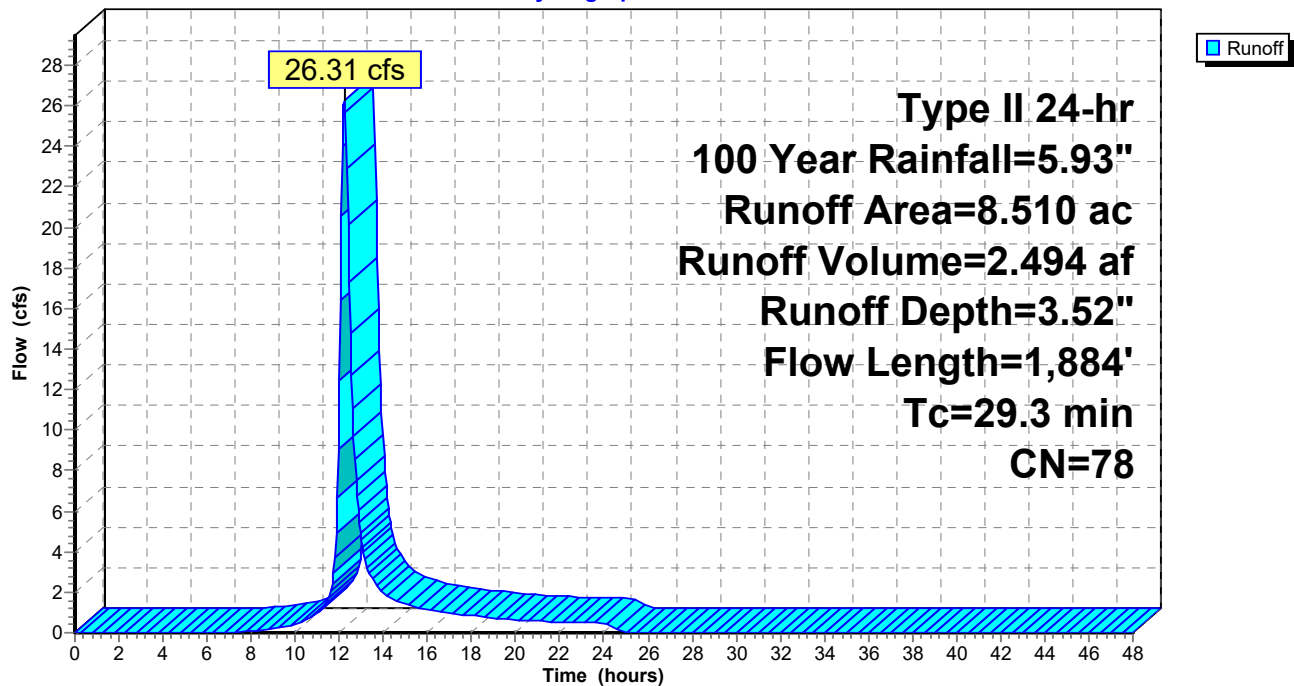
Area (ac)	CN	Description
8.460	78	Meadow, non-grazed, HSG D
0.050	98	Paved parking, HSG D
8.510	78	Weighted Average
8.460		99.41% Pervious Area
0.050		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
19.3	1,784	0.0482	1.54		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
29.3	1,884	Total			

**Subcatchment G: Watershed G**

Hydrograph





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**Summary for Subcatchment H: Watershed H**

Runoff = 56.18 cfs @ 12.22 hrs, Volume= 5.226 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

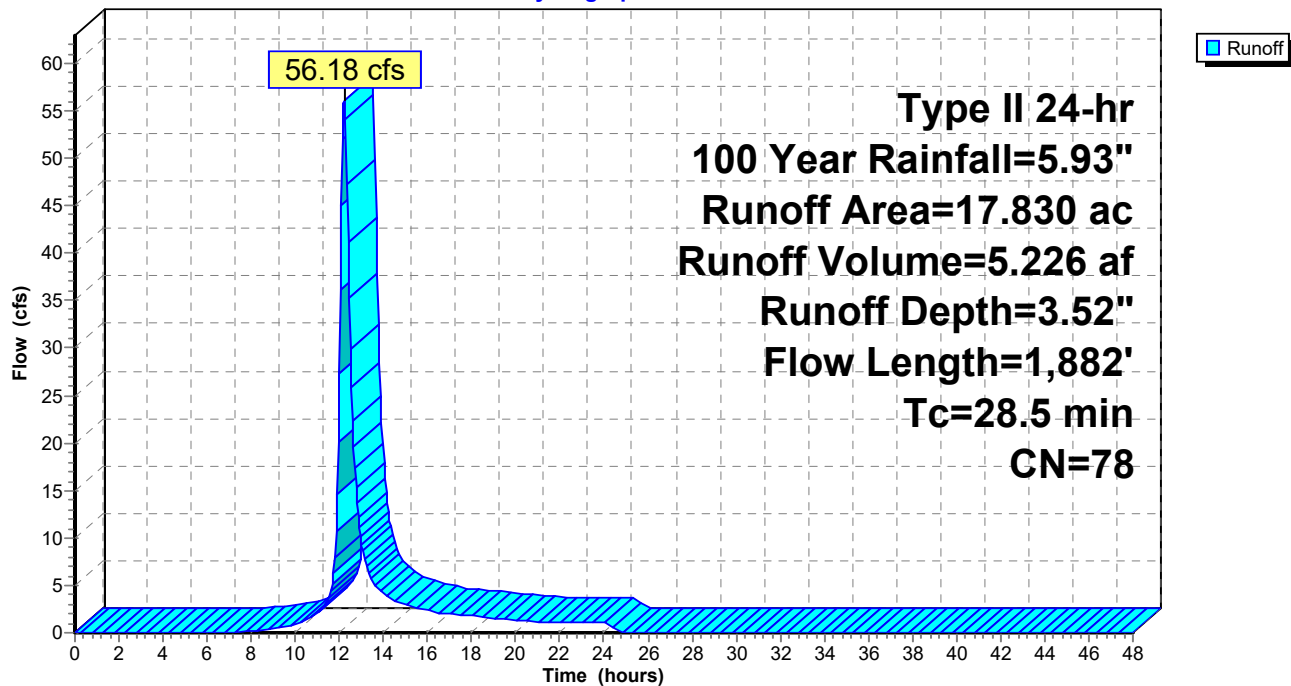
Area (ac)	CN	Description
17.580	78	Meadow, non-grazed, HSG D
0.250	98	Paved parking, HSG D
17.830	78	Weighted Average
17.580		98.60% Pervious Area
0.250		1.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
21.7	1,782	0.0382	1.37		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
28.5	1,882	Total			

**Subcatchment H: Watershed H**

Hydrograph



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**Summary for Subcatchment I: Watershed I**

Runoff = 4.13 cfs @ 12.04 hrs, Volume= 0.246 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

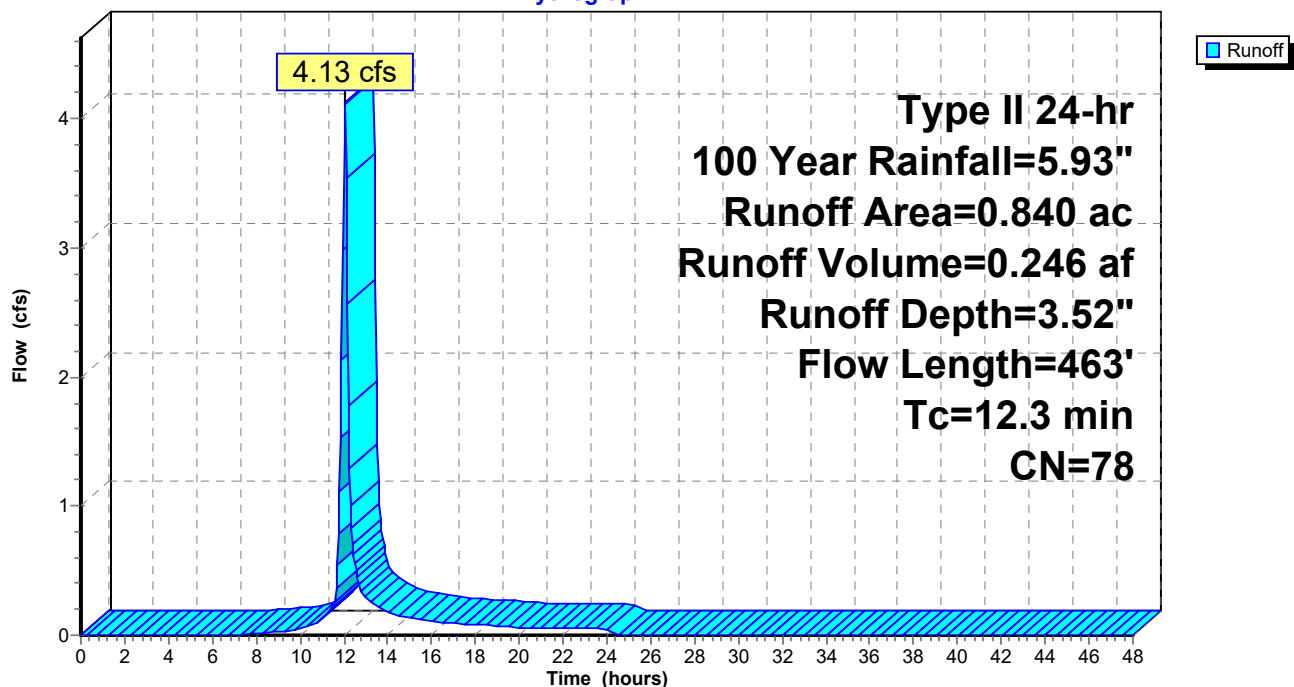
Area (ac)	CN	Description
0.840	78	Meadow, non-grazed, HSG D
0.840		100.00% Pervious Area

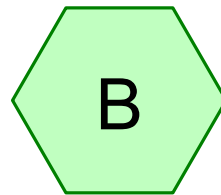
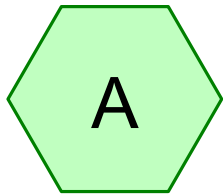
  

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0800	0.19		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
3.4	363	0.0660	1.80		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
12.3	463	Total			

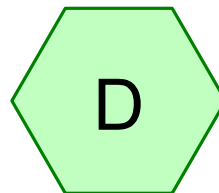
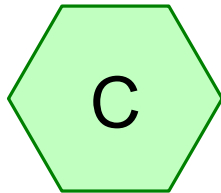
**Subcatchment I: Watershed I**

Hydrograph

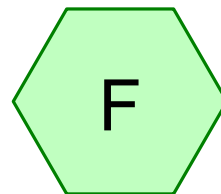
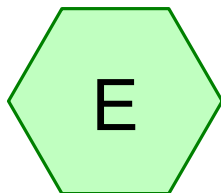




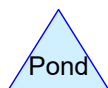
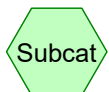
Watershed A (West Array)    Watershed B (West Array)



Watershed C (East Array)    Watershed D (East Array)



Watershed E (East Array)    Watershed F (East Array)



## Post-Developed Model (SOUTH PLANT)

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### Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
117.255	78	Meadow, non-grazed, HSG D (A, B, D, E, F)
0.505	98	Paved parking, HSG D (B, E, F)
0.190	79	Woods/grass comb., Good, HSG D (C)
<b>117.950</b>	<b>78</b>	<b>TOTAL AREA</b>

## Post-Developed Model (SOUTH PLANT)

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### Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
117.950	HSG D	A, B, C, D, E, F
0.000	Other	
<b>117.950</b>		<b>TOTAL AREA</b>

## Post-Developed Model (SOUTH PLANT)

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### Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	117.255	0.000	117.255	Meadow, non-grazed	A, B, D, E, F
0.000	0.000	0.000	0.505	0.000	0.505	Paved parking	B, E, F
0.000	0.000	0.000	0.190	0.000	0.190	Woods/grass comb., Good	C
<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>117.950</b>	<b>0.000</b>	<b>117.950</b>	<b>TOTAL AREA</b>	

## Post-Developed Model (SOUTH PLANT)

Type II 24-hr 1 Year Rainfall=2.01"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A (West Array)** Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=623' Tc=27.2 min CN=78 Runoff=0.80 cfs 0.084 af

**Subcatchment B: Watershed B (West Array)** Runoff Area=50.110 ac 0.70% Impervious Runoff Depth=0.49"  
Flow Length=2,811' Tc=47.5 min CN=78 Runoff=13.02 cfs 2.046 af

**Subcatchment C: Watershed C (East Array)** Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=0.53"  
Flow Length=126' Slope=0.0700 '/' Tc=9.6 min CN=79 Runoff=0.15 cfs 0.008 af

**Subcatchment D: Watershed D (East Array)** Runoff Area=17.260 ac 0.00% Impervious Runoff Depth=0.49"  
Flow Length=1,701' Tc=28.7 min CN=78 Runoff=6.46 cfs 0.705 af

**Subcatchment E: Watershed E (East Array)** Runoff Area=24.550 ac 0.03% Impervious Runoff Depth=0.49"  
Flow Length=1,635' Tc=27.5 min CN=78 Runoff=9.46 cfs 1.002 af

**Subcatchment F: Watershed F (East Array)** Runoff Area=23.790 ac 0.62% Impervious Runoff Depth=0.49"  
Flow Length=1,624' Tc=30.4 min CN=78 Runoff=8.52 cfs 0.971 af

**Total Runoff Area = 117.950 ac Runoff Volume = 4.817 af Average Runoff Depth = 0.49"**  
**99.57% Pervious = 117.445 ac 0.43% Impervious = 0.505 ac**

## Post-Developed Model (SOUTH PLANT)

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Type II 24-hr 1 Year Rainfall=2.01"

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### Summary for Subcatchment A: Watershed A (West Array)

Runoff = 0.80 cfs @ 12.24 hrs, Volume= 0.084 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

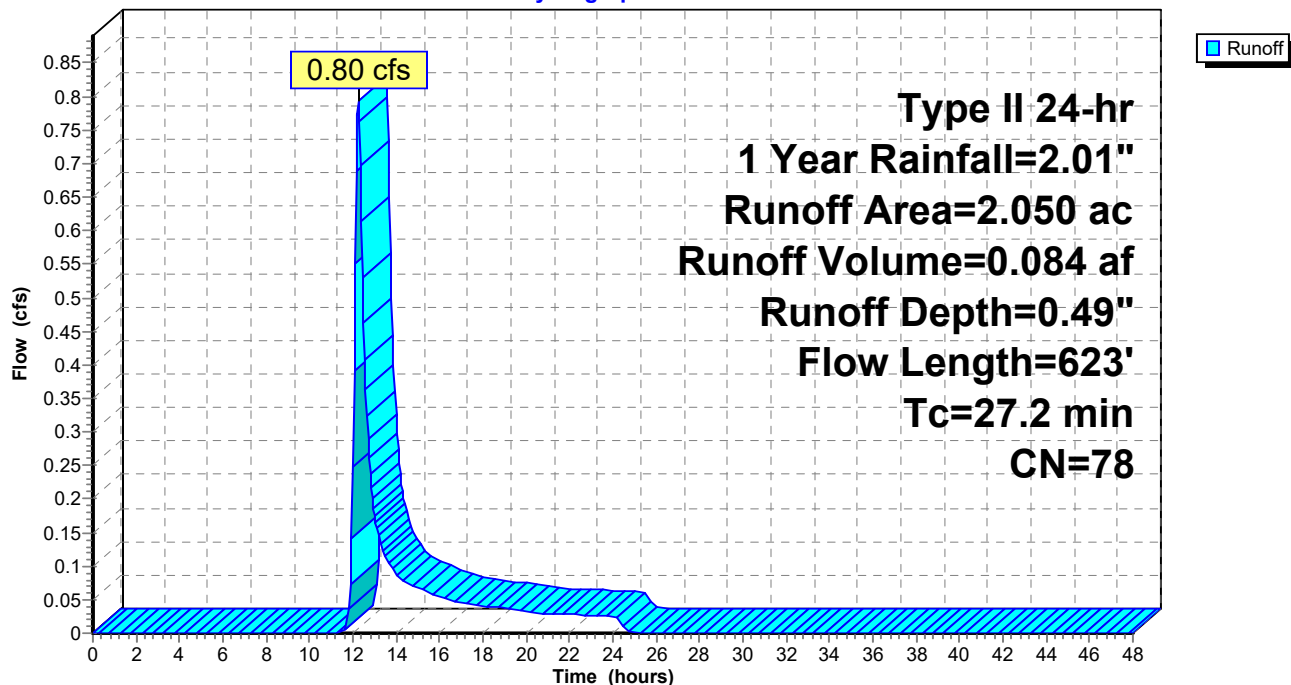
Area (ac)	CN	Description
2.050	78	Meadow, non-grazed, HSG D
2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	523	0.0114	0.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
27.2	623	Total			

### Subcatchment A: Watershed A (West Array)

Hydrograph





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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment B: Watershed B (West Array)**

Runoff = 13.02 cfs @ 12.52 hrs, Volume= 2.046 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

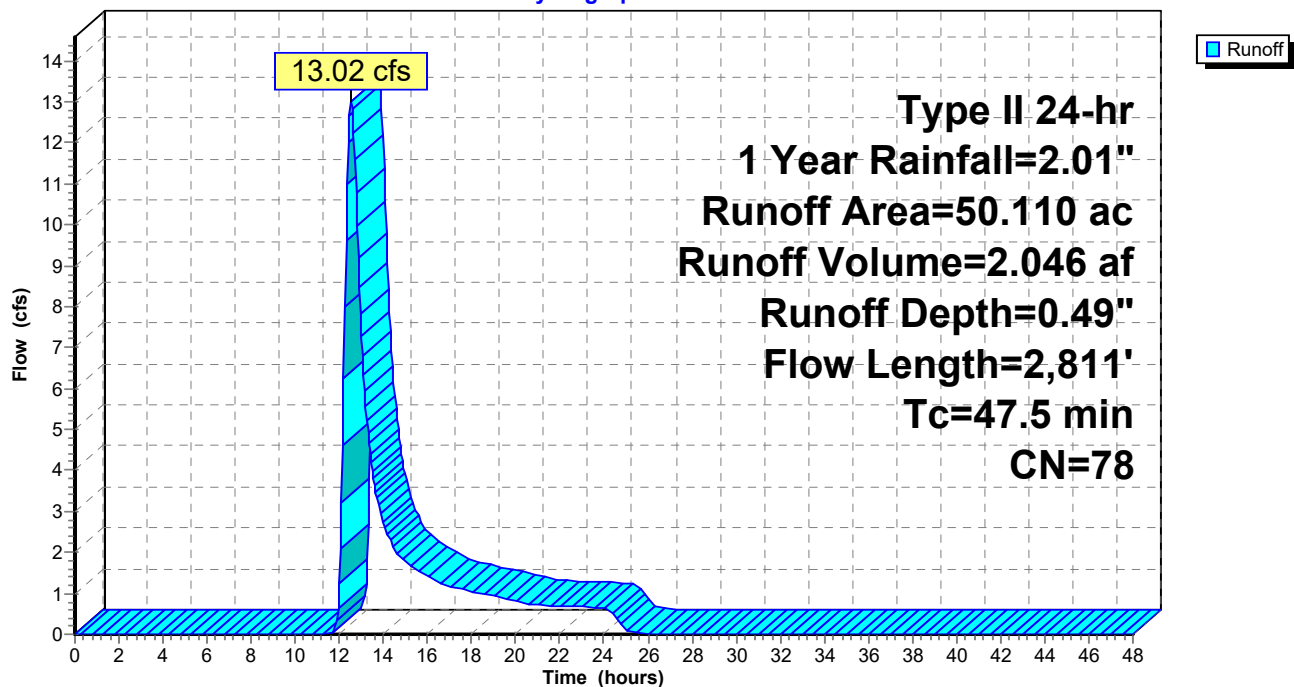
Area (ac)	CN	Description
49.759	78	Meadow, non-grazed, HSG D
0.021	98	Paved parking, HSG D
0.330	98	Paved parking, HSG D
50.110	78	Weighted Average
49.759		99.30% Pervious Area
0.351		0.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
32.0	2,711	0.0406	1.41		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
47.5	2,811	Total			

**Subcatchment B: Watershed B (West Array)**

Hydrograph



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**Summary for Subcatchment C: Watershed C (East Array)**

Runoff = 0.15 cfs @ 12.02 hrs, Volume= 0.008 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

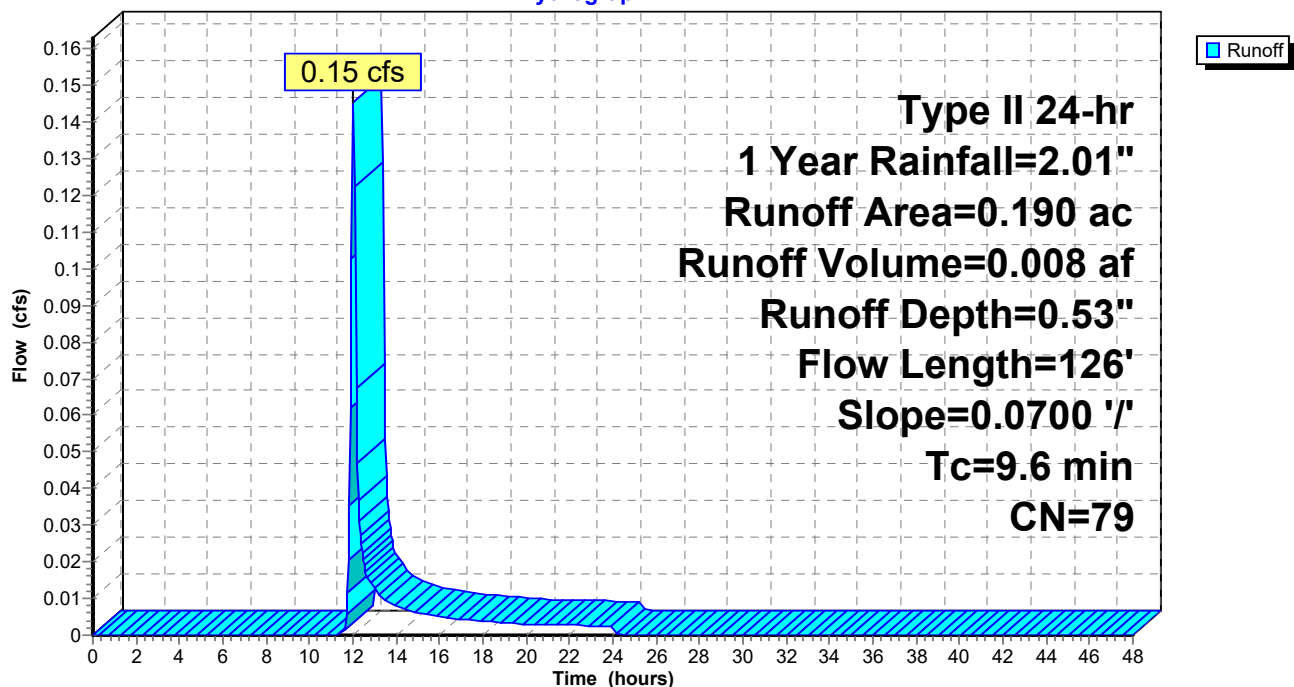
Area (ac)	CN	Description
0.190	79	Woods/grass comb., Good, HSG D
0.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0700	0.18		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
0.2	26	0.0700	1.85		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
9.6	126	Total			

**Subcatchment C: Watershed C (East Array)**

Hydrograph



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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment D: Watershed D (East Array)**

Runoff = 6.46 cfs @ 12.26 hrs, Volume= 0.705 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

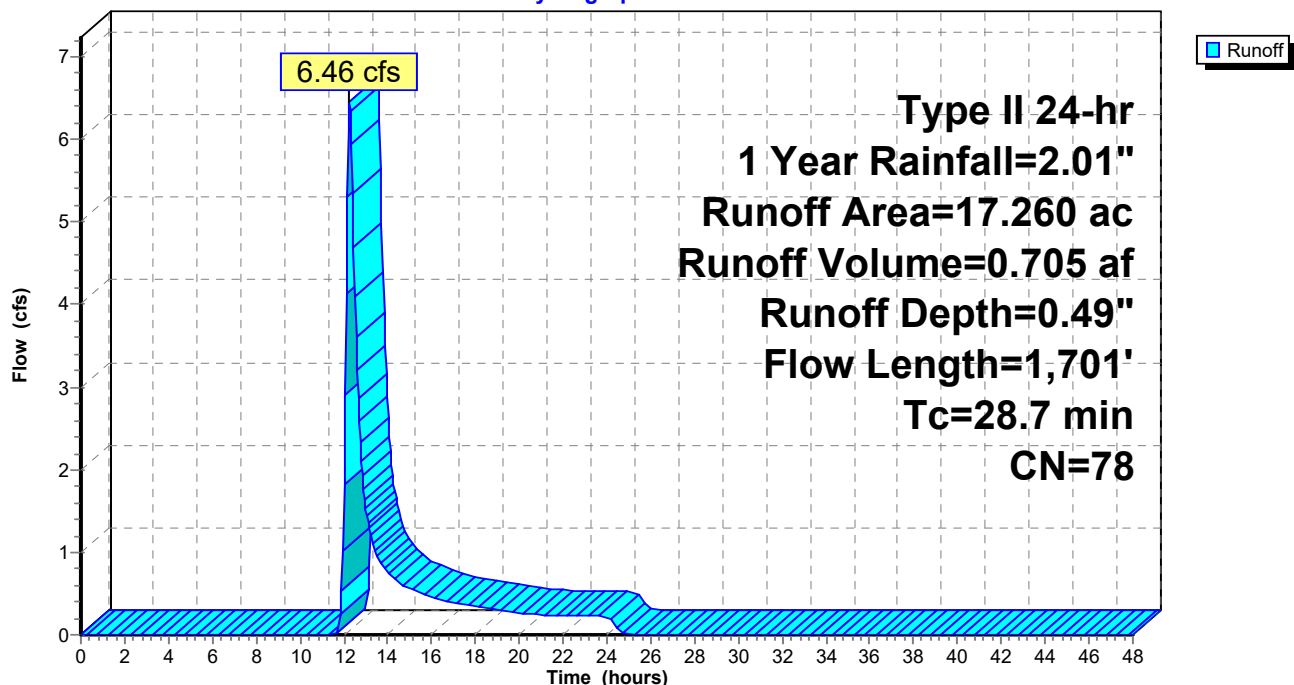
Area (ac)	CN	Description
17.260	78	Meadow, non-grazed, HSG D
17.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
10.4	898	0.0423	1.44		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.7	321	0.0747	3.18	0.95	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.035 Earth, dense weeds
4.8	382	0.0366	1.34		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
28.7	1,701	Total			

**Subcatchment D: Watershed D (East Array)**

Hydrograph



**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment E: Watershed E (East Array)**

Runoff = 9.46 cfs @ 12.25 hrs, Volume= 1.002 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

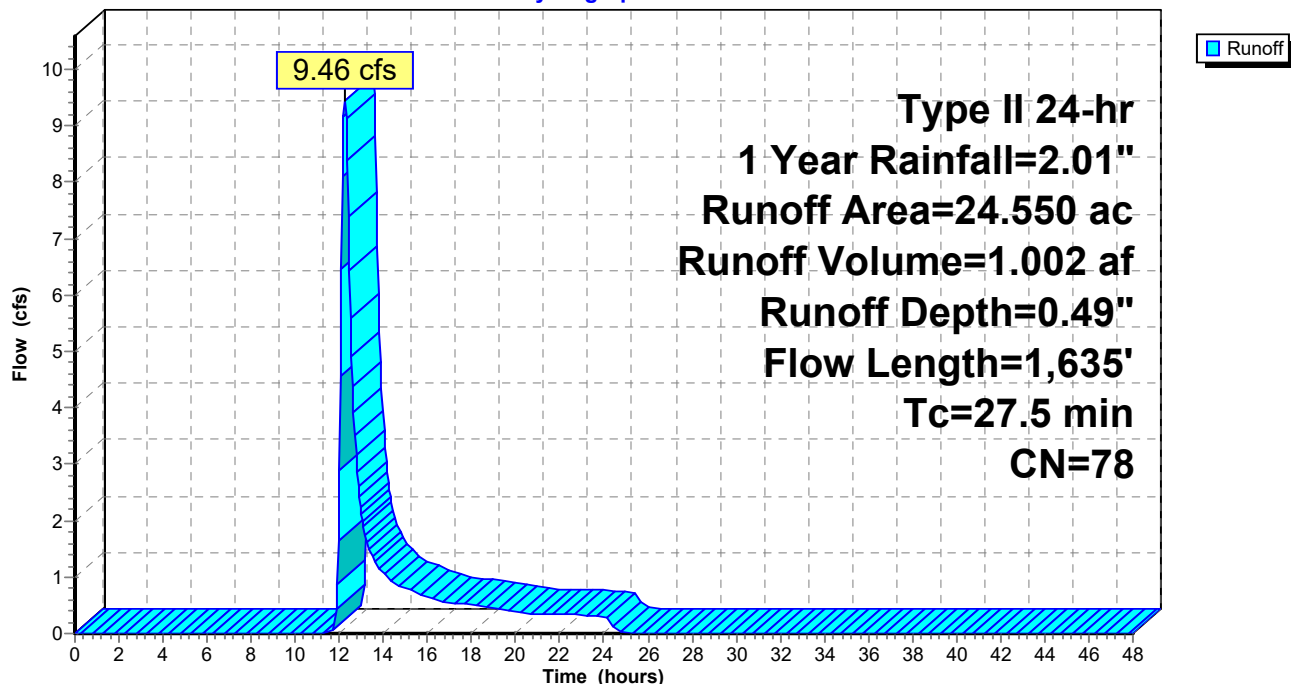
Area (ac)	CN	Description
24.543	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
24.550	78	Weighted Average
24.543		99.97% Pervious Area
0.007		0.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
4.2	335	0.0358	1.32		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
4.1	520	0.0538	2.09	0.42	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.2 '/' Top.W=0.40' n= 0.035 Earth, dense weeds
9.2	680	0.0309	1.23		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
27.5	1,635	Total			

**Subcatchment E: Watershed E (East Array)**

Hydrograph



**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 1 Year Rainfall=2.01"

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**Summary for Subcatchment F: Watershed F (East Array)**

Runoff = 8.52 cfs @ 12.29 hrs, Volume= 0.971 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 1 Year Rainfall=2.01"

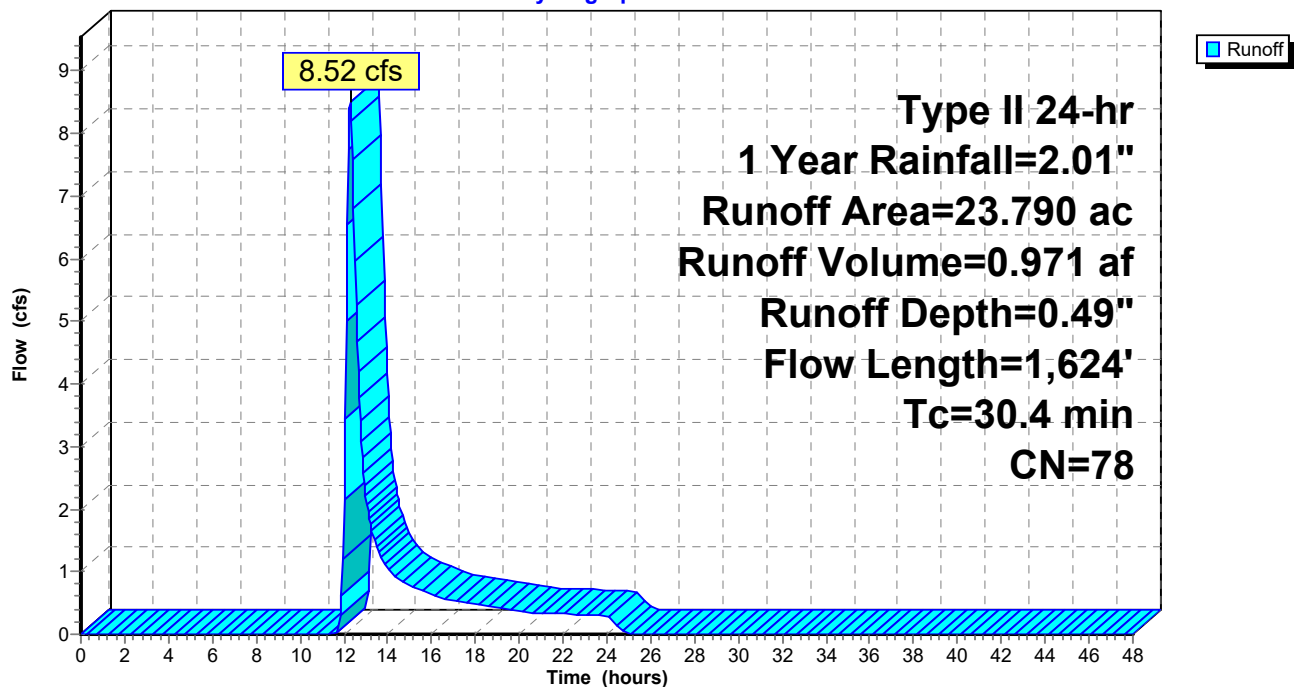
Area (ac)	CN	Description
23.643	78	Meadow, non-grazed, HSG D
0.140	98	Paved parking, HSG D
0.007	98	Paved parking, HSG D
23.790	78	Weighted Average
23.643		99.38% Pervious Area
0.147		0.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.6	1,524	0.0380	1.36		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
30.4	1,624	Total			

**Subcatchment F: Watershed F (East Array)**

Hydrograph



## Post-Developed Model (SOUTH PLANT)

Type II 24-hr 10 Year Rainfall=3.43"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A (West Array)** Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=623' Tc=27.2 min CN=78 Runoff=2.67 cfs 0.247 af

**Subcatchment B: Watershed B (West Array)** Runoff Area=50.110 ac 0.70% Impervious Runoff Depth=1.44"  
Flow Length=2,811' Tc=47.5 min CN=78 Runoff=44.34 cfs 6.032 af

**Subcatchment C: Watershed C (East Array)** Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=1.51"  
Flow Length=126' Slope=0.0700 '/' Tc=9.6 min CN=79 Runoff=0.44 cfs 0.024 af

**Subcatchment D: Watershed D (East Array)** Runoff Area=17.260 ac 0.00% Impervious Runoff Depth=1.44"  
Flow Length=1,701' Tc=28.7 min CN=78 Runoff=21.69 cfs 2.078 af

**Subcatchment E: Watershed E (East Array)** Runoff Area=24.550 ac 0.03% Impervious Runoff Depth=1.44"  
Flow Length=1,635' Tc=27.5 min CN=78 Runoff=31.79 cfs 2.955 af

**Subcatchment F: Watershed F (East Array)** Runoff Area=23.790 ac 0.62% Impervious Runoff Depth=1.44"  
Flow Length=1,624' Tc=30.4 min CN=78 Runoff=28.79 cfs 2.863 af

**Total Runoff Area = 117.950 ac Runoff Volume = 14.198 af Average Runoff Depth = 1.44"**  
**99.57% Pervious = 117.445 ac 0.43% Impervious = 0.505 ac**

**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment A: Watershed A (West Array)**

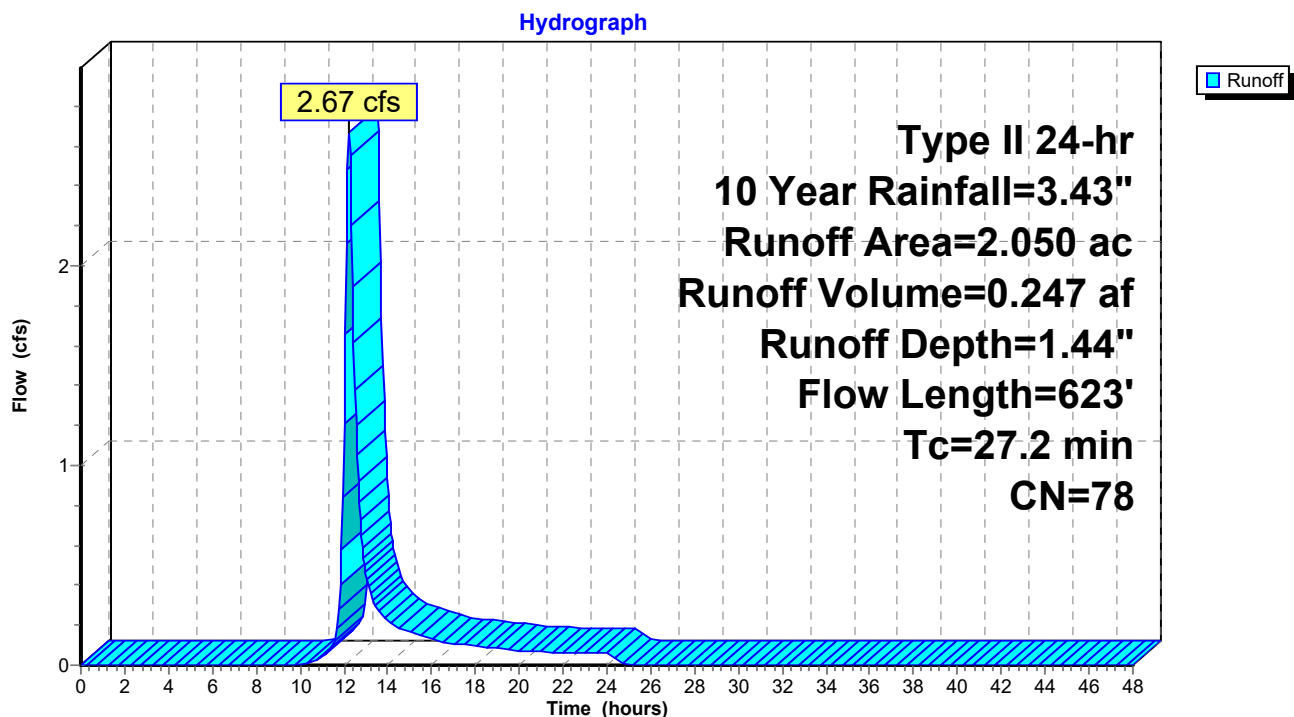
Runoff = 2.67 cfs @ 12.22 hrs, Volume= 0.247 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

Area (ac)	CN	Description
2.050	78	Meadow, non-grazed, HSG D
2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b>
					Grass: Dense n= 0.240 P2= 2.70"
11.7	523	0.0114	0.75		<b>Shallow Concentrated Flow, B-C</b>
					Short Grass Pasture Kv= 7.0 fps
27.2	623	Total			

**Subcatchment A: Watershed A (West Array)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment B: Watershed B (West Array)**

Runoff = 44.34 cfs @ 12.48 hrs, Volume= 6.032 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

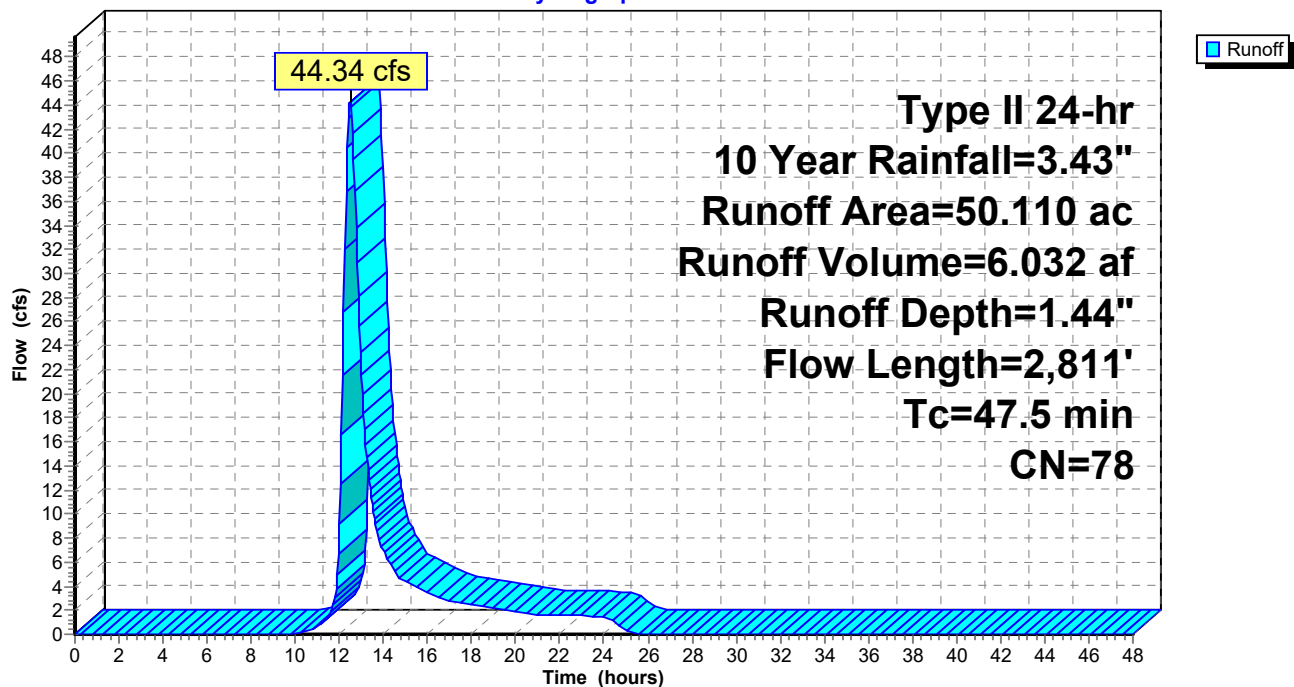
Area (ac)	CN	Description
49.759	78	Meadow, non-grazed, HSG D
0.021	98	Paved parking, HSG D
0.330	98	Paved parking, HSG D
50.110	78	Weighted Average
49.759		99.30% Pervious Area
0.351		0.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b>
					Grass: Dense n= 0.240 P2= 2.70"
32.0	2,711	0.0406	1.41		<b>Shallow Concentrated Flow, B-C</b>
					Short Grass Pasture Kv= 7.0 fps
47.5	2,811	Total			

**Subcatchment B: Watershed B (West Array)**

Hydrograph





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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment C: Watershed C (East Array)**

Runoff = 0.44 cfs @ 12.01 hrs, Volume= 0.024 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

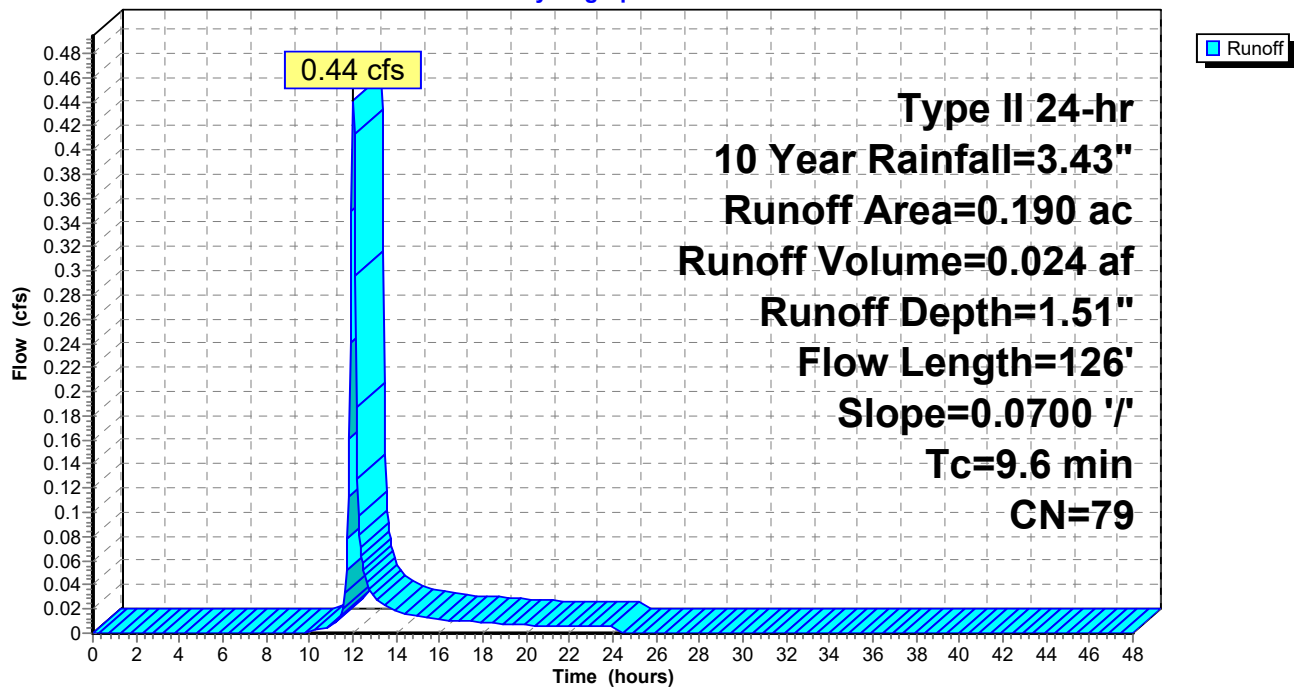
Area (ac)	CN	Description
0.190	79	Woods/grass comb., Good, HSG D
0.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0700	0.18		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
0.2	26	0.0700	1.85		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
9.6	126	Total			

**Subcatchment C: Watershed C (East Array)**

Hydrograph



**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment D: Watershed D (East Array)**

Runoff = 21.69 cfs @ 12.24 hrs, Volume= 2.078 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

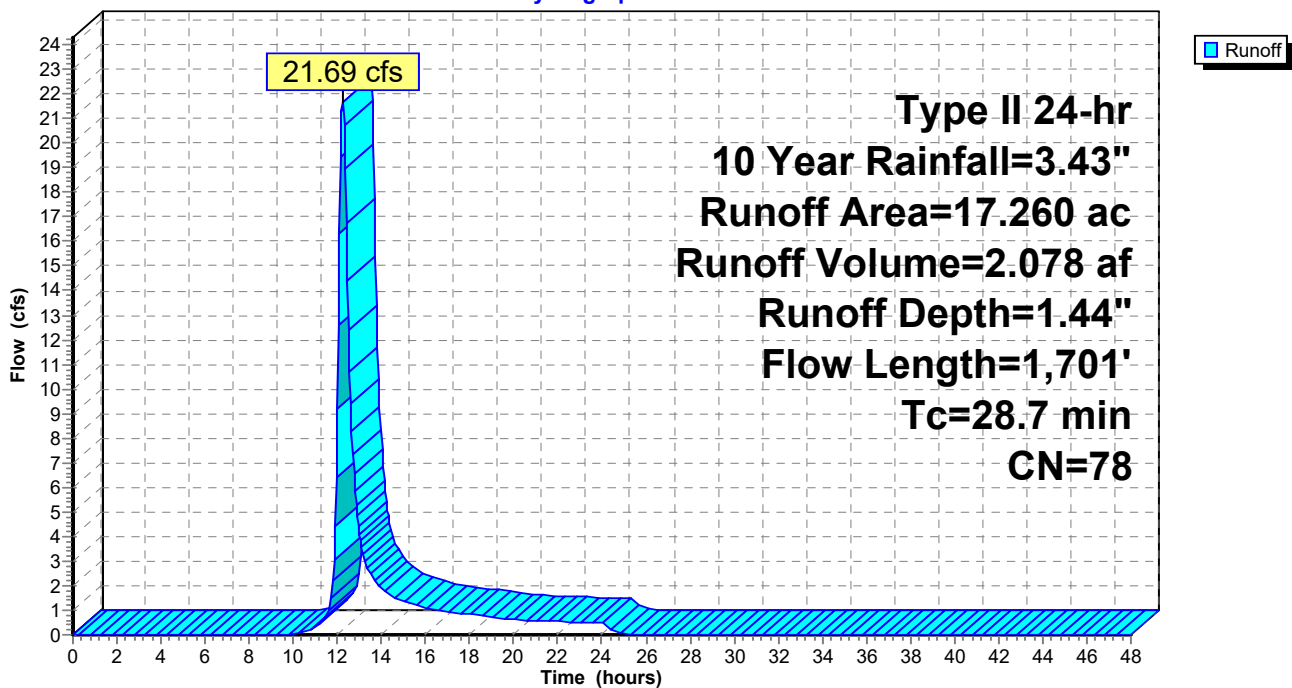
Area (ac)	CN	Description
17.260	78	Meadow, non-grazed, HSG D
17.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
10.4	898	0.0423	1.44		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.7	321	0.0747	3.18	0.95	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.035 Earth, dense weeds
4.8	382	0.0366	1.34		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
28.7	1,701				Total

**Subcatchment D: Watershed D (East Array)**

Hydrograph



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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment E: Watershed E (East Array)**

Runoff = 31.79 cfs @ 12.22 hrs, Volume= 2.955 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

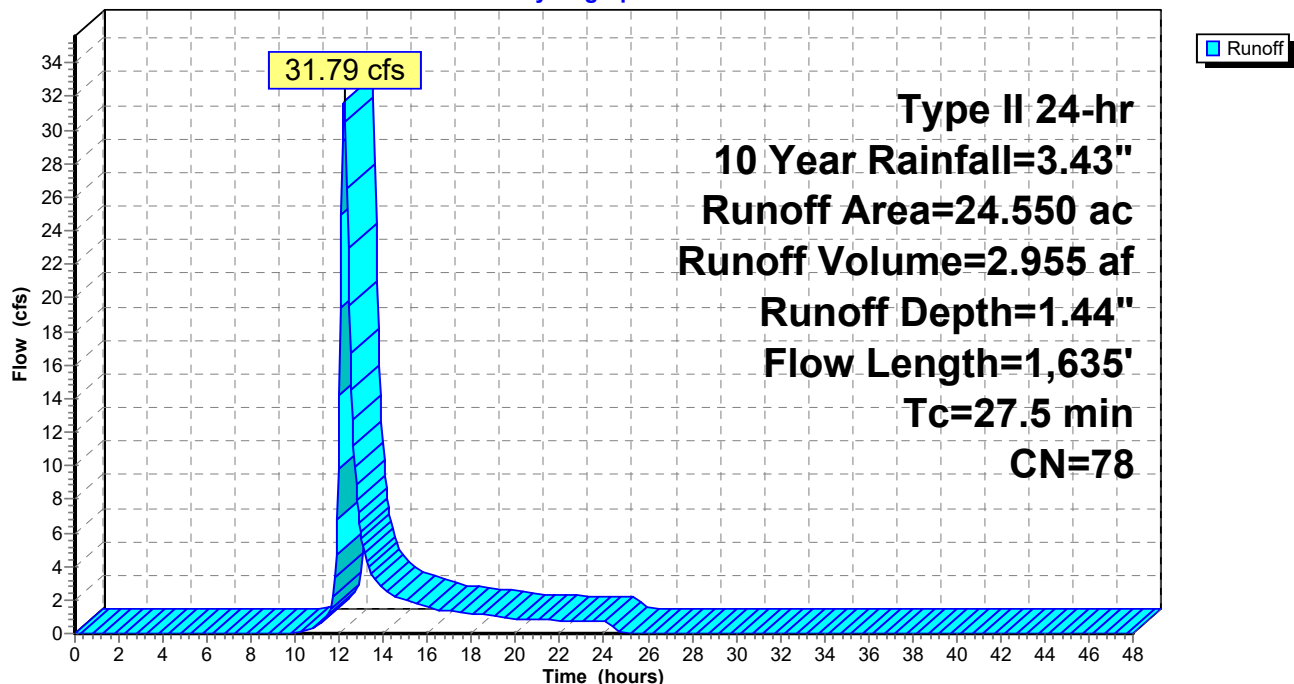
Area (ac)	CN	Description
24.543	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
24.550	78	Weighted Average
24.543		99.97% Pervious Area
0.007		0.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
4.2	335	0.0358	1.32		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
4.1	520	0.0538	2.09	0.42	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.2 '/' Top.W=0.40' n= 0.035 Earth, dense weeds
9.2	680	0.0309	1.23		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
27.5	1,635	Total			

**Subcatchment E: Watershed E (East Array)**

Hydrograph



**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 10 Year Rainfall=3.43"

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**Summary for Subcatchment F: Watershed F (East Array)**

Runoff = 28.79 cfs @ 12.26 hrs, Volume= 2.863 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 Year Rainfall=3.43"

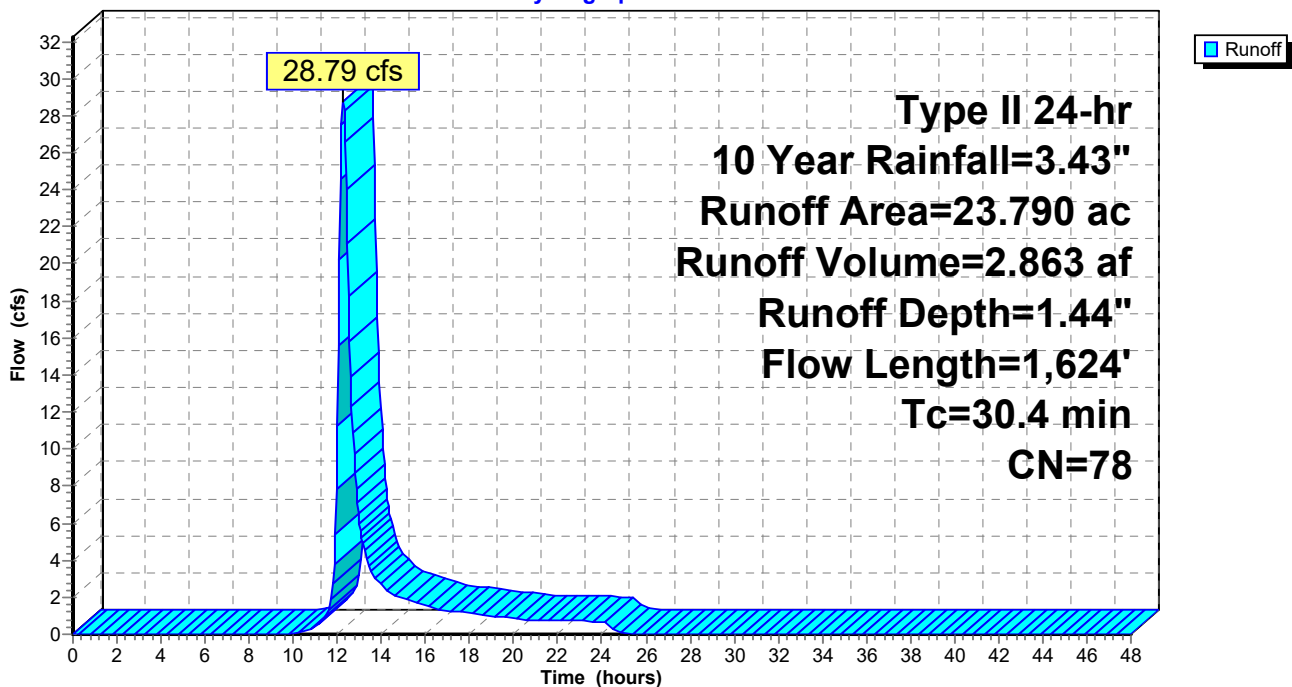
Area (ac)	CN	Description
23.643	78	Meadow, non-grazed, HSG D
0.140	98	Paved parking, HSG D
0.007	98	Paved parking, HSG D
23.790	78	Weighted Average
23.643		99.38% Pervious Area
0.147		0.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b>
					Grass: Dense n= 0.240 P2= 2.70"
18.6	1,524	0.0380	1.36		<b>Shallow Concentrated Flow, B-C</b>
					Short Grass Pasture Kv= 7.0 fps
30.4	1,624	Total			

**Subcatchment F: Watershed F (East Array)**

Hydrograph



## Post-Developed Model (SOUTH PLANT)

Type II 24-hr 25 Year Rainfall=4.26"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A (West Array)** Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=623' Tc=27.2 min CN=78 Runoff=3.94 cfs 0.358 af

**Subcatchment B: Watershed B (West Array)** Runoff Area=50.110 ac 0.70% Impervious Runoff Depth=2.10"  
Flow Length=2,811' Tc=47.5 min CN=78 Runoff=65.62 cfs 8.753 af

**Subcatchment C: Watershed C (East Array)** Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=2.18"  
Flow Length=126' Slope=0.0700 '/' Tc=9.6 min CN=79 Runoff=0.64 cfs 0.034 af

**Subcatchment D: Watershed D (East Array)** Runoff Area=17.260 ac 0.00% Impervious Runoff Depth=2.10"  
Flow Length=1,701' Tc=28.7 min CN=78 Runoff=31.99 cfs 3.015 af

**Subcatchment E: Watershed E (East Array)** Runoff Area=24.550 ac 0.03% Impervious Runoff Depth=2.10"  
Flow Length=1,635' Tc=27.5 min CN=78 Runoff=46.86 cfs 4.288 af

**Subcatchment F: Watershed F (East Array)** Runoff Area=23.790 ac 0.62% Impervious Runoff Depth=2.10"  
Flow Length=1,624' Tc=30.4 min CN=78 Runoff=42.47 cfs 4.156 af

**Total Runoff Area = 117.950 ac Runoff Volume = 20.605 af Average Runoff Depth = 2.10"**  
**99.57% Pervious = 117.445 ac 0.43% Impervious = 0.505 ac**

**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment A: Watershed A (West Array)**

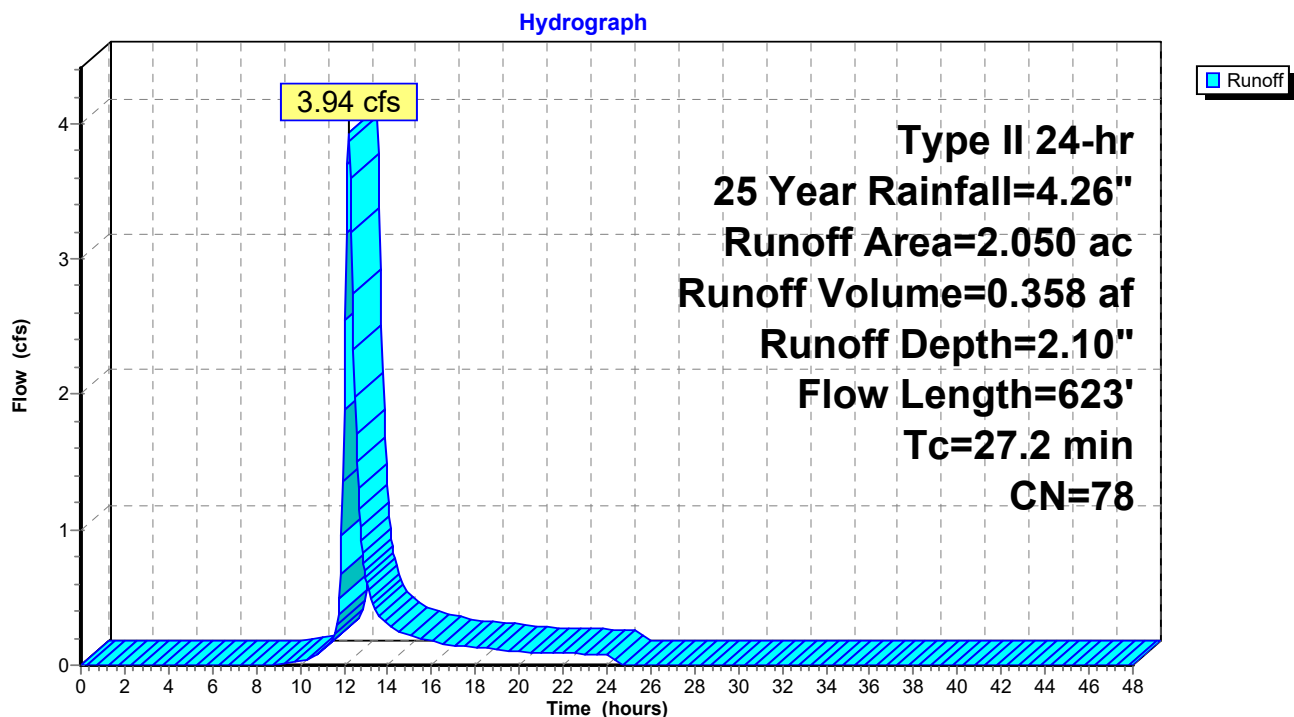
Runoff = 3.94 cfs @ 12.22 hrs, Volume= 0.358 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

Area (ac)	CN	Description
2.050	78	Meadow, non-grazed, HSG D
2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
11.7	523	0.0114	0.75		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
27.2	623	Total			

**Subcatchment A: Watershed A (West Array)**

**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment B: Watershed B (West Array)**

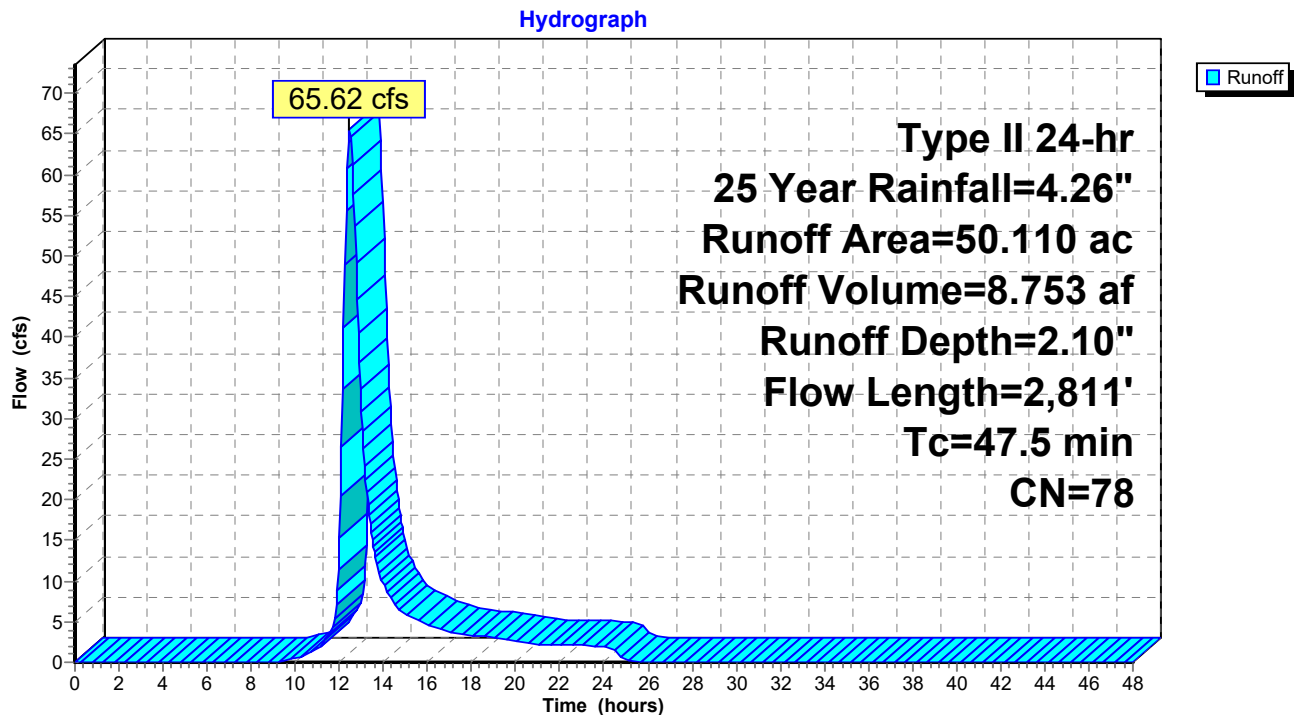
Runoff = 65.62 cfs @ 12.48 hrs, Volume= 8.753 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

Area (ac)	CN	Description
49.759	78	Meadow, non-grazed, HSG D
0.021	98	Paved parking, HSG D
0.330	98	Paved parking, HSG D
50.110	78	Weighted Average
49.759		99.30% Pervious Area
0.351		0.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
32.0	2,711	0.0406	1.41		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
47.5	2,811	Total			

**Subcatchment B: Watershed B (West Array)**

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment C: Watershed C (East Array)**

Runoff = 0.64 cfs @ 12.01 hrs, Volume= 0.034 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

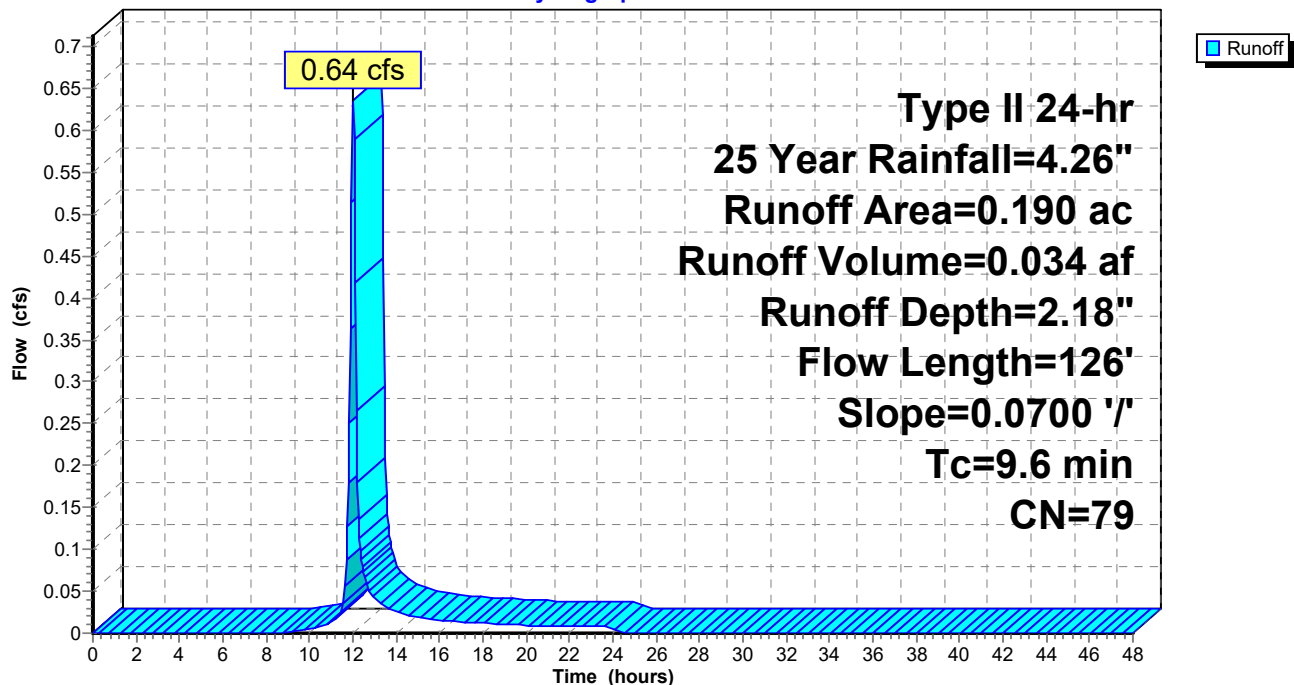
Area (ac)	CN	Description
0.190	79	Woods/grass comb., Good, HSG D
0.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0700	0.18		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
0.2	26	0.0700	1.85		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
9.6	126	Total			

**Subcatchment C: Watershed C (East Array)**

Hydrograph





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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment D: Watershed D (East Array)**

Runoff = 31.99 cfs @ 12.23 hrs, Volume= 3.015 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

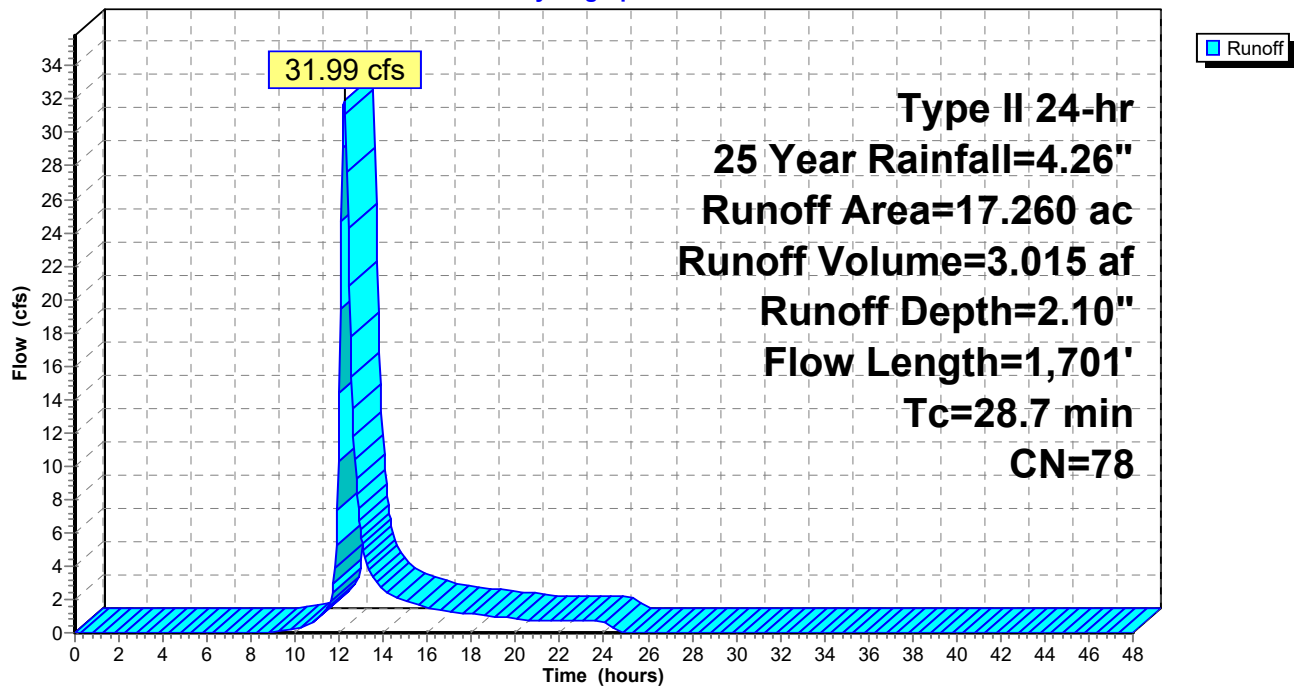
Area (ac)	CN	Description
17.260	78	Meadow, non-grazed, HSG D
17.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
10.4	898	0.0423	1.44		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.7	321	0.0747	3.18	0.95	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 ' Top.W=0.60' n= 0.035 Earth, dense weeds
4.8	382	0.0366	1.34		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
28.7	1,701				Total

**Subcatchment D: Watershed D (East Array)**

Hydrograph



**Post-Developed Model (SOUTH PLANT)**

Prepared by Maser Engineering

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment E: Watershed E (East Array)**

Runoff = 46.86 cfs @ 12.22 hrs, Volume= 4.288 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

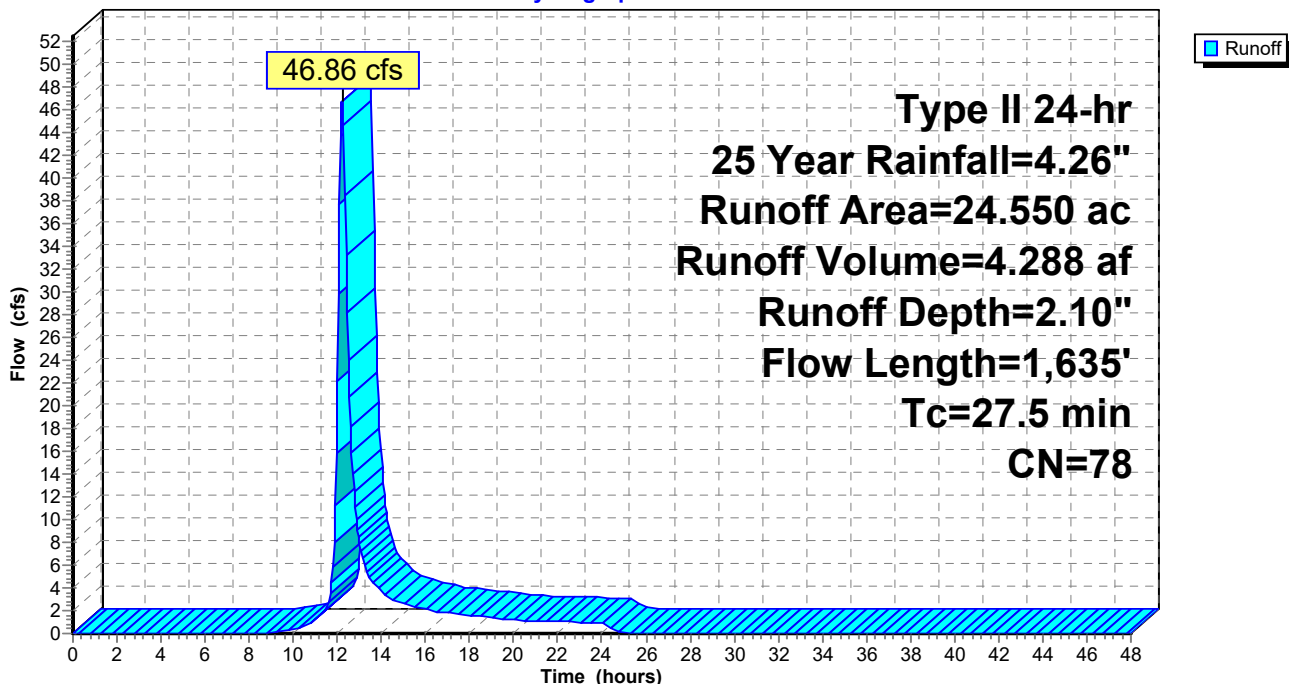
Area (ac)	CN	Description
24.543	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
24.550	78	Weighted Average
24.543		99.97% Pervious Area
0.007		0.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
4.2	335	0.0358	1.32		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
4.1	520	0.0538	2.09	0.42	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.2 '/' Top.W=0.40' n= 0.035 Earth, dense weeds
9.2	680	0.0309	1.23		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
27.5	1,635	Total			

**Subcatchment E: Watershed E (East Array)**

Hydrograph



**Post-Developed Model (SOUTH PLANT)**

Prepared by Maser Engineering

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Type II 24-hr 25 Year Rainfall=4.26"

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**Summary for Subcatchment F: Watershed F (East Array)**

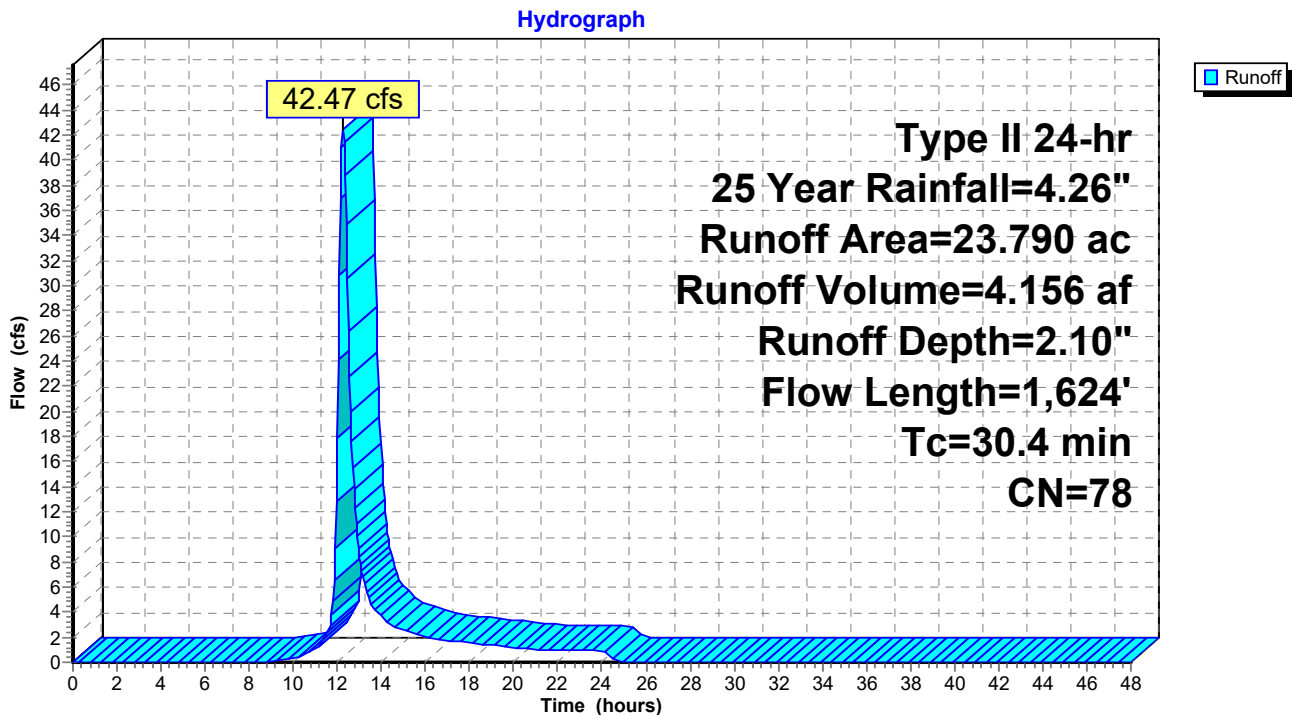
Runoff = 42.47 cfs @ 12.25 hrs, Volume= 4.156 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 Year Rainfall=4.26"

Area (ac)	CN	Description
23.643	78	Meadow, non-grazed, HSG D
0.140	98	Paved parking, HSG D
0.007	98	Paved parking, HSG D
23.790	78	Weighted Average
23.643		99.38% Pervious Area
0.147		0.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.6	1,524	0.0380	1.36		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
30.4	1,624	Total			

**Subcatchment F: Watershed F (East Array)**

**Post-Developed Model (SOUTH PLANT)***Type II 24-hr 100 Year Rainfall=5.93"*

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment A: Watershed A (West Array)** Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=623' Tc=27.2 min CN=78 Runoff=6.65 cfs 0.601 af

**Subcatchment B: Watershed B (West Array)** Runoff Area=50.110 ac 0.70% Impervious Runoff Depth=3.52"  
Flow Length=2,811' Tc=47.5 min CN=78 Runoff=111.30 cfs 14.687 af

**Subcatchment C: Watershed C (East Array)** Runoff Area=0.190 ac 0.00% Impervious Runoff Depth=3.62"  
Flow Length=126' Slope=0.0700 '/' Tc=9.6 min CN=79 Runoff=1.05 cfs 0.057 af

**Subcatchment D: Watershed D (East Array)** Runoff Area=17.260 ac 0.00% Impervious Runoff Depth=3.52"  
Flow Length=1,701' Tc=28.7 min CN=78 Runoff=54.18 cfs 5.059 af

**Subcatchment E: Watershed E (East Array)** Runoff Area=24.550 ac 0.03% Impervious Runoff Depth=3.52"  
Flow Length=1,635' Tc=27.5 min CN=78 Runoff=79.15 cfs 7.196 af

**Subcatchment F: Watershed F (East Array)** Runoff Area=23.790 ac 0.62% Impervious Runoff Depth=3.52"  
Flow Length=1,624' Tc=30.4 min CN=78 Runoff=71.82 cfs 6.973 af

**Total Runoff Area = 117.950 ac Runoff Volume = 34.572 af Average Runoff Depth = 3.52"**  
**99.57% Pervious = 117.445 ac 0.43% Impervious = 0.505 ac**

**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment A: Watershed A (West Array)**

Runoff = 6.65 cfs @ 12.21 hrs, Volume= 0.601 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

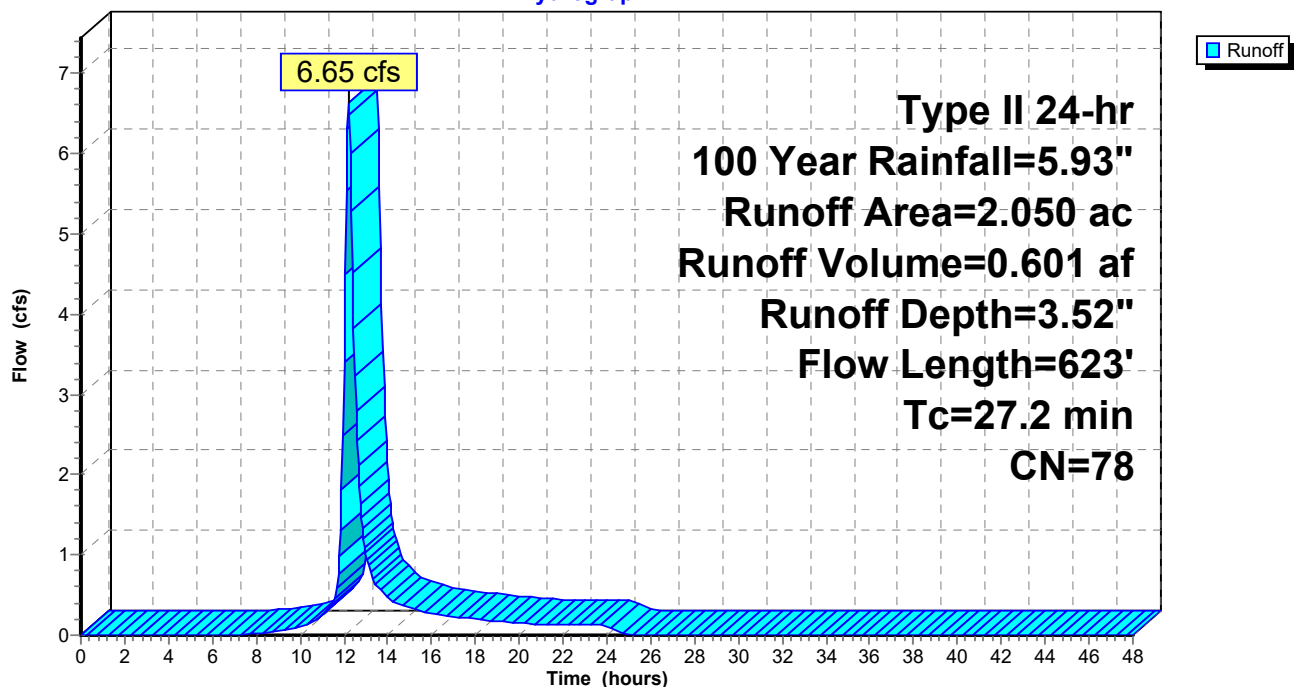
Area (ac)	CN	Description
2.050	78	Meadow, non-grazed, HSG D
2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b>
					Grass: Dense n= 0.240 P2= 2.70"
11.7	523	0.0114	0.75		<b>Shallow Concentrated Flow, B-C</b>
					Short Grass Pasture Kv= 7.0 fps
27.2	623	Total			

**Subcatchment A: Watershed A (West Array)**

Hydrograph



**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment B: Watershed B (West Array)**

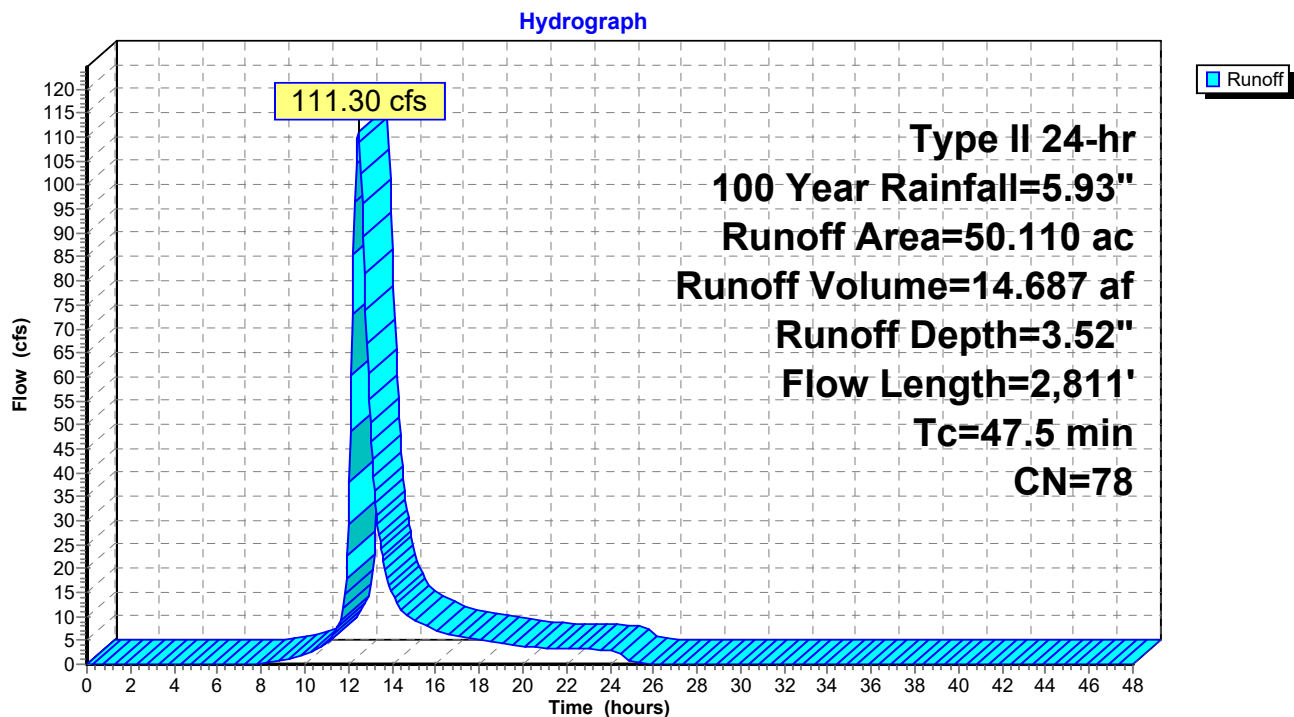
Runoff = 111.30 cfs @ 12.46 hrs, Volume= 14.687 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

Area (ac)	CN	Description
49.759	78	Meadow, non-grazed, HSG D
0.021	98	Paved parking, HSG D
0.330	98	Paved parking, HSG D
50.110	78	Weighted Average
49.759		99.30% Pervious Area
0.351		0.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
32.0	2,711	0.0406	1.41		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
47.5	2,811	Total			

**Subcatchment B: Watershed B (West Array)**

**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment C: Watershed C (East Array)**

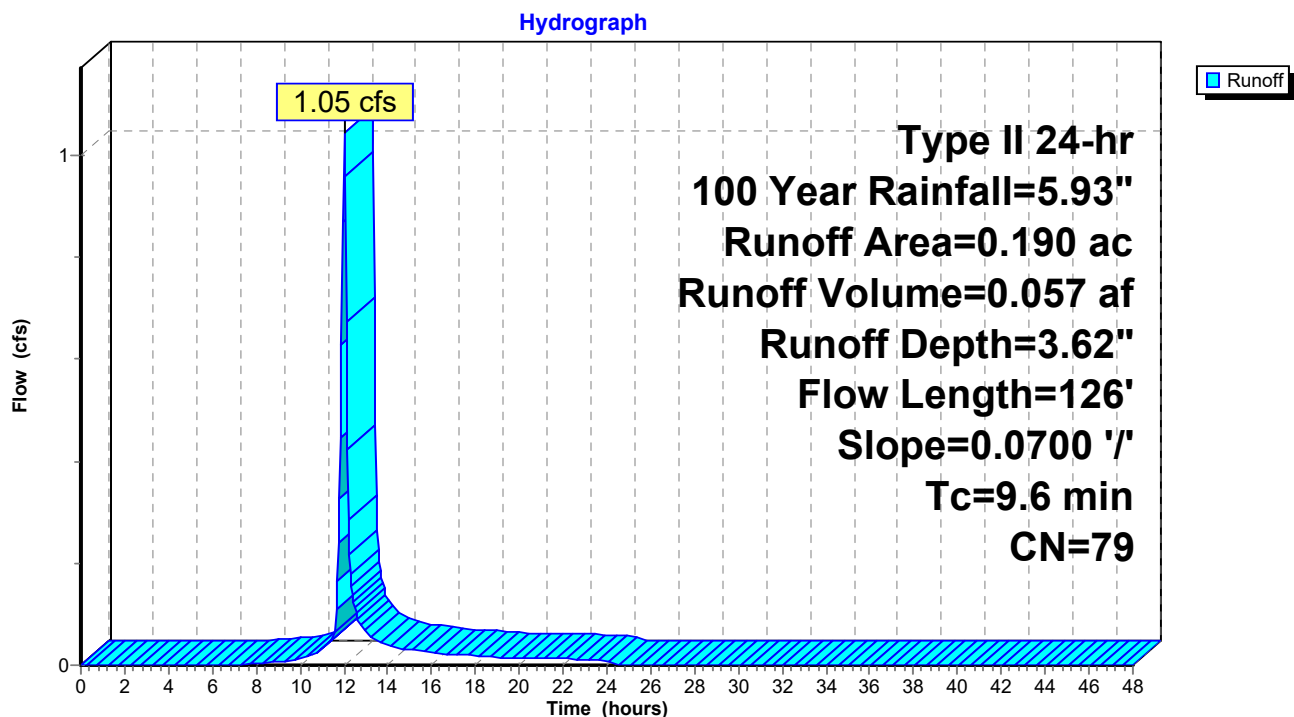
Runoff = 1.05 cfs @ 12.01 hrs, Volume= 0.057 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

Area (ac)	CN	Description
0.190	79	Woods/grass comb., Good, HSG D
0.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0700	0.18		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
0.2	26	0.0700	1.85		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
9.6	126	Total			

**Subcatchment C: Watershed C (East Array)**

**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment D: Watershed D (East Array)**

Runoff = 54.18 cfs @ 12.22 hrs, Volume= 5.059 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

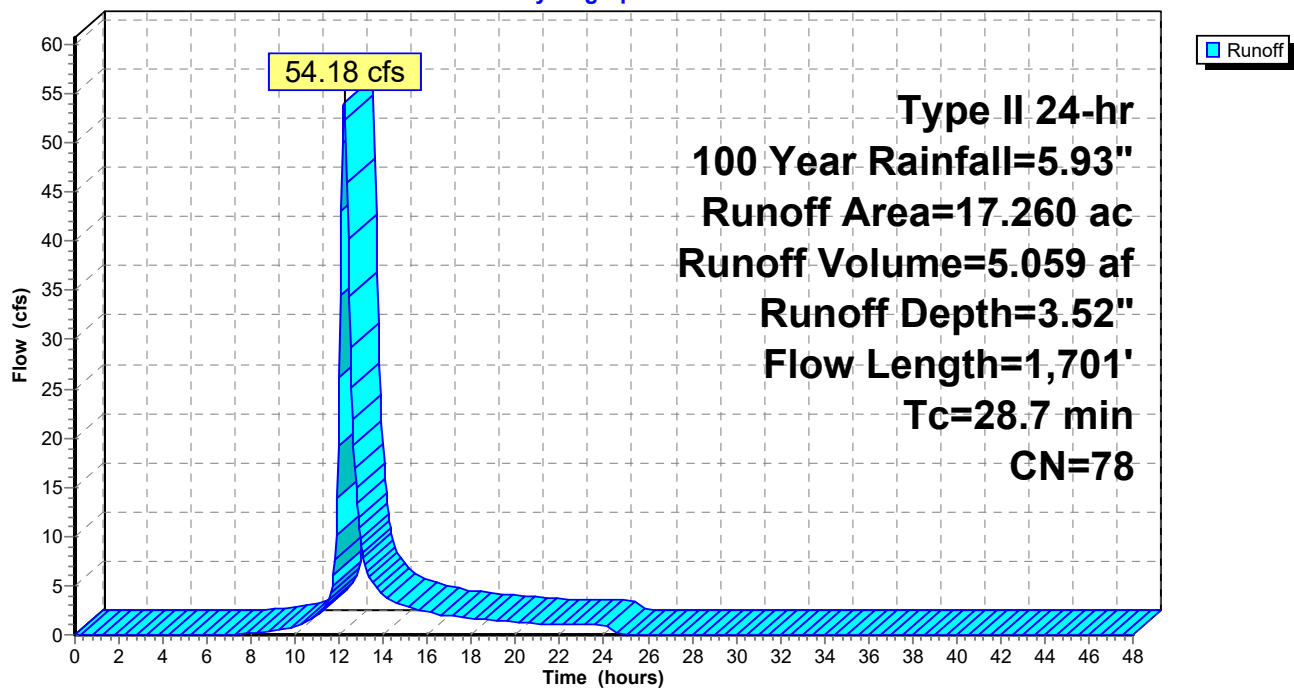
Area (ac)	CN	Description
17.260	78	Meadow, non-grazed, HSG D
17.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
10.4	898	0.0423	1.44		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
1.7	321	0.0747	3.18	0.95	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.3 '/' Top.W=0.60' n= 0.035 Earth, dense weeds
4.8	382	0.0366	1.34		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
28.7	1,701				Total

**Subcatchment D: Watershed D (East Array)**

Hydrograph





**Post-Developed Model (SOUTH PLANT)**

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment E: Watershed E (East Array)**

Runoff = 79.15 cfs @ 12.21 hrs, Volume= 7.196 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

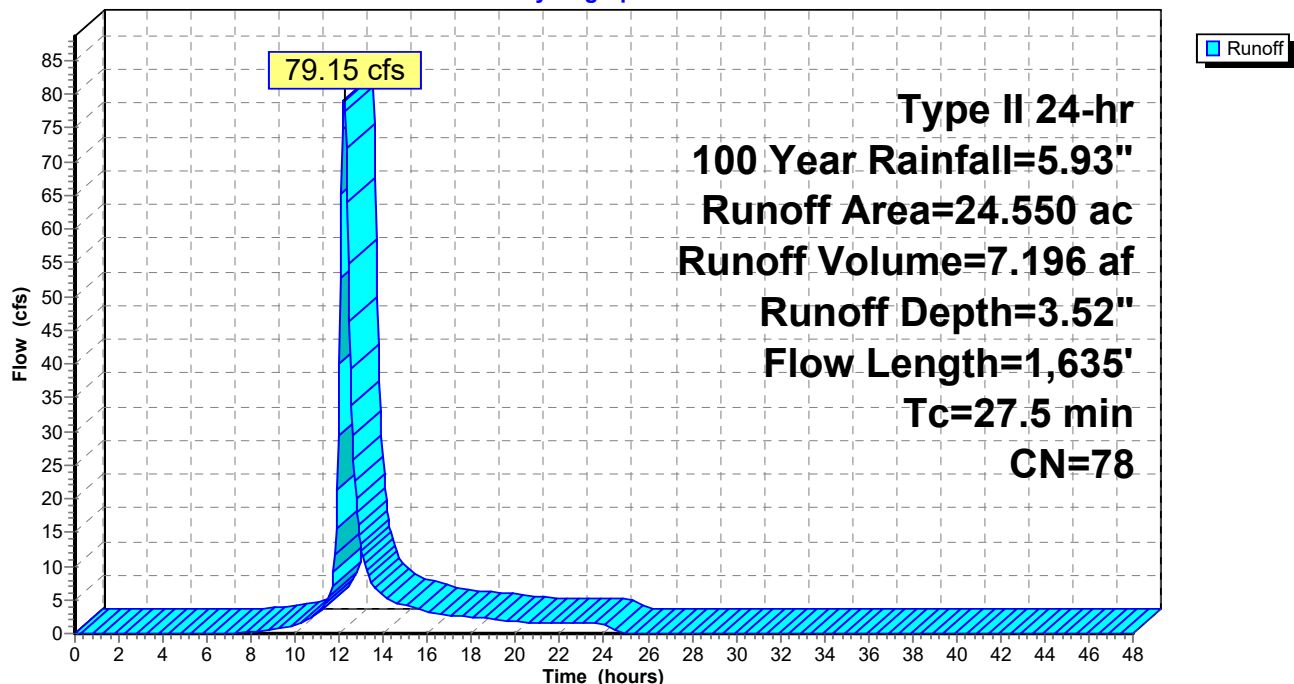
Area (ac)	CN	Description
24.543	78	Meadow, non-grazed, HSG D
0.007	98	Paved parking, HSG D
24.550	78	Weighted Average
24.543		99.97% Pervious Area
0.007		0.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0600	0.17		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
4.2	335	0.0358	1.32		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
4.1	520	0.0538	2.09	0.42	<b>Trap/Vee/Rect Channel Flow, C-D</b> Bot.W=0.00' D=1.00' Z= 0.2 '/' Top.W=0.40' n= 0.035 Earth, dense weeds
9.2	680	0.0309	1.23		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
27.5	1,635	Total			

**Subcatchment E: Watershed E (East Array)**

Hydrograph



**Post-Developed Model (SOUTH PLANT)**

Prepared by Maser Engineering

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Type II 24-hr 100 Year Rainfall=5.93"

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**Summary for Subcatchment F: Watershed F (East Array)**

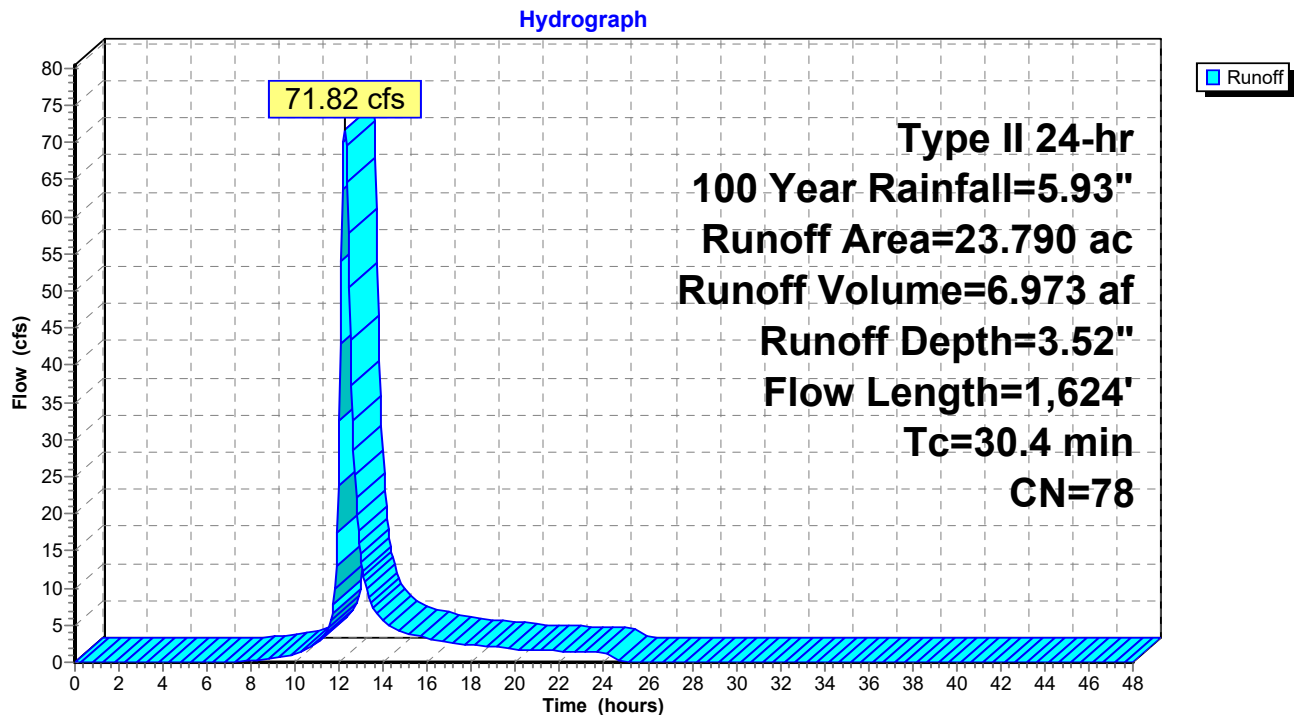
Runoff = 71.82 cfs @ 12.25 hrs, Volume= 6.973 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs  
Type II 24-hr 100 Year Rainfall=5.93"

Area (ac)	CN	Description
23.643	78	Meadow, non-grazed, HSG D
0.140	98	Paved parking, HSG D
0.007	98	Paved parking, HSG D
23.790	78	Weighted Average
23.643		99.38% Pervious Area
0.147		0.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0400	0.14		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.70"
18.6	1,524	0.0380	1.36		<b>Shallow Concentrated Flow, B-C</b> Short Grass Pasture Kv= 7.0 fps
30.4	1,624	Total			

**Subcatchment F: Watershed F (East Array)**

## **APPENDIX L**

### **Erosion and Sediment Control Plans and Specifications**







**Notes:**

1. A vegetated swale shall be constructed on the side of the gravel access roads where necessary.
2. A timber mat will be installed wherever a delineated wetland will be crossed.
3. For the trees to be cleared, they will be chipped on-site and stumps will remain in place.
4. Where there is clearing proposed in wetlands, trees shall be removed with chainsaws, not heavy machinery.
5. Some areas have been identified as habitat for the NLEB. These areas shall not be cleared until after August 31, 2017.

TYPICAL SILT FENCE  
INSTALLATION

CONCRETE  
WASHOUT AREA

STABILIZED  
CONSTRUCTION  
ENTRANCE

TYPICAL STAGING AREA FOR VEHICLES,  
EQUIPMENT AND MATERIALS

STABILIZED  
CONSTRUCTION  
ENTRANCE





DRAWN BY:	MDM
CHECKED BY:	MDM
DATE:	May 26, 2017
SCALE:	1" = 400'
BY:	MDM

DESCRIPTION OF REVISION:  
DATE: 05-26-2017  
ISSUED FOR CLIENT REVIEW

1 2 3 4 5 6 7 8 9 10 11 12  
13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1. Unauthorized Alteration Or Addition To Plans Bearing A Licensed Engineer Or Architect Seal, Is A Violation Of Section 7209 Of The New York State Education Law.

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112 NORTH MAIN STREET, HORSEHEADS, NY 14845 | 607-377-7900

EROSION AND SEDIMENT CONTROL PLAN (SOUTH)

**ELLIS TRACT SOLAR PV ARRAY SITE**  
SUN8 PDC LLC  
TOWN OF DRYDEN, TOMPKINS COUNTY, NEW YORK

DRN-06

PROJECT NO:  
17-008



I. EROSION & SEDIMENT POLLUTION CONTROL (E & SPC) GUIDELINES:

1. THE CONTRACTOR PERFORMING CONSTRUCTION WILL BE HIRED DIRECTLY BY SUN8 PDC LLC. THE CONTRACTOR WILL BE LICENSED PER APPLICABLE LAWS AND WILL SUBMIT FINAL CONSTRUCTION PLANS FOR REVIEW AND ANY REVISIONS TO THE SWPPP, IF APPLICABLE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING EROSION AND SEDIMENT CONTROL TO PROTECT SURROUNDING WATER BODIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION CONTROL AND MAINTENANCE OF SOIL EROSION AND SEDIMENT CONTROL FACILITIES TO ENSURE PROPER FUNCTIONING OF SAID FACILITIES (DURING CONSTRUCTION).
4. AFTER THE PROJECT HAS BEEN COMPLETED, THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY FOR ENSURING THAT ALL TEMPORARY SOIL EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN REMOVED OR REPLACED BY PERMANENT CONTROLS.
5. THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP), WHICH INCLUDES THE E&S PLANS, DEFINES AND MEETS THE REQUIREMENTS OF THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) PHASE II STORMWATER REGULATIONS.
6. EROSION CONTROL MEASURES INSTALLED AND MAINTAINED BY THE SITE WORK CONTRACTOR ARE SUBJECT TO THE REVIEW AND APPROVAL NYSDEC, DESIGN ENGINEER AND OWNERS REPRESENTATIVE. IMMEDIATE ACTION BY THE CONTRACTOR SHALL BE TAKEN IF ADDITIONAL OR CORRECTIVE MEASURES ARE REQUIRED BY ANY ONE OF THESE CITED REVIEWERS. EROSION CONTROL MEASURES NOT SPECIFICALLY SHOWN ON CONTRACT DRAWINGS, SHALL BE INSTALLED AS WARRANTED BY FIELD CONDITIONS AND AS DIRECTED BY THE AFOREMENTIONED REVIEWERS.
7. AS DESIGN ENGINEER, OUR OFFICE HAS NOTIFIED THE OWNER OF THE INSPECTION REQUIREMENTS UNDER THE GENERAL PERMIT. DISTURBANCES OF ONE ACRE OR GREATER REQUIRE THAT THE OWNER FILE A NOTICE OF INTENT AND A SWPPP WITH THE NYSDEC UNDER STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES). THE REGULATIONS REQUIRE THAT A LICENSED PROFESSIONAL COMPLETE A WEEKLY INSPECTION THROUGHOUT THE PERIOD OF LAND DISTURBANCE AND AN INSPECTION AFTER EVERY EVENT OF ½ INCH OR MORE OF RAIN.
8. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED FOR MORE THAN 5 DAYS, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW OR EQUIVALENT MATERIAL, AT A RATE OF 2.5 - 3.0 TONS PER ACRE, ACCORDING TO STATE STANDARDS.
9. PERMANENT VEGETATION TO BE SEEDDED OR SODDED ON ALL EXPOSED AREAS WITHIN FIVE (5) DAYS AFTER FINAL GRADING. MULCH AS NECESSARY FOR SEED PROTECTION AND ESTABLISHMENT. LIME AND FERTILIZE SEED BED PRIOR TO PERMANENT SEEDING.
10. EROSION AND SEDIMENT POLLUTION CONTROL FACILITIES AND PRACTICES, UTILIZED IN THE CONSTRUCTION OF THE PROJECT, SHALL BE CONSISTENT WITH THE LATEST EDITIONS OF THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL, THE NEW YORK STATE STORMWATER MANAGEMENT DESIGN MANUAL, AND THE NEW YORK STATE SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES.
11. NATURAL VEGETATION SHALL BE RETAINED, PROTECTED, AND SUPPLEMENTED, AS FEASIBLE PRIOR TO AND DURING CONSTRUCTION.
12. CUT AND FILL SLOPES REQUIRED FOR THE CONSTRUCTION OF THE ACCESS ROAD SHALL BE BROUGHT TO FINAL PROPOSED GRADES AS SOON AS POSSIBLE IN THE CONSTRUCTION SEQUENCES.
13. EROSION AND SEDIMENT POLLUTION CONTROL FACILITIES (STONE CHECK DAMS, FILTER FABRIC FENCING, STABILIZED CONSTRUCTION ENTRANCES, AND OTHER ACCEPTABLE FACILITIES) SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION UNTIL COMPLETE SITE STABILIZATION.
14. HEAVY CONSTRUCTION EQUIPMENT SHALL BE KEPT AS CLOSE TO THE WORK AREA AS PRACTICED TO MINIMIZE DISTURBANCE OF SOIL ALREADY STABILIZED OR UNDISTURBED.
15. TOPSOIL AND OTHER SOIL REMOVED DURING CONSTRUCTION SHALL BE STOCKPILED IN A SUITABLE LOCATION CLEAR FROM ANY STORMWATER DRAINAGE COURSES. STOCKPILES WHICH ARE INACTIVE FOR MORE THAN 5 DAYS SHALL BE SEEDDED.
16. VEGETATIVE STABILIZATION SHALL BE PERIODICALLY INSPECTED FOR SUFFICIENT GROWTH AND PROGRESS. AREAS NOT RESPONDING SHALL BE PROMPTLY RESEEDDED AND REMULCHED AS SOON AS POSSIBLE. AREAS SHOWING SIGNS OF EROSION PRIOR TO STABILIZATION SHALL BE GRADED, RESEEDDED, AND REMULCHED AS SOON AS POSSIBLE. SOD OR EROSION CONTROL FABRIC SHALL BE UTILIZED WHERE ADEQUATE STABILIZATION IS NOT OCCURRING
17. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED BEFORE BEGINNING EARTH MOVING ACTIVITIES, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
18. A STABILIZED CONSTRUCTION ENTRANCE PAD OF 1.5' TO 2' CLEAN STONE WILL BE PLACED AT ALL CONSTRUCTION DRIVEWAYS IMMEDIATELY AFTER INITIAL SITE DISTURBANCE.
19. THE APPLICATION OF TOPSOIL, LIMING, FERTILIZING, SEEDING, AND MULCHING FOR DISTURBED AREAS SHALL BE CONSISTENT WITH THE STANDARD GENERAL PRACTICES FOR CONSTRUCTION.
20. IMMEDIATELY FOLLOWING INITIAL DISTURBANCES OF ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E., STEEP SLOPES AND ROADWAY EMBANKMENTS) WILL RECEIVE A TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AT A RATE OF 2.5 - 3.0 TONS PER ACRE.
21. AT THE TIME WHEN SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS TO BE ESTABLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER SHALL BE REMOVED OR TREATED IN SUCH A WAY THAT WILL PERMANENTLY ADJUST THE SOIL CONDITIONS AND RENDER IT SUITABLE FOR VEGETATIVE GROUND COVER.
22. IF THE REMOVAL OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE CONDITIONS, NON-VEGETATIVE MEANS OF PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED.
23. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES UNTIL ALL AREAS HAVE BEEN PERMANENTLY STABILIZED.

II. MULCHING AND SEEDING REQUIREMENTS

TEMPORARY SEED REQUIREMENTS

1. SEEDBED PREPARATION:
  - a. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT (50%) CALCIUM PLUS MAGNESIUM OXIDES) AT A RATE OF 90 POUNDS PER 1,000 SQUARE FEET. APPLY FERTILIZER AT A RATE OF 600 POUNDS PER ACRE OR 14 POUNDS PER 1,000 SQUARE FEET USING 10-20-10 OR EQUIVALENT.
  - b. WORK LIME AND FERTILIZER INTO SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRINGTOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISCING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM SEEDBED IS PREPARED.
  - c. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACT, THE AREA MUST BE RETILLED AS ABOVE
2. SEEDING:
  - a. APPLY LAWN MIX AT A RATE (SEE SPECIFICATIONS)
  - b. APPLY SEED WITH MECHANICAL SEEDER. OPTIMUM SEEDING DEPTH IS ONE INCH (EXCEPT SANDY SOILS, 2 INCHES).
  - c. WHERE FEASIBLE, EXCEPT WHERE EITHER A CULTIPAKER TYPE SEEDER OR HYDROSEEDER IS USED, THE SEEDBED SHALL BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A ROLLER, OR LIGHT DRAG. SEEDING OPERATIONS SHOULD BE ON THE CONTOUR.
3. MULCHING
  - a. MULCH MATERIALS SHALL BE UNROTTED SALT HAY OR SMALL GRAIN STRAW AT A RATE OF 2-1/2 TO 3 TONS PER ACRE, OR 70 TO 90 POUNDS PER 1,000 SQUARE FEET. MULCH SHOULD NOT BE GROUND OR CHOPPED INTO SHORT PIECES.
  - b. SPREAD UNIFORMLY BY HAND OR MECHANICALLY SO THAT APPROXIMATELY 75 PERCENT TO 95 PERCENT OF THE SOIL SURFACE WILL BE COVERED.
  - c. MULCH ANCHORING SHALL BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT TO MINIMIZE LOSS BY WIND OR WATER. 1. MULCHING NETTINGS - STAPLE, JUTE OR COTTON NETTINGS TO THE SOIL SURFACE. USE A DEGRADABLE NETTING IN AREAS TO BE MOWED.

PERMANENT SEED REQUIREMENTS

1. SEEDBED PREPARATION  
REFER TO TEMPORARY SEED REQUIREMENTS ABOVE.

II. MAINTENANCE AND REPAIR OF EROSION AND SEDIMENT FACILITIES

1. PROPER MAINTENANCE AND REPAIR OF EROSION AND SEDIMENT CONTROL FACILITIES ARE NECESSARY TO THE EFFECTIVENESS OF THE EROSION AND SEDIMENT POLLUTION CONTROL FACILITIES.
2. DISTURBED GROUND SURFACES SHALL BE SPRINKLED WITH WATER, AS NEEDED, TO LIMIT THE FORMATION AND MIGRATION OF AIRBORNE DUST.
3. OPERATIONAL MEASURES SHALL BE EMPLOYED DURING CONSTRUCTION TO PREVENT THE SPILLS OF FUELS AND LUBRICANTS. IF A SPILL OCCURS, IT SHALL BE CONTROLLED IMMEDIATELY TO PREVENT ITS ENTRY INTO OFF-SITE AREAS INCLUDING ADJACENT STORM SEWER.
4. ANY TEMPORARY EROSION CONTROL FACILITY SHALL REMAIN FUNCTIONAL UNTIL VEGETATIVE COVER IS SUFFICIENTLY ESTABLISHED WITHIN THE RESPECTIVE TRIBUTARY DRAINAGE AREA.
5. ANY DEBRIS ACCUMULATED IN EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE REMOVED AND PROPERLY DISPOSED. THESE FACILITIES SHALL BE CHECKED DAILY AND AFTER RAINFALL EVENTS, AND REALIGNED AS NEEDED. SEDIMENT SHALL BE REMOVED WHEN IT REACHES THE FOLLOWING DEPTHS:

SILT SOCK - 1/2 HEIGHT (6 INCHES)

CHECK DAM - 1/2 HEIGHT (5 INCHES)

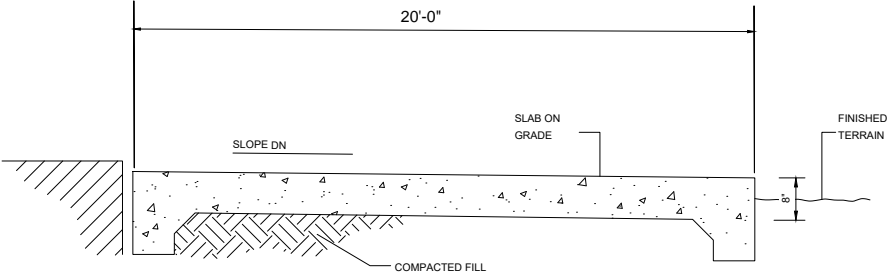
NOTE: DISTURBED AREAS SHALL BE CONSIDERED AS PERMANENTLY STABILIZED WHEN A MINIMUM COVER OF 80% HAS BEEN ESTABLISHED.
6. ANY EROSION AND SEDIMENT CONTROL DEVICES THAT ARE NOTED AS DEFICIENT BY A INSPECTOR OR NYSDEC STAFF SHALL BE REPAIRED OR REPLACED WITHIN ONE WEEKS TIME.

IV. SOIL RESTORATION REQUIREMENTS

1. AERATION AND THE APPLICATION OF 6 INCHES OF TOPSOIL IS REQUIRED IN ANY PROPOSED LAWN AREA WHERE TOPSOIL HAS BEEN DISTURBED.
2. FULL SOIL RESTORATION REQUIREMENTS ARE AS FOLLOWS:
  - SOIL RESTORATION IS TO TAKE PLACE DURING PERIODS OF RELATIVELY LOW TO MODERATE SUBSOIL MOISTURE, FOLLOWING ROUGH GRADING OF THE DISTURBED SUBSOILS
  - APPLY 3 INCHES OF COMPOST OVER SUBSOIL
  - TILL COMPOST INTO SUBSOIL TO A DEPTH OF AT LEAST 12 INCHES USING A CAT-MOUNTED RIPPER, TRACTOR-MOUNTED DISC, OR TILLER, MIXING, AND CIRCULATING AIR AND COMPOST INTO SUBSOILS
  - ROCK-PICK UNTIL UPLIFTED STONE/ROCK MATERIALS OF FOUR INCHES AND LARGER SIZE ARE CLEANED OFF THE SITE
  - APPLY TOPSOIL TO A DEPTH OF 6 INCHES
  - VEGETATE AS SPECIFIED ON PLANS
4. AT THE END OF THE PROJECT AN INSPECTOR SHOULD BE ABLE TO PUSH A 3/8 INCH METAL BAR 12 INCHES INTO THE SOIL JUST WITH BODY WEIGHT.
5. TILLING SHOULD NOT BE PERFORMED WITHIN THE DRIP LINE OF ANY EXISTING TREES OR OVER UTILITY INSTALLATIONS THAT ARE WITHIN 24 INCHES OF THE SURFACE.
6. ADDITIONAL INFORMATION AND GUIDANCE MAY BE FOUND IN "DEEP-RIPPING AND DECOMPACTION" PUBLISHED BY NYSDEC DIVISION OF WATER 2008.

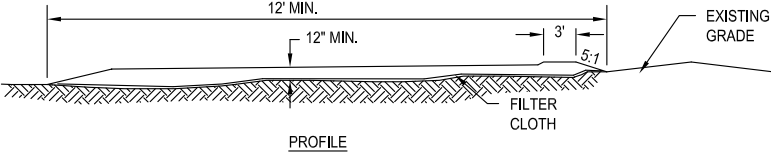
V. CONSTRUCTION SEQUENCING

1. PRE-CONSTRUCTION MEETING.
2. DELINEATE DISTURBED AREAS AND INSTALL ORANGE CONSTRUCTION FENCE FOR PROTECTED AREAS.
3. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE, STAGING AREA LAYOUT, CONCRETE WASHOUT AREA.
4. INSTALL SILT FENCE.
5. SETUP PERIMETER CONTROLS WITH LIMITED CLEARING.
6. REMOVE, STOCKPILE AND STABILIZE ANY TOPSOIL.
7. PERFORM ROUGH GRADING OF DRIVEWAY AND TEMPORARY STABILIZATION. MEASURES AND DURATIONS TO KEEP OPEN.
8. CONSTRUCT UTILITIES.
9. TEMPORARILY STABILIZE ALL DISTURBED AREAS.
10. CONSTRUCT THE SOLAR ARRAY.
11. PERFORM SOIL RESTORATION.
12. PERFORM FINAL STABILIZATION.
13. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROLS ONCE 80% STABILIZATION HAS BEEN ACHIEVED.



5 **CONCRETE TRANSFORMER PAD DETAIL**

SCALE: N.T.S.

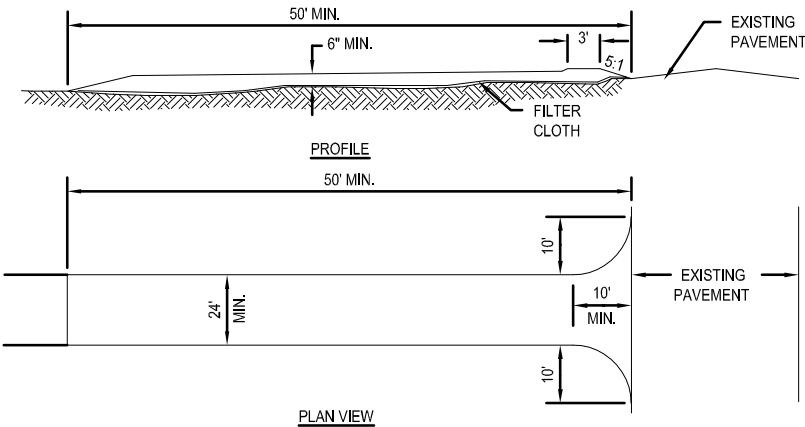


CONSTRUCTION NOTES FOR ACCESS ROAD

1. STONE SIZE - USE 2" STONE.
2. LENGTH - AS SHOWN ON PLANS .
3. THICKNESS - NOT LESS THAN 12 INCHES.
4. WIDTH - 12 FOOT MINIMUM.
5. FILTER CLOTH - WILL BE PLACED OVER ENTIRE AREA PRIOR TO PLACING OF STONE.

4 **STONE ACCESS ROAD**

SCALE: NOT TO SCALE

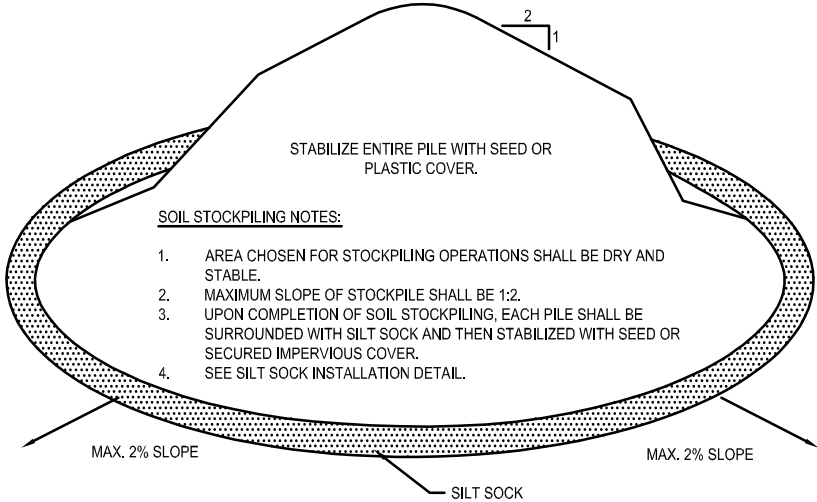


CONSTRUCTION NOTES FOR STABILIZED CONSTRUCTION ENTRANCE

1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - AS REQUIRED, BUT NOT LESS THAN 50 FEET .
3. THICKNESS - NOT LESS THAN 6 INCHES.
4. WIDTH - 24 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. FILTER CLOTH - WILL BE PLACED OVER ENTIRE AREA PRIOR TO PLACING OF STONE. FILTER CLOTH WILL NOT BE REQUIRED ON A SINGLE RESIDENCE LOT
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIRECTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING IF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANEST OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAT MUST BE REMOVED IMMEDIATELY.
8. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

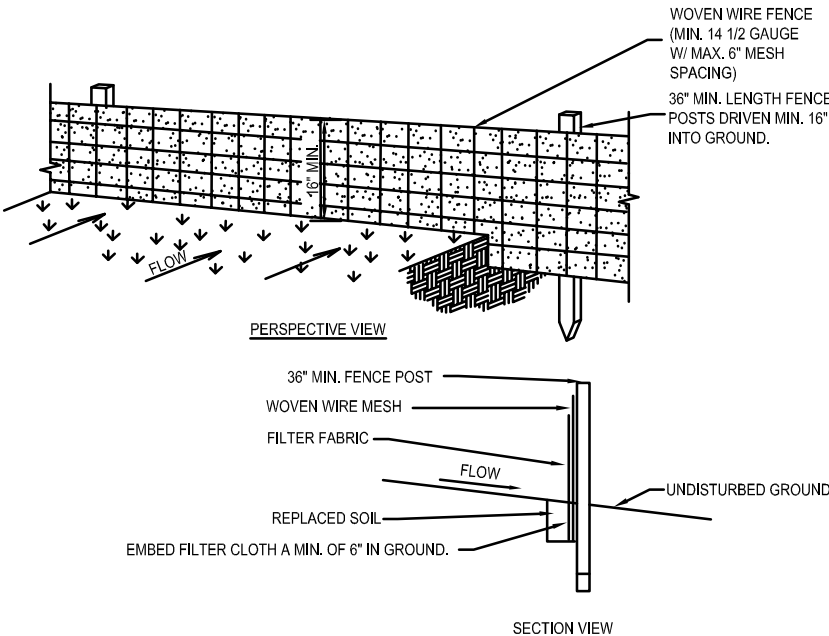
2 **STABILIZED CONSTRUCTION ENTRANCE**

SCALE: NOT TO SCALE



3 **SOIL STOCKPILE DETAIL**

SCALE: NOT TO SCALE



NOTES:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POST WITH WIRE TIRES OR STAPLES, POSTS SHALL BE HARDWOOD OR STEEL OF EITHER "T" OR "U" TYPE.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 6" MAXIMUM MESH OPENINGS.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRA1 100X, STABILINKA T140N, OR APPROVED EQUAL.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUAL.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

1 **SILT FENCE DETAIL**

SCALE: NOT TO SCALE

DRAWN BY:  
MDM

CHECKED BY:  
MDM

DATE:  
May 26, 2017

SCALE:  
N.T.S.

BY:  
MDM

DESCRIPTION OF REVISION:  
ISSUED FOR CLIENT REVIEW

DATE:  
05-26-2017

REVISIONS:  
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 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1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1

# STANDARD AND SPECIFICATIONS FOR CONSTRUCTION ROAD STABILIZATION



## **Definition & Scope**

The stabilization of temporary construction access routes, on-site vehicle transportation routes, and construction parking areas to control erosion on temporary construction routes and parking areas.

## **Conditions Where Practice Applies**

All traffic routes and parking areas for temporary use by construction traffic.

## **Design Criteria**

Construction roads should be located to reduce erosion potential, minimize impact on existing site resources, and maintain operations in a safe manner. Highly erosive soils, wet or rocky areas, and steep slopes should be avoided. Roads should be routed where seasonal water tables are deeper than 18 inches. Surface runoff and control should be in accordance with other standards.

**Road Grade** – A maximum grade of 12% is recommended, although grades up to 15% are possible for short distances.

**Road Width** – 12 foot minimum for one-way traffic or 24 foot minimum for two-way traffic.

**Side Slope of Road Embankment** – 2:1 or flatter.

**Ditch Capacity** – On-site roadside ditch and culvert capacities shall be the 10 yr. peak runoff.

**Composition** – Use a 6-inch layer of NYS DOT sub-base Types 1,2,3, 4 or equivalent as specified in NYSDOT Standard Specifications.

## **Construction Specifications**

1. Clear and strip roadbed and parking areas of all vegetation, roots, and other objectionable material.
2. Locate parking areas on naturally flat areas as available. Keep grades sufficient for drainage, but not more than 2 to 3 percent.
3. Provide surface drainage and divert excess runoff to stabilized areas.
4. Maintain cut and fill slopes to 2:1 or flatter and stabilized with vegetation as soon as grading is accomplished.
5. Spread 6-inch layer of sub-base material evenly over the full width of the road and smooth to avoid depressions.
6. Provide appropriate sediment control measures to prevent offsite sedimentation.

## **Maintenance**

Inspect construction roads and parking areas periodically for condition of surface. Top dress with new gravel as needed. Check ditches for erosion and sedimentation after rainfall events. Maintain vegetation in a healthy, vigorous condition. Areas producing sediment should be treated immediately.



# STANDARD AND SPECIFICATIONS FOR CONCRETE TRUCK WASHOUT



## **Definition & Scope**

A temporary excavated or above ground lined constructed pit where concrete truck mixers and equipment can be washed after their loads have been discharged, to prevent highly alkaline runoff from entering storm drainage systems or leaching into soil.

## **Conditions Where Practice Applies**

Washout facilities shall be provided for every project where concrete will be poured or otherwise formed on the site. This facility will receive highly alkaline wash water from the cleaning of chutes, mixers, hoppers, vibrators, placing equipment, trowels, and screeds. Under no circumstances will wash water from these operations be allowed to infiltrate into the soil or enter surface waters.

## **Design Criteria**

**Capacity:** The washout facility should be sized to contain solids, wash water, and rainfall and sized to allow for the evaporation of the wash water and rainfall. Wash water shall be estimated at 7 gallons per chute and 50 gallons per hopper of the concrete pump truck and/or discharging drum. The minimum size shall be 8 feet by 8 feet at the bottom and 2 feet deep. If excavated, the side slopes shall be 2 horizontal to 1 vertical.

**Location:** Locate the facility a minimum of 100 feet from drainage swales, storm drain inlets, wetlands, streams and other surface waters. Prevent surface water from entering the structure except for the access road. Provide appropriate access with a gravel access road sloped down to the structure. Signs shall be placed to direct drivers to the facility after their load is discharged.

**Liner:** All washout facilities will be lined to prevent

leaching of liquids into the ground. The liner shall be plastic sheeting with a minimum thickness of 10 mils with no holes or tears, and anchored beyond the top of the pit with an earthen berm, sand bags, stone, or other structural appurtenance except at the access point.

If pre-fabricated washouts are used they must ensure the capture and containment of the concrete wash and be sized based on the expected frequency of concrete pours. They shall be sited as noted in the location criteria.

## **Maintenance**

- All concrete washout facilities shall be inspected daily. Damaged or leaking facilities shall be deactivated and repaired or replaced immediately. Excess rainwater that has accumulated over hardened concrete should be pumped to a stabilized area, such as a grass filter strip.
- Accumulated hardened material shall be removed when 75% of the storage capacity of the structure is filled. Any excess wash water shall be pumped into a containment vessel and properly disposed of off site.
- Dispose of the hardened material off-site in a construction/demolition landfill. On-site disposal may be allowed if this has been approved and accepted as part of the projects SWPPP. In that case, the material should be recycled as specified, or buried and covered with a minimum of 2 feet of clean compacted earthfill that is permanently stabilized to prevent erosion.
- The plastic liner shall be replaced with each cleaning of the washout facility.
- Inspect the project site frequently to ensure that no concrete discharges are taking place in non-designated areas.



# STANDARD AND SPECIFICATIONS FOR DUST CONTROL



dust control (see Section 3).

**Mulch** (including gravel mulch) – Mulch offers a fast effective means of controlling dust. This can also include rolled erosion control blankets.

**Spray adhesives** – These are products generally composed of polymers in a liquid or solid form that are mixed with water to form an emulsion that is sprayed on the soil surface with typical hydroseeding equipment. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations for the specific soils on the site. In no case should the application of these adhesives be made on wet soils or if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators and others working with the material.

## **Definition & Scope**

The control of dust resulting from land-disturbing activities, to prevent surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards, and traffic safety problems.

## **Conditions Where Practice Applies**

On construction roads, access points, and other disturbed areas subject to surface dust movement and dust blowing where off-site damage may occur if dust is not controlled.

## **Design Criteria**

**Construction operations should be scheduled to minimize the amount of area disturbed at one time.** Buffer areas of vegetation should be left where practical. Temporary or permanent stabilization measures shall be installed. No specific design criteria is given; see construction specifications below for common methods of dust control.

Water quality must be considered when materials are selected for dust control. Where there is a potential for the material to wash off to a stream, ingredient information must be provided to the NYSDEC.

No polymer application shall take place without written approval from the NYSDEC.

## **Construction Specifications**

**A. Non-driving Areas** – These areas use products and materials applied or placed on soil surfaces to prevent airborne migration of soil particles.

**Vegetative Cover** – For disturbed areas not subject to traffic, vegetation provides the most practical method of

**B. Driving Areas** – These areas utilize water, polymer emulsions, and barriers to prevent dust movement from the traffic surface into the air.

**Sprinkling** – The site may be sprayed with water until the surface is wet. This is especially effective on haul roads and access route to provide short term limited dust control.

**Polymer Additives** – These polymers are mixed with water and applied to the driving surface by a water truck with a gravity feed drip bar, spray bar or automated distributor truck. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations. Incorporation of the emulsion into the soil will be done to the appropriate depth based on expected traffic. Compaction after incorporation will be by vibratory roller to a minimum of 95%. The prepared surface shall be moist and no application of the polymer will be made if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators working with the material.

**Barriers** – Woven geo-textiles can be placed on the driving surface to effectively reduce dust throw and particle migration on haul roads. Stone can also be used for construction roads for effective dust control.

**Windbreak** – A silt fence or similar barrier can control air currents at intervals equal to ten times the barrier height. Preserve existing wind barrier vegetation as much as practical.

## **Maintenance**

Maintain dust control measures through dry weather periods until all disturbed areas are stabilized.

# STANDARD AND SPECIFICATIONS FOR PROTECTING VEGETATION DURING CONSTRUCTION



## **Definition & Scope**

The protection of trees, shrubs, ground cover and other vegetation from damage by construction equipment. In order to preserve existing vegetation determined to be important for soil erosion control, water quality protection, shade, screening, buffers, wildlife habitat, wetland protection, and other values.

## **Conditions Where Practices Applies**

On planned construction sites where valued vegetation exists and needs to be preserved.

## **Design Criteria**

### **1. Planning Considerations**

#### **A. Inventory:**

1) Property boundaries, topography, vegetation and soils information should be gathered. Identify potentially high erosion areas, areas with tree windthrow potential, etc. A vegetative cover type map should be made on a copy of a topographic map which shows other natural and manmade features. Vegetation that is desirable to preserve because of its value for screening, shade, critical erosion control, endangered species, aesthetics, etc., should be identified and marked on the map.

2) Based upon this data, general statements should be prepared about the present condition, potential problem areas, and unique features of the property.

#### **B. Planning:**

1) After engineering plans (plot maps) are prepared, another field review should take place and

recommendations made for the vegetation to be saved. Minor adjustments in location of roads, dwellings, and utilities may be needed. Construction on steep slopes, erodible soils, wetlands, and streams should be avoided. Clearing limits should be delineated (See "Determine Limits of Clearing and Grading" on page 2.2).

2) Areas to be seeded and planted should be identified. Remaining vegetation should blend with their surroundings and/or provide special function such as a filter strip, buffer zone, or screen.

3) Trees and shrubs of special seasonal interest, such as flowering dogwood, red maple, striped maple, serviceberry, or shadbush, and valuable potential shade trees should be identified and marked for special protective treatment as appropriate.

4) Trees to be cut should be marked on the plans. If timber can be removed for salable products, a forester should be consulted for marketing advice.

5) Trees that may become a hazard to people, personal property, or utilities should be removed. These include trees that are weak-wooded, disease-prone, subject to windthrow, or those that have severely damaged root systems.

6) The vigor of remaining trees may be improved by a selective thinning. A forester should be consulted for implementing this practice.

### **2. Measures to Protect Vegetation**

A. Limit soil placement over existing tree and shrub roots to a maximum of 3 inches. Soils with loamy texture and good structure should be used.

B. Use retaining walls and terraces to protect roots of trees and shrubs when grades are lowered. Lowered grades should start no closer than the dripline of the tree. For narrow-canopied trees and shrubs, the stem diameter in inches is converted to feet and doubled, such that a 10 inch tree should be protected to 20 feet.

C. Trenching across tree root systems should be the same minimum distance from the trunk, as in "B". Tunnels under root systems for underground utilities should start 18 inches or deeper below the normal ground surface. Tree roots which must be severed should be cut clean. Backfill material that will be in contact with the roots should be topsoil or a prepared planting soil mixture.

D. Construct sturdy fences, or barriers, of wood, steel, or other protective material around valuable

vegetation for protection from construction equipment. Place barriers far enough away from trees, but not less than the specifications in "B", so that tall equipment such as backhoes and dump trucks do not contact tree branches.

E. Construction limits should be identified and clearly marked to exclude equipment.

F. Avoid spills of oil/gas and other contaminants.

G. Obstructive and broken branches should be pruned properly. The branch collar on all branches whether living or dead should not be damaged. The 3 or 4 cut method should be used on all branches larger than two inches at the cut. First cut about one-third the way through the underside of the limb (about 6-12 inches from the tree trunk). Then (approximately an inch further out) make a second cut through the limb from the upper side. When the branch is removed, there is no splintering of the main tree trunk. Remove the stub. If the branch is larger than 5-6 inches in diameter, use the four cut system. Cuts 1 and 2 remain the same and cut 3 should be from the underside of the limb, on the outside of the branch collar. Cut 4 should be from the top and in alignment with the 3rd cut. Cut 3 should be 1/4 to 1/3 the way through the limb. This will prevent the bark from peeling down the trunk. Do not paint the cut surface.

H. Penalties for damage to valuable trees, shrubs, and herbaceous plants should be clearly spelled out in the contract.

## **PROTECTING TREES IN HEAVY USE AREAS**

The compaction of soil over the roots of trees and shrubs by the trampling of recreationists, vehicular traffic, etc., reduces oxygen, water, and nutrient uptake by feeder roots. This weakens and may eventually kill the plants. Table 2.6 rates the "Susceptibility of Tree Species to Compaction."

Where heavy compaction is anticipated, apply and maintain a 3 to 4 inch layer of undecayed wood chips or 2 inches of No. 2 washed, crushed gravel. In addition, use of a wooden or plastic mat may be used to lessen compaction, if applicable.

**Table 2.6**  
**Susceptibility of Tree Species to Compaction<sup>1</sup>**

Resistant:

Box elder.....	<i>Acer negundo</i>	Willows.....	<i>Salix spp.</i>
Green ash.....	<i>Fraxinus pennsylvanica</i>	Honey locust.....	<i>Gleditsia triacanthos</i>
Red elm.....	<i>Ulmus rubra</i>	Eastern cottonwood.....	<i>Populus deltoides</i>
Hawthornes.....	<i>Crataegus spp.</i>	Swamp white oak.....	<i>Quercus bicolor</i>
Bur oak.....	<i>Quercus macrocarpa</i>	Hophornbeam.....	<i>Ostrya virginiana</i>
Northern white cedar....	<i>Thuja occidentalis</i>		

Intermediate:

Red maple.....	<i>Acer rubrum</i>	Sweetgum.....	<i>Liquidambar styraciflua</i>
Silver maple.....	<i>Acer saccharinum</i>	Norway maple.....	<i>Acer platanoides</i>
Hackberry.....	<i>Celtis occidentalis</i>	Shagbark hickory.....	<i>Carya ovata</i>
Black gum.....	<i>Nyssa sylvatica</i>	London plane.....	<i>Platanus x hybrida</i>
Red oak.....	<i>Quercus rubra</i>	Pin oak.....	<i>Quercus palustris</i>
Basswood.....	<i>Tilia americana</i>		

Susceptible:

Sugar maple.....	<i>Acer saccharum</i>	Austrian Pine.....	<i>Pinus nigra</i>
White pine.....	<i>Pinus strobus</i>	White ash.....	<i>Fraxinus americana</i>
Blue spruce.....	<i>Picea pungens</i>	Paper birch.....	<i>Betula papyrifera</i>
White oak.....	<i>Quercus alba</i>	Mountain ash.....	<i>Sorbus aucuparia</i>
Red pine.....	<i>Pinus resinosa</i>	Japanese maple.....	<i>Acer palmatum</i>

<sup>1</sup> If a tree species does not appear on the list, insufficient information is available to rate it for this purpose.



# STANDARD AND SPECIFICATIONS FOR SITE POLLUTION PREVENTION



## **Definition & Scope**

A collection of management practices intended to control non-sediment pollutants associated with construction activities to prevent the generation of pollutants due to improper handling, storage, and spills and prevent the movement of toxic substances from the site into surface waters.

## **Conditions Where Practice Applies**

On all construction sites where the earth disturbance exceeds 5,000 square feet, and involves the use of fertilizers, pesticides, petroleum based chemicals, fuels and lubricants, as well as sealers, paints, cleared woody vegetation, garbage, and sanitary wastes.

## **Design Criteria**

The variety of pollutants on a particular site and the severity of their impacts depend on factors such as the nature of the construction activity, the physical characteristics of the construction site, and the proximity of water bodies and conveyances to the pollutant source.

1. All state and federal regulations shall be followed for the storage, handling, application, usage, and disposal of pesticides, fertilizers, and petroleum products.
2. Vehicle and construction equipment staging and maintenance areas will be located away from all drainage ways with their parking areas graded so the runoff from these areas is collected, contained and treated prior to discharge from the site.
3. Provide sanitary facilities for on-site personnel.
4. Store, cover, and isolate construction materials including topsoil, and chemicals, to prevent runoff of

pollutants and contamination of groundwater and surface waters.

5. Develop and implement a spill prevention and control plan. The plan should include NYSDEC's spill reporting and initial notification requirements.
6. Provide adequate disposal for solid waste including woody debris, stumps, and other construction waste and include these methods and directions in the construction details on the site construction drawings. Fill, woody debris, stumps and construction waste shall not be placed in regulated wetlands, streams or other surface waters.
7. Distribute or post informational material regarding proper handling, spill response, spill kit location, and emergency actions to be taken, to all construction personnel.
8. Refueling equipment shall be located at least 100 feet from all wetlands, streams and other surface waters.



# STANDARD AND SPECIFICATIONS FOR STABILIZED CONSTRUCTION ACCESS



## Definition & Scope

A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area. The purpose of stabilized construction access is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

## Conditions Where Practice Applies

A stabilized construction access shall be used at all points of construction ingress and egress.

## Design Criteria

See Figure 2.1 on page 2.31 for details.

**Aggregate Size:** Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.

**Thickness:** Not less than six (6) inches.

**Width:** 12-foot minimum but not less than the full width of points where ingress or egress occurs. 24-foot minimum if there is only one access to the site.

**Length:** As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum would apply).

**Geotextile:** To be placed over the entire area to be covered with aggregate. Filter cloth will not be required on a single-family residence lot. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.

**Criteria for Geotextile:** The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be

inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

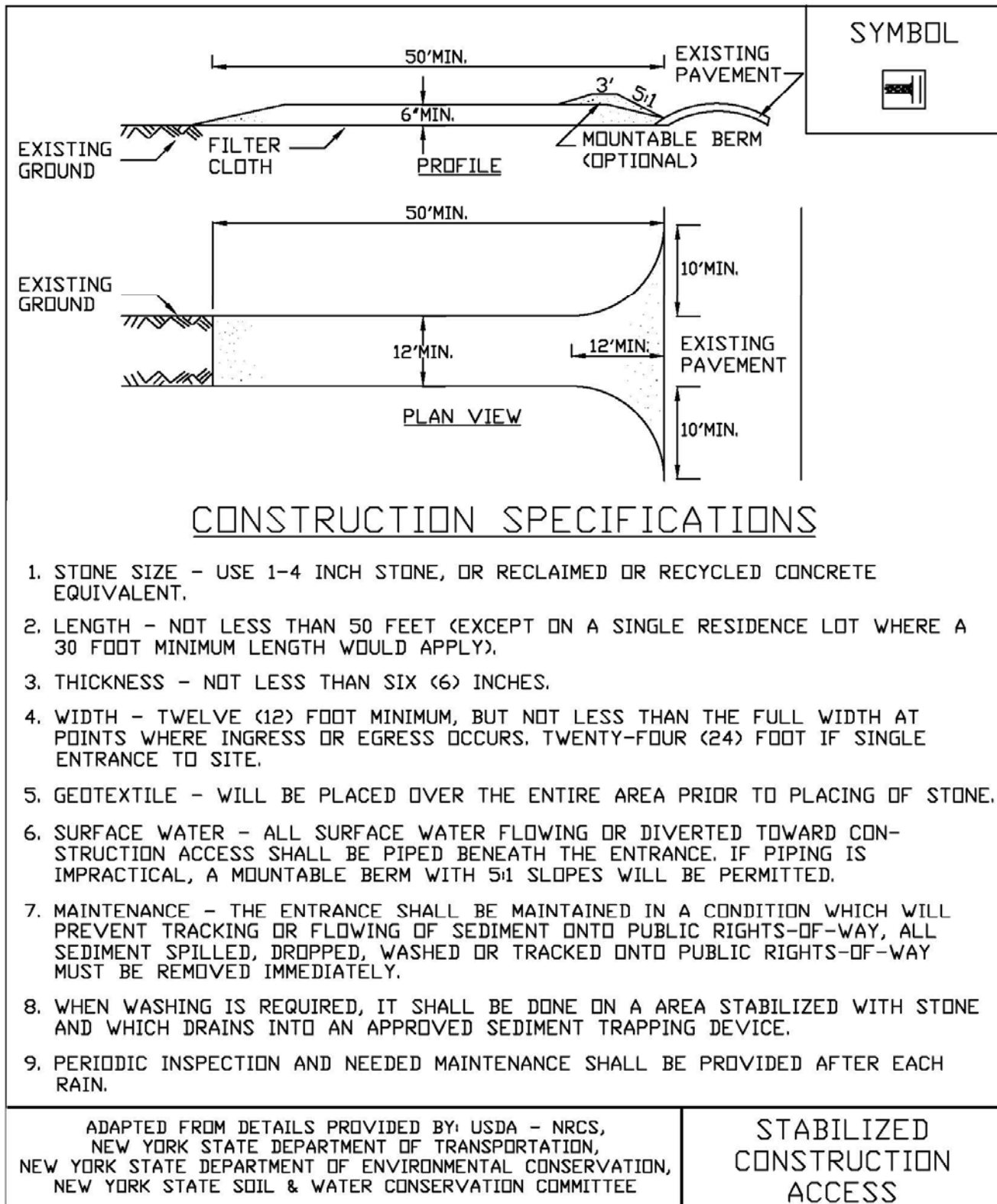
Fabric Properties <sup>3</sup>	Light Duty <sup>1</sup> Roads Grade Sub-grade	Heavy Duty <sup>2</sup> Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Burst Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 Modified
Equivalent	40-80	40-80	US Std Sieve
Opening Size			CW-02215
Aggregate Depth	6	10	-
<sup>1</sup> Light Duty Road: Area sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Acceptable materials are Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.			
<sup>2</sup> Heavy Duty Road: Area sites with only rough grading, and where most travel would be multi-axle vehicles. Acceptable materials are Trevira Spunbond 1135, Mirafi 600X, or equivalent.			
<sup>3</sup> Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.			

## Maintenance

The access shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately.

When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

**Figure 2.1**  
**Stabilized Construction Access**





# STANDARD AND SPECIFICATIONS FOR PERMANENT CONSTRUCTION AREA PLANTING



## Definition & Scope

Establishing **permanent** grasses with other forbs and/or shrubs to provide a minimum 80% perennial vegetative cover on areas disturbed by construction and critical areas to reduce erosion and sediment transport. Critical areas may include but are not limited to steep excavated cut or fill slopes as well as eroding or denuded natural slopes and areas subject to erosion.

## Conditions Where Practice Applies

This practice applies to all disturbed areas void of, or having insufficient, cover to prevent erosion and sediment transport. See additional standards for special situations such as sand dunes and sand and gravel pits.

## Criteria

All water control measures will be installed as needed prior to final grading and seedbed preparation. Any severely compacted sections will require chiseling or disking to provide an adequate rooting zone, to a minimum depth of 12", see Soil Restoration Standard. The seedbed must be prepared to allow good soil to seed contact, with the soil not too soft and not too compact. Adequate soil moisture must be present to accomplish this. If surface is powder dry or sticky wet, postpone operations until moisture changes to a favorable condition. If seeding is accomplished within 24 hours of final grading, additional scarification is generally not needed, especially on ditch or stream banks. Remove all stones and other debris from the surface that are greater than 4 inches, or that will interfere with future mowing or maintenance.

Soil amendments should be incorporated into the upper 2 inches of soil when feasible. **The soil should be tested to determine the amounts of amendments needed.** Apply

ground agricultural limestone to attain a pH of 6.0 in the upper 2 inches of soil. If soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply commercial fertilizer at 600 lbs. per acre of 5-5-10 or equivalent. If manure is used, apply a quantity to meet the nutrients of the above fertilizer. This requires an appropriate manure analysis prior to applying to the site. Do not use manure on sites to be planted with birdsfoot trefoil or in the path of concentrated water flow.

Seed mixtures may vary depending on location within the state and time of seeding. Generally, warm season grasses should only be seeded during early spring, April to May. These grasses are primarily used for vegetating excessively drained sands and gravels. See Standard and Specification for Sand and Gravel Mine Reclamation. Other grasses may be seeded any time of the year when the soil is not frozen and is workable. When legumes such as birdsfoot trefoil are included, spring seeding is preferred. See Table 4.4, "Permanent Construction Area Planting Mixture Recommendations" for additional seed mixtures.

### General Seed Mix:

	Variety	lbs./acre	lbs/1000 sq. ft.
Red Clover <sup>1</sup> <u>OR</u>	Acclaim, Rally, Red Head II, Renegade	8 <sup>2</sup>	0.20
Common white clover <sup>1</sup>	Common	8	0.20
<u>PLUS</u>			
Creeping Red Fescue	Common	20	0.45
<u>PLUS</u>			
Smooth Bromegrass <u>OR</u>	Common	2	0.05
Ryegrass (perennial)	Pennfine/Linn	5	0.10
<sup>1</sup> add inoculant immediately prior to seeding <sup>2</sup> Mix 4 lbs each of Empire and Pardee OR 4 lbs of Birdsfoot and 4 lbs white clover per acre. All seeding rates are given for Pure Live Seed (PLS)			

Pure Live Seed, or (PLS) refers to the amount of live seed in a lot of bulk seed. Information on the seed bag label includes the type of seed, supplier, test date, source of seed, purity, and germination. Purity is the percentage of pure seed. Germination is the percentage of pure seed that will produce normal plants when planted under favorable conditions.



To compute Pure Live Seed multiply the “germination percent” times the “purity” and divide that by 100 to get Pure Live Seed.

$$\text{Pure Live Seed (PLS)} = \frac{\% \text{ Germination} \times \% \text{ Purity}}{100}$$

For example, the PLS for a lot of Kentucky Blue grass with 75% purity and 96% germination would be calculated as follows:

$$\frac{(96) \times (75)}{100} = 72\% \text{ Pure Live Seed}$$

For 10lbs of PLS from this lot =

$$\frac{10}{0.72} = 13.9 \text{ lbs}$$

Therefore, 13.9 lbs of seed is the actual weight needed to meet 10lbs PSL from this specific seed lot.

Time of Seeding: The optimum timing for the general seed mixture is early spring. Permanent seedings may be made any time of year if properly mulched and adequate moisture is provided. Late June through early August is not a good time to seed, but may facilitate covering the land without additional disturbance if construction is completed. Portions of the seeding may fail due to drought and heat. These areas may need reseeding in late summer/fall or the following spring.

Method of seeding: Broadcasting, drilling, cultipack type seeding, or hydroseeding are acceptable methods. Proper soil to seed contact is key to successful seedings.

Mulching: Mulching is essential to obtain a uniform stand of seeded plants. Optimum benefits of mulching new seedings are obtained with the use of small grain straw applied at a rate of 2 tons per acre, and anchored with a netting or tackifier. See the Standard and Specifications for Mulching for choices and requirements.

Irrigation: Watering may be essential to establish a new seeding when a drought condition occurs shortly after a new seeding emerges. Irrigation is a specialized practice and care must be taken not to exceed the application rate for the soil or subsoil. When disconnecting irrigation pipe, be sure pipes are drained in a safe manor, not creating an erosion concern.



80% Perennial Vegetative Cover



50% Perennial Vegetative Cover

**Table 4.4**  
**Permanent Construction Area Planting Mixture Recommendations**

Seed Mixture	Variety	Rate in lbs./acre (PLS)	Rate in lbs./ 1, 000 ft <sup>2</sup>
<b>Mix #1</b>			
Creeping red fescue	Ensylva, Pennlawn, Boreal	10	.25
Perennial ryegrass	Pennfine, Linn	10	.25
*This mix is used extensively for shaded areas.			
<b>Mix #2</b>			
Switchgrass	Shelter, Pathfinder, Trailblazer, or Blackwell	20	.50
*This rate is in pure live seed, this would be an excellent choice along the upland edge of a wetland to filter runoff and provide wildlife benefits. In areas where erosion may be a problem, a companion seeding of sand lovegrass should be added to provide quick cover at a rate of 2 lbs. per acre (0.05 lbs. per 1000 sq. ft.).			
<b>Mix #3</b>			
Switchgrass	Shelter, Pathfinder, Trailblazer, or Blackwell	4	.10
Big bluestem	Niagara	4	.10
Little bluestem	Aldous or Camper	2	.05
Indiangrass	Rumsey	4	.10
Coastal panicgrass	Atlantic	2	.05
Sideoats grama	El Reno or Trailway	2	.05
Wildflower mix		.50	.01
*This mix has been successful on sand and gravel plantings. It is very difficult to seed without a warm season grass seeder such as a Truax seed drill. Broadcasting this seed is very difficult due to the fluffy nature of some of the seed, such as bluestems and indiangrass.			
<b>Mix #4</b>			
Switchgrass	Shelter, Pathfinder, Trailblazer, or Blackwell	10	.25
Coastal panicgrass	Atlantic	10	.25
*This mix is salt tolerant, a good choice along the upland edge of tidal areas and roadsides.			
<b>Mix #5</b>			
Saltmeadow cordgrass ( <i>Spartina patens</i> )—This grass is used for tidal shoreline protection and tidal marsh restoration. It is planted by vegetative stem divisions.			
'Cape' American beachgrass can be planted for sand dune stabilization above the saltmeadow cordgrass zone.			
<b>Mix #6</b>			
Creeping red fescue	Ensylva, Pennlawn, Boreal	20	.45
Chewings Fescue	Common	20	.45
Perennial ryegrass	Pennfine, Linn	5	.10
Red Clover	Common	10	.45
*General purpose erosion control mix. Not to be used for a turf planting or play grounds.			

## **APPENDIX M**

### **Construction Site Log Book**

**STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION  
ACTIVITIES**

**CONSTRUCTION SITE LOG BOOK**

**For The**

Ellis Tract Solar PV Array Project

**At**

Turkey Hill Road, Mount Pleasant Road, Stevenson Road, and Dodge Road  
Town of Dryden, NY 13053

JUNE 2017

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  - b. Blank Inspection Forms
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**I. PRE-CONSTRUCTION MEETING DOCUMENTS**

Project Name \_\_\_\_\_

Permit No. \_\_\_\_\_ Date of Authorization \_\_\_\_\_

Name of Operator \_\_\_\_\_

Prime Contractor \_\_\_\_\_

**a. Preamble to Site Assessment and Inspections**

The Following Information to be read by all person's involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified professional<sup>1</sup> conduct an assessment of the site prior to the commencement of construction<sup>2</sup> and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements.

When construction starts, two site inspections shall be conducted by the qualified professional every 7 calendar days and within 24 hours of the end of a storm event (Construction Duration Inspections). The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization<sup>3</sup> using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

- 1) "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control).
- 2) "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.
- 3) "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

**b. Qualified Professional's Credentials & Certification**

"I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the following Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction."

Name (please print): \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Signature: \_\_\_\_\_

**c. Pre-construction Site Assessment Checklist**  
**(NOTE: Provide comments below as necessary)**

**1. Notice of Intent, SWPPP, and Contractors Certification:**

**Yes No NA**

- ☐ ☐ ☐ Has a Notice of Intent been filed with the NYS Department of Conservation?
- ☐ ☐ ☐ Is the SWPPP on-site? Where? \_\_\_\_\_
- ☐ ☐ ☐ Is the Plan current? What is the latest revision date? \_\_\_\_\_
- ☐ ☐ ☐ Is a copy of the NOI (with brief description) onsite? Where? \_\_\_\_\_
- ☐ ☐ ☐ Have all contractors involved with stormwater related activities signed a contractor's certification?

**2. Resource Protection**

**Yes No NA**

- ☐ ☐ ☐ Are construction limits clearly flagged or fenced?
- ☐ ☐ ☐ Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
- ☐ ☐ ☒ Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

**3. Surface Water Protection**

**Yes No NA**

- ☐ ☐ ☐ Clean stormwater runoff has been diverted from areas to be disturbed.
- ☐ ☐ ☐ Bodies of water located either on site or in the vicinity of the site have been identified and protected.
- ☐ ☐ ☐ Appropriate practices to protect on-site or downstream surface water are installed.
- ☐ ☐ ☐ Are clearing and grading operations divided into areas <5 acres?

**4. Stabilized Construction Entrance**

**Yes No NA**

- ☐ ☐ ☐ A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
- ☐ ☐ ☐ Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
- ☐ ☐ ☐ Sediment tracked onto public streets is removed or cleaned on a regular basis.

**5. Perimeter Sediment Controls**

**Yes No NA**

- ☐ ☐ ☐ Silt fence material and installation comply with the standard drawing and specifications.
- ☐ ☐ ☐ Silt fences are installed at appropriate spacing intervals.
- ☐ ☐ ☐ Sediment/detention basin was installed as first land disturbing activity.
- ☐ ☐ ☐ Sediment traps and barriers are installed.

**6. Pollution Prevention for Waste and Hazardous Materials**

**Yes No NA**

- ☐ ☐ ☐ The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
- ☐ ☐ ☐ The contractor maintains a Spill Prevention Control and Counter Measures Program. A supplemental Materials Handling and Spill Prevention plan is contained in Section III of this log book.

☐ ☐ ☐ Appropriate materials to control spills are onsite. Where? \_\_\_\_\_

## II. CONSTRUCTION DURATION INSPECTION DOCUMENTS

### a. Directions:

**Inspection Forms will be filled out during the entire construction phase of the project.**

Required Elements:

- (1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 7-day period;
- (2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;
- (3) Indicate all disturbed site areas that have not undergone active site work during the previous 7-day period;
- (4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);
- (5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and
- (6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

CONSTRUCTION DURATION INSPECTIONS

Page 1 of \_\_\_\_\_  
DATE \_\_\_\_\_  
BY \_\_\_\_\_

SITE PLAN/SKETCH

\_\_\_\_\_  
Inspector (print name)

\_\_\_\_\_  
Date of Inspection

\_\_\_\_\_  
Qualified Professional (print name)

\_\_\_\_\_  
Qualified Professional Signature

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.



**CONSTRUCTION DURATION INSPECTIONS**

Page 2 of \_\_\_\_\_  
DATE \_\_\_\_\_  
BY \_\_\_\_\_

**Maintaining Water Quality****Yes No NA**

- ☐ ☐ ☐ Is there an increase in turbidity causing a substantial visible contrast to natural conditions?
- ☐ ☐ ☐ Is there residue from oil and floating substances, visible oil film, or globules or grease?
- ☐ ☐ ☐ All disturbance is within the limits of the approved plans.
- ☐ ☐ ☐ Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

**Housekeeping****1. General Site Conditions****Yes No NA**

- ☐ ☐ ☐ Is construction site litter and debris appropriately managed?
- ☐ ☐ ☐ Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
- ☐ ☐ ☐ Is construction impacting the adjacent property?
- ☐ ☐ ☐ Is dust adequately controlled?

**2. Temporary Stream Crossing****Yes No NA**

- ☐ ☐ ☐ Maximum diameter pipes necessary to span creek without dredging are installed.
- ☐ ☐ ☐ Installed non-woven geotextile fabric beneath approaches.
- ☐ ☐ ☐ Is fill composed of aggregate (no earth or soil)?
- ☐ ☐ ☐ Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

**Runoff Control Practices****1. Excavation Dewatering****Yes No NA**

- ☐ ☐ ☐ Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
- ☐ ☐ ☐ Clean water from upstream pool is being pumped to the downstream pool.
- ☐ ☐ ☐ Sediment laden water from work area is being discharged to a silt-trapping device.
- ☐ ☐ ☐ Constructed upstream berm with one-foot minimum freeboard.

**2. Level Spreader****Yes No NA**

- ☐ ☐ ☐ Installed per plan.
- ☐ ☐ ☐ Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
- ☐ ☐ ☐ Flow sheets out of level spreader without erosion on downstream edge.

**3. Interceptor Dikes and Swales****Yes No NA**

- ☐ ☐ ☐ Installed per plan with minimum side slopes 2H:1V or flatter.
- ☐ ☐ ☐ Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.

☐ ☐ ☐ Sediment-laden runoff directed to sediment trapping structure  
**CONSTRUCTION DURATION INSPECTIONS**

Page 3 of \_\_\_\_\_

DATE \_\_\_\_\_

BY \_\_\_\_\_

**Runoff Control Practices (continued)**

## 4. Stone Check Dam

**Yes No NA**

- ☐ ☐ ☐ Is channel stable? (flow is not eroding soil underneath or around the structure).  
☐ ☐ ☐ Check is in good condition (rocks in place and no permanent pools behind the structure).  
☐ ☐ ☐ Has accumulated sediment been removed?

## 5. Rock Outlet Protection

**Yes No NA**

- ☐ ☐ ☐ Installed per plan.  
☐ ☐ ☐ Installed concurrently with pipe installation.

**Soil Stabilization**

## 1. Topsoil and Spoil Stockpiles

**Yes No NA**

- ☐ ☐ ☐ Stockpiles are stabilized with vegetation and/or mulch.  
☐ ☐ ☐ Sediment control is installed at the toe of the slope.

## 2. Revegetation

**Yes No NA**

- ☐ ☐ ☐ Temporary seedings and mulch have been applied to idle areas.  
☐ ☐ ☐ 4 inches minimum of topsoil has been applied under permanent seedings.

**Sediment Control Practices**

## 1. Stabilized Construction Entrance

**Yes No NA**

- ☐ ☐ ☐ Stone is clean enough to effectively remove mud from vehicles.  
☐ ☐ ☐ Installed per standards and specifications?  
☐ ☐ ☐ Does all traffic use the stabilized entrance to enter and leave site?  
☐ ☐ ☐ Is adequate drainage provided to prevent ponding at entrance?

## 2. Silt Fence

**Yes No NA**

- ☐ ☐ ☐ Installed on Contour, 10 feet from toe of slope (not across conveyance channels).  
☐ ☐ ☐ Joints constructed by wrapping the two ends together for continuous support.  
☐ ☐ ☐ Fabric buried 6 inches minimum.  
☐ ☐ ☐ Posts are stable, fabric is tight and without rips or frayed areas.  
Sediment accumulation is \_\_\_\_\_% of design capacity.

**CONSTRUCTION DURATION INSPECTIONS**

Page 4 of \_\_\_\_\_  
DATE \_\_\_\_\_  
BY \_\_\_\_\_

**Sediment Control Practices (continued)**

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated practices).

**Yes No NA**

- ☐ ☐ ☐ Triangular Silt Dikes are installed.
- ☐ ☐ ☐ Geotextile fabric is installed over silt dikes and extends two to three feet beyond dike
- ☐ ☐ ☐ Staples (or applicable adhesive in hard surface areas) have been installed per plan detail.
- ☐ ☐ ☐ If silt sacks are used, they have been installed correctly.
- ☐ ☐ ☐ Drainage area is 1 acre or less.
- ☐ ☐ ☐ Sediment accumulation is \_\_\_\_\_% of design capacity.

4. Temporary Sediment Trap

**Yes No NA**

- ☐ ☐ ☐ Trap and outlet structure is constructed per the approved plan or drawing.
- ☐ ☐ ☐ Side slopes are stabilized with seed/mulch.
- ☐ ☐ ☐ Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
- Sediment accumulation is \_\_\_\_\_% of design capacity.

5. Temporary Sediment Basin

**Yes No NA**

- ☐ ☐ ☐ Basin and outlet structure constructed per the approved plan.
- ☐ ☐ ☐ Basin side slopes are stabilized with seed/mulch.
- ☐ ☐ ☐ Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
- Sediment accumulation is \_\_\_\_\_% of design capacity.

**Action Items and Required Maintenance**

**Yes No NA**

- ☐ ☐ ☐ All previous action and maintenance items have been addressed.

**ACTIONS/MAINTENANCE REQUIRED**

Area	Action/Maintenance Item	Responsible Party

The Operator shall amend the SWPPP whenever:

- Modification & Reason:**

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### III. MATERIALS HANDLING AND SPILL PREVENTION

The Contractor shall follow all Federal, State and local regulations pertaining to material handling, spill prevention and spill cleanup. The Contractor shall notify the appropriate agencies when a spill occurs. The following are recommended guidelines for the Contractor and shall not replace governmental regulations:

**Concrete Washout Structure:** Concrete Washout Structures are used to contain concrete and liquids when the chutes of concrete mixers and hoppers of concrete pumps are rinsed out after delivery. The washout facilities can be constructed or ready-made. All washout facilities consolidate solids for easier disposal and prevent runoff of liquids. The wash water is alkaline and contains high levels of chromium, which can leach into the ground and contaminate groundwater. It can also migrate to a storm drain, which can increase the pH of nearby waterways and harm aquatic life.

- The Contractor shall designate a concrete washout area and shall install the washout a minimum of 100 feet upstream from a storm drain, stream, pond or waterway.
- The facilities shall be cleaned out once they are 2/3 full or new facilities be constructed to provide additional storage.
- Adding solvents, flocculent, or acid to washwater is prohibited.
- Permanent disposal of concrete washout waste on the construction site is prohibited. Disposal of waste shall be in a legal manner.

**Construction Site Liquid and Solid Waste Management:** Building materials and other construction site wastes, including sanitary wastes, must be properly managed and disposed of to reduce the risk of pollution. Practices such as trash disposal, recycling, proper sanitary facility maintenance, and spill prevention and cleanup measures can reduce the potential for stormwater runoff to mobilize construction site wastes and contaminate surface or ground water.

- The Contractor shall designate one area for construction vehicle refueling that is at least 100 feet away from a storm drain, stream, pond or waterway.
- Temporary sanitary facilities should be located at least 50 feet away from drainageways, storm drains, receiving waters, areas of high traffic, and areas susceptible to flooding. Wastewater generated from sanitary facilities shall not be allowed to flow into storm sewers and drainageways. Only licensed haulers shall be authorized to dispose of waste. Facilities shall be secured to prevent overturning in areas susceptible to strong winds.
- Construction waste shall be segregated properly into various categories such as hazardous materials, toxic liquids and non-hazardous materials.
- Containers of liquids should have secondary containment and be stored away from drainageways, storm drains, receiving waters, areas of high traffic, and areas susceptible to flooding. Containers shall also be properly labeled.

**Spill Prevention and Control:** Spill Prevention, Control and Counter Measure Plan (SPCC) shall clearly state measures to stop the source of a spill, contain the spill, clean up the spill, dispose of contaminated materials, and train personnel to prevent and control future spills. SPCCs are applicable to construction sites where hazardous waste are stored or used. Hazardous waste includes pesticides, paints, cleaners, petroleum products, fertilizers, and solvents.

- The Contractor shall develop and implement a Spill Prevention, Control and Counter Measure Plan in conformance with State and Federal Regulations.
- Spills shall be contained and cleaned up as soon as possible.
- Residuals left over from the clean up activity, such as absorbent pads or containers of spill material, shall be disposed of properly.
- Proper spill and illicit discharge reporting procedures including calling NYS DEC hotline (1-800-457-7362) shall be followed for both hazardous and non-hazardous materials.
- Spills shall not be washed down into the storm drain or buried anywhere.

- The Contractor shall refer to NYS DEC Spill Guidance Manual (SGM) for additional requirements.

#### **SECTION IV – COMPLETED INSPECTION REPORTS**

**SECTION V – COMPLETED MODIFICATIONS TO THE SWPPP**