STORMWATER POLLUTION CONTROL PLAN
VOLUME 1

CPV TOWANTIC ENERGY CENTER

OXFORD, CONNECTICUT

Prepared by:

CIVIL 1
43 Sherman Hill Road
Suite D-101
Woodbury, CT 06798

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APPENDICES

Contact Information / Responsible Parties:

Permitted:
CPV Towantic, LLC
50 Braintreee Hill Office Park
Suite 300
Braintree, MA
(781)848-3611

Contractor Co-Permittee:
To be determined

Contractor Operator(s):
To be determined

Stormwater Pollution Control Plan Contact(s):
CPV Towantic, LLC
50 Braintreee Hill Office Park
Suite 300
Braintree, MA
(781)848-3611

Civil1
43 Sherman Hill Road
Suite D-101
Woodbury, CT 06798
(203)266-0778

This Stormwater Pollution Control Plan was prepared by:
Curtis Jones, PE
Civil1
43 Sherman Hill Road
Suite D-101
Woodbury, CT 06798
(203)266-0778

Section 1.0

PROJECT INTRODUCTION

1.0 PROJECT INTRODUCTION

Project/Site Information:

Project/Site Name: CPV Towantic Energy Center

Location: Woodruff Hill Road
Oxford, Connecticut

Latitude/Longitude:	Latitude:	Longitude:
	41º 28' 58" N	73º 07' 21" W

Method for determining latitude/longitude: Google Earth

1.1 SITE SUMMARY

1.1.1 Existing Conditions

The project is located on two adjacent lots totaling 26.5 acres at the northern end of Woodruff Hill Road in Oxford. Currently, the site consists mostly of woodlands while the southwestern section of the property (+/-7.5 acres) is open hayfield. The property is bordered to the east and south by the Algonquin Gas Transmission Facility (Lot 9 of the Woodruff Hill Industrial Park Subdivision), to the west by Woodruff Hill Road and Lots 6, 7 and 8 of the Woodruff Hill Industrial Park Subdivision and to the north by Open Space of the Woodruff Hill Industrial Park Subdivision. There is an Algonquin Gas Transmission Company easement along the northern border of the property as well as a CL&P easement for three existing 115-kV overhead transmission lines which run through the property.

There are four wetlands areas located on or immediately adjacent to the property, which were flagged by All-Points Technology Corporation in July of 2014. The wetlands areas are shown on Sheet C310 of the plan set entitled CPV Towantic Energy Center. There are no 100 year flood plains located on the site as defined by FEMA Flood Insurance Rate Mapping.

The project site is located within the Little River Watershed Drainage Basin Number 6920. This watershed is located within the Naugatuck Regional Basin within the Housatonic Major Basin, identified on the Connecticut Department of Environmental Protection Atlas of Public Water Supply Sources and Drainage Basins.

1.1.2 Project Description

The proposal is to construct, operate and maintain a 785 MW combined cycle electric generating facility. The plant is proposed to be located on a primary 20.3-acre parcel located immediately east of the Woodruff Hill Road cul-de-sac. The property is owned by CPV Towantic LLC (CPV), and it is the same parcel as the certificated project. In May 2014, CPV entered into an option agreement for the purchase of an additional 6.2-acre parcel, designated Lot 9A, in the Woodruff Hill Industrial Park. This additional parcel abuts the original parcel and is located immediately to the south. This additional parcel will be used as the access point to the proposed facility and to accommodate a stormwater renovation basin designed in conformance with the Department of

Energy and Environmental Protection's (DEEP) current stormwater management guidelines.

Electricity from the plant is proposed to be supplied to the grid via an overhead interconnection with three existing 115-kV transmission lines passing through the northwest corner of the primary site parcel. CPV will also have a proposed 115-kV switchyard on the subject property. CPV will own a disconnect switch on the high-side of its step-up transformers. That disconnect switch will represent the demarcation point between CPV and Eversource Energy d/b/a The Connecticut Light and Power Company (Eversource).

1.2 PROJECT OWNER AND OPERATOR

The project owner and operator, CPV Towantic, LLC, will be the responsible entity for completing the project. The address and telephone is:

CPV Towantic, LLC
50 Braintreee Hill Office Park
Suite 300
Braintree, MA
(781)848-3611

1.3 PERMIT COVERAGE AND ELIGIBILITY

The U.S. Environmental Protection Agency (EPA) requires a National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from construction sites that disturb more than one acre of land or from smaller sites that are part of a larger, common plan of development. For the purposes of the NPDES program, construction activities are defined as clearing, excavating, grading, or other land disturbing activities.

The General Permit for the Discharge of Stormwater and dewatering Wastewaters associated with Construction Activities (CGP) authorizes stormwater discharges from construction activities which result in the disturbance of one or more acres of land area on a site regardless of project phasing. In the case of a larger plan of development, the estimate of total acres of site disturbance shall include, but is not limited to, road and utility construction, individual lot construction, and all other construction associated with the overall plan, regardless of the individual parties responsible for the construction of these various elements. These conditions are subject to the conditions outlined in DEEP-WPED-GP-015. The effective date of this CGP is October 1, 2013, and covers all areas of Connecticut. This CGP includes provisions for the development of this Stormwater Pollution Control Plan to maximize the potential benefits of pollution prevention and sediment and erosion control measures at a construction site.

CGP eligibility is limited to discharges from "large" and "small" construction activity as defined in Section 3 Connecticut General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. A copy of DEEP-WPED-GP-015 is included in Appendix J of this document. The permittee has requested coverage under this CGP by submission of a complete and accurate General Permit Registration Form and Transmittal. Copies of these are included in Appendix A. A map showing project site indicated on the registration form, and covered under this CGP, is included in Appendix D.

1.4 CERTIFICATION REQUIREMENTS

The registrant, the design professional and the qualified professional in charge of reviewing plans are required to sign a Stormwater Pollution Control Plan certification as a condition of the CGP. These certifications are located in the complete CGP registration form in Appendix A.

Each contractor and subcontractor that will perform construction activities on the site must sign certifications confirming that they have been informed that a Stormwater Pollution Control Plan has been prepared for the project and they will be required to perform necessary actions that have been identified to comply with both the Stormwater Pollution Control Plan and the CGP. No permittee or operator shall commence work on this project site until they have familiarized themselves with this plan and signed the appropriate Stormwater Pollution Control Plan certification. It may be necessary for the contractor to implement additional erosion control and pollution prevention measures not previously identified to maintain compliance with the CGP. A copy of the Contractor's Certification form is included in Appendix B.

1.5 COASTAL CONSISTENCY REVIEW

After review of the applicable policies and standards in Connecticut's Coastal Management Act (CCMA), codified in Sections 22a-90 through 22a-112 of the Connecticut General Statutes (CGS), as amended, it has been determined that this project does not require a coastal consistency review.

1.6 ENDANGERED OR THREATENED SPECIES

The nearest Important Bird Area is the Naugatuck State Forest, located approximately 1.65 miles to the southeast of the proposed facility. Because the Naugatuck State Forest is quite far from the subject property, and because the subject property's open field is not large enough to support grassland bird species habitat, the Naugatuck State Forest Preserve IBA would not experience an adverse impact resulting from the development of the proposed facility.

There are no federally-listed threatened or endangered species, critical habitat, or National Wildlife Refuges located within the vicinity of the project. Four State-designated Species of Special Concern are known to occur on or within the vicinity of the proposed facility site. These species are the Red bat, Hoary bat, Silver- haired bat, and Eastern box turtle. All three bat species roost in trees.

In order to avoid impact to bat roosting habitat, CPV proposes the following protective measures that are equally protective of bats. The measures are listed below.

a) Tree clearing activities shall be completed between November 1 and April 30 to avoid potential impact to bat roost habitat through the removal of possible roosting trees prior to the start of the bats' active roosting season (May 1 to August 15).
b) If clearing activities are not completed by May 1st, the recommended seasonal restriction would be observed.

While it is possible that Eastern box turtles may be found at the site, the likelihood is low because they are not typically found at the project's designed elevations. Notwithstanding, CPV has been consulting with DEEP to protect turtles from construction impacts and mitigation measures to minimize potential impacts to turtles as listed below:

To limit the potential for impacts to eastern box turtles (a Connecticut species of special concern) resulting from the construction of the CPV Towantic project, the permittee shall adhere to the

following precautionary measures at any time that work is done during the turtle's active period of April 1 to November 1:

Prior to construction:
a. silt fencing shall be installed around the work area prior to construction and prior to the beginning or after the conclusion of the turtle hibernation period November 1 to April 1.
b. the area within the perimeter of the silt fence shall be canvassed daily for a period of 2 weeks for the presence of turtles and any turtles found within the bounds of the silt fence shall be relocated outside of the bounds of the silt fence.

During construction:
c. work crews shall be apprised of the species description and possible presence prior to construction.
d. work crews shall search the work area for eastern box turtles prior to the start of each construction day.
e. any eastern box turtles encountered during the work shall be moved unharmed to an area immediately outside of the fenced work area and oriented in the same direction it was walking when found.
f. all precautionary measures should be taken to avoid degradation to wetland habitats including any wet meadows and seasonal pools.
g. work conducted in these habitats during the early morning and evening hours should occur with special care not to harm basking or foraging individuals.
h. no heavy machinery or vehicles shall be parked in any turtle habitat and precautions shall be taken when the machinery is traveling to the work area to avoid turtles.
i. all silt fencing shall be removed after work is completed when soils are stable so that reptile and amphibian movement between uplands and wetlands is not restricted.

The existence and/or mitigation for endangered or threatened species are discussed in more detail within the comprehensive assessment of potential environmental impacts associated with the CPV Towantic Energy Center. This assessment has been prepared by All-Points Technology Corporation on behalf of CPV Towantic, LLC.

1.7 SOILS, SLOPES, DRAINAGE PATTERNS AND VEGETATION,

1.7.1 Soil Type(s)

Based upon a review of typical geologic conditions and the National Cooperative Soil Survey, the soils have been classified as (1) Woodbridge fine sandy loam, 3 to 8 percent slopes; (2) Woodbridge fine sandy loam, 2 to 15 percent slopes – extremely stony; (3) Paxton and Montauk fine sand loams, 3 to 8 percent slopes; (4) Paxton and Montauk fine sandy loams, 8 to 15 percent slopes; (5) Paxton and Montauk fine sandy loams, 15 to 25 percent slopes; and (6) Paxton and Montauk fine sandy loams, 8 to 15 percent slopes – very stony.

1.7.2 Slopes

The project site consists of varying slope conditions ranging from relatively flat conditions in the southern central portion of the property to steep slopes along the western and southern property boundary.

1.7.3 Drainage Patterns

Existing site topography shows that there is a drainage divide through the center of the property that causes runoff to flow, typically via overland sheet flow, either to the east or west. Runoff that flows to the east flows into a drainage ditch on the Algonquin Gas Transmission Facility property (Lot 9 of the Woodruff Hill Industrial Park Subdivision) eventually to an unnamed watercourse that flows to Towantic Pond.

Runoff that flows to the west either flows to existing wetlands areas north of Woodruff Hill Road or into the Woodruff Hill road storm drainage system eventually all of the runoff to the west flows into the upper reaches of Jacks Brook.

1.7.4 Vegetation

The site consists of a complex of mature, even-aged, hardwood forests and open fields with wetlands inclusions. The surrounding land-use consists of primarily undeveloped industrial parcels that currently include large tracts of mature forest.

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1.8 SITE FEATURES AND SENSITIVE AREAS TO BE PROTECTED

1.8.1 Receiving Waters and TMDL Applicability

There are currently zero impaired waterways on the most current 303(d) listing of impaired waterways within the vicinity of the project site.

1.8.2 Wetlands

Within the property boundary four wetland areas have been identified and delineated consisting of several scrub/shrub, wet meadow and seep systems and a small isolated, forested man-made wetlands depression. Each wetlands area is described in more detail in the Wetlands Investigation Report prepared by All-Points Technology Corporation dated August 22, 2014.

1.9 FINAL STABILIZATION AND TERMINATION OF COVERAGE

At the completion of a construction project registered pursuant to Section 4 of the general permit, a Notice of Termination must be filed with the commissioner. The project shall be considered complete after the site has been stabilized for at least three months following the cessation of construction activities. The site is not considered stabilized until there is no active erosion or sedimentation present and no disturbed areas remain exposed for all phases.

The termination notice shall be filed on forms prescribed and provided by the commissioner and shall include the following:
(1) The permit number as provided to the permittee on the permit certificate;
(2) The name of the registrant as reported on the general permit registration form DEP- PED-REG-015;
(3) The address of the completed construction site;
(4) The dates when:

a) All storm drainage structures were cleaned of construction debris pursuant to "Other Controls" section (subsection 5 (b)(2)(d)) of the general permit,

b) The post construction inspection was conducted pursuant to subsection 6 (a)(1); and

c) The date of completion of construction, and;
d) The date of the final stabilization inspection pursuant to subsection 6(a)(2)

(5) A description of the post-construction activities at the site; and;
(6) Signature of the permittee and the post-construction inspection pursuant to subsection 6(a)(1).

The termination form should be filed with the commissioner at the following address:

Central Permits Processing Unit
Bureau of Materials Management & Compliance Assurance
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

1.10 RETENTION OF RECORDS

The Stormwater Pollution Control Plan document will be maintained by the contractor in the appropriate construction office or location from the date the construction is initiated until the project is concluded.

Records will be maintained for at least five years from the date that construction is complete. The permittee shall retain copies of the Stormwater Pollution Control Plan and all reports required by the CGP, and records of all data used to complete the registration for the CGP, unless the Commissioner specifies another time period in writing. Inspection records must be retained as part of the Stormwater Pollution Control Plan for a period of five years after the date of inspection.

Section 2.0

CONSTRUCTION ACTIVITIES

2.0 CONSTRUCTION ACTIVITIES

2.1 DESCRIPTION OF CONSTRUCTION ACTIVITY

Prior to construction, CPV Towantic, LLC will complete all pre-construction planning activities. CPV Towantic will continue to consult with municipalities, state agencies and federal agencies, as applicable, and will conduct site surveys to determine construction methodologies and procedures to minimize adverse effects to the environment and public.

Construction will typically consist of activities such as:

- Surveys to stake access roads and structural locations
- Wetland delineation
- Geotechnical investigations
- Establishment of construction staging area
- Installation of sediment and erosion control devices
- Excavation and installation of access roads
- Excavation and installation of lay-down and equipment assembly areas
- Excavation and installation of foundations and erection of new structures
- Restoration of site, including re-establishment of vegetative areas

2.2 CONSTRUCTION SITE ESTIMATES

The following are estimates of the construction site:

Area to be disturbed: 22.3 acres
Total Project area: 26.5 acres
Percentage impervious area before construction: .05%
Runoff coefficient before construction: 71
Percentage impervious area after construction: 14.9 %
Runoff coefficient after construction: 79
Summary of peak flows: See 2.3.3

2.3 PROPOSED STORMWATER MANAGEMENT PRACTICES

2.3.1 Stormwater Treatment Practices

In addition to mitigating post development stormwater flow rates another goal of the storm drainage system design is to ensure that long-term post-development stormwater quality is protected. This is being accomplished through the creation of two stormwater renovation areas, grass-lined water quality swales and pervious surface treatments.

Both of the storm water renovation areas are designed as stormwater wetlands to hold and renovate the Water Quality Volume (WQV) while attenuating peak rates of stormwater runoff. The WQV is the initial flush of stormwater that contains most of the sediment and pollutants as defined in the CT DEP 2004 Stormwater Quality Manual. The WQV will be retained by a forebay, low marsh swales

and micro-pools in each renovation area. These will hold stormwater, allow it to cool and be exposed to vegetation for filtration & treatment. This design allows for the maximum water quality treatment of post development stormwater runoff. More specifically the renovation areas have been designed as Extended Detention Shallow Wetlands systems.

The Water Quality Volume calculations are included in Appendix L. For stormwater renovation area A we are providing 169% of the required WQV and for stormwater renovation area B we are providing 151% of the required WQV. These are both well in excess of the requirement providing for superior stormwater treatment.

Where the topography of the site allowed, grass lined water quality swales have been designed. These swales will provide for filtration of stormwater coming off of the proposed access drive prior to discharge into the existing storm drainage system south of the property. It should also be noted that the storm drainage system south of the property contains existing stormwater facilities that will further treat and renovate the stormwater prior to the eventual discharge into the wetlands at the bottom of Woodruff Hill Road.

In the interior of the proposed plant access drive where the equipment pad areas are set, in the switchyard area and in the condenser area to the north of stormwater renovation area A, a 12" thick layer of pervious crushed stone will be installed. Stormwater that falls in these areas will be held and will not runoff immediately into the storm drainage system. The water will either infiltrate in smaller storm events or will slowly work its way through the stone towards one of the proposed catch basin inlets for the storm drainage system in larger events. This pervious surface treatment encompasses approximately 9.5 acres of the 11.7 acre level power plant area (81.2%).

2.3.2 Flood Control and Peak Runoff Attenuation Management Practices

The primary method of predicting the surface water runoff rates utilized in this report is the computer program HydroCAD V10 Stormwater Modeling System. HydroCAD combines the methodology of technical release No. 55 (TR-55) "Urban Hydrology for Small Watersheds" and technical release No. 20 (TR-20) "Project Formulation-Hydrology". Both TR-55 & TR-20 were originally developed by the USDA Soil Conservation Service (SCS). The HydroCAD program forecasts the rate of surface water runoff based upon several factors, including information on land use, vegetation, watershed areas, soil types, time of concentration, rainfall data, storage volumes and hydraulic capacities of structures. The program predicts the amount of runoff as a function of time. Rainfall events with recurrence frequencies of 2, 10, 25, 50 and 100 years were utilized as input data. The National Weather Service developed 4 types of storm events to simulate rainfall around the country. The Type III rainfall pattern with 24-hour duration is appropriate for use in Connecticut and was utilized in this analysis.

Existing land use for the site was determined from aerial mapping, field survey and USGS Mapping. The types of land use utilized in the analysis include wood, grass, meadow and impervious cover. Soil types in the watershed were determined from the NRCS Web Soil Survey prepared by the

United States Department of Agriculture. The existing watershed was found to contain only type C soils, along with impervious areas. The HydroCAD routing analysis was also completed under the proposed conditions in order to compare pre-development and post-development flows for all the proposed design storms, which are listed below in Section 2.3.3.

The proposed storm drainage piping and swale system were designed using the rational method with adequate capacity to convey the 25-year storm event (Appendix D). The overall watershed was subdivided into sub-basins to determine the drainage area and stormwater runoff to each catch basin, pipe and swale. Inlet control capacity as well as the velocity were also analyzed at each structure.

The pre and post development stormwater runoff was analyzed at seven key points down gradient of the site (DP-1, DP-2A, DP-2B, DP-3, DP-4, DP-5 and DP-6). The storm drainage system is designed so that post development stormwater flows will either remain the same or be decreased at all of the design points. In addition to protecting long-term water quality, the two proposed stormwater renovation areas provide storage and peak flow rate attenuation in excess of the 100-year design storm. Appropriate outlet protection has also been designed at all points where the storm drainage system discharges.

2.3.3 Pre- and Post Development Stormwater Flows

	Area (Acres)	Runoff Curve Number (CN)
Existing Drainage Area 1 -	19.53	72
Proposed Drainage Area 1D -	8.29	77
Proposed Drainage Area 1ND -	9.88	76
Existing Drainage Area 2A-	2.69	72
Proposed Drainage Area 2A -	2.38	72
Existing Drainage Area 2B-	4.21	70
Proposed Drainage Area 2B -	1.95	72
Existing Drainage Area 3 -	4.98	73
Proposed Drainage Area 3D -	9.36	83
Proposed Drainage Area 3ND -	0.50	92
Existing Drainage Area 4 -	0.89	74
Proposed Drainage Area 4 -	0.22	79
Existing Drainage Area 5 -	1.76	77
Proposed Drainage Area 5 -	1.41	79
Existing Drainage Area 6 -	1.43	75
Proposed Drainage Area 6 -	1.15	79

Storm Interval (DP-1)

	2yr.	**10yr.**	**25yr.**	**50yr.**	**100yr**
Existing Flow (cfs)	8.2	19.3	23.6	28.8	34.9
Proposed Flow (cfs)	7.2	17.4	21.7	26.8	32.7

Storm Interval (DP-2A)

	2yr.	**10yr.**	**25yr.**	**50yr.**	**100yr**
Existing Flow (cfs)	1.7	4.0	4.8	5.9	7.2
Proposed Flow (cfs)	1.6	3.8	4.6	5.6	6.8

Storm Interval (DP-2B)

	2yr.	**10yr.**	**25yr.**	**50yr.**	**100yr**
Existing Flow (cfs)	1.8	4.5	5.5	6.8.	8.3
Proposed Flow (cfs)	1.5	3.5	4.3	5.3	6.4

Storm Interval (DP-3)

	2yr.	**10yr.**	**25yr.**	**50yr.**	**100yr**
Existing Flow (cfs)	3.0	7.0	8.5	10.3	12.4
Proposed Flow (cfs)	2.0	3.6	4.1	4.6	6.9

Storm Interval (DP-4)

	2yr.	**10yr.**	**25yr.**	**50yr.**	**100yr**
Existing Flow (cfs)	0.9	1.9	2.4	2.8	3.4
Proposed Flow (cfs)	0.4	0.7	0.9	1.0	1.2

Storm Interval (DP-5)

	2yr.	**10yr.**	**25yr.**	**50yr.**	**100yr**
Existing Flow (cfs)	2.2	4.6	5.4	6.5	7.7
Proposed Flow (cfs)	2.3	4.6	5.4	6.4	7.6

Storm Interval (DP-6)

	2yr.	**10yr.**	**25yr.**	**50yr.**	**100yr**
Existing Flow (cfs)	1.7	3.7	4.5	5.4	6.5
Proposed Flow (cfs)	1.9	3.7	4.4	5.3	6.2

Section 3.0

BEST MANAGEMENT PRACTICES

3.0 BEST MANAGEMENT PRACTICES

Soil erosion and sediment controls are measures that are used to reduce the amount of soil particles that are carried from a land area and deposited in receiving waters. This section provides a general description of the most appropriate control measures proposed for the Project. The permittee's construction contractor(s) and their subcontractors will be responsible for amending the erosion and sediment controls in the SPCP for their portion(s) of the project. Based on field conditions at the time of construction, the contractors or subcontractors may adjust the locations and types of BMPs so that erosion and sedimentation are controlled to the maximum extent practicable. However, in no case will modifications to the SPCP result in any less stringent erosion and sedimentation control measures than specified herein.

Any revision to the SPCP will be recorded on the Record of Revisions form. The application of the techniques in the field will be determined by the professional judgment of the permittee's field construction personnel and will depend on site-specific conditions. All applicable soil erosion and sediment control measures will be implemented in accordance with this SPCP and the Permit prior to commencement of field construction activities. Measures will be maintained during and after the construction activity, until final stabilization of the soil is accomplished. Upon final stabilization of disturbed areas, all temporary soil erosion and sediment control measures will be removed.

3.1 STRUCTURAL CONTROL PRACTICES

Structural control practices divert flows from exposed soils, store water flow, or otherwise limit runoff from exposed areas of the site. Such practices may include silt fences, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, rock outlet protection (rip-rap), reinforced soil retaining systems, and temporary or permanent sediment basins. Some of these practices may be used as both temporary and permanent control measures. Structural control practices should be placed in upland areas to the degree practicable to prevent erosion and reduce sedimentation in lower elevation areas.

3.2 TEMPORARY EROSION CONTROL PRACTICES

Erosion and sediment control measures will be in place prior to the initiation of soil disturbing activities and will be maintained throughout construction. The contractor may need erosion control measures in other locations of the project as work progresses to keep sediment from leaving the construction site. These measures will be determined by the contractor in the field; if measures are changed in the field, the SPCP must be modified accordingly. All temporary erosion controls will be removed after the protected area is finally stabilized. The minimum temporary erosion and sediment control practices that will be used for the Project are discussed in the following sections.

3.2.1 Sediment Fence (GSF)

Will retain sediment from small disturbed areas. Sediment fence will be placed along slopes as shown on construction details. The contractor will use his best judgment to install additional sediment fence as necessary to prevent loss of sediment. Refer to section 5-11 of 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

Maintenance: Inspect the silt fence at least once a week and within 24 hours of the end of a storm that generates a discharge to determine maintenance needs. When used for dewatering operations, inspect frequently before, during and after pumping operations. Remove the sediment deposits, or if room allows, install a second silt fence up slope from the existing fence when deposits reach approximately one half the height of the existing fence. Replace or repair within 24 hours of an observed failure. Refer to Connecticut Guidelines for Soil Erosion and Sediment Control figure GF-5 for troubleshooting failures. Maintain silt fence until the contributing area is stabilized.

3.2.2 Hay Bale Barrier (HB)

Will retain sediment from small disturbed areas. Hay bales will be placed along slopes as shown on construction details. Hay bale filters shall also be placed around catch basin inlets to prevent siltation of storm drainage system during construction. The contractor will use his best judgment to install additional hay bales as necessary to prevent loss of sediment. Refer to section 5-11 of 2002 Connecticut Guidelines for Soil and Sediment Control. Additionally, staked straw wattles/compost filter socks may be used as sediment barriers in appropriate locations on site.

Maintenance: Inspect the hay bale barrier at least once a week and within 24 hours of the end of a storm that generates a discharge to determine maintenance needs. When used for dewatering operations, inspect frequently before, during and after pumping operations. Remove the sediment deposits, or if room allows, install a secondary barrier up slope from the existing barrier when deposits reach approximately one half the height of the barrier. Replace or repair within 24 hours of an observed failure. Refer to Connecticut Guidelines for Soil Erosion and Sediment Control figure HB-5 for troubleshooting failures. Maintain hay bale barrier until the contributing area is stabilized.

3.2.3 Stone Check Dam (SCD)

Will be used to reduce velocity of concentrated flows, thus reducing of the drainage way.

Maintenance: Inspect the stone check dam at least once a week and a within 24 hours of the end of a storm that generates a discharge to determine maintenance needs. Remove the sediment deposits when deposits reach approximately one half the height of the check dam. Replace or repair within 24 hours of an observed failure. Maintain until the contributing area is stabilized.

3.2.4 Temporary Fill Berm (TFB)

Will be used to divert runoff from unprotected fill slopes during construction to a stabilized outlet or sediment trapping facility.

Maintenance: Inspect the temporary fill berm and associated controls at the end of each work day to ensure the criteria for installing the measures have been met. Determine if repair or modification is needed. This measure is temporary and under most situations will be covered the next work day. Maintenance requirements should be minimal. The contractor should avoid placing other material over the berm and construction traffic should not be allowed to cross.

3.2.5 Temporary Diversion (TD)

Will be used to divert sediment laden runoff from a disturbed area to a sediment trapping facility.

Maintenance: When the temporary diversion is located within close proximity to ongoing construction activities, inspect the diversion at the end of each work day and immediately repair damage caused by construction equipment. Otherwise, inspect the temporary diversion and associated measures at least once a week and within 24 hours of the end of a storm that generates a discharge to determine maintenance needs. Repair within 24 hours of an observed failure.

3.2.6 Temporary Soil Stockpile Areas (ST)

Will be used to store natural topsoil for re-establishing stable ground cover upon construction completion.

Maintenance: Stockpile topsoil in such a manner that natural site drainage is not obstructed. Locate stockpiles to maximize distance from wetlands and /or watercourses. The side slopes of all stockpiles shall not exceed 2:1. Install silt fence (GSF) or other sediment barrier down slope to trap sediments. If stockpile is to remain for a period of 30 days or longer it shall be stabilized with temporary soil protection and seeding measures. See CT Guidelines for Soil Erosion and Sediment Control Page 5-2-3 for more information.

3.2.7 Temporary Sediment Trap (TST)

Will be used to detain sediment laden runoff from small disturbed areas long enough to allow the majority of sediment to settle out.

Maintenance: Inspect the temporary sediment trap and associated controls at least once a week and within 24 hours of the end of a storm that generates a discharge to determine maintenance needs. Check the outlet to verify that it is structurally sound and has not been damaged by erosion or construction equipment. The height of the stone outlet should be maintained at least 1 foot below the crest of the embankment. When sediment has accumulated more than one quarter of the minimum wet storage volume, dewater and remove sediment as necessary to restore the trap to its original dimensions.

3.2.8 Construction Entrance (CE)

Will be used to reduce tracking of sediment off site to paved areas.

Maintenance: Maintain the entrance in a condition which will prevent tracking and washing of sediment onto paved surfaces. Provide periodic top dressing with additional stone or additional length as required. Immediately remove all sediment spilled, dropped, washed or tracked onto paved surfaces.

3.2.9 Tree Protection (TP)

Will be used to ensure the survival of existing desirable trees for their effectiveness in soil erosion and sediment control during construction.

Maintenance: Inspect tree protection zones weekly during site construction for damage to the tree

crown, trunk and root system. When trees have been damaged or the protection zone has been compromised, consult an arborist licensed in CT to determine how damage should be addressed.

3.2.10 Temporary Erosion Control Blankets (ECB)

Will be used to provide temporary surface protection to disturbed soils to absorb raindrop impact and to reduce sheet and rill erosion.

Maintenance: Inspect temporary erosion control blankets at least once a week and within 24 hours of the end of a storm that generates a discharge to determine maintenance needs. Repair any dislodged or failed blankets immediately.

3.2.11 Silt Sacks (SS)

Will be used to provide filtration of sediment prior to entering into the storm drainage catch basins and piping system during construction.

Maintenance: Inspect each silt sack every 2-3 weeks and within 24 hours of the end of a storm that generates a discharge to determine maintenance needs. When the restraint cord is no longer visible the silt sack is full and needs to be emptied.

3.3 SOIL STABILIZATION PRACTICES

Soil stabilization involves covering disturbed soils with grass, mulch, straw, geotextiles, trees, vines, or shrubs. Stabilization practices for exposed disturbed soils are extremely important while conducting construction activities. Vegetative cover serves to reduce the erosion potential by absorbing the energy of raindrops, promoting infiltration in lieu of runoff, and reducing the velocity of runoff. Stabilization measures shall be initiated as soon as practicable, but no more than 14 days after construction activities have temporarily or permanently ceased on any portion of the site.

3.4 MAINTENANCE, INSPECTIONS AND MONITORING

All erosion and sediment control devices shall be installed pursuant to the specifications in the construction details. They will be maintained so that they remain effective at all times.

Erosion and sediment control devices will be inspected by qualified personnel at least once every seven calendar days and within 24 hours of the end of a storm that generates a discharge. During each inspection, the construction inspector will complete the Inspection and Maintenance Report Form located in the appendix. This form will be copied and used as necessary. Ineffective temporary erosion control measures will be repaired or replaced before the next storm event or as soon as practicable. The permittee will immediately install additional temporary erosion control devices in any area deemed in need of protection.

In addition to regular erosion control inspections cited above the qualified personnel but monitor stormwater runoff for turbidity during the construction process. The monitoring requirements are as follows:

- Turbidity monitoring is required at least once a month at all outfalls until site is finally stabilized. (Sample Method consistent with 40 CFR Part 136).
- Samples shall be taken at least three times during a storm event at each outfall (multiple adjacent, similar outfalls can be combined to sample just one, representative outfall). Average the three results to determine turbidity value.
- Results of Stormwater Monitoring must be submitted to DEEP within 30 days of the end of each month using the appropriate SMR Form and submitted electronically using DEEPs' NetDMR web tool.

Following temporary or final stabilization, inspections must be conducted at least once a month for three months. If construction has been halted due to frozen conditions, regular inspections are not mandatory until one month before the expected thaw. If vegetation establishment is not satisfactory, special steps to correct the problem will be implemented such as over seeding, mulching, sodding, or the use of erosion control blankets. Once a definable area of the construction site has been finally stabilized, no further inspection requirements apply to that area.

3.5 FINAL STABILIZATION

3.5.1 Seeding

The contractor will be responsible for labor, materials, tools, equipment, and other related items required for preparing ground, providing for sowing of seeds, fertilizing, mulching and top dressing, and other management practices required for erosion control and to achieve final stabilization. It will be the contractor's responsibility to make sure that the soil seedbed is not blown, washed, or otherwise removed from the site. The contractor will make repairs (including replacement of lost topsoil and mulch) to the seedbed preparation site in the event of heavy rain, wind, or other natural events that cause damage. When practicable, native plant species should be used for landscaping.

3.5.2 Fertilizer

Soil in areas of disturbance may need supplementation from fertilizer. Soil tests may be necessary to determine the most appropriate fertilizer for each location. Once applied, the fertilizer will be worked into the soil to limit exposure to stormwater. Fertilizer spills will be cleaned up immediately and will not be applied along or in a waterway.

3.5.3 Mulching

Mulching will be used in conjunction with both temporary and permanent seeding practices to enhance success by providing erosion protection prior to the onset of vegetative growth. Mulches enhance plant establishment by moderating soil temperatures and conserving moisture. After seeding, straw or hay mulch will be applied at a rate of two to three tons per acre on the disturbed areas. Other forms of mulch will be applied at a rate designated by the Project Engineer. Mulch will not be applied in wetlands, on lawns, and areas where hydro-mulch is used. Mulch will be anchored immediately after placement on steep slopes and stream banks. Mulch will be held in place by a very thin covering of topsoil, small brush, pins, stakes, wire mesh, asphalt binder, or other adhesive material approved by the project engineer.

3.5.4 Topsoiling

Topsoil should be applied in areas where the subsoil or existing surface soil does not provide an adequate growth medium for the desired vegetation, where soil is too shallow to provide adequate rooting depth, or where the soil contains substances toxic to the desired vegetation. Topsoil shall be reasonably free from subsoil and stumps, roots, brush, stones, and clay lumps or similar objects.

3.5.5 Temporary Control Removal

Temporary erosion controls will be left in place until the Project site is stabilized with a uniform vegetative cover of 70 percent density of the native background vegetative cover on all unpaved areas. Following re-vegetation, the permittee will conduct periodic site visits to make sure that vegetation establishment is satisfactory. If sufficient vegetative cover has not been achieved, additional restoration measures will be implemented. Inspection results will be documented using the Inspection and Maintenance Report Form found in the appendix. All temporary soil erosion and sediment control measures will be removed and disposed of after final site stabilization is achieved and before submitting the NOT.

Section 4.0

GOOD HOUSEKEEPING BMP'S

4.0 GOOD HOUSKEEPING BMP'S

4.1 POTENTIAL SOURCES OF POLLUTION

Potential exists for construction sediment to be contained in any runoff that occurs on the project site. This sediment is a result of clearing and grading activities.

4.2 CONTROLS TO REDUCE POLLUTION FROM THE CONSTRUCTION SITE

Minimize Disturbed Area, Protect Natural Features, and Soil:
Only areas required for construction activities will be graded. This practice will reduce sediment transport into receiving bodies.

4.2.1 Material Handling and Waste Management

The contractor will establish control measures to prevent discharge and dispose of construction and sanitary waste on site.

4.2.2 Establish Proper Building Material Staging Areas

The contractor will establish a permanent staging area within the project site for materials and equipment storage.

4.2.3 Allowable Non-Stormwater Discharge Management

Non-stormwater discharges are allowable provided the non-stormwater component of the discharge is in compliance applicable state regulation. Prior to any non storm discharge, the appropriate BMP will be installed and inspected.

4.2.4 Maintenance of Controls

All erosion and sediment control practices will be checked for stability and operation following every runoff-producing rainfall, but in no case less than once every week. Any needed repairs will be made immediately to maintain all practices as designed.

All sediment control features shall be maintained until final stabilization has been obtained. Contractor will maintain appropriate recording keepings as required by DEEP-WPED-GP-015. Maintenance records shall describe repair, replacement, and maintenance of BMPs undertaken based on the inspections and maintenance procedures described above and the individual requirements of the BMPs. Actions related to the findings of inspections should reference the specific inspection report. Records should describe actions taken, dates completed, and note the party that completed the work.

During construction the contractor will be responsible for maintaining integrity of all permanent and temporary structures. Prior to submittal of NOT, the contractor and owner will inspect permanent structures to remain in place and correct all noted deficiencies. Upon acceptance from contractor, the owner will maintain responsibility for inspection of the structure semi-annually.

Section 5.0

HAZARDOUS SUBSTANCE OR OIL SPILL REPORTING

5.0 HAZARDOUS SUBSTANCE OR OIL SPILL REPORTING

The Spill Prevention Control and Countermeasure Plan (SPCC), describes measures to prevent, control, and minimize impacts from a spill of a hazardous, toxic, or petroleum substance during construction of the proposed project. This plan identifies the potentially hazardous materials to be used during this project, describes the transport, storage, and disposal procedures for these substances, and outlines the procedures to be followed in the event of a spill of a contaminating or toxic substance.

As per 40 CFR 112, a Spill Prevention Control and Countermeasures Plan (SPCC) must be prepared if the construction site will have 1,320 gallons of above ground storage capacity (or 42,000 gallons in underground storage not regulated by UST rules) or more in 55-gallon-sized (or larger) containers. This would include any temporary tanks or fueling trucks used to "store" petroleum on-site. The truck would be subject to the SPCC Plan rules when parked on the construction site and used for "storage." If, at any time, a subcontractor's cumulative above ground storage capacity on-site exceeds 1,320 gallons, the subcontractor shall maintain a certified SPCC Plan (40 CFR 112).

5.1 MATERIAL MANAGEMENT PRACTICES

Properly managing materials on the construction site will greatly reduce the potential for stormwater pollution of materials. Good housekeeping, along with proper use and storage of construction materials, form the basis for proper management of potentially hazardous materials.

5.2 NON-PETROLEUM PRODUCTS

Due to the chemical makeup of specific products, certain handling and storage procedures are required to promote the safety of handlers and prevent the possibility of pollution. Care shall be taken to follow all directions and warnings for products used on the site. All pertinent information can be found on the MSDS for each product. The MSDS will be kept on-site.

5.3 PETROLEUM PRODUCTS

On-site vehicles will be monitored for leaks and receive regular maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers that are clearly labeled. Preferably, the containers will be stored in a covered truck or trailer that provides secondary containment for the products. Bulk storage tanks having a capacity of greater than 55 gallons will be provided with secondary containment. Containment can be provided by a temporary earthen berm or other means. After each rainfall event, the contractor shall inspect the contents of the secondary containment area for excess water. If no sheen is visible, the collected water can be pumped to the ground in a manner that does not cause scouring. If any sheen is present, it must be treated prior to discharging the water. Otherwise, the contaminated water must be transported and disposed off-site in accordance with local, state, and federal requirements. Bulk fuel or lubricating oil dispensers shall not have a self-locking mechanism that allows for unsupervised fueling. Fueling operations shall be observed to immediately detect and contain spills. No waste oil or other petroleum-based products will be disposed of on-site (e.g., buried, poured, etc.), but shall be taken off-site for proper disposal.

5.4 SPILL CONTROL AND CLEAN UP

In addition to the material management practices discussed previously, the following spill control and cleanup practices will be adhered to prevent stormwater pollution in the event of a spill:

- Personnel on-site will be made aware of cleanup procedures and the location of spill cleanup.
- Equipment spills will be contained and cleaned up immediately after discovery.
- Manufacturer methods for spill cleanup of a material will be followed as described on the material's MSDS.
- Materials and equipment needed for cleanup procedures will be kept readily available on the site, either at an equipment storage area or on contractor's trucks; equipment to be kept on the site will include, but not be limited to, brooms, dust pans, shovels, granular absorbents, sand, saw dust, absorbent pads and booms, plastic and metal trash containers, gloves, and goggles.
- Toxic, hazardous or petroleum product spills required to be reported by regulation will be documented to the appropriate federal, state, and local agencies.
- Spills will be documented and a record of the spills will be kept with this Stormwater Pollution Control Plan.

The federal reportable spill quantity for petroleum products is defined in 40 CFR 110 as any oil spill that:

- violates applicable water quality standards;
- causes a film or sheen upon or discoloration of the water surface or adjoining shoreline; or
- causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

Section 6.0

SWPPP APPENDICES

6.0 SWPPP APPENDICES

Attach the following documentation to the SWPPP in the following appendices.

Appendix A – Permit Coverage

- Submitted General Permit Registration Form and Transmittal
- Other applicable permits

Appendix B – Certifications

- Contractor Certifications

Appendix C – Pre-Construction Meeting – Items to be added upon completion of meeting includes:

- Agenda
- Attendees
- Minutes

Appendix D – Maps and Drawings

- Site Location Map
- Soils Mapping and Data (NRCS)

Appendix E – Inspection and Maintenance

- Construction Activities and Control Installation Log

Appendix F – Inspection and Maintenance Records

- Inspection & Maintenance Log
- Inspection Report
- Maintenance Report

Appendix G – Hazardous Material or Oil Spill Records

- Spill Report

Appendix H – Update Records

- Plan Update Description
- Plan Update Log

Appendix I – Copy of CT DEP Notice of Termination

Appendix J – Connecticut General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities (DEEP-WPED-GP-015)

Appendix K – Site Development Drawings

Appendix L – Supporting Calculations

APPENDIX A
PERMIT COVERAGE
(CGP)

Connecticut Department of
Energy & Environmental Protection
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

General Permit Registration Form for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, effective 10/1/13 (non-electronic form)

Prior to completing this form, you **must** read the instructions for the subject general permit available at **DEEP-WPED-INST-015**.
This form must be filled out electronically before being printed.
You must submit the registration fee along with this form.

The status of your registration can be checked on the DEEP's ezFile Portal. Please note that DEEP will no longer mail certificates of registration.

CPPU USE ONLY

App #:_____

Doc #:_____

Check #:_____

Program: Stormwater

Part I: Registration Type

Select the appropriate boxes identifying the registration type and registration deadline.

Registration Type			Registration Timeline	
☒	**New Registration** (Refer to Section 2 of the permit for definitions of Locally Exempt and Locally Approvable Projects)	☐ Locally Approvable Projects ***Size of soil disturbance*:**	**New registration - Sixty (60) days prior to the initiation of the construction activity for:** Sites with a total soil disturbance area of 5 or more acres	
		☒ Locally Exempt Projects ***Size of soil disturbance*:22.3 ac.**	☐	**New registration - Sixty (60) days prior to the initiation of the construction activity for:** Sites with a total disturbance area of one (1) to twenty (20) acres except those with discharges to impaired waters or tidal wetlands
			☒	**New registration - Ninety (90) days prior to the initiation of the construction activity for:** (i) Sites with a total soil disturbance area greater than twenty (20) acres, or (ii) Sites discharging to a tidal wetland (that is not fresh-tidal and is located within 500 feet), or (iii) Sites discharging to an impaired water listed in the "Impaired Waters Table for Construction Stormwater Discharges"

Part II: Fee Information

1. New Registrations
   a. Locally approvable projects (registration only):
      ☐ $625 [#1855]
   b. Locally exempt projects (registration and Plan):
      ☐ $3,000 total soil disturbance area ≥ one (1) and < twenty (20) acres. [#1856]
      ☒ $4,000 total soil disturbance ≥ twenty (20) acres and < fifty (50) acres. [#1857]
      ☐ $5,000 total soil disturbance ≥ fifty (50) acres. [#1858]

The fees for municipalities shall be half of those indicated in subsections 1.a., 1.b., and 2 above pursuant to section 22a-6(b) of the Connecticut General Statutes. State and Federal agencies shall pay the full fees specified in this subsection. The registration will not be processed without the fee. The fee shall be non-refundable and shall be paid by certified check or money order payable to the Department of Energy and Environmental Protection.

Part III: Registrant Information

- If a registrant is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of the State. If applicable, the registrant's name shall be stated **exactly** as it is registered with the Secretary of the State. This information can be accessed at **CONCORD.**
- If a registrant is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).

1. Registrant /Client Name: CPV Towantic, LLC

   Business Entity ⬇

   Secretary of the State business ID #:

   Mailing Address: 50 Braintree Hill Office Park Suite 300

   City/Town: Braintree State: MA Zip Code: 02184

   Business Phone: 781-848-3611 ext.:

   Example:(xxx) xxx-xxxx

   Contact Person: Andrew Bazinet Title:

   E-Mail: **abazinet@cpv.com**

   Additional Phone Number (if applicable): ext.

2. List billing contact, if different than the registrant:

   Name:

   Mailing Address:

   City/Town: State: Zip Code:

   Business Phone: ext.:

   Contact Person: Title:

Part III: Registrant Information (continued)

3. List primary contact for departmental correspondence and inquiries, if different than the registrant:

Name: Curtis Jones, P.E. - Civil 1

Mailing Address: 43 Sherman Hill Road Suite D-101

City/Town: Woodbury State: CT Zip Code: 06798

Business Phone: 203-266-0778 ext.: 101

Site Phone: Emergency Phone:

Contact Person: Title:

Association (e.g. developer, general or site contractor, etc.): Civil Engineer

4. List owner of the property on which the activity will take place, if different from registrant:

Name:

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.:

Contact Person:

5. List developer, if different from registrant or primary contact:

Name:

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.:

Contact Person: Title:

6. List general contractor, if different from registrant or primary contact:

Name: To Be Determined

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.:

Site Phone: Off Hours Phone:

Contact Person: Title:

7. List any engineer(s) or other consultant(s) employed or retained to assist in preparing the registration and/or Stormwater Pollution Control Plan. ☐ Please select if additional sheets are necessary, and label and attach them to this sheet.

Name: Curtis Jones, P.E. - Civil 1

Mailing Address: 43 Sherman Hill Road Suite D-101

City/Town: Woodbury State: CT Zip Code: 06798

Business Phone: 203-266-0778 ext.: 101

Contact Person: Curtis Jones or Brian Baker Title: Project Manager

Service Provided: **Prepared Site Plans/Civil Engineering** Email:curt@civil1.com

8. List Reviewing Qualified Professional (for locally approvable projects only). This information must match the information provided in Part IX of this registration.

Name: N/A/ - Locally Exempt Contact Person:

Mailing Address: Email:

City/Town: State: Zip Code:

Business Phone: ext.:

Part IV: Site Information

1. Site Name: Woodruff Hill Road, Oxford CT
   Street Address or Description of Location: At the end of Woodruff Hill Road
   (if linear, project location should be the project begining point)
   City/Town: Oxford State: CT Zip Code: 06478
   (use only one zip code)
   Longitude: -7_3.1_2_1_9_5 Latitude: 4_1.4_8_4_4_2

   Brief Description of construction activity: Construction of 885 MW combined cycle electric generating facility with associated parking areas, driveways, and stormwater treatment areas.

   Project Start Date (must be on or after the authorization date of this registration) : 11 / 2015
   Anticipated Completion Date: 11 / 2018 *month/ yr)*
   (month/ yr)
   Normal working hours: **8** to **5**

2. MINING: Is the activity on the site in question part of mining operations (i.e. sand and gravel)? ☐ Yes ☒ No

   If yes, mining is not authorized by this general permit. You must submit the Registration Form for the General Permit for the Discharge of Stormwater Associated with Industrial Activity.

3. COMBINED OR SANITARY SEWER: Does all of the stormwater from the proposed activity discharge to a combined or sanitary sewer (i.e. a sewage treatment plant)? ☐ Yes ☒ No

   If yes, this activity is not regulated by this permit. Contact the Water Permitting & Enforcement Division at 860-424-3018.

4. INDIAN LANDS: Is or will the facility be located on federally recognized Indian lands ☐ Yes ☒ No

5. COASTAL BOUNDARY: Is the activity which is the subject of this registration located within the coastal boundary as delineated on DEEP approved coastal boundary maps ☐ Yes ☒ No

   The coastal boundaries fall within the following towns: Branford, Bridgeport, Chester, Clinton, Darien, Deep River, East Haven, East Lyme, Essex, Fairfield, Greenwich, Groton (City and Town), Old Lyme, Guilford, Hamden, Ledyard, Lyme, Madison, Milford, Montville, New London, New Haven, North Haven, Norwalk, Norwich, Old Saybrook, Orange, Preston, Shelton, Stamford, Stonington (Borough and Town), Stratford, Waterford, West Haven, Westbrook and Westport.

   If “yes”, and this registration is for a new authorization or a modification of an existing authorization where the physical footprint of the subject activity is modified, you must provide documentation the DEEP Office of Long Island Sound Programs or the local governing authority has issued a coastal site plan approval or determined the project is exempt from coastal site plan review. Provide this documentation with your registration as Attachment B. See guidance in Appendix D of the general permit. Information on the coastal boundary is available at the local town hall or at www.cteco.uconn.edu/map_catalog.asp. Additional DEEP Maps and Publications are available by contacting DEEP staff at 860-424-3555.

Part IV: Site Information (continued)

6. ENDANGERED OR THREATENED SPECIES:

In order to be eligible to register for this General Permit, each registrant must perform a self-assessment, obtain a limited one-year determination, or obtain a safe-harbor determination regarding threatened and endangered species. This may include the need to develop and implement a mitigation plan. While each alternative has different limitations, the alternatives are not mutually exclusive; a registrant may register for this General Permit using more than one alternative. See Appendix A of the General Permit. Each registrant must complete this section AND Attachment C to this Registration form and a registrant who does not or cannot do so is not eligible to register under this General Permit.

Each registrant must perform a review of the Department's Natural Diversity Database maps to determine if the site of the construction activity is located within or in proximity (within ¼ mile) to a shaded area.

a. Verify that I have completed Attachment C to this Registration Form. ☒ Yes

b. Provide the date the NDDB maps were reviewed: April 2015 Date of map should be **one** year or less than the submittal date of this application. Print a copy of the NDDB map you viewed since it must be submitted with this registration as part of Attacment C.

c. For a registrant using a limited one-year determination or safe harbor determination to register for this General Permit, provide the Department's Wildlife Divison NDDB identification number for any such determination: _____ (The number is on the determination issued by the Department's Wildlife Divison).

For more information on threatened and endangered species requirements, refer to Appendix A and Section 3(b)(2) of this General Permit, visit the DEEP website at www.ct.gov/deep/nddbrequest or call the NDDB at 860-424-3011.

7. WILD AND SCENIC RIVERS: Is the proposed project within the watershed of a designated Wild and Scenic River? (See Appendix H for guidance) ☐ Yes ☒ No

8. AQUIFER PROTECTION AREAS: Is the site located within a mapped aquifer protection area www.ct.gov/deep/aquiferprotection as defined in section 22a-354h of the CT General Statutes? (For additional guidance, please refer to Appendix C of the General Permit) ☐ Yes ☒ No

9. CT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL: Is the activity in accordance with CT Guidelines for Erosion and Sediment Control and local erosion & sediment control ordinances, where applicable? ☒ Yes ☐ No

10. HISTORIC AND/OR ARCHAEOLOGICAL RESOURCES:
Verify that the site of the proposed activity been reviewed (using the process outlined in Appendix G of this permit) for historic and/or archaeological resources: ☒ Yes

a. The review indicates the proposed site does not have the potential for historic/ archaeological resources, OR ☒ Yes ☐ No

b. The review indicated historic and/ or archaeological resource potential exists and the proposed activity is being or has been reviewed by the Offices of Culture and Tourism, OR ☐ Yes ☐ No

c. The proposed activity has been reviewed and authorized under an Army Corps of Engineers Section 404 wetland permit. ☐ Yes ☐ No

11. CONSERVATION OR PRESERVATION RESTRICTION:
Is the property subject to a conservation or preservation restriction? ☐ Yes ☒ No

If Yes, proof of written notice of this registration to the holder of such restriction or a letter from the holder of such restriction verifying that this registration is in compliance with the terms of the restriction, must be submitted as Attachment D.

Part V: Stormwater Discharge Information

Table 1

Outfall #	a) Type	b) Pipe Material	c) Pipe Size	d) Note: To find lat/long, go to: CT ECO. A decimal format is required here. Directions on how to use CT ECO to find lat./long. and conversions can be found in Part V, Section d of the DEEP-WPED-INST-015 .		e) What method was used to obtain your latitude/longitude information?
				Longitude	Latitude	
DP-1	pipe	concrete	24"	-73.12012	41.48278	CT ECO
DP-3	pipe	plastic	15"	-73.12375	41.48356	CT ECO
DP-4	pipe	plastic	15"	-73.12345	41.48258	CT ECO
DP-5	pipe	plastic	15"	-73.12303	41.48456	CT ECO
DP-6	swale	not applicable	not applicable	-73.12288	41.48156	CT ECO

Table 2

Outfall #	a) For temporary and permanent outfalls, provide a start date. For temporary discharges, also provide a date the discharge will cease.	b) For the drainage area associated with each outfall: Effective Impervious Area Before Construction	c) For the drainage area associated with each outfall: Effective Impervious Area After Construction	d) To what system or receiving water does your stormwater runoff discharge? either "storm sewer or wetlands" or "waterbody" (If you select "storm sewer or wetland" proceed to Part VI of the form. If you select "waterbody" proceed to next question)	e) For each outfall, does it discharge to any of the following towns: *Branford, Kent, Manchester, Meriden, North Branford, Norwalk, or Wilton?* (If no, proceed to Part VI of the form. If yes, proceed to next question.)	f) For each outfall, does it discharge to a "freshwater" or "salt water" ? (If you select "freshwater" proceed to Table 3. If you selected "salt water", proceed to Part VI of the form.)
DP-1	11/2015-mm/dd-mm/dd	49,100 sq feet	116,191 sq feet	storm sewer or wetland	☐ Yes ☒ No	freshwater
DP-3	11/2015-mm/dd-mm/dd	16,490 sq feet	163,632 sq feet	storm sewer or wetland	☐ Yes ☒ No	freshwater
DP-4	11/2015-mm/dd-mm/dd	1,995 sq feet	1,995 sq feet	storm sewer or wetland	☐ Yes ☒ No	freshwater
DP-5	11/2015-mm/dd-mm/dd	9,035 sq feet	13,827 sq feet	storm sewer or wetland	☐ Yes ☒ No	freshwater
DP-6	11/2015-mm/dd-mm/dd	1,794 sq feet	9,613 sq feet	storm sewer or wetland	☐ Yes ☒ No	freshwater
		78,414 total sq feet	**305,258 total sq feet**			

Part V: Stormwater Discharge Information (continued)

Table 3 Provide the following information about the receiving water(s)/wetland(s) that receive stormwater runoff from your site:			
Outfall #	a) What is your 305b ID # (water body ID #)? (Section 3.b, of the DEEP-WPED-INST-015, explains how to find this information)	b) Is your receiving water identified as a impaired water in the "Impaired Waters Table for Construction Stormwater Discharges"? If yes, proceed to next question. If no, proceed to Part VI: Pollution Control Plan.	c) Has any Total Maximum Daily Load (TMDL) been approved for the impaired water?
		☐ Y ☐ N	☐ Y ☐ N
		☐ Y ☐ N	☐ Y ☐ N
		☐ Y ☐ N	☐ Y ☐ N
		☐ Y ☐ N	☐ Y ☐ N
		☐ Y ☐ N	☐ Y ☐ N

Part V: Stormwater Discharge Information (continued)

Impaired waters: If you answered "yes" to Table 3, question b.,**verify** that the project's Pollution Control Plan (Plan) addresses the control measures below in Question 1 or 2, as appropriate.

1. If the impaired water does not have a TMDL, confirm compliance by selecting 1.a. or 1.b. below:

a. No more than 3 acres is disturbed at any time; ☐ Yes

OR

b. Stormwater runoff from a 2 yr, 24 rain event is **retained.** ☐ Yes

2. If the impaired water has a TMDL, confirm compliance by selecting 2.a. and 2.b. below and either question 2.c.1. or 2.c.2. below:

a. The Plan documents there is sufficient remaining Waste Load Allocations (WLA)in the TMDL for the proposed discharge, ☐ Yes

AND

b. Control measures shall be implemented to assure the WLA will not be exceeded, ☐ Yes

AND

c. 1. Stormwater discharges will be monitored for the indicator pollutant identified in theTMDL, ☐ Yes

OR

2. The Plan documents specific requirements for stormwater discharges specified in the TMDL. ☐ Yes

Part VI: Pollution Control Plan (select one of the following three categories)

☒ I am registering a Locally Exempt project and submitting the required electronic Plan (in Adobe™ PDF or similar publically available format) pursuant to Section 3(*c*)(2)(E) of this permit. (If you do not have the capability to submit the Plan electronically please call 860-418-5982).

☒ Plan is attached to this registration form

☐ Plan is available at the following Internet Address (URL):

☐ I am registering a Locally Approvable project and have chosen not to submit the Plan with this registration pursuant to Section 3(*c*)(1) of this permit.

☐ I am registering a Locally Approvable project and have chosen to make my Plan electronically available pursuant to Section 4(*c*)(2)(N) of this permit.

☐ Plan is attached to this registration form

☐ Plan is available at the following Internet Address (URL):

Part VII: Registrant Certification

The registrant *and* the individual(s) responsible for actually preparing the registration must sign this part. A registration will be considered incomplete unless all required signatures are provided.

For New Registrants:

" I hereby certify that I am making this certification in connection with a registration under such general permit,

[INSERT NAME OF REGISTRANT BELOW]

submitted to the commissioner by CPV Towantic, LLC for

[INSERT ADDRESS OF PROJECT OR ACTIVITY BELOW]

an activity located at Woodruff Hill Road, Oxford, CT and that all terms and conditions of the general permit are being met for all discharges which have been initiated and such activity is eligible for authorization under such permit. I further certify that a system is in place to ensure that all terms and conditions of this general permit will continue to be met for all discharges authorized by this general permit at the site. I certify that the registration filed pursuant to this general permit is on complete and accurate forms as prescribed by the commissioner without alteration of their text. I certify that I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*) (8)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I certify that I have made an affirmative determination in accordance with Section 3(*b*)(8)(B) of this general permit. I understand that the registration filed in connection with such general permit is submitted in accordance with and shall comply with the requirements of Section 22a-430b of Connecticut General Statutes. I also understand that knowingly making any false statement made in the submitted information and in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under Section 53a-157b of the Connecticut General Statutes and any other applicable law."

For Re-registrants:

" I hereby certify that I am making this certification in connection with a registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, submitted to the commissioner

[INSERT NAME OF REGISTRANT BELOW]

by for an activity located at

[INSERT ADDRESS OF PROJECT OR ACTIVITY BELOW]

and that all terms and conditions of the general permit are being met for all discharges which have been initiated and such activity is eligible for authorization under such permit. I further certify that all designs and plans for such activity meet the current terms and conditions of the general permit in accordance with Section 5(b)(5)(C) of such general permit and that a system is in place to ensure that all terms and conditions of this general permit will continue to be met for all discharges authorized by this general permit at the site. I certify that the registration filed pursuant to this general permit is on complete and accurate forms as prescribed by the commissioner without alteration of their text. I certify that I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*)(8)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I also understand that knowingly making any false statement made in the submitted information and in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under Section 53a-157b of the Connecticut General Statutes and any other applicable law."

Signature of Registrant (Must be an original signature, not a copy or fax)	**Date**
CPV Towantic - Andrew Bazinet	Representative
Name of Registrant (print or type)	**Title** (if applicable)
Signature of Preparer (if different than above) (Must be an original signature, not a copy or fax)	**Date** July 6, 2015
Civil 1, Inc. - Curtis Jones, P.E.	President
Name of Preparer (print or type)	**Title** (if applicable)

Part VIII: Professional Engineer (or Landscape Architect, where appropriate) Design Certification (for publically approvable and exempt projects)

The following certification must be signed by a Professional Engineer or Landscape Architect where appropriate.

"I hereby certify that I am a professional engineer licensed in the State of Connecticut. I am making this certification in connection with a registration under such general permit, submitted to the commissioner by

[INSERT NAME OF REGISTRANT BELOW]

CPV Towantic, LLC for an activity located at

[INSERT ADDRESS OF PROJECT OR ACTIVITY BELOW]

Woodruff Hill Road, Oxford, CT

I certify that I have thoroughly and completely reviewed the Stormwater Pollution Control Plan for the project or activity covered by this certification. I further certify, based on such review and on the standard of care for such projects, that the Stormwater Pollution Control Plan has been prepared in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, the Stormwater Quality Manual, as amended, and the conditions of the general permit, and that the controls required for such Plan are appropriate for the site. I further certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate, and complete to the best of my knowledge and belief. I also understand that knowingly making any false statement in this certification may subject me to sanction by the Department and/or be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

Signature of Design Professional (Must be an original signature, not a copy or fax)	**Date**
Civil 1, Inc. - Curtis Jones, P.E.	July 6, 2015
Name of Professional (print or type)	**Title**
43 Sherman Hill Road Suite D-101	President
Mailing Address	**City/Town**
CT 06798	Woodbury
State **Zip Code**	203-266-0778 X 101
	Business Phone
STATE OF CONNECTICUT ★ CURTIS C. JONES ★ No. 17206 LICENSED PROFESSIONAL ENGINEER	17206
	License # 17206
Affix P.E/L.A Stamp Here	

Part IX: Reviewing Qualified Professional Certification

The following certification must be signed by a) a Conservation District reviewer OR, b) a qualified soil erosion and sediment control and/or professional engineer

☐ **Review certification by Conservation District:**

1.) District: list of districts

Date of Affirmative Determination:

" I am making this certification in connection with a registration under General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, submitted to the commissioner

[INSERT NAME OF REGISTRANT BELOW]

by _____ for an activity located at

[INSERT ADDRESS OF PROJECT OR ACTIVITY BELOW]

_____.

I have personally examined and am familiar with the information that provides the basis for this certification, and I affirm, based on the review described in Section 3(*b*)(11)(C) of this general permit and on the standard of care for such projects, that the Stormwater Pollution Control Plan is adequate to assure that the activity authorized under this general permit will comply with the terms and conditions of such general permit and that all stormwater management systems: (i) have been designed to control pollution to the maximum extent achievable using measures that are technologically available and economically practicable and that conform to those in the Guidelines and the Stormwater Quality Manual; (ii) will function properly as designed; (iii) are adequate to ensure compliance with the terms and conditions of this general permit; and (iv) will protect the waters of the state from pollution."

_____

Signature of District Professional and Date (Must be an original signature, not a copy or fax)

_____

Name of District Professional and License Number (if applicable)

Or

☐ **Review certification by Qualified Professional**

Company: _____

Name: _____

License # : _____

Level of independency of professional:

Required for all projects disturbing over 1 acre:

1. I verify I am not an employee of the registrant. ☐ Yes
2. I verify I have no ownership interest of any kind in the project for which the registration is being submitted. ☐ Yes

Required for projects with 15 or more acres of site disturbance (in addition to questions 1&2):

3. I verify I did not engage in any activities associated with the preparation, planning, designing or engineering of the soil erosion and sediment control plan or stormwater management systems plan for this registrant. ☐ Yes
4. I verify I am not under the same employ as any person associated with the preparation, planning, designing or engineering of the soil erosion and sediment control plan or stormwater management systems plan for this registrant. ☐ Yes

Part IX: Reviewing Qualified Professional Certification (continued)

"I hereby certify that I am a qualified professional engineer or qualified soil erosion and sediment control professional, or both, as defined in the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and as further specified in Sections 3(*b*)(11)(A) and (B) of such general permit. I am making this certification in connection with a registration under such general permit,

[INSERT NAME OF REGISTRANT BELOW]

submitted to the commissioner by _____

[INSERT ADDRESS OF PROJECT OR ACTIVITY BELOW]

for an activity located at _____.

I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*)(11)(C) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I further certify that I have made the affirmative determination in accordance with Sections 3(*b*)(11)(D)(i) and (ii) of this general permit. I understand that this certification is part of a registration submitted in accordance with Section 22a-430b of Connecticut General Statutes and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under Section 53a-157b of the Connecticut General Statutes and any other applicable law."

_____

Signature of Reviewing Qualified Professional Date: _____

(Must be an original signature, not a copy or fax)

_____

Name of Reviewing Qualified Professional License No.: _____

Affix P.E./L.A. Stamp Here

Part X: Supporting Documents

Select the applicable box below for each attachment being submitted with this registration form. When submitting any supporting documents, please label the documents as indicated below (e.g., Attachment A, etc.) and be sure to include the registrant's name as indicated on this certification form.

☒ **Attachment A:** Select here as verification that an 8 ½" X 11" copy of the relevant portion of a USGS Quadrangle Map with a scale of 1:24,000, showing the exact location of the facility has been submitted with this registration. Indicate the quadrangle name on the map, and be sure to include the registrant's name. (To obtain a copy of the relevant USGS Quadrangle Map, call your town hall or DEEP Maps and Publications Sales at 860-424-3555)

☐ **Attachment B:** Documentation related to *Coastal Consistency Review,* if applicable.

☒ **Attachment C:** Threatened and Endangered Species Form and any additional information (such as a copy of a NDDB map)

☐ **Attachment D:** Conservation or Preservation Restriction Information, if applicable.

☐ **Attachment E:** Where applicable, non-electronic Pollution Control Plan.

Note: Please submit the fee along with a completed, printed and signed Registration Form and all additional supporting documents to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

ATTACHMENT C: THREATENED AND ENDANGERED SPECIES

Information about compliance with the requirements of Section 3(b)(2) of this general permit, regarding threatened and endangered species, is in Appendix A of the general permit. Choose one or more (if applicable) of the following in order to be eligible to register for this General Permit. A registrant who does not or cannot do so is not eligible to register under this General Permit.

☐ Self Assessment using the NDDB maps – Select this only if:

a. The site of the construction activity is not entirely, partially or within a ¼ mile of a shaded area depicted on the Department's Natural Diversity Database maps and this determination was made not more than six months before the date of submitting this registration;

AND

b. The entity registering for this General Permit has no reasonably available verifiable scientific, or other credible information that the construction activity could reasonably be expected to have an adverse impact upon a federal or state species listed as threatened or endangered.

Attach a copy of the NDDB map used to conduct the self assessment used to register for this general permit.

Note: Both a and b as used in this section, must be true in order for a Registrant to register for this General Permit using the self-assessment option. If neither is true, a Registrant cannot use the self-assessment option to comply with Section 3(b)(2) and Appendix A of the General Permit.

☐ Limited One-Year Determination – Select this only if:

a. The entity registering for this General Permit has obtained a limited one-year determination from the Department's Wildlife Division regarding threatened and endangered species: i) within a year of the date of submitting this registration; or ii) more than 1 year before submitting this registration, but such determination has been extended by the Department within one year of the date of submitting this registration;

AND

b. The Registrant has provided to the Department's Wildlife Division any reasonably available verifiable scientific, or other credible information that the construction activity could reasonably be expected to have an adverse impact upon a federal or state species listed as threatened or endangered.

Provide the date the limited one-year determination was issued by the Department's Wildlife Division _____;

or

Provide the date that the most recent extension to a limited one year determination was issued by the Department's Wildlife Division _____.

Note: Both a and b as used in this section, must be true in order for a Registrant to register for this General Permit using the Limited One-Year Determination option. If a Limited One-Year Determination or extension to any such determination was issued by the Department's Wildlife Division more than one year before the submission of this registration, a Registrant cannot use any such determination or extension to comply with Section 3(b)(2) and Appendix A of the General Permit.

ATTACHMENT C: THREATENED AND ENDANGERED SPECIES (continued)

☐ **Select here if the Limited One-Year Determination issued by the Department includes a Mitigation Plan.**

Provide the date the Mitigation Plan was approved: _____

Governmental Entity Approving the Plan: _____

As of the date this Registration is submitted,

Has the Mitigation Plan been fully implemented? ☐ Yes ☐ No

Date commenced: _____ Date completed: _____

Is the Mitigation Plan partially implemented? ☐ Yes ☐ No

If yes, what actions have been taken? _____

And which actions are yet to be implemented and what is the timeframe for completion of such actions: _____

Is the Mitigation Plan yet to be implemented? ☐ Yes ☐ No

If yes, specify the timeframe for implementation: _____ to _____

And summarize actions to be implemented: _____

☐ Safe Harbor Determination - Select this only if:

a. The entity registering for this General Permit has obtained a Safe Harbor Determination from the Department's Wildlife Division regarding threatened and endangered species: i) within 3 years of the date of submitting this registration; or ii) more than 3 years before submitting this registration, but within one-year of a one-year extension issued by the Department's Wildlife Division to a safe harbor determination;

AND

b. The entity registering for this General Permit has provided to the Department's Wildlife Division any reasonably available verifiable scientific, or other credible information that the construction activity could reasonably be expected to have an adverse impact upon a federal or state species listed as threatened or endangered.

Provide the date the Department's Wildlife Division issued a Safe Harbor Determination: _____

If applicable, provide the date that any one-year extension to a Safe Harbor Determination was issued by the Department's Wildlife Division: _____.

Note: Both a and b as used in this section, must be true in order for a Registrant to register for this General Permit using the Safe Harbor Determination option. If a Safe Harbor Determination was issued by the Department's Wildlife Division more than three years before the submission of this registration, and has not been extended, a Registrant cannot use any such safe harbor to comply with section 3(b)(2) and Appendix A of this General Permit. If a Safe Harbor Determination was granted and extended for one-year, more than four years before the submission of this registration, a Registrant cannot use any such Safe Harbor Determination to comply with Section 3(b)(2) and Appendix A of the general permit.

ATTACHMENT C: THREATENED AND ENDANGERED SPECIES (continued)

☐ **Select here if the safe harbor noted above includes a Mitigation Plan.**

Provide the date the Mitigation Plan was approved: _____

Governmental Entity Approving the Plan: _____

As of the date this Registration is submitted,

Has the Mitigation Plan been fully implemented? ☐ Yes ☐ No

Date commenced: _____ Date completed: _____

Is the Mitigation Plan partially implemented? ☐ Yes ☐ No

If yes, what actions have been taken? _____

And which actions are yet to be implemented and what is the timeframe for completion of such actions: _____

Is the Mitigation Plan yet to be implemented? ☐ Yes ☐ No

If yes, specify the timeframe for implementation: _____ to _____

And summarize actions to be implemented: _____

APPENDIX B
CONTRACTOR'S CERTIFICATIONS

CONTRACTOR CERTIFICATION STATEMENT

I certify under penalty of law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that as a contractor or subcontractor at the site, I am authorized by this general permit, including but not limited to the requirements of the Stormwater Pollution Control Plan prepared for the site.

Name:__________________________ Company:_______________________

Signature:_______________________ Address:________________________

Date:___________________________ Phone #:________________________

CONTRACTOR CERTIFICATION STATEMENT

I certify under penalty of law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that as a contractor or subcontractor at the site, I am authorized by this general permit, including but not limited to the requirements of the Stormwater Pollution Control Plan prepared for the site.

Name:__________________________ Company:_______________________

Signature:_______________________ Address:________________________

Date:___________________________ Phone #:________________________

CONTRACTOR CERTIFICATION STATEMENT

I certify under penalty of law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that as a contractor or subcontractor at the site, I am authorized by this general permit, including but not limited to the requirements of the Stormwater Pollution Control Plan prepared for the site.

Name:__________________________ Company:_______________________

Signature:_______________________ Address:________________________

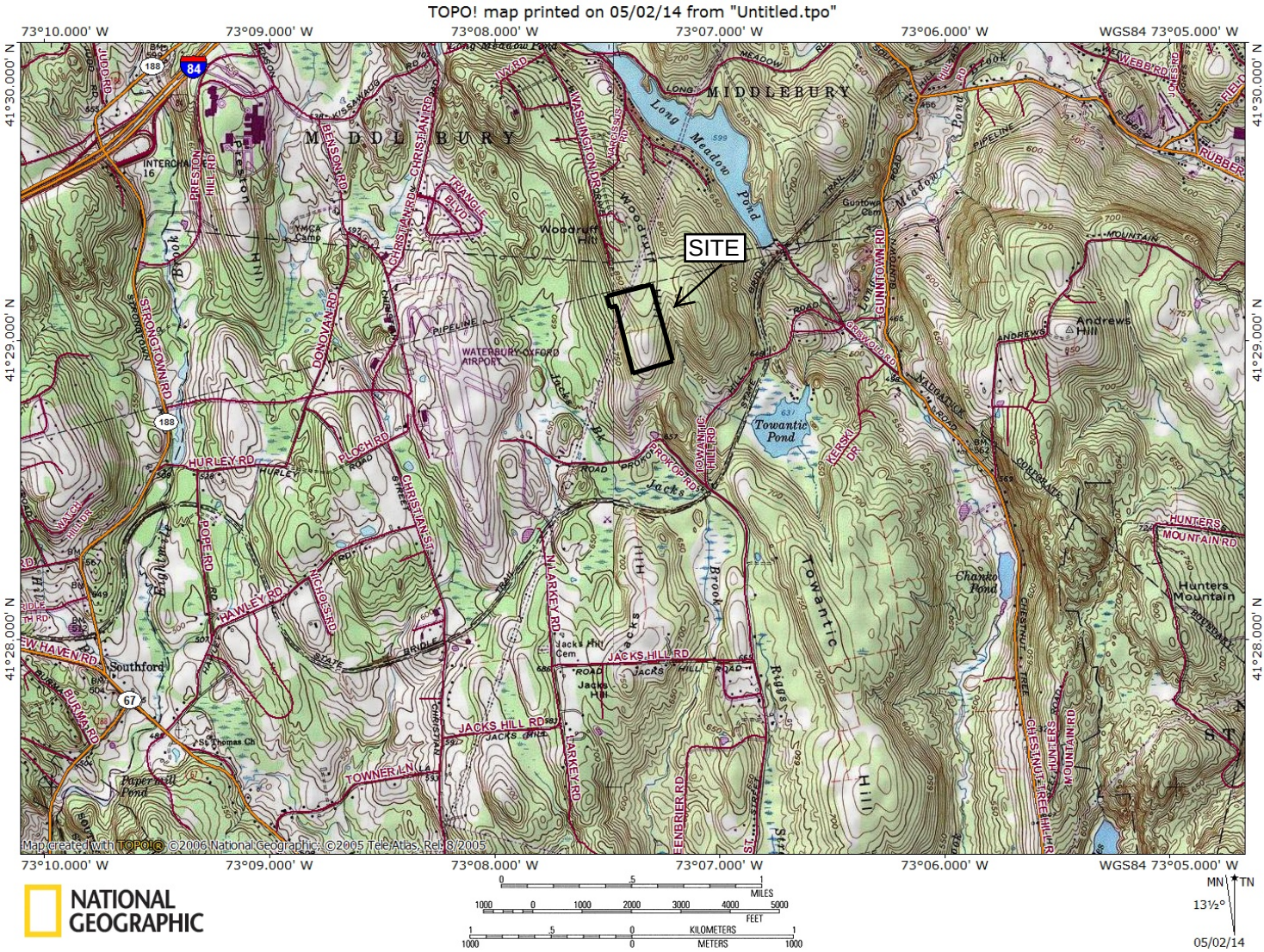
Date:___________________________ Phone #:________________________

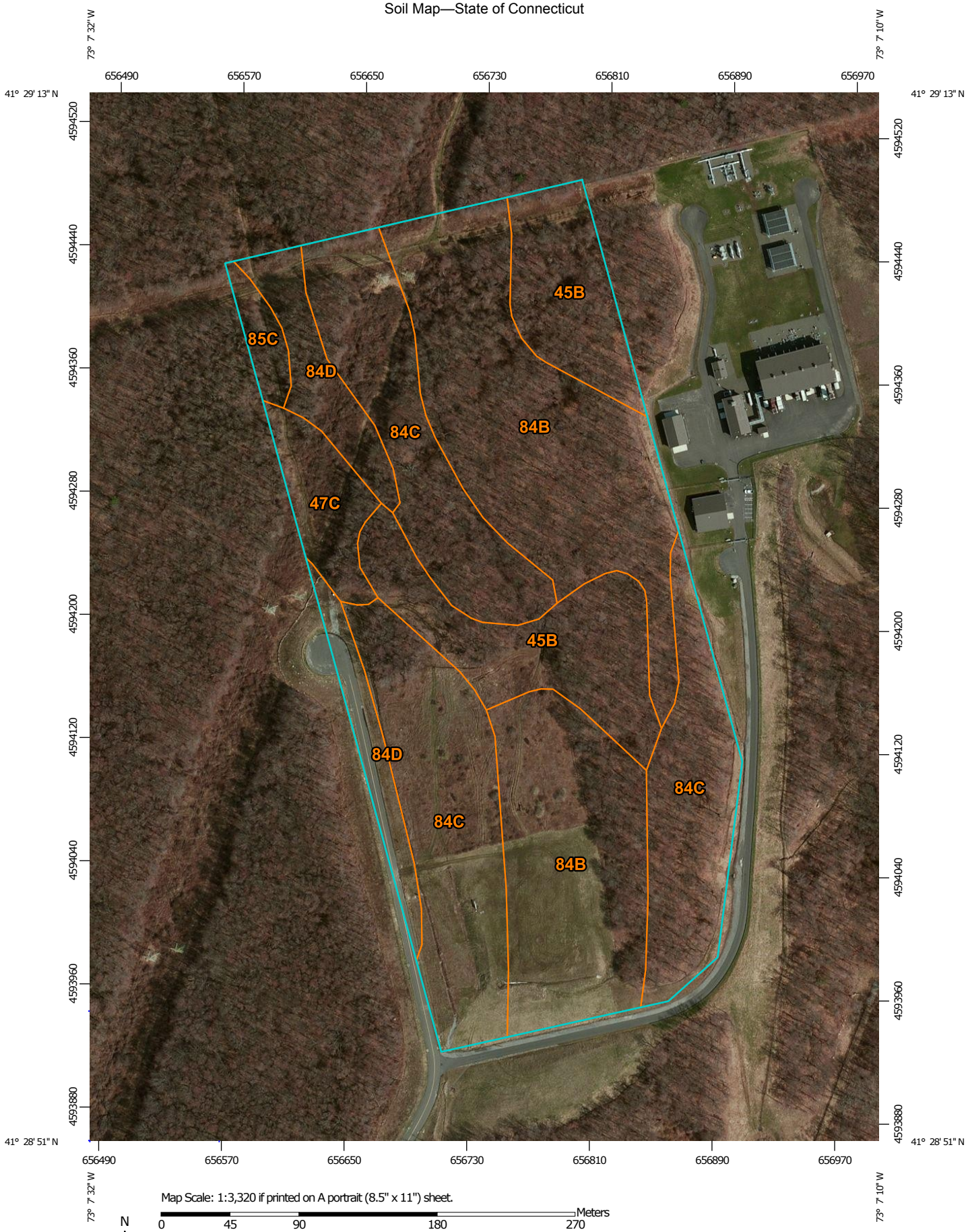
APPENDIX C
PRE-CONSTRUCTION MEETING

Although a pre-construction meeting is not a requirement for this CGP, a meeting will be conducted. A copy of this documentation should be kept in this appendix.

APPENDIX D
LOCATION MAPS AND SOIL TYPES

Site Location Map
CPV Towantic Energy Center





Map Scale: 1:3,320 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 13, Oct 28, 2014

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

Date(s) aerial images were photographed: Mar 28, 2011—Apr 18, 2011

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.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	5.0	16.4%
47C	Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	1.2	4.0%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	11.1	36.4%
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	10.5	34.4%
84D	Paxton and Montauk fine sandy loams, 15 to 25 percent slopes	2.2	7.3%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	0.5	1.5%
Totals for Area of Interest		**30.5**	**100.0%**

APPENDIX E
INSPECTION AND MAINTENANCE RECORDS

PROJECT INFORMATION

Project:	CPV Towantic Energy Center
Project Location:	Woodruff Hill Road Oxford, CT
Contractor:	
Address:	
Phone:	
Fax:	

SITE INSPECTION REPORT

General Information				
Permittee:	CPV Towantic Energy Center			
CT DEP Permit No.		Report No.		
Date of Inspection:		Start / End Time:		
Inspector's Name(s):				
Inspector's Title(s):				
Inspector's Contact Information:				
Describe present phase of construction:				

Type of Inspection:
❑ Regular ❑ Within 24 hours of storm with a discharge
❑ Within 24 hours of storm with discharge of 0.5 inches or greater on weekend or holiday

Weather Information

Has it rained since the last inspection?
❑Yes ❑No

If yes, provide:
Storm Start Date & Time: Storm Duration (hrs): Approx.Rainfall (in):

Weather at time of this inspection?

Discharge Information (A)

Do you suspect that discharges may have occurred since the last inspection? ❑Yes ❑No
Are there any discharges at the time of inspection? ❑Yes ❑No
Were samples for turbidity monitoring taken at the time of inspection? ❑Yes ❑No
Describe location and nature of any discharges from the site:

SITE-SPECIFIC CONTROL MEASURES

(B)	Control Measure Description	Installed and Operating Properly?	Corrective Action Needed	Date for corrective action / responsible party*
1		❑Yes ❑No		
2		❑Yes ❑No		
3		❑Yes ❑No		
4		❑Yes ❑No		
5		❑Yes ❑No		
6		❑Yes ❑No		
7		❑Yes ❑No		
8		❑Yes ❑No		
9		❑Yes ❑No		
10		❑Yes ❑No		
11		❑Yes ❑No		
12		❑Yes ❑No		

OVERALL SITE ISSUES

(C)	Control Measure/Site Activity	Implemented?	Maintained?	Corrective Action	Date for corrective action/responsible person*
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No		
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with silt barriers or similar control measures?	❑Yes ❑No	❑Yes ❑No		
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	❑Yes ❑No	❑Yes ❑No		
4	Are discharge points and receiving waters free of sediment deposits?	❑Yes ❑No	❑Yes ❑No		
5	Are storm drain inlets properly protected?	❑Yes ❑No	❑Yes ❑No		
6	Is there evidence of sediment being tracked into the street?	❑Yes ❑No	❑Yes ❑No		
7	Is trash/litter from work areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No		
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	❑Yes ❑No	❑Yes ❑No		
9	Are vehicle and equipment fueling, cleaning, and	❑Yes ❑No	❑Yes ❑No		

(C)	Control Measure/Site Activity	Implemented?	Maintained?	Corrective Action	Date for corrective action/responsible person*
	maintenance areas free of spills, leaks, or any other deleterious material?				
10	Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No		
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No		
12	(Other)	❑Yes ❑No	❑Yes ❑No		
13	(Other)	❑Yes ❑No	❑Yes ❑No		

*Note: Per General Permit requirements:
Non-engineered corrective actions are to be implemented within 24 hours and incorporated into the Stormwater Pollution Control Plan within 3 calendar days.
Engineered corrective actions are to be implemented within 7 days and incorporated into the Stormwater Pollution Control Plan within 10 days.

GENERAL INSPECTION COMMENTS AND CONCLUSIONS

General Inspection Comments (D)

Is the site in compliance with the terms and conditions of the Stormwater Pollution Control Plan and the permit?
❑Yes ❑No
If not, summarize items needed to maintain compliance:

Plan Information (E)
Were all current plan control measures in place at the time of inspection? ❑Yes ❑No
Are additional control measures required? ❑Yes ❑No

Does the plan need to be updated? ❑Yes ❑No
Explanation of additional control measures and Plan update requirements:

Qualified Inspector:_____
(Please print)
Signature: _____

Title: _____ Date: _____

Permittee:_____
(Please print)
Signature: _____

Title: _____ Date: _____

APPENDIX F
MONITORING REPORTS

Connecticut Department of
Energy & Environmental Protection
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, issued 8/21/13, effective 10/1/13
Stormwater Monitoring Report

SITE INFORMATION

Permittee: _____

Mailing Address: _____

Business Phone: _____ ext.: _____ Fax: _____

Contact Person: _____ Title: _____

Site Name: _____

Site Address: _____

Receiving Water (name, basin): _____

Stormwater Permit No. GSN _____

SAMPLING INFORMATION (Submit a separate form for each outfall)

Outfall Designation: _____ Date/Time Collected: _____

Outfall Location(s) (lat/lon or map link): _____

Person Collecting Sample: _____

Storm Magnitude (inches): _____ Storm Duration (hours): _____

Size of Disturbed Area at any time: _____

MONITORING RESULTS

Sample #	Parameter	Method	Results (units)	Laboratory (if applicable)
1	Turbidity			
2	Turbidity			
3	Turbidity			
4	Turbidity			

(provide an attachment if more than 4 samples were taken for this outfall) | Avg =

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____

Signature: _____ Date: _____

Please send completed form to:

DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
BUREAU OF MATERIALS MANAGEMENT AND COMPLIANCE ASSURANCE

79 ELM STREET

HARTFORD, CT 06106-5127
ATTN: NEAL WILLIAMS

APPENDIX G
HAZARDOUS MATERIAL OR OIL SPILL RECORDS

HAZARDOUS SUBSTANCE/OIL SPILL DISCHARGE EVENT

General Information			
Project Name:	CPV Towantic Energy Center		
Location:	Woodruff Hill Road Oxford, Connecticut		
CT DEP Tracking No.:		(2) Discharge Report No.	
Date of Event:		Time of Event:	
Responsible Party:			
Substance Discharged:			
Description of Event			
Is other descriptive information attached to this inspection report? ❑Yes ❑No			
Control and Containment Measures Implemented			

Counter Measures Proposed
Does the SPCP need to be updated? ❑Yes ❑No
Explanation of additional BMP and SPCP update requirements:

Certification statement:
I certify that I have thoroughly and completely reviewed the Stormwater Pollution Control Plan for the site. I further certify, based on such review and in my professional judgment, that the Stormwater Pollution Control Plan has been prepared in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, and the conditions for the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities issued on October 1, 2002 (or as reissued or modified), and the controls required for such Plan are appropriate for the site. I am aware that there are significant penalties for false statements in this certification, including the possibility of fine and imprisonment for knowingly making false statements.

Name: _____

Signature: _____

Company: _____

Title: _____ Date: _____

APPENDIX H
UPDATE RECORDS

PLAN UPDATE DESCRIPTION

General Information			
Project Name:	CPV Towantic Energy Center		
Location:	Woodruff Hill Road Oxford, Connecticut		
CT DEP Tracking No.		Revision No.	
Section:		Date:	
Description of Revision			
Reason for Revision			
Revision Requested By: ❑ Inspection ❑ Maintenance ❑ Agency Inspection ❑ Other:			

PLAN UPDATE LOG

Revision No.	Description -	
Section:	Date of Revision :	
By:		
Revision No.	Description -	
Section:	Date of Revision :	
By:		

Revision No.	Description -	
Section:	Date of Revision :	
By:		
Revision No.	Description -	
Section:	Date of Revision :	
By:		
Revision No.	Description -	
Section:	Date of Revision :	
By:		

Certification statement:
I certify that I have thoroughly and completely reviewed the Stormwater Pollution Control Plan for the site. I further certify, based on such review and in my professional judgment, that the Stormwater Pollution Control Plan has been prepared in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, and the conditions for the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities issued on October 1, 2002 (or as reissued or modified), and the controls required for such Plan are appropriate for the site. I am aware that there are significant penalties for false statements in this certification, including the possibility of fine and imprisonment for knowingly making false statements.

Name: _____

Signature: _____

Company: _____

Title: _____ Date: _____

APPENDIX I
CT DEEP NOTICE OF TERMINATION

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Notice of Termination Form

Please complete and submit this form in accordance with the general permit (DEP-PED-GP-015) in order to ensure the proper handling of your termination. Print or type unless otherwise noted.

Note: Ensure that for commercial and industrial facilities, registrations under the *General Permit for the Discharge of Stormwater Associated with Industrial Activity* (DEP-PED-GP-014) or the *General Permit for the Discharge of Stormwater from Commercial Activities* (DEP-PED-GP-004) have been filed where applicable. For questions about the applicability of these general permits, please call the Department at 860-424-3018.

Part I: Registrant Information

1. Permit number: ***GSN***

2. Fill in the name of the registrant(s) as indicated on the registration certificate:

   Registrant:

3. Site Address:

   City/Town: State: Zip Code:

4. Date all storm drainage structures were cleaned of construction sediment:

   Date of Completion of Construction:

   Date of Last Inspection (must be at least three months after final stabilization pursuant to Section 6(b)(6)(D) of the general permit):

5. Check the post-construction activities at the site (check all that apply):

   ☐ Industrial ☐ Residential ☐ Commercial ☐ Capped Landfill

   ☐ Other (describe):

Part II: Certification

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a

false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Signature of Permittee	Date
Name of Permittee (print or type)	Title (if applicable)

Note: Please submit this Notice of Termination Form to:

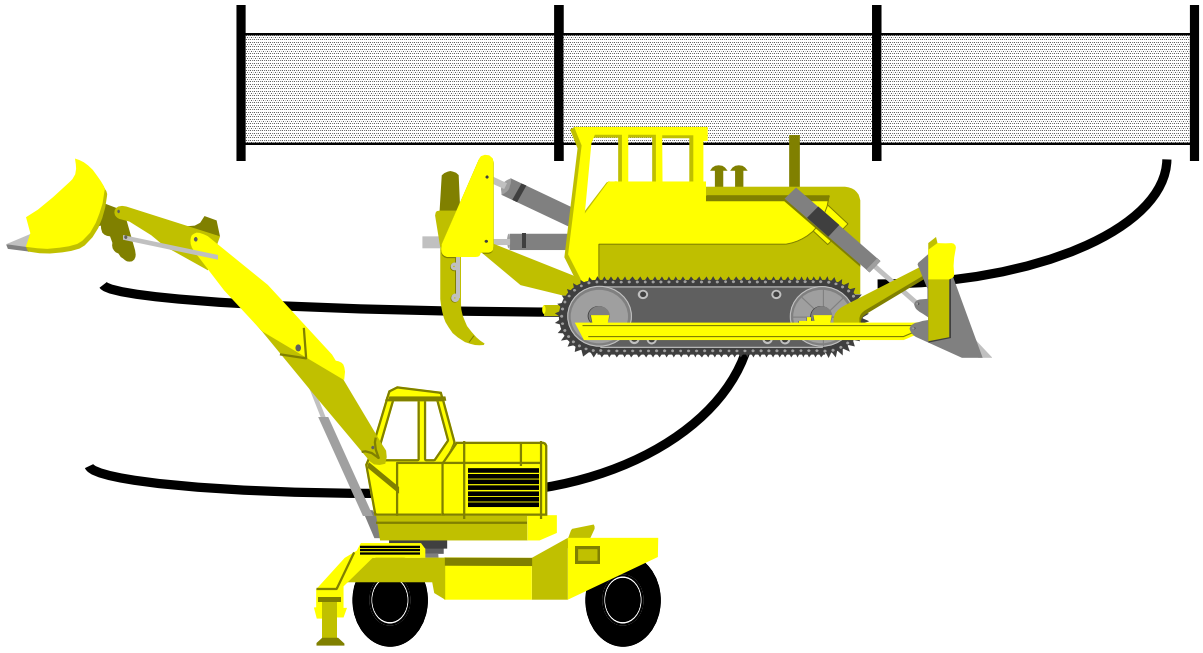
STORMWATER PERMIT COORDINATOR
BUREAU OF WATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

APPENDIX J
CONNECTICUT GENERAL PERMIT FOR THE DISCHARGE OF STORMWATER AND DEWATERING WASTEWATERS ASSOCIATED WITH CONSTRUCTION
DEEP-WPED-GP-015

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities



Issuance Date: August 21, 2013
Effective Date: October 1, 2013

Printed on recycled paper

General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Table of Contents

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Section 1. Authority

This general permit is issued under the authority of section 22a-430b of the Connecticut General Statutes.

Section 2. Definitions

The definitions of terms used in this general permit shall be the same as the definitions contained in section 22a-423 of the Connecticut General Statutes and section 22a-430-3(a) of the Regulations of Connecticut State Agencies. As used in this general permit, the following definitions shall apply:

"*x-year, 24-hour rainfall event*" means the maximum 24-hour precipitation event with a probable recurrence interval of once in the given number of years (i.e. x=2, 25 or 100), as defined by the National Weather Service in Technical Paper Number 40, "Rainfall Frequency Atlas of the United States," May 1961, and subsequent amendments, or equivalent regional or state rainfall probability information developed therefrom.

"*Annual sediment load*" means the total amount of sediment carried by stormwater runoff on an annualized basis.

"*Aquifer protection area*" means aquifer protection area as defined in section 22a-354h of the Connecticut General Statutes.

"*Best engineering practices*" means the design of engineered control measures to control pollution to the maximum extent achievable using measures that are technologically available and economically practicable.

"*CFR*" means the Code of Federal Regulations.

"*Coastal area*" means coastal area as defined in section 22a-93(3) of the Connecticut General Statutes.

"*Coastal waters*" means coastal waters as defined in section 22a-93(5) of the Connecticut General Statutes.

"*Commissioner*" means commissioner as defined in section 22a-2(b) of the Connecticut General Statutes.

"*Construction activity*" means any activity associated with construction at a site including, but not limited to, clearing and grubbing, grading, excavation, and dewatering.

"*Department*" means the Department of Energy & Environmental Protection.

"*Developer*" means a person who or municipality which is responsible, either solely or partially through contract, for the design and construction of a project site.

"*Dewatering wastewater*" means wastewater associated with the construction activity generated from the lowering of the groundwater table, the pumping of accumulated stormwater or uncontaminated groundwater from an excavation, the pumping of surface water from a cofferdam, or pumping of other surface water that has been diverted into a construction site.

"*District*" means a soil and water conservation district established pursuant to section 22a-315 of the Connecticut General Statutes. Appendix E lists the Districts, their geographic delineations, and contact information.

"*Disturbance*" means the execution of any of the construction activity(ies) defined in this general permit.

"*Effective Impervious Cover*" is the total area of a site with a Rational Method runoff coefficient of 0.7 or greater (or other equivalent methodology) from which stormwater discharges directly to a surface water or to a storm sewer system.

"*Engineered stormwater management system*" means any control measure and related appurtenances which requires engineering analysis and/or design by a professional engineer.

"*Erosion*" means the detachment and movement of soil or rock fragments by water, wind, ice and gravity.

"*Fresh-tidal wetland*" means a tidal wetland with an average salinity level of less than 0.5 parts per thousand.

"*Grab sample*" means an individual sample collected in less than fifteen minutes.

"*Groundwater*" means those waters of the state that naturally exist or flow below the surface of the ground.

"*Guidelines*" means the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, established pursuant to section 22a-328 of the Connecticut General Statutes.

"*High Quality Waters*" means those waters defined as high quality waters in the Connecticut Water Quality Standards published by the Department, as may be amended.

"*Impaired water(s)*" means those surface waters of the state designated by the commissioner as impaired pursuant to Section 303(d) of the Clean Water Act and as identified in the most recent State of Connecticut Integrated Water Quality Report.

"*In Responsible charge*" means professional experience for which the Commissioner determines that a professional's primary duties consistently involve a high level of responsibility and decision making in the planning and designing of engineered stormwater management systems or in the planning and designing of soil erosion and sediment controls for residential and commercial construction projects. The Commissioner shall consider the following in determining whether a professional's experience qualifies as responsible charge experience:

(i) the level of independent decision-making exercised;

(ii) the number of individuals and the disciplines of the other professionals that the professional supervised or coordinated;

(iii) the extent to which a professional's responsibilities consistently involved the review of work performed by other professionals involved the planning and designing of engineered stormwater management systems or the planning and designing of soil erosion and sediment controls for residential and commercial construction projects;

(iv) the extent to which a professional's responsibilities consistently involved the planning and designing of engineered stormwater management systems or the planning and designing of soil erosion and sediment controls for residential and commercial construction projects and whether such responsibilities were an integral and substantial component of the professional's position;

(v) the nature of a professional's employer's primary business interests and the relation of those interests to planning and designing of engineered stormwater management systems or to planning and designing of soil erosion and sediment controls for residential and commercial construction projects;

(vi) the extent to which a professional has engaged in the evaluation and selection of scientific or technical methodologies for planning and designing of engineered stormwater management systems or for planning and designing of soil erosion and sediment controls for residential and commercial construction projects;

(vii) the extent to which a professional drew technical conclusions, made recommendations, and issued opinions based on the results of planning and designing of engineered stormwater management systems or of planning and designing of soil erosion and sediment controls for residential and commercial construction projects; or

(viii) any other factor that the Commissioner deems relevant.

"*Individual permit*" means a permit issued to a specific permittee under section 22a-430 of the Connecticut General Statutes.

"*Inland wetland*" means wetlands as defined in section 22a-38 of the Connecticut General Statutes.

"*Landscape Architect*" means a person with a currently effective license issued in accordance with chapter 396 of the Connecticut General Statutes.

"*Linear Project*" includes the construction of roads, railways, bridges, bikeways, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

"*Locally approvable project*" means a construction activity for which the registration is not for a municipal, state or federal project and is required to obtain municipal approval for the project.

"*Locally exempt project*" means a construction activity for which the registration is for a project authorized under municipal, state or federal authority and may not be required to obtain municipal approval for the project.

"*Low Impact Development*" or "*LID*" means a site design strategy that maintains, mimics or replicates pre-development hydrology through the use of numerous site design principles and small-scale treatment practices distributed throughout a site to manage runoff volume and water quality at the source.

"*Minimize*", for purposes of implementing the control measures in Section 5(*b*)(2) of this general permit, means to reduce and/or eliminate to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice.

"*Municipal separate storm sewer system*" or "*MS4*" means conveyances for stormwater (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) owned or operated by any municipality and discharging to surface waters of the state.

"*Municipality*" means a city, town or borough of the state as defined in section 22a-423 of the Connecticut General Statutes.

"*Nephelometric Turbidity Unit*" or "*NTU*" means a unit measure of turbidity from a calibrated nephelometer.

"*Normal Working Hours*", for the purposes of monitoring under Section 5(*c*) of this general permit, are considered to be, at a minimum, Monday through Friday, between the hours of 8:00 am and 6:00 pm, unless additional working hours are specified by the permittee.

"*Permittee*" means any person who or municipality which initiates, creates or maintains a discharge in accordance with Section 3 of this general permit.

"*Person*" means person as defined in section 22a-423 of the Connecticut General Statutes.

"*Phase*" means a portion of a project possessing a distinct and complete set of activities that have a specific functional goal wherein the work to be completed in the phase is not dependent upon the execution of work in a later phase in order to make it functional.

"*Point Source*" means any discernible, confined and discrete stormwater conveyance (including but not limited to, any pipe, ditch, channel, tunnel, conduit, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft) from which pollutants are or may be discharged.

"*Professional Engineer*" or *"P.E.*" means a person with a currently effective license issued in accordance with chapter 391 of the Connecticut General Statutes.

"*Qualified Inspector*" means an individual possessing either (1) a professional license or certification by a professional organization recognized by the commissioner related to agronomy, civil engineering, landscape architecture, soil science, and two years of demonstrable and focused experience in erosion and sediment control plan reading, installation, inspection and/or report writing for residential and commercial construction projects in accordance with the Guidelines; or (2) five years of demonstrable and focused experience in erosion and sediment control plan reading, installation, inspection and/or report writing for residential and commercial construction projects in accordance with the Guidelines; or (3) certification by the Connecticut Department of Transportation (DOT).

"*Qualified professional engineer*" means a professional engineer who has, for a minimum of eight years, engaged in the planning and designing of engineered stormwater management systems for residential and commercial construction projects in accordance with the Guidelines and the Stormwater Quality Manual including, but not limited to, a minimum of four years in responsible charge of the planning and designing of engineered stormwater management systems for such projects.

"*Qualified soil erosion and sediment control professional*" means a landscape architect or a professional engineer who: (1) has for a minimum of eight years engaged in the planning and designing of soil erosion and sediment controls for residential and commercial construction projects in accordance with the Guidelines including, but not limited to, a minimum of four years in responsible charge of the planning and designing of soil erosion and sediment controls for such projects; or (2) is currently certified as a professional in erosion and sediment control as designated by EnviroCert International, Incorporated (or other certifying organization acceptable to the commissioner) and has for a minimum of six years experience engaged in the planning and designing of soil erosion and sediment controls for residential and commercial construction projects in accordance with the Guidelines including, but not limited to, a minimum of four years in responsible charge in the planning and designing of soil erosion and sediment controls for such projects.

"*Registrant*" means a person or municipality that files a registration.

"*Registration*" means a registration form filed with the commissioner pursuant to Section 4 of this general permit.

"*Regulated Municipal Separate Storm Sewer System*" or "*Regulated MS4*" means the separate storm sewer system of the City of Stamford or any municipally-owned or -operated separate storm sewer system (as defined above) authorized by the most recently issued General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 general permit) including all those located partially

or entirely within an Urbanized Area and those additional municipally-owned or municipally-operated Small MS4s located outside an Urbanized Area as may be designated by the commissioner.

"*Retain*" means to hold runoff on-site to promote vegetative uptake and groundwater recharge through the use of runoff reduction or LID practices or other measures. In addition, it means there shall be no subsequent point source release to surface waters from a storm event defined in this general permit or as approved by the commissioner.

"*Runoff reduction practices*" means those post-construction stormwater management practices used to reduce post-development runoff volume delivered to the receiving water, as defined by retaining the volume of runoff from a storm up to the first half inch or one inch of rainfall in accordance with Sections 5(b)(2)(C)(i)(a) or (b), respectively. Runoff reduction is quantified as the total annual post-development runoff volume reduced through canopy interception, soil amendments, evaporation, rainfall harvesting, engineered infiltration, extended filtration or evapo-transpiration.

"*Sediment*" means solid material, either mineral or organic, that is in suspension, is transported, or has been moved from its site of origin by erosion.

"*Site*" means geographically contiguous land on which a construction activity takes place or on which a construction activity for which authorization is sought under this general permit is proposed to take place. Non-contiguous land or water owned by the same person shall be deemed the same site if such land is part of a linear project (as defined in this section) or is otherwise connected by a right-of-way, which such person controls.

"*Soil*" means any unconsolidated mineral and organic material of any origin.

"*Stabilize"* means the use of measures as outlined in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, or as approved by the commissioner, to prevent the visible movement of soil particles and development of rills.

"*Structural measure*" means a measure constructed for the temporary storage and/or treatment of stormwater runoff.

"*Standard Industrial Classification Code*" or "*SIC Code*" means those codes provided in the Standard Industrial Classification Manual, Executive Office of the President, Office of Management and Budget 1987.

"S*tandard of care*", as used in Section 3(b), means to endeavor to perform in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances.

"*Stormwater*" means waters consisting of rainfall runoff, including snow or ice melt during a rain event.

"*Stormwater Quality Manual*" means the 2004 Connecticut Stormwater Quality Manual published by the Connecticut Department of Energy & Environmental Protection, as amended.

"*Surface water*" means that portion of waters, as the term "waters" is defined in section 22a-423 of the Connecticut General Statutes, located above the ground surface.

"*Tidal wetland*" means a wetland as that term is defined in section 22a-29(2) of the Connecticut General Statutes.

"*Total disturbance*" means the total area on a site where soil will be exposed or susceptible to erosion during the course of all phases of a project.

"*Total Maximum Daily Load*" or "*TMDL*" means the maximum capacity of a surface water to assimilate a pollutant as established by the commissioner, including pollutants contributed by point and non-point sources and a margin of safety.

"*Upland soils*" means soils which are not designated as poorly drained, very poorly drained, alluvial, or flood plain by the National Cooperative Soils Survey, as may be amended, of the Natural Resources Conservation Service of the United States Department of Agriculture and/or the inland wetlands agency of the municipality in which the project will take place.

"*Water company*" means water company as defined in section 25-32a of the Connecticut General Statutes.

"*Water Quality Standards or Classifications*" means those water quality standards or classifications contained in the Connecticut Water Quality Standards published by the Department, as may be amended.

"*Water Quality Volume*" or "*WQV*" means the volume of runoff generated by one inch of rainfall on a site as defined in the 2004 Connecticut Stormwater Quality Manual, as amended.

Section 3. Authorization Under This General Permit

(a) Eligible Activities

This general permit authorizes the discharge of stormwater and dewatering wastewaters to surface waters from construction activities on a site, as defined in this general permit, with a total disturbance of one or more acres of land area on a site, *regardless of project phasing*.

In the case of a larger plan of development (such as a subdivision), the estimate of total acres of site disturbance shall include, but is not limited to, road and utility construction, individual lot construction (e.g. house, driveway, septic system, etc.), and all other construction associated with the overall plan, regardless of the individual parties responsible for construction of these various elements.

(b) Requirements for Authorization

This general permit authorizes the construction activity listed in the "Eligible Activities" section (Section 3(*a*)) of this general permit provided:

(1) Coastal Management Act

Such construction activity must be consistent with all applicable goals and policies in section 22a-92 of the Connecticut General Statutes, and must not cause adverse impacts to coastal resources as defined in section 22a-93(15) of the Connecticut General Statutes. Please refer to the Appendix D for additional guidance.

(2) Endangered and Threatened Species

Such activity must not threaten the continued existence of any species listed pursuant to section 26-306 of the Connecticut General Statutes as endangered or threatened and must not result in the destruction or adverse modification of habitat designated as essential to such species. See Appendix A.

(3) Aquifer Protection Areas

Such construction activity, if it is located within an aquifer protection area as mapped under section 22a-354b of the General Statutes, must comply with regulations adopted pursuant to section 22a-354i of the General Statutes. Please refer to the Appendix C for additional guidance.

For any construction activity regulated pursuant to sections 8(c) and 9(b) of the Aquifer Protection Regulations (section 22a-354i(1)-(10) of the Regulations of Connecticut State Agencies), the Stormwater Pollution Control Plan (Plan) must assure that stormwater run-off generated from the regulated construction activity (i) is managed in a manner so as to prevent pollution of groundwater, and (ii) complies with all the requirements of this general permit.

(4) Mining Operations Exception

The stormwater discharge resulting from an activity classified as Standard Industrial Classification 10 through 14 (the mining industry) is not authorized by this general permit and is regulated under the most recently issued General Permit for the Discharge of Stormwater Associated with Industrial Activity.

(5) Discharge to POTW

The stormwater is *not* discharged to a Publicly Owned Treatment Works (POTW).

(6) Discharge to Groundwater

The stormwater is *not* discharged entirely to groundwater, meaning a stormwater discharge to a surface water will not occur up to a 100-year, 24-hour rainfall event.

(7) Such construction activity must be consistent with the Wild and Scenic Rivers Act (16 U.S.C. 1271-1287) for those river components and tributaries which have been designated as Wild and Scenic by the United States Congress. Further, such construction activities must not have a direct and adverse effect on the values for which such river designation was established. Please refer to Appendix H for additional guidance.

(8) Certification Requirements for Registrants and other Individuals

As part of the registration for this general permit, the registrant and any other individual or individuals responsible for preparing the registration submits to the commissioner a written certification which, at a minimum, complies with the following requirements:

(A) The registrant and any other individual or individuals responsible for preparing the registration and signing the certification has completely and thoroughly reviewed, at a minimum, this general permit and the following regarding the activities to be authorized under such general permit:

(i) all registration information provided in accordance with Section 4(*c*)(2) of such general permit;

(ii) the project site, based on a site inspection;

(iii) the Stormwater Pollution Control Plan; and

(iv) any plans and specifications and any Department approvals regarding such Stormwater Pollution Control Plan;

(B) The registrant and any other individual or individuals responsible for preparing the registration and signing the certification pursuant to this general permit has, based on the review described in section 3(*b*)(8)(A) of this general permit, made an affirmative determination to:

(i) comply with the terms and conditions of this general permit;

(ii) maintain compliance with all plans and documents prepared pursuant to this general permit including, but not limited to, the Stormwater Pollution Control Plan;

(iii) properly implement and maintain the elements of the Stormwater Pollution Control Plan; and

(iv) properly operate and maintain all stormwater management systems in compliance with the terms and conditions of this general permit to protect the waters of the state from pollution;

(C) Such registrant and any other individual or individuals responsible for preparing the registration certifies to the following statement: "I hereby certify that I am making this certification in connection with a registration under such general permit, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY] and that all terms and conditions of the general permit are being met for all discharges which have been initiated and such activity is eligible for authorization under such permit. I further certify that a system is in place to ensure that all terms and conditions of this general permit will continue to be met for all discharges authorized by this general permit at the site. I certify that the registration filed pursuant to this general permit is on complete and accurate forms as prescribed by the commissioner without alteration of their text. I certify that I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*)(8)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I certify that I have made an affirmative determination in accordance with Section 3(*b*)(8)(B) of this general permit. I understand that the registration filed in connection with such general permit is submitted in accordance with and shall comply with the requirements of Section 22a-430b of Connecticut General Statutes. I also understand that knowingly making any false statement made in the submitted information and in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

(9) The registrant has submitted to the commissioner a written certification by a professional engineer or, where appropriate, a landscape architect licensed in the State of Connecticut for the preparation, planning and design of the Stormwater Pollution Control Plan and stormwater management systems:

(A) The professional engineer or landscape architect shall certify to the following statement:

"I hereby certify that I am a [professional engineer][landscape architect] licensed in the State of Connecticut. I am making this certification in connection with a registration under such general permit, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY]. I certify that I have thoroughly and completely reviewed the Stormwater

Pollution Control Plan for the project or activity covered by this certification. I further certify, based on such review and on the standard of care for such projects, that the Stormwater Pollution Control Plan has been prepared in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, the Stormwater Quality Manual, as amended, and the conditions of the general permit, and that the controls required for such Plan are appropriate for the site. I further certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I also understand that knowingly making any false statement in this certification may subject me to sanction by the Department and/or be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

(B) Nothing in this section shall be construed to authorize a professional engineer or a landscape architect to engage in any profession or occupation requiring a license under any other provision of the general statutes without such license.

(10) Plan Review and Certification by a District for Locally Approvable Projects

For those Plans not reviewed in accordance with Section 3(*b*)(11), below, the registrant has submitted to the commissioner a written certification by the appropriate regional District for the review of the Stormwater Pollution Control Plan pursuant to Appendix F, which, at a minimum, complies with the following requirements:

(A) the Plan Review Certification must be signed by the District. Information on the District review process is outlined in the Memorandum of Agreement provided in Appendix F. In cases where the District is unable to complete review of the Plan within the time limits specified in the Memorandum of Agreement in Appendix F, a notice to that effect signed by the District may be submitted in lieu of the certification.

(B) the Stormwater Pollution Control Plan has been prepared in accordance with the requirements of Section 5(*b*) of the general permit.

(C) Nothing in this subsection shall be construed to authorize District personnel to engage in any profession or occupation requiring a license under any other provision of the general statutes without such license.

(11) Plan Review and Certification by a Qualified Soil Erosion and Sediment Control Professional and Qualified Professional Engineer for Locally Approvable Projects

For those Plans not reviewed in accordance with Section 3(*b*)(10), above, the registrant has submitted to the commissioner a written certification by a qualified professional engineer or a qualified soil erosion and sediment control professional in accordance with the following requirements:

(A) for projects disturbing more than one acre and less than fifteen (15) acres, such qualified soil erosion and sediment control professional or qualified professional engineer:

(i) is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the registrant; and

(ii) has no ownership interest of any kind in the project for which the registration is being submitted.

(B) for projects disturbing fifteen (15) acres or more, such qualified soil erosion and sediment control professional or qualified professional engineer:

(i) is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the registrant;

(ii) did not engage in any activities associated with the preparation, planning, designing or engineering of such plan for soil erosion and sediment control or plan for stormwater management systems on behalf of such registrant;

(iii) is not under the same employ as any person who engaged in any activities associated with the preparation, planning, designing or engineering of such plans and specifications for soil erosion and sediment control or plans and specifications for stormwater management systems on behalf of such registrant; and

(iv) has no ownership interest of any kind in the project for which the registration is being submitted.

(C) The qualified professional engineer or qualified soil erosion and sediment control professional signing the certification has, at a minimum, completely and thoroughly reviewed this general permit and the following regarding the discharges to be authorized under such general permit:

(i) all registration information provided in accordance with Section 4(*c*)(2) of such general permit;

(ii) the site, based on a site inspection;

(iii) the Stormwater Pollution Control Plan;

(iv) the Guidelines;

(v) the Stormwater Quality Manual, if applicable; and

(vi) all non-engineered and engineered stormwater management systems, including any plans and specifications and any Department approvals regarding such stormwater management systems.

(D) Affirmative Determination

(i) The qualified soil erosion and sediment control professional signing the certification must have made an affirmative determination, based on the review described in section 3(*b*)(11)(C) of this general permit that:

(a) the Stormwater Pollution Control Plan prepared and certified pursuant to the registration is adequate to assure that the project or activity authorized under this general permit, if implemented in accordance with the Stormwater Pollution Control Plan, will comply with the terms and conditions of such general permit; and

(b) all non-engineered stormwater management systems:

(*1*) have been designed to control pollution to the maximum extent achievable using measures that are technologically available and economically

practicable and that conform to those in the Guidelines and the Stormwater Quality Manual;

(*2*) will function properly as designed;

(*3*) are adequate to ensure compliance with the terms and conditions of this general permit; and

(*4*) will protect the waters of the state from pollution.

(ii) The qualified professional engineer signing the certification must have made an affirmative determination, based on the review described in section 3(*b*)(11)(C) of this general permit that:

(a) the Stormwater Pollution Control Plan prepared and certified pursuant to the registration is adequate to assure that the activity authorized under this general permit, if implemented in accordance with the Stormwater Pollution Control Plan, will comply with the terms and conditions of such general permit; and

(b) all non-engineered and engineered stormwater management systems:

(*1*) have been designed to control pollution to the maximum extent achievable using measures that are technologically available and economically practicable and that conform to those in the Guidelines and the Stormwater Quality Manual;

(*2*) will function properly as designed;

(*3*) are adequate to ensure compliance with the terms and conditions of this general permit; and

(*4*) will protect the waters of the state from pollution.

(E) The qualified professional engineer or qualified soil erosion and sediment control professional shall, provided it is true and accurate, certify to the following statement:

"I hereby certify that I am a qualified professional engineer or qualified soil erosion and sediment control professional, or both, as defined in the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and as further specified in sections 3(*b*)(11)(A) and (B) of such general permit. I am making this certification in connection with a registration under such general permit, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY]. I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*)(11)(C) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I further certify that I have made the affirmative determination in accordance with Sections 3(*b*)(11)(D)(i) and (ii) of this general permit. I understand that this certification is part of a registration submitted in accordance with Section 22a-430b of Connecticut General Statutes and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be

punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

(F) Nothing in this subsection shall be construed to authorize a qualified soil erosion and sediment control professional or a qualified professional engineer to engage in any profession or occupation requiring a license under any other provision of the general statutes without such license.

(12) New Discharges to Impaired Waters

New stormwater discharges directly to an impaired water, as indicated in the State's Integrated Water Quality Report, must be in accordance with the following conditions:

(A) Stormwater discharges that go directly to impaired waters seeking authorization under this general permit shall comply with the requirements of this subsection (B) below if the indicated cause or potential cause of the impairment is one of the following:

- Site Clearance (Land Development or Redevelopment)
- Post-Development Erosion and Sedimentation
- Source Unknown (if cause of impairment is Sedimentation/Siltation)

(B) Such stormwater discharge is authorized if the permittee complies with the requirements of Section 5(*b*)(3) of this permit and receives a written affirmative determination from the commissioner that the discharge meets the requirements of that section. In such case, the permittee must keep a copy of the written determination onsite with the Plan. If the permittee does not receive such affirmative determination, the construction activity is not authorized by this general permit and must obtain an individual permit.

(c) Registration

Pursuant to the "Registration Requirements" section (Section 4) of this general permit, a completed registration with respect to the construction activity shall be filed with the commissioner as follows:

(1) Locally Approvable Projects

The registration must:

(A) Be electronically submitted, along with all required elements in subsections (B), (C) and (D), below, at least sixty (60) days prior to the planned commencement of the construction activity.

(B) Include the Registration Form (available at www.ct.gov/deep/stormwater).

(C) Include any additional forms and information regarding compliance and/or consistency with the Coastal Management Act, Impaired Waters (including TMDL requirements), Endangered and Threatened Species, and Aquifer Protection Areas that may be required pursuant to the "Requirements of Authorization" section (Section 3(*b*)).

(D) Include a Plan Review Certification in accordance with the "Plan Review Certification" (Section 5(*b*)(8)).

Locally Approvable projects may also choose to make their Plan electronically available in accordance with Section 4(*c*)(2)(N) of this general permit. The 60 day period cited in subsection

(A), above, will not begin until all required elements have been submitted. Failure to include any of these required submissions shall be grounds to reject the registration.

(2) Locally Exempt Projects

The registration must:

(A) Be electronically submitted, along with all required elements in subsections (B), (C) and (D), below, at least:

(i) sixty (60) days prior to the planned commencement of the construction activity if the site has a total disturbed area of between one (1) and twenty (20) acres; ***or***

(ii) ninety (90) days prior to the planned commencement of construction activity if the site:

(a) has a total disturbed area greater than twenty (20) acres;

(b) discharges to a tidal wetland (that is not a fresh-tidal wetland) within 500 feet of the discharge point; ***or***

(c) is subject to the impaired waters provisions of Section 3(*b*)(12).

(B) Include the Registration Form (available at www.ct.gov/deep/stormwater).

(C) Include any additional forms and information regarding compliance and/or consistency with the Coastal Management Act, Impaired Waters (including TMDL requirements), Endangered and Threatened Species, and Aquifer Protection that may be required pursuant to the "Requirements of Authorization" section (Section 3(*b*)).

(D) Include an electronic copy of the Stormwater Pollution Control Plan (Plan) (or a web address where the electronic Plan can be downloaded) for the commissioner's review. The electronic Plan shall be in Adobe™ PDF format or similar publicly available format in common use. **DO NOT INCLUDE** in this electronic copy any pages or other material that do not pertain to stormwater management or erosion and sedimentation control (such as electrical and lighting plans, boundary or lot surveys, building plans, non-stormwater related detail sheets, etc.).

The 60 or 90 day periods cited in subsections (A), above, will not begin until all required elements have been submitted. Failure to include any of these required submissions shall be grounds to reject the registration.

(3) Re-Registration of Existing Projects

For sites previously registered under any previous version of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" section (Section 6), a Re-Registration Form (available at www.ct.gov/deep/stormwater) pursuant to Section 4(*c*)(3) shall be submitted on or before February 1, 2014. The re-registration fee is payable (or waived) in accordance with Section 4(c)(1)(A)(iii). Resubmission of the permittee's Plan is not required unless specifically requested by the commissioner.

(d) Small Construction

For construction projects with a total disturbance of between one and five acres, the permittee shall adhere to the erosion and sediment control land use regulations of the municipality in which the construction activity is conducted, as well as the Guidelines and the Stormwater Quality Manual.

No registration or Plan review and certification shall be required for such construction activity provided a land-use commission of the municipality (i.e. planning/zoning, wetland, conservation, etc) reviews and issues a written approval of the proposed erosion and sediment control measures, pursuant to the requirements of section 22a-329 of the Connecticut General Statutes. In the absence of such municipal commission approval, the permittee shall register with the DEEP under the requirements for a Locally Exempt Project and comply with all applicable conditions of this general permit.

(e) Geographic Area

This general permit applies throughout the State of Connecticut.

(f) Effective Date and Expiration Date of this General Permit

The registration provisions of Section 3(*c*) and 4 of this General Permit, including any applicable definitions or provisions referred to in those sections insofar as they facilitate submission of a registration, shall be effective September 1, 2013. All remaining provisions of this General Permit shall be effective on October 1, 2013. The provisions of this General Permit shall expire on September 30, 2018.

(g) Effective Date of Authorization

A construction activity is authorized by this general permit at such time as specified in subsections (1) and (2), below.

(1) Authorization Timelines

The activity is authorized based on the following timelines unless superseded by subsection (2), below:

(A) for locally approvable projects, sixty (60) days after the submission of the registration form required by Section 4(*c*), or

(B) for locally exempt projects under 20 acres, sixty (60) days after the submission of the registration form required by Section 4(*c*), or

(C) for locally exempt projects over 20 acres, ninety (90) days after the submission of the registration form required by Section 4(*c*).

(2) Alternate Authorization Timelines

If one of the following conditions for authorization applies, that condition shall supersede those of subsection (1), above:

(A) for sites for which the registration and Plan availability and review provisions of Section 4(e) are completed prior to the authorization periods in subsection (1), above, the commissioner may authorize the activity upon such completion, or

(B) for sites subject to the conditions of Section 3(b)(2), 3(*b*)(12) and/or Section 5(*a*)(2), the activity is authorized on the date of the commissioner's affirmative determination and/or approval, or

(C) for sites authorized by any previous version of this general permit and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" section (Section 6), the activity is authorized effective October 1, 2013. Authorization under this general permit shall cease if a re-registration form is not submitted on or before February 1. 2014.

(h) Revocation of an Individual Permit

If a construction activity is eligible for authorization under this general permit and such activity is presently authorized by an individual permit, the existing individual permit may be revoked by the commissioner upon a written request by the permittee. If the commissioner revokes such individual permit in writing, such revocation shall take effect on the effective date of authorization of such activity under this general permit.

(i) Issuance of an Individual Permit

If the commissioner issues an individual permit under section 22a-430 of the Connecticut General Statutes, authorizing a construction activity authorized by this general permit, this general permit shall cease to authorize that activity beginning on the date such individual permit is issued.

Section 4. Registration Requirements

(a) Who Must File a Registration

With the exception noted in the "Small Construction" section (Section 3(*d*)) of this general permit, any person or municipality which initiates, creates, originates or maintains a discharge described in the "Eligible Activities" section (Section 3(*a*)) of this general permit shall file with the commissioner a registration form that meets the requirements of the "Contents of Registration" section (Section 4(*c*)) of this general permit (or a re-registration form) and the applicable fee within the timeframes and in the amounts specified in Sections 3(*c*) and 4(*c*)(1)(A), respectively. Any such person or municipality filing a registration remains responsible for maintaining compliance with this general permit.

(b) Scope of Registration

Each registration shall be limited to the discharge at or from one site; no registration shall cover discharges at or from more than one site.

(c) Contents of Registration

(1) Fees

(A) Registration Fee

A registration, if required, shall not be deemed complete unless the registration fee has been paid in full.

(i) Locally Approvable Projects

A registration fee of $625.00 shall be submitted to the Department with the registration form.

(ii) Locally Exempt Projects

A registration fee shall be submitted with a registration form as follows:

(a) For sites with total disturbance of between one (1) and twenty (20) acres, the fee shall be $3,000.

(b) For sites with total disturbance equal to or greater than twenty (20) acres and less than fifty (50) acres, the fee shall be $4,000.

(c) For sites with total disturbance equal to or greater than fifty (50) acres, the fee shall be $5,000.

The fees for municipalities shall be half of those indicated in subsections (a), (b) and (c) above pursuant to section 22a-6(b) of the Connecticut General Statutes. State and Federal agencies shall pay the full fees specified in this subsection.

(iii) Re-registration

(a) For sites that registered under the previous version of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities prior to September 1, 2012 and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" section (Section 6), the re-registration fee shall be $625 payable with submission of the re-registration form within one hundred twenty (120) days from the effective date of this general permit. If a Notice of Termination is submitted prior to that time, no registration or fee are required.

(b) For sites that registered under the previous version of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities on or after September 1, 2012 and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" section (Section 6), the re-registration fee is waived.

(B) The registration fee shall be paid electronically or by check or money order payable to the Department of Energy & Environmental Protection.

(C) The registration fee is non-refundable.

(2) Registration Form

A registration shall be filed electronically on forms prescribed and provided by the commissioner (available at: www.ct.gov/deep/stormwater) and shall include, but not be limited to, the following:

(A) Legal name, address, and telephone number of the registrant. If the registrant is a person (as defined in Section 2 of this permit) transacting business in Connecticut and is registered with the Connecticut Secretary of the State, provide the exact name as registered with the Connecticut Secretary of the State.

(B) Legal name, address and telephone number of the owner of the property on which the construction activity will take place.

(C) Legal name, address and telephone number of the primary contact for departmental correspondence and inquiries, if different from the registrant.

(D) Legal name, address and telephone number of the developer of the property on which the construction activity is to take place.

(E) Legal name, address and daytime and off-hours telephone numbers of the general contractor(s) or other representative(s), if different from the developer.

(F) Legal name, address and telephone number of any consultant(s), engineer(s) or landscape architect(s) retained by the permittee to prepare the registration and Stormwater Pollution Control Plan.

(G) Location address or description of the site for which the registration is filed.

(H) The estimated duration of the construction activity.

(I) Indication of the normal working hours of the site.

(J) A brief description of the construction activity, including, but not limited to:

(i) Total number of acres to be disturbed, regardless of phasing.

(ii) Assurance that construction is in accordance with the Guidelines and local erosion and sediment control ordinances, where applicable.

(iii) For sites in the Coastal Boundary, documentation that the DEEP Office of Long Island Sound Programs or local governing authority has issued a coastal site plan approval or a determination that the project is exempt from coastal site plan review (see Appendix D) in accordance with section 22a-92 and 22a-93(15) of the Connecticut General Statutes.

(iv) Documentation that the construction activity will not threaten the continued existence of any species listed pursuant to section 26-306 of the Connecticut General Statutes as endangered or threatened and will not result in the destruction or adverse modification of habitat designated as essential to such species (see Appendix A).

(v) For sites discharging to certain impaired waters, as specified in Section 3(*b*)(12), documentation that the construction activity meets the requirements of that section and Section 5(*b*)(3) for authorization under this general permit.

(vi) Assurance that the construction activity is not located within an aquifer protection area (see Appendix C) as mapped under section 22a-354b of the Connecticut General Statutes or, if it is located within an aquifer protection area, that the construction activity will comply with regulations adopted pursuant to section 22a-354i of the Connecticut General Statutes.

(vii) For a proposed locally approvable project, a plan review certification from the appropriate District, qualified soil erosion and sediment control professional, and/or qualified professional engineer in accordance with Section 5(*b*)(10) or (11) or a notice from the District that they were unable to complete the Plan review within the time limits specified in the Memorandum of Agreement in Appendix F.

(K) A brief description of the stormwater discharge, including:

(i) The name of the municipal separate storm sewer system or immediate surface water body or wetland to which the stormwater runoff will discharge;

(ii) Verification of whether or not the site discharges to a tidal wetland (that is not a fresh-tidal wetland) within 500 feet of the discharge point, to a high quality water or to an impaired water with or without a TMDL;

(iii) The name of the watershed or nearest waterbody to which the site discharges.

(iv) Location of the stormwater discharge(s) including latitude and longitude.

(L) The total effective impervious cover for the site before and after the proposed construction activity.

(M) Documentation that the proposed construction activity has been reviewed for consistency with state Historic Preservation statutes, regulations, and policies including identification of any potential impacts on property listed or eligible for listing on the Connecticut Register of Historic Places. A review conducted for an Army Corps of Engineers Section 404 wetland permit would meet this qualification. Refer to Appendix G for guidance on conducting the required review.

(N) Registrants for locally approvable projects may, if they choose, attach an electronic copy of their Plan to their registration or provide a web address where their Plan may be downloaded. If an electronic plan is not provided, the registrant is still subject to the requirements for submission of a Plan to the commissioner or a member of the public pursuant to the "Plan Availability" section (Section 4(e)(2)). An electronic Plan shall be in Adobe™ PDF format or similar publicly available format in common use. **DO NOT INCLUDE** in the Plan any pages or other material that do not pertain to stormwater management or erosion and sedimentation control (such as electrical and lighting plans, boundary or lot surveys, building plans, non-stormwater related detail sheets, etc.).

(O) Registrants for all locally exempt projects must submit an electronic copy of their Plan or a web address where the electronic Plan can be downloaded. The electronic Plan shall be in Adobe™ PDF format or similar publicly available format in common use. **DO NOT INCLUDE** in this Plan any pages or other material that do not pertain to stormwater management or erosion and sedimentation control (such as electrical and lighting plans, boundary or lot surveys, building plans, non-stormwater related detail sheets, etc.).

(P) The certification of the registrant and of the individual or individuals responsible for actually preparing the registration, in accordance with Section 3(*b*)(8).

(Q) For all registrations, a design certification must be signed by a professional engineer in accordance with Section 3(*b*)(9).:

(R) For registrations for locally approvable projects a review certification must be signed by either: (i) a District in accordance with Section 3(*b*)(10), or (ii) a qualified soil erosion and sediment control professional and/or qualified professional engineer in accordance with either Section 3(*b*)(11).

If the registrant is not capable of submitting electronically, a paper form may be submitted in accordance with Section 4(*d*).

(3) Re-Registration Form

For sites previously registered under any previous version of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and for which no Notice of Termination has been submitted pursuant to the "Termination Requirements" section (Section 6), a re-registration shall be filed electronically pursuant to Sections 3(*c*)(3) and 3(*g*) on forms prescribed and provided by the commissioner (available at: www.ct.gov/deep/stormwater) and shall include, but not be limited to, the following:

(A) Legal name, address, and telephone number of the registrant. If the registrant is a person (as defined in Section 2 of this permit) transacting business in Connecticut and is registered with the Connecticut Secretary of the State, provide the exact name as registered with the Connecticut Secretary of the State.

(B) The previously issued permit number (beginning with GSN).

(C) Legal name, address and telephone number of the owner of the property on which the construction activity will take place.

(D) Legal name, address and telephone number of the primary contact for departmental correspondence and inquiries, if different from the registrant.

(E) Legal name, address and telephone number of the developer of the property on which the subject construction activity is to take place.

(F) Legal name, address and daytime and off-hours telephone numbers of the general contractor(s) or other representative(s), if different from the developer.

(G) Legal name, address and telephone number of any consultant(s) or engineer(s) retained by the permittee to prepare the registration and Stormwater Pollution Control Plan.

(H) Location address or description of the site for which the re-registration is filed.

(I) Indication of the normal working hours of the site.

(J) The estimated duration of the construction activity.

(K) The signature of the registrant and of the individual or individuals responsible for actually preparing the re-registration, each of who shall certify in writing as follows:

"I hereby certify that I am making this certification in connection with a registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY] and that all terms and conditions of the general permit are being met for all discharges which have been initiated and such activity is eligible for authorization under such permit. I further certify that all designs and plans for such activity meet the current terms and conditions of the general permit in accordance with Section 5(b)(5)(C) of such general permit and that a system is in place to ensure that all terms and conditions of this general permit will continue to be met for all discharges authorized by this general permit at the site. I certify that the registration filed pursuant to this general permit is on complete and accurate forms as prescribed by the commissioner without alteration of their text. I certify that I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section

3(*b*)(8)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I also understand that knowingly making any false statement made in the submitted information and in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

If the registrant is not capable of submitting electronically, a paper form may be submitted in accordance with Section 4(*d*).

(d) Where to File a Registration

A registration (available at: www.ct.gov/deep/stormwater) shall be filed electronically with the commissioner in accordance with Section 3(*c*)(2) or (3). If the registrant does not have the capability to submit electronically, a paper registration may be filed at the following address:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

(e) Availability of Registration and Plan

By the fifteenth (15th) day of each month, the commissioner shall post on the DEEP website a list of registrations submitted in the previous month.

(1) Registration Availability

On or before fifteen (15) days from the date of posting by the commissioner, members of the public may review and comment on a registration. Any electronically available Plans will be posted with the corresponding registration.

(2) Plan Availability

(A) Electronic Plan Availability

For an electronically available Plan, on or before fifteen (15) days from the date of posting by the commissioner, members of the public may review and comment on a registrant's Plan.

(B) Non-Electronic Plan Availability

For any Plan that is not electronically available, on or before fifteen (15) days from the date of a registration posting by the commissioner, members of the public may submit a written request to the commissioner to obtain a copy of a registrant's Plan. The commissioner shall inform the registrant of the request and the name of the requesting party. If the commissioner does not already have access to a copy of the requested Plan, the registrant shall submit a copy of their Plan to the commissioner within seven (7) days of their receipt of such request. On or before fifteen (15) days from the date the commissioner makes a Plan available to the requesting party, they may submit written comments on the Plan to the commissioner.

(f) Additional Information

The commissioner may require a permittee to submit additional information that the commissioner reasonably deems necessary to evaluate the consistency of the subject construction activity with the requirements for authorization under this general permit.

(g) Additional Notification

For discharges authorized by this general permit to a regulated municipal separate storm sewer system, a copy of the registration and all attachments thereto shall also be submitted to the owner and operator of that system.

For discharges authorized by this general permit to a DOT separate storm sewer system, a copy of the registration and all attachments thereto shall also be submitted to the DOT upon request.

For discharges within a public drinking water supply watershed or aquifer area, a copy of the registration and the Plan described in subsection 5(*b*) of this general permit shall be submitted to the water company.

For discharges to river components and tributaries which have been designated as Wild and Scenic under the Wild and Scenic Rivers Act, a copy of the registration and the Plan described in 5(*b*) of this general permit shall be submitted to the applicable Wild and Scenic Coordinating Committee. Please refer to Appendix H for additional guidance

In addition, a copy of this registration and the Plan shall be available upon request to the local inland wetlands agency established pursuant to section 22a-42 of the Connecticut General Statutes, or its duly authorized agent.

(h) Action by Commissioner

(1) The commissioner may reject without prejudice a registration if it does not satisfy the requirements of the "Contents of Registration" section (subsection 4(*c*)) of this general permit. Any registration refiled after such a rejection shall be accompanied by the fee specified in the "Fees" subsection (subsection 4(*c*)(1)) of this general permit.

(2) The commissioner may disapprove a registration if is inconsistent with the requirements for authorization under the "Requirements for Registration" section (Section 3(*b*)) of this general permit, or for any other reason provided by law.

(3) Disapproval of a registration under this subsection shall constitute notice to the registrant that the subject construction activity must be authorized under an individual permit.

(4) Rejection or disapproval of a registration shall be in writing.

(i) Transition to New General Permit

On or after August 1, 2013, up until and including August 31, 2013, a person filing a new registration for a site may file such registration: (a) under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities that expires on September 30, 2013; or (b) this general permit. A person filing a new registration for a site shall <u>not</u> register under both the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities that expires on September 30, 2013 and this general permit. After August 31, 2013, a person filing a new registration for a site shall only register under this general permit and shall be authorized pursuant to Section 3(*g*) of this general permit.

(Note: Any person who, on or after August 1, 2013, up until and including August 31, 2013, files a new registration for a site under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities that expires on September 30, 2013 shall, after October 1, 2013, re-register such site pursuant to Section 3(*c*)(3) and Section 4(*c*)(3) of this general permit.)

A person re-registering a site pursuant to Section 3(*c*)(3) and Section 4(*c*)(3) of this general permit may submit the required re-registration information anytime on or after August 1, 2013.

(j) Latest Date to Submit a Registration Under this General Permit

No person shall submit a registration under this general permit after June 30, 2018.

Section 5. Conditions of this General Permit

The permittee shall meet all requirements of this general permit at all times. In addition, a permittee shall be responsible for conducting authorized construction activities in accordance with the following conditions:

(a) Conditions Applicable to Certain Discharges

(1) Structures and Dredging in Coastal and Tidal Areas

Any person who or municipality that discharges stormwater into coastal tidal waters for which a permit is required under section 22a-361 of the Connecticut General Statutes (structures and dredging) or section 22a-32 of the Connecticut General Statutes (Tidal Wetlands Act), shall obtain such permit(s) from the commissioner. A tidal wetland permit is required for the placement of any sediment upon a tidal wetland, whether it is deposited directly or indirectly.

(2) Discharges to Tidal Wetlands

Any site which has a post-construction stormwater discharge to a tidal wetland (that is not a fresh-tidal wetland) where such discharge is within 500 feet of the tidal wetland, shall discharge such stormwater through a system designed to retain and infiltrate the volume of stormwater runoff generated by 1 inch of rainfall on the site. If there are site constraints that would prevent retention of this volume on-site (e.g., brownfields, capped landfills, bedrock, elevated groundwater, etc.), documentation must be submitted, for the commissioner's review and written approval, which explains the site limitations and offers an alternative retention volume. In such cases, the portion of 1 inch that cannot be retained must be provided with additional stormwater treatment so as to protect water quality. Any such treatment shall be designed, installed and maintained in accordance with the Stormwater Quality Manual.

For sites unable to comply with this section, the commissioner, at the commissioner's sole discretion, may require the submission of an individual permit in lieu of authorization under this general permit.

(3) Toxicity to Aquatic and Marine Life

The discharge shall not cause pollution due to acute or chronic toxicity to aquatic and marine life, impair the biological integrity of aquatic or marine ecosystems, or result in an unacceptable risk to human health.

(4) Water Quality Standards

The stormwater discharge shall not cause or contribute to an exceedance of the applicable Water Quality Standards in the receiving water.

(5) High Quality Waters

Any new or increased stormwater discharge to high quality waters shall be discharged in accordance with the Connecticut Anti-Degradation Implementation Policy in the Water Quality Standards.

(b) Stormwater Pollution Control Plan

All registrants shall develop and maintain on-site a Stormwater Pollution Control Plan (Plan) for the construction activity authorized by this general permit. Once the construction activity begins, the permittee shall perform all actions required by such Plan and shall maintain compliance with the Plan thereafter. The Plan shall be designed to minimize (as defined in Section 2): (1) pollution caused by soil erosion and sedimentation during and after construction; and (2) stormwater pollution caused by use of the site after construction is completed.

(1) Development and Contents of Plan

(A) The Plan shall consist of site plan drawings and a narrative. The Plan shall be prepared in accordance with sound engineering practices, and shall be consistent with the Guidelines and the 2004 Connecticut Stormwater Quality Manual (available at http://www.ct.gov/deep/stormwater). The Plan shall also be consistent with any remedial action plan, closure plan or other plan required by any other DEEP permit.

(B) The Plan shall include, at a minimum, the following items:

(i) Site Plan

Site drawings indicating drainage patterns and approximate slopes anticipated after major grading activities, areas of soil disturbance, the location of major structural and non-structural controls (as specified in subsection 5(*b*)(2), below), the location of areas where stabilization practices are expected to occur, areas which will be vegetated following construction, monitored outfalls, surface waters, impaired waters (identifying those with and without a TMDL), high quality waters, inland wetlands, tidal wetlands, fresh-tidal wetlands, and locations where stormwater will be discharged to a surface water (both during and post-construction);

(ii) Site Description

(a) A narrative description of the nature of the construction activity;

(b) An estimate of the total area of the site and the total area of the site that is expected to be disturbed by construction activities;

(c) An estimate of the average runoff coefficient of the site after construction activities are completed;

(d) The name of the immediate receiving water(s) and the ultimate receiving water(s) of the discharges authorized by this general permit; and

(e) Extent of wetland acreage on the site.

(iii) Construction Sequencing

The Plan shall clearly identify the expected sequence of major construction activities on the site and corresponding erosion and sediment controls and shall include an estimated timetable for all construction activities, which shall be revised as necessary to keep the Plan current. Wherever possible, the site shall be phased to avoid the disturbance of over five acres at one time (or a lesser area of disturbance as required in the "Impaired Waters" section (Section 5(*b*)(3)). The Plan shall clearly show the limits of disturbance for the entire construction activity and for each phase.

(iv) Control Measures

The Plan shall include a description, in narrative and on the site plan drawings, of appropriate control measures that will be performed at the site to minimize the discharge of pollutants to waters of the state. Control measures shall be implemented in accordance with Section 5(*b*)(2) below. In addition, the following information shall be provided:

(a) Calculations supporting the design of sediment and floatables removal controls pursuant to Section 5(*b*)(2)(C)(ii)(b).

(b) Calculations supporting the design of velocity dissipation controls pursuant to Section 5(*b*)(2)(C)(ii)(c).

(v) Runoff Reduction and Low Impact Development (LID) Information

Where runoff reduction practices and/or LID measures are utilized, the following information shall be included in the site plan and narrative:

(a) The location of the site's streams, floodplains, all wetlands, riparian buffers, slopes 3:1 and steeper, and vegetation identified for preservation and non-disturbance during construction such as forested areas, hay fields, and old fields;

(b) Natural drainage patterns, swales, and other drainage ways, that are not streams, floodplains, or wetland areas;

(c) The location of all areas with soils suitable for infiltration[1] and areas of the site best suited for infiltration for the siting of runoff reduction practices and LID design measures;

(d) The location of all areas unsuitable or least suitable for infiltration for the siting of areas of development/building;

(e) The location of all post-construction stormwater management measures, runoff reduction practices and LID design measures developed pursuant to subsection 5(*b*)(2)(C)(i) below;

(f) Identification of areas inappropriate for the infiltration of stormwater runoff from land uses with a significant potential for groundwater pollution;

1 Infiltration rates must be measured by a field permeability test. The measured field design infiltration rate is equal to one-half the field-measured infiltration rate.

(g) A narrative describing the nature, purpose, implementation and long-term maintenance of the post-construction measures, runoff reduction practices and LID design measures;

(h) Calculations, for measures developed pursuant to Section 5(*b*)(2)(C)(i), illustrating the retention of the water quality volume or half the water quality volume for the site, as applicable, including a discussion of the impact of any runoff reduction and/or LID practices on these calculations.

(i) A narrative describing any site constraints that prevent retention of the appropriate volume specified in Section 5(*b*)(2)(C)(i) including: an explanation of the site limitations; a description of the runoff reduction practices implemented; an explanation of why the amount retained constitutes the maximum extent achievable; an alternative retention volume; and a description of the measures used to provide additional stormwater treatment for sediment, floatables and nutrients above the alternate volume up to the water quality volume.

(j) Calculations showing the proposed effective impervious cover for the site and, where necessary or appropriate for measures developed for linear projects pursuant to Section 5(*b*)(2)(C)(i), each outfall drainage area.

(vi) Inspections

The Plan shall include a narrative of all inspection personnel conducting the routine inspections, their responsibilities and procedures pursuant to subsection 5(*b*)(4)(B) below. The Plan shall also include documentation of the qualifications of the inspector(s) and the findings, actions and results of all inspections conducted at the site.

(vii) Monitoring

The Plan shall provide a narrative of the stormwater monitoring procedures pursuant to Section 5(*c*). This narrative shall include documentation of the monitoring frequency, personnel conducting monitoring, identification of monitored outfalls, methodology for monitoring, provisions for monitoring a linear project (if applicable), the site's normal working hours, the method for measuring turbidity and a copy of all monitoring records.

(viii) Contractors

(a) The Plan shall clearly identify each contractor and subcontractor that will perform construction activities on the site that have the potential to cause pollution of the waters of the State. The Plan shall include a copy of the certification statement in the "Contractor Certification Statement" section, below, signed by each such contractor and subcontractor.

(b) Contractor Certification Statement

The Plan shall include the following certification signed by each contractor and subcontractor identified in the Plan as described above:

"I certify under penalty of the law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that as a contractor or

subcontractor at the site, I am authorized by this general permit, and must comply with the terms and conditions of this general permit, including, but not limited to, the requirements of the Stormwater Pollution Control Plan prepared for the site."

The certification shall include the name and title of the person providing the signature; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made.

(c) Subdivisions

Where individual lots in a subdivision or other common plan of development are conveyed or otherwise the responsibility of another person or municipality, those individual lot contractors shall be required to comply with the provisions of this general permit and the Stormwater Pollution Control Plan, and shall sign the certification statement in the "Contractor Certification Statement" section, above, regardless of lot size or disturbed area. In such cases, the permittee shall provide a copy of the Plan to each individual lot contractor, obtain signed certifications from such contractors and retain all signed certifications in the Plan.

(ix) Impaired Waters

For construction activities that discharge to impaired waters, as specified in "New Discharges to Impaired Waters" (Section 3(*b*)(12)), the Plan shall include a description of the provisions for controlling the construction and post-construction stormwater discharges to these waters pursuant to subsection 5(*b*)(3) below.

(2) Stormwater Control Measures

Control Measures are required Best Management Practices (BMPs) that the permittee must implement to minimize the discharge of pollutants from the permitted activity. The term "minimize" means reduce and/or eliminate to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice.

Control Measures shall be designed in accordance with the Guidelines, the Stormwater Quality Manual or the DOT Qualified Products List (http://www.ct.gov/dot/lib/dot/documents/dresearch/conndot_qpl.pdf). Use of controls to comply with the "Erosion and Sediment Controls" section (subsection (A) below) of this general permit that are not included in those resources must be approved by the commissioner or the commissioner's designated agent. The narrative and drawings of controls shall address the following minimum components:

(A) Erosion and Sediment Controls

(i) Soil Stabilization and Protection

The Plan shall include a narrative and drawings of interim and permanent soil stabilization practices for managing disturbed areas and soil stockpiles, including a schedule for implementing the practices. The Permittee shall ensure that existing vegetation is preserved to the maximum extent practicable and that disturbed portions of the site are minimized and stabilized.

Where construction activities have permanently ceased or when final grades are reached in any portion of the site, stabilization and protection practices as specified in Chapter 5 of the Guidelines or as approved by the commissioner or his/ her designated agent shall be implemented within seven days. Areas that will remain disturbed but inactive for at least thirty days shall receive temporary seeding or soil protection within seven days in accordance with the Guidelines.

Areas that will remain disturbed beyond the seeding season as identified in the Guidelines, shall receive long-term, non-vegetative stabilization and protection sufficient to protect the site through the winter. In all cases, stabilization and protection measures shall be implemented as soon as possible in accordance with the Guidelines or as approved by the commissioner or his/ her designated agent.

A reverse slope bench is required for any slope steeper than 3:1 (horizontal: vertical) that exceeds 15 feet vertically, except when engineered slope stabilization structures or measures are included or a detailed soil mechanics analysis has been conducted to verify stability. Engineered analyses and measures must be designed by a CT licensed Professional Engineer with experience in geotechnical engineering or soil mechanics.

(ii) Structural Measures

The Plan shall include a narrative and drawings of structural measures to divert flows away from exposed soils, store flows or otherwise limit runoff and minimize the discharge of pollutants from the site. Unless otherwise specifically approved in writing by the commissioner or his/ her designated agent, or if otherwise authorized by another state or federal permit, structural measures shall be installed on upland soils.

For points of discharge from disturbed sites with a total contributing drainage area of between two to five acres, a temporary sediment trap must be installed in accordance with the Guidelines. For points of discharge from disturbed sites with a total contributing drainage area greater than five acres, a temporary basin must be designed and installed in accordance with the Guidelines. Such trap(s) or basin(s) must be maintained until final stabilization of the contributing area as defined in "Notice of Termination" (Section 6(a)).

The requirement for sediment traps or basins shall not apply to flows from off-site areas and flows from the site that are either undisturbed or have undergone final stabilization where such flows are diverted around the temporary sediment trap or basin. Any exceptions must be approved in writing by the commissioner or his/ her designated agent.

(iii) Maintenance

The Plan shall include a narrative of the procedures to maintain in good and effective operating conditions all erosion and sediment control measures, including vegetation, and all other protective measures identified in the site plan. Maintenance of all erosion and sediment controls shall be performed in accordance with the Guidelines, or more frequently as necessary, to protect the waters of the state from pollution.

(B) Dewatering Wastewaters

Dewatering wastewaters shall be managed in accordance with the Guidelines. Dewatering wastewaters discharged to surface waters shall be discharged in a manner that minimizes the discoloration of the receiving waters. The Plan shall include a narrative and drawings of the

operational and structural measures that will be used to ensure that all dewatering wastewaters will not cause scouring or erosion or contain suspended solids in amounts that could reasonably be expected to cause pollution of surface waters of the State. Unless otherwise specifically approved in writing by the commissioner or his/ her designated agent, or if otherwise authorized by another state or federal permit, dewatering measures shall be installed on upland soils.

No discharge of dewatering wastewater(s) shall contain or cause a visible oil sheen, floating solids, or foaming in the receiving water.

(C) Post-Construction Stormwater Management

The Plan shall include a narrative and drawings of measures that will be installed during the construction process to minimize the discharge of pollutants in stormwater discharges that will occur after construction operations have been completed. Post-construction stormwater management measures shall be designed and implemented in accordance with the Stormwater Quality Manual, the DOT Qualified Products List or as approved by the commissioner or his/ her designated agent in writing. Unless otherwise specifically provided by the commissioner in writing, or authorized by another state or federal permit, structural measures shall be placed on upland soils. The Plan shall include provisions to address the long-term maintenance of any post-construction stormwater management measure installed.

(i) Post-Construction Performance Standards

The permittee shall utilize runoff reduction practices (as defined in Section 2) to meet runoff volume requirements based on the conditions below. For sites unable to comply with these conditions, the commissioner, at the commissioner's sole discretion, may require the submission of an individual permit in lieu of authorization under this general permit.

(a) Redevelopment

For sites that are currently developed with an effective impervious cover of forty percent or more and for which the permittee is proposing redevelopment, the permittee shall design the site in such a manner as to retain on-site half the water quality volume (as defined in Section 2) for the site and provide additional stormwater treatment without retention for discharges up to the full water quality volume for sediment, floatables and nutrients to the maximum extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice. In cases where the permittee is not able to retain half the water quality volume, the permittee shall design the redevelopment to retain runoff volume to the maximum extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice. In such cases, additional stormwater treatment up to the full water quality volume is still required. Any such treatment shall be designed, installed and maintained in accordance with the Stormwater Quality Manual. If retention of the half the water quality volume is not achieved, the permittee shall submit a report to the commissioner describing: the measures taken to maximize runoff reduction practices on the site; the reasons why those practices constitute the maximum extent achievable; the alternative retention volume; and a description of the measures used to provide additional stormwater treatment above the alternate volume up to the water quality volume. In the case of linear redevelopment projects (e.g. roadway reconstruction or widening) for the developed portion of

the right of way: (1) for projects that may be unable to comply with the full retention standard, the alternate retention and treatment provisions may also be applied as specified above, or (2) for projects that will not increase the effective impervious cover within a given watershed, the permittee shall implement the additional stormwater treatment measures referenced above, but will not be required to retain half of the water quality volume.

(b) Other Development

The following performance standard applies to all sites that are currently undeveloped or are currently developed with less than forty percent effective impervious cover. For these sites, the permittee shall design the site to retain the water quality volume for the site. If there are site constraints that would prevent retention of this volume on-site (e.g., brownfields, capped landfills, bedrock, elevated groundwater, etc.), documentation must be submitted, for the commissioner's review and written approval, which: explains the site limitations; provides a description of the runoff reduction practices implemented; provides an explanation of why this constitutes the maximum extent achievable; offers an alternative retention volume; and provides a description of the measures used to provide additional stormwater treatment for sediment, floatables and nutrients above the alternate volume up to the water quality volume. Any such treatment shall be designed, installed and maintained in accordance with the Stormwater Quality Manual. In the case of linear projects that do not involve impervious surfaces (e.g. electrical transmission rights-of-way or natural gas pipelines), retention of the water quality volume is not required as long as the post-development runoff characteristics do not differ significantly from pre-development conditions.

(ii) Post-Construction Control Measures

(a) Runoff Reduction and Low Impact Development ("LID") Practices

The site design shall incorporate runoff reduction practices, low impact development ("LID") practices or other measures to meet the performance standards in subsection (i) above, promote groundwater recharge and minimize post-construction impacts to water quality. Please refer to Appendix B for additional guidance information.

(b) Suspended Solids and Floatables Removal

The permittee shall install post-construction stormwater management measures designed to minimize the discharge of suspended solids and floatables (e.g. oil and grease, other floatable liquids, floatable solids, trash, etc.) from stormwater. A goal of 80 percent removal of the annual sediment load from the stormwater discharge shall be used in designing and installing stormwater management measures. The Plan shall provide calculations supporting the capability of such measures in achieving this goal and any third-party verification, as applicable, of the sediment removal efficiencies of such measures. This goal is not intended to limit local approval authorities from requiring a higher standard pursuant to local requirements.

(c) Velocity Dissipation

Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow to the receiving watercourse so that the natural physical and biological characteristics and functions are maintained and protected.

(D) Other Controls

The following additional controls shall be implemented:

(i) Waste Disposal: Best management practices shall be implemented to minimize the discharge of litter, debris, building materials, hardened concrete waste, or similar materials to waters of the State. A narrative of these practices shall be provided in the Plan.

(ii) Washout Areas

Washout of applicators, containers, vehicles and equipment for concrete, paint and other materials shall be conducted in a designated washout area. There shall be no surface discharge of washout wastewaters from this area. Such washout shall be conducted: (1) outside of any buffers and at least 50 feet from any stream, wetland or other sensitive resource; or (2) in an entirely self-contained washout system. The permittee shall clearly flag off and designate areas to be used for washing and conduct such activities only in these areas. The permittee shall direct all washwater into a container or pit designed such that no overflows can occur during rainfall or after snowmelt.

In addition, dumping of liquid wastes in storm sewers is prohibited. The permittee shall remove and dispose of hardened concrete waste consistent with practices developed for the "Waste Disposal" section (subparagraph 5(*b*)(2)(D)(i), above). At least once per week, the permittee must inspect any containers or pits used for washout to ensure structural integrity, adequate holding capacity, and to check for leaks or overflows. If there are signs of leaks, holes or overflows in the containers or pits that could lead to a discharge, the permittee shall repair them prior to further use. For concrete washout areas, the permittee shall remove hardened concrete waste whenever the hardened concrete has accumulated to a height of ½ of the container or pit or as necessary to avoid overflows. A narrative of maintenance procedures and a record of maintenance and inspections shall be included in the Plan.

(iii) Off-site vehicle tracking of sediments and the generation of dust shall be minimized. Wet dust suppression shall be used, in accordance with section 22a-174-18(b) of the Connecticut General Statutes, for any construction activity that causes airborne particulates. The volume of water sprayed for controlling dust shall be minimized so as to prevent the runoff of water. No discharge of dust control water shall contain or cause a visible oil sheen, floating solids, visible discoloration, or foaming in the receiving stream.

(iv) All post-construction stormwater structures shall be cleaned of construction sediment and any remaining silt fence shall be removed upon stabilization of the site.

(v) All chemical and petroleum product containers stored on the site (excluding those contained within vehicles and equipment) shall be provided with impermeable containment which will hold at least 110% of the volume of the largest container, or

10% of the total volume of all containers in the area, whichever is larger, without overflow from the containment area. All chemicals and their containers shall be stored under a roofed area except for those chemicals stored in containers of 100 gallon capacity or more, in which case a roof is not required. Double-walled tanks satisfy this requirement.

(3) Additional Control Measures for Impaired Waters

For construction activities that discharge directly to impaired waters, as specified in "New Discharges to Impaired Waters" (Section 3(*b*)(12)), the Plan shall include the following provisions:

(A) In lieu of the provisions of "Construction Sequencing" (Section 5(*b*)(1)(B)(iii)), no more than 3 acres may be disturbed at any one time. For those areas for which construction activity will be temporarily suspended for a period of greater than 14 days, temporary stabilization measures shall be implemented within 3 days of such suspension of activity. For all areas, permanent stabilization shall be implemented within 30 days of disturbance; ***or***

(B) The Plan shall document that measures are in place to ensure that there will be no discharge to the impaired water from rain events up to a 2-year, 24-hour rain event while construction activity is occurring; ***or***

(C) For discharges to impaired waters with an established TMDL:

(i) the Plan shall document that there is sufficient remaining Waste Load Allocation (WLA) in the TMDL to allow the discharge, ***and***

(ii) measures shall be implemented to ensure the WLA will not be exceeded, ***and***

(iii) stormwater discharges shall be monitored, if applicable, for any indicator pollutant identified in the TMDL for every rain event that produces a discharge to ensure compliance with the WLA. Such monitoring shall be in addition to the requirements specified in Section 5(*c*), ***or***

(iv) the specific requirements for stormwater discharges specified in the TMDL are met.

Construction activities discharging to impaired waters that do not comply with this subsection are not authorized by this general permit.

(4) Inspections

All construction activities submitting a registration for this general permit shall be inspected initially for Plan implementation and then weekly for routine inspections.

(A) Plan Implementation Inspections

Within the first 30 days following commencement of the construction activity on the site, the permittee shall contact: (1) the appropriate District; or (2) a qualified soil erosion and sediment control professional or a qualified professional engineer to inspect the site. The site shall be inspected at least once and no more than three times during the first 90 days to confirm compliance with the general permit and proper initial implementation of all controls measures designated in the Plan for the site for the initial phase of construction. For sites not inspected by District personnel, the following conditions shall apply:

(i) for projects disturbing more than one acre and less than fifteen (15) acres, the inspector shall be someone who:

(a) is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the registrant, and

(b) has no ownership interest of any kind in the project for which the registration is being submitted.

(ii) for projects disturbing fifteen (15) acres or more, the inspector shall be someone who:

(a) is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the registrant, and

(b) has not engaged in any activities associated with the preparation, planning, designing or engineering of such plan for soil erosion and sediment control or plan for engineered stormwater management systems on behalf of such registrant, and

(c) is not under the same employ as any person who engaged in any activities associated with the preparation, planning, designing or engineering of such plans and specifications for soil erosion and sediment control or plans and specifications for engineered stormwater management systems on behalf of such registrant, and

(d) has no ownership interest of any kind in the project for which the registration is being submitted.

The permittee may use, if they wish, the same person(s) that provided the Plan Review Certification pursuant to Section 5(*b*)(11).

(B) Routine Inspections

The permittee shall routinely inspect the site for compliance with the general permit and the Plan for the site until a Notice of Termination has been submitted. Inspection procedures for these routine inspections shall be addressed and implemented in the following manner:

(i) The permittee shall maintain a rain gauge on-site to document rainfall amounts. At least once a week and within 24 hours of the end of a storm that generates a discharge, a qualified inspector (provided by the permittee), as defined in the "Definitions" section (Section 2) of this general permit, shall inspect, at a minimum, the following: disturbed areas of the construction activity that have not been finally stabilized; all erosion and sedimentation control measures; all structural control measures; soil stockpile areas; washout areas and locations where vehicles enter or exit the site. These areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system and impacts to the receiving waters. Locations where vehicles enter or exit the site shall also be inspected for evidence of off-site sediment tracking. For storms that end on a weekend, holiday or other time after which normal working hours will not commence within 24 hours, an inspection is required within 24 hours only for storms that equal or exceed 0.5 inches. For storms of less than 0.5 inches, an inspection shall occur immediately upon the start of the subsequent normal working hours. Where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three months.

(ii) The qualified inspector(s) shall evaluate the effectiveness of erosion and sediment controls, structural controls, stabilization practices, and any other controls implemented

to prevent pollution and determine if it is necessary to install, maintain, or repair such controls and/or practices to improve the quality of stormwater discharge(s).

(iii) A report shall be prepared and retained as part of the Plan. This report shall summarize: the scope of the inspection; name(s) and qualifications of personnel making the inspection; the date(s) of the inspection; weather conditions including precipitation information; major observations relating to erosion and sediment controls and the implementation of the Plan; a description of the stormwater discharge(s) from the site; and any water quality monitoring performed during the inspection. The report shall be signed by the permittee or his/her authorized representative in accordance with the "Certification of Documents" section (subsection 5(*i*)) of this general permit.

The report shall include a statement that, in the judgment of the qualified inspector(s) conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the Plan and permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance. Non-engineered corrective actions (as identified in the Guidelines) shall be implemented on site within 24 hours and incorporated into a revised Plan within three (3) calendar days of the date of inspection unless another schedule is specified in the Guidelines. Engineered corrective actions (as identified in the Guidelines) shall be implemented on site within seven (7) days and incorporated into a revised Plan within ten (10) days of the date of inspection, unless another schedule is specified in the Guidelines or is approved by the commissioner. During the period in which any corrective actions are being developed and have not yet been fully implemented, interim measures shall be implemented to minimize the potential for the discharge of pollutants from the site.

(iv) Inspectors from the DEEP and the appropriate District may inspect the site for compliance with this general permit at any time construction activities are ongoing and upon completion of construction activities to verify the final stabilization of the site and/or the installation of post-construction stormwater management measures pursuant to Section 6(*a*).

(v) Additional inspections, reports and documentation may also be required to comply with the "Monitoring Requirements" section (Section 5(*c*)).

(5) Keeping Plans Current

The Permittee is responsible for keeping their Plan in compliance with this general permit at all times. This may involve any or all of the following:

(A) The permittee shall amend the Plan if the actions required by the Plan fail to prevent pollution or fail to otherwise comply with any other provision of this general permit. The Plan shall also be amended whenever there is a change in contractors or subcontractors at the site, or a change in design, construction, operation, or maintenance at the site which has the potential for the discharge of pollutants to the waters of the state and which has not otherwise been addressed in the Plan.

(B) The commissioner may notify the permittee at any time that the Plan and/or the site do not meet one or more of the minimum requirements of this general permit. Within 7 days of such notice, or such other time as the commissioner may allow, the permittee shall make the required changes to the Plan and perform all actions required by such revised Plan. Within 15 days of such notice, or such other time as the commissioner may allow, the permittee shall submit to the commissioner a written certification that the requested changes have been

made and implemented and such other information as the commissioner requires, in accordance with the 'Duty to Provide Information" and "Certification of Documents" sections (subsections 5(*h*) and 5(*i*)) of this general permit.

(C) For any stormwater discharges authorized under any previous version of this general permit, the existing Plan shall be updated by February 1, 2014, as applicable, in accordance with the "Development and Contents of the Plan" (subsection 5(*b*)(1)), "Stormwater Control Measures" (subsection 5(*b*)(2)), "Routine Inspections" (subsection 5(*b*)(4)(B)), and "Monitoring" (subsection 5(*c*)) sections of this general permit, except for the post-construction measures in subsection 5(*b*)(2)(C)(i)(a) & (b) and 5(*b*)(2)(C)(ii)(a). The permittee shall maintain compliance with such Plan thereafter. For previously authorized sites discharging to impaired waters or other sensitive areas, the commissioner may require additional control measures or provide authorization under an individual permit pursuant to Sections 4(*h*) and 3(*i*).

(6) Failure to Prepare, Maintain or Amend Plan

In no event shall failure to complete, maintain or update a Plan, in accordance with the "Development of Contents of the Plan" and "Keeping Plans Current" sections (subsections 5(*b*)(1) and 5(*b*)(5)) of this general permit, relieve a permittee of responsibility to implement any actions required to protect the waters of the state and to comply with all conditions of the permit.

(7) Plan Signature

The Plan shall be signed and certified as follows:

(A) The Plan shall be signed by the permittee in accordance with the "Certification of Documents" section (subsection 5(*i*)) of this general permit.

(B) The Plan shall include certification by all contractors and subcontractors in accordance with the "Contractors" section (subsection 5(*b*)(1)(B)(viii)) of this general permit.

(C) The Plan shall include a copy of the certification by a professional engineer or landscape architect made in accordance with Section 3(*b*)(9) of this general permit.

(8) Plan Review Certification

For a locally approvable project pursuant to Section 3(*c*) of this general permit, a copy of the Plan review certification made in accordance with either Section 3(*b*)(10) or (11) shall be maintained with the Plan. Note that construction activities reviewed and certified pursuant to those sections are still subject to the local erosion and sediment control and stormwater management regulations of the municipality in which the activity is conducted.

(9) Plan Submittal

The Plan shall be submitted to the commissioner and other certain parties under the following conditions:

(A) All Locally Exempt Projects with greater than one acre of soil disturbance shall submit an electronic copy of the Plan and a completed Registration Form to the commissioner.

(B) For all other projects, the permittee shall provide a copy of the Plan, and a completed Registration Form for this general permit to the following persons immediately upon request:

(i) The commissioner at his or her request or at the request of a member of the public during the registration and Plan availability period pursuant to Section 4(*e*);

(ii) The municipal planning commission, zoning commission and/or inland wetlands agency, or its respective enforcement officer or designated agent;

(iii) In the case of a stormwater discharge through a municipal separate storm sewer system, the municipal operator of the system;

(iv) In the case of a stormwater discharge located within a public drinking water supply watershed or aquifer area, the water company responsible for that water supply.

DO NOT SUBMIT any pages or other material that do not pertain to stormwater management or erosion and sedimentation control (such as electrical and lighting plans, boundary or lot surveys, building plans, non-stormwater related detail sheets, etc.).

(c) Monitoring Requirements

The primary requirements for monitoring turbidity are summarized in the table below:

Table 1

Area of Soil Disturbance	*Monitoring Required?*	*Monitoring Frequency*	*Sample Method*
Sites which disturb 1 acre or more, but less than 5 acres	Only IF a Registration is required	Monthly IF a Registration is required	Procedure consistent with 40 CFR Part 136
Sites which disturb 5 acres or more	Yes	Monthly	Procedure consistent with 40 CFR Part 136

(1) Turbidity Monitoring Requirements

(A) Monitoring Frequency

(i) Sampling shall be conducted in accordance with Table 1, above, at least once every month, when there is a discharge of stormwater from the site while construction activity is ongoing, until final stabilization of the drainage area associated with each outfall is achieved.

(ii) The permittee is only required to take samples during normal working hours as defined in Section 2. The site's normal working hours must be identified in the Plan pursuant to Section 5(*b*)(1)(B)(vii). If sampling is discontinued due to the end of normal working hours, the permittee shall resume sampling the following morning or the morning of the next working day following a weekend or holiday, as long as the discharge continues.

(iii) Sampling may be temporarily suspended any time conditions exist that may reasonably pose a threat to the safety of the person taking the sample. Such conditions may include high winds, lightning, impinging wave or tidal activity, intense rainfall or other

hazardous condition. Once the unsafe condition is no longer present, sampling shall resume.

(iv) If there is no stormwater discharge during a month, sampling is not required.

(B) Sample Collection

(i) All samples shall be collected from discharges resulting from a storm event that occurs at least 24 hours after any previous storm event generating a stormwater discharge. Any sample containing snow or ice melt must be identified on the Stormwater Monitoring Report form. Sampling of snow or ice melt in the absence of a storm event is not a valid sample.

(ii) Samples shall be grab samples taken *at least* three separate times during a storm event and shall be *representative* of the flow and characteristics of the discharge(s). Samples may be taken manually or by an in-situ turbidity probe or other automatic sampling device equipped to take individual turbidity readings (i.e. not composite). The first sample shall be taken within the first hour of stormwater discharge from the site. In cases where samples are collected manually and the discharge begins outside of normal working hours, the first sample shall be taken at the start of normal working hours.

(C) Sampling Locations

(i) Sampling is required of all point source discharges of stormwater from disturbed areas except as may be modified for linear projects under subparagraph (ii) below. Where there are two or more discharge points that discharge substantially identical runoff, based on similarities of the exposed soils, slope, and type of stormwater controls used, a sample may be taken from just one of the discharge points. In such case, the permittee shall report that the results also apply to the substantially identical discharge point(s). No more than 5 substantially identical outfalls may be identified for one representative discharge. If such project is planned to continue for more than one year, the permittee shall rotate twice per year the location where samples are taken so that a different discharge point is sampled every six months. The Plan must identify each outfall authorized by this permit and describe the rationale for any substantially identical outfall determinations.

(ii) Linear Projects

For a linear project, as defined in Section 2, the protocols of subparagraph (i), above, shall apply except that up to 10 substantially identical outfalls may be identified for one representative discharge.

(iii) All sampling point(s) shall be identified in the Plan and be clearly marked in the field with a flag, stake, or other visible marker.

(D) Sampling and analysis shall be prescribed by 40 CFR Part 136.

(E) Turbidity Values

The stormwater discharge turbidity value for each sampling point shall be determined by taking the average of the turbidity values of all samples taken at that sampling point during a given storm.

(2) Stormwater Monitoring Reports

(A) Within thirty (30) days following the end of each month, permittees shall enter the stormwater sampling result(s) on the Stormwater Monitoring Report (SMR) form (available at www.ct.gov/deep/stormwater) and submit it in accordance with the NetDMR provisions in subsection F, below, or, if the permittee has opted out of NetDMR, to the following address:

Bureau of Materials Management and Compliance Assurance
Water Permitting and Enforcement Division (Attn: DMR Processing)
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

(B) If there was no discharge during any given monitoring period, the permittee shall submit the form as required with the words "no discharge" entered in place of the monitoring results.

(C) If the permittee monitors any discharge more frequently than required by this general permit, the results of this monitoring shall be included in additional SMRs for the month in which the samples were collected.

(D) If sampling protocols are modified due to the limitations of normal working hours or unsafe conditions in accordance with Section 5(c)(1)(A)(ii) or (iii) above, a description of and reason for the modifications shall be included with the SMR.

(E) If the permittee samples a discharge that is representative of two or more substantially identical discharge points, the permittee shall include the names or locations of the other discharge points.

(F) NetDMR Reporting Requirements

(i) Prior to one-hundred and eighty (180) days after the issuance of this permit, the Permittee may either submit monitoring data and other reports to the Department in hard copy form or electronically using NetDMR, a web-based tool that allows Permittees to electronically submit stormwater monitoring reports through a secure internet connection. Unless otherwise approved in writing by the commissioner, no later than one-hundred and eighty (180) days after the issuance of this permit the Permittee shall begin reporting electronically using NetDMR. Specific requirements regarding subscription to NetDMR and submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

(a) Submittal of NetDMR Subscriber Agreement

On or before fifteen (15) days after the issuance of this permit, the Permittee and/or the person authorized to sign the Permittee's discharge monitoring reports ("Signatory Authority") as described in RCSA Section 22a-430-3(b)(2) shall contact the Department at deep.netdmr@ct.gov and initiate the NetDMR subscription process for electronic submission of Stormwater Monitoring Report information. Information on NetDMR is available on the Department's website at www.ct.gov/deep/netdmr. On or before ninety (90) days after issuance of this permit the Permittee shall submit a signed and notarized copy of the *Connecticut DEEP NetDMR Subscriber Agreement* to the Department.

(b) Submittal of Reports Using NetDMR

Unless otherwise approved by the commissioner, on or before one-hundred and eighty (180) days after issuance of this permit, the Permittee and/or the Signatory Authority shall electronically submit SMRs required under this permit to the Department using NetDMR in satisfaction of the SMR submission requirements of Sections 5(*c*)(2)(A) of this permit.

SMRs shall be submitted electronically to the Department no later than the 30th day of the month following the completed reporting period. Any additional monitoring conducted in accordance with 40 CFR 136 shall be submitted to the Department as an electronic attachment to the SMR in NetDMR. Once a Permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of SMRs to the Department. NetDMR is accessed from: http://www.epa.gov/netdmr.

(c) Submittal of NetDMR Opt-Out Requests

If the Permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for electronically submitting SMRs, the commissioner may approve the submission of SMRs in hard copy form ("opt-out request"). Opt-out requests must be submitted in writing to the Department for written approval on or before fifteen (15) days prior to the date a Permittee would be required under this permit to begin filing SMRs using NetDMR. This demonstration shall be valid for twelve (12) months from the date of the Department's approval and shall thereupon expire. At such time, SMRs shall be submitted electronically to the Department using NetDMR unless the Permittee submits a renewed opt-out request and such request is approved by the Department.

All opt-out requests and requests for the NetDMR subscriber form should be sent to the following address or by email at deep.netdmr@ct.gov:

Attn: NetDMR Coordinator
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

(d) Reporting and Record Keeping Requirements

(1) For a period of at least five years from the date that construction is complete, the permittee shall retain copies of the Plan and all reports required by this general permit, and records of all data used to complete the registration for this general permit, unless the commissioner specifies another time period in writing. Inspection records must be retained as part of the Plan for a period of five (5) years after the date of inspection.

(2) The permittee shall retain an updated copy of the Plan required by this general permit at the construction site from the date construction is initiated at the site until the date construction at the site is completed.

(e) Regulations of Connecticut State Agencies Incorporated into this General Permit

The permittee shall comply with sections 22a-430-3 and 22a-430-4 of the Regulations of Connecticut State Agencies which are hereby incorporated into this general permit, as if fully set forth herein.

(f) Reliance on Registration

In evaluating the registrant's registration, the commissioner has relied on information provided by the registrant. If such information proves to be false or incomplete, any authorization reliant on such information may be suspended or revoked in accordance with law, and the commissioner may take any other legal action provided by law.

(g) Duty to Correct and Report Violations

Upon learning of a violation of a condition of this general permit, unless otherwise specified in this general permit, a permittee shall immediately take all reasonable action to determine the cause of such violation, correct and mitigate the results of such violation, prevent further such violation, and report in writing such violation and such corrective action to the commissioner within five (5) days of the permittee's learning of such violation. Such information shall be filed in accordance with the "Certification of Documents" section (Section 5(*i*)) of this general permit.

(h) Duty to Provide Information

If the commissioner requests any information pertinent to the construction activity or to compliance with this general permit or with the permittee's authorization under this general permit, the permittee shall provide such information within fifteen (15) days of such request or other time period as may be specified in writing by the commissioner. Such information shall be filed in accordance with the "Certification of Documents" section (Section 5(*i*)) of this general permit.

(i) Certification of Documents

Unless otherwise specified in this general permit, any document, including but not limited to any notice, information or report, which is submitted to the commissioner under this general permit shall be signed by the permittee, or a duly authorized representative of the permittee, and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with section 22a-6 of the Connecticut General Statutes, pursuant to section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

(j) Date of Filing

For purposes of this general permit, the date of filing with the commissioner of any document is the date such document is received by the commissioner. The word "day" as used in this general permit means the calendar day; if any date specified in the general permit falls on a Saturday, Sunday, or legal holiday, such deadline shall be the next business day thereafter.

(k) False Statements

Any false statement in any information submitted pursuant to this general permit may be punishable as a criminal offense, in accordance with section 22a-6 of the Connecticut General Statutes, pursuant to section 53a-157b of the Connecticut General Statutes.

(l) Correction of Inaccuracies

Within fifteen (15) days after the date a permittee becomes aware of a change in any information in any material submitted pursuant to this general permit, or becomes aware that any such information is inaccurate or misleading or that any relevant information has been omitted, such permittee shall correct the inaccurate or misleading information or supply the omitted information in writing to the commissioner. Such information shall be filed in accordance with the certification requirements prescribed in Section 5(*i*) of this general permit.

(m) Transfer of Authorization

Any authorization issued by the commissioner under this general permit is transferable only in accordance with the provisions of section 22a-6o of the General Statutes. Any person or municipality proposing to transfer any such authorization shall submit a license transfer form to the commissioner. The transferee is not authorized to conduct any activities under this general permit until the transfer is approved by the commissioner (typically 30 days). The transferee may adopt by reference the Plan developed by the transferor. The transferee shall amend the Plan as required by the "Keeping Plans Current" Section 5(b)(5) of this general permit).

(n) Reopener

At such time as the USEPA may institute a new rule for post-construction stormwater management or modify the requirements for their National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Construction Activities (CGP) to institute a numeric Effluent Limitation Guideline (ELG) for turbidity in stormwater discharges from construction activities, the commissioner may reopen this general permit pursuant to the Section 40 Part 122.62(a) of the Code of Federal Regulations for implementation of these elements.

(o) Other Applicable Law

Nothing in this general permit shall relieve the permittee of the obligation to comply with any other applicable federal, state and local law, including but not limited to the obligation to obtain any other authorizations required by such law.

(p) Other Rights

This general permit is subject to and does not derogate any present or future rights or powers of the State of Connecticut and conveys no rights in real or personal property nor any exclusive privileges, and is subject to all public and private rights and to any federal, state, and local laws pertinent to the property or construction activity affected by such general permit. In conducting any construction activity authorized hereunder, the permittee may not cause pollution, impairment, or destruction of the air, water, or other natural resources of this state. The issuance of this general permit shall not create any presumption that this general permit should or will be renewed.

Section 6. Termination Requirements

(a) Notice of Termination

At the completion of a construction project registered pursuant to the "Registration Requirements" section (Section 4) of this general permit, a Notice of Termination must be filed with the commissioner. A project shall be considered complete after all post-construction measures are installed, cleaned and functioning and the site has been stabilized for at least three months following the cessation of construction activities. A site is considered stabilized when there is no active erosion or sedimentation present and no disturbed areas remain exposed **for all phases**.

(1) Post-Construction Inspection

For locally approvable projects, once all post-construction stormwater measures have been installed in accordance with the Post-Construction Stormwater Management section (subsection 5(*b*)(2)(C)) and cleaned of any construction sediment or debris, the registrant shall contact the appropriate Conservation District or a qualified soil erosion and sediment control professional and/or a qualified professional engineer, as appropriate, who will inspect the site to confirm compliance with these post-construction stormwater measures. This person(s) shall not be an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the permittee and shall have no ownership interest of any kind in the project for which the site's registration was submitted.

(2) Final Stabilization Inspection

For all projects, once the site has been stabilized for at least three months, the registrant shall have the site inspected by a qualified inspector to confirm final stabilization. The registrant shall indicate compliance with this requirement on the Notice of Termination form.

(b) Termination Form

A termination notice shall be filed on forms prescribed and provided by the commissioner and shall include the following:

(1) The permit number as provided to the permittee on the permit certificate.

(2) The name of the registrant as reported on the general permit registration form (DEEP-PED-REG-015).

(3) The address of the completed construction site.

(4) The dates when:

(A) All storm drainage structures were cleaned of construction debris pursuant to the "Other Controls" section (subsection 5(*b*)(2)(D)) of this general permit; and

(B) The post-construction inspection was conducted pursuant to subsection 6(*a*)(1), above; and

(C) The date of completion of construction; and

(D) The date of the final stabilization inspection pursuant to subsection 6(*a*)(2), above.

(5) A description of the post-construction activities at the site.

(6) Signatures of:

(A) The permittee; and

(B) The person certifying the post-construction inspection pursuant to subsection 6(*a*)(1), above.

(c) Where to File a Termination Form

A termination form shall be filed with the commissioner at the following address:

CENTRAL PERMITS PROCESSING UNIT
BUREAU OF MATERIALS MANAGEMENT & COMPLIANCE ASSURANCE
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

Section 7. Commissioner's Powers

(a) Abatement of Violations

The commissioner may take any action provided by law to abate a violation of this general permit, including but not limited to penalties of up to $25,000 per violation per day under Chapter 446k of the Connecticut General Statutes, for such violation. The commissioner may, by summary proceedings or otherwise and for any reason provided by law, including violation of this general permit, revoke a permittee's authorization hereunder in accordance with sections 22a-3a-2 through 22a-3a-6, inclusive, of the Regulations of Connecticut State Agencies. Nothing herein shall be construed to affect any remedy available to the commissioner by law.

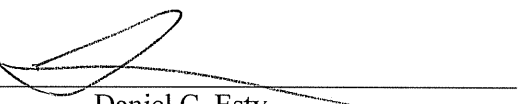
(b) General Permit Revocation, Suspension, or Modification

The commissioner may, for any reason provided by law, by summary proceedings or otherwise, revoke or suspend this general permit or modify to establish any appropriate conditions, schedules of compliance, or other provisions which may be necessary to protect human health or the environment.

(c) Filing of an Individual Permit Application

If the commissioner notifies a permittee in writing that such permittee must obtain an individual permit if he wishes to continue lawfully conducting the construction activity, the permittee shall file an application for an individual permit within thirty (30) days of receiving the commissioner's notice. While such application is pending before the commissioner, the permittee shall continue to comply with the terms and conditions of this general permit. Nothing herein shall affect the commissioner's power to revoke a permittee's authorization under this general permit at any time.

Issued: August 21, 2013



Daniel C. Esty
Commissioner

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

APPENDIX A

Endangered and Threatened Species

In order to be eligible for coverage under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ("GP" or "the GP"), under section 3(*b*)(2) of the GP, a registrant must ensure that the construction activity, which includes, but is not limited to, excavation, site development or other ground disturbance activities, and stormwater flow, discharges and control measures ("construction activity"), does not threaten the continued existence of any state or federal species listed as endangered or threatened ("listed species") or result in the destruction or adverse modification of any habitat associated with such species.

In order to prevent significant, unforeseen delays in the processing of a registration under the GP, registrants should assess compliance with section 3(*b*)(2) early in the planning stages of a project. The Department of Energy and Environmental Protection ("the Department") strongly recommends that this assessment *be initiated up to one year, or more,* prior to the projected construction initiation date, and even before the purchase of the site of the construction activity. At a minimum, registrants must assess compliance with section 3(*b*)(2) prior to submission of the Registration Form for the GP.

This Appendix describes the ways that a registrant can comply with section 3(*b*)(2) of the GP. In connection with the filing of a registration a registrant can perform a self-assessment described in Section 1, seek a limited one-year determination or a safe harbor determination from the Department's Wildlife Division under Sections 2 or 3, respectively, or stipulate in writing to the presence of listed species or any habitat associated with such species and develop a mitigation plan pursuant to Section 5 of this Appendix. While some means of compliance are more limited than others, the options set out in this Appendix are not mutually exclusive and all options remain available to a registrant. For example, a registrant may perform a self-assessment under Section 1 and seek a safe harbor determination under Section 3 of this Appendix. Provided the requirements of this Appendix are met, the choice of how to proceed is the registrant's.

Section 1. Self Assessment through Natural Diversity Database Map Review and Screening

Before submission of a registration for coverage under this GP, a registrant must review the current versions of the Department's Natural Diversity Data Base ("NDDB") maps. Except as provided for in Sections 2, 3 or 5 of this Appendix, such review must occur no more than six months before such submission. Such review provides a method for screening whether the Department is already aware of listed species that may be present on the site of the construction activity. These maps can be viewed at the following locations:

1. Online at the following links:

   CT DEEP Natural Diversity Data Base Maps
   CTECO Webpage (in the interactive Simple Map Viewer)

2. At the DEEP Public File Room at 79 Elm Street in Hartford.

Screening

The site of the construction activity must be compared to the shaded areas depicted on the NDDB map to determine if the site is entirely, partially, or within ¼ mile of a shaded area. If the site is entirely, partially or within a ¼ mile of a shaded area for a listed species a registrant can only achieve compliance with section 3(*b*)(2) of the GP by obtaining a limited one-year determination under Section 2, a safe harbor determination under Section 3, or an approved mitigation plan under Section 5 of this Appendix from the Department's Wildlife Division.

If the site of the construction activity is not entirely, partially or within ¼ mile of a shaded area, then the Department is not aware of any listed species at the site of the construction activity. Based upon this screening, and provided the registrant has no reasonably available verifiable, scientific or other credible information that the construction activity could reasonably be expected to violate section 3(b)(2) of the GP, when completing the Registration Form for this GP a registrant may check the box that indicates that the construction activity will not impact federal or state listed species.

A registrant using only self-assessment under this section may utilize the results of any such self assessment for up to, but no more than, six months from the date of such assessment. Note, however, that the NDDB maps are not the result of comprehensive state-wide field investigations, but rather serve as a screening tool. Using such maps as a screening tool does not provide a registrant with an assurance that listed species or their associated habitat may not be encountered at the site of the construction activity. Notwithstanding the NDDB screening results, if a listed species is encountered at the site of the construction activity, the registrant shall promptly contact the Department and may need to take additional action to ensure that the registrant does not violate section 3(b)(2) of the GP.

Section 2. Obtaining a Limited One-Year Determination

A registrant may seek a written determination from the Department's Wildlife Division, good for one-year, that the proposed construction activity complies with section 3(b)(2) of the GP. To obtain this limited one-year determination, a registrant must, in addition to conducting the NDDB map review in Section 1 of this Appendix, provide the Department's Wildlife Division with (1) any reasonably available verifiable, scientific or other credible information about whether the construction activity could reasonably be expected to result in a violation of section 3(b)(2) of the GP, and (2) limited information about the site of the proposed construction activity, but less information than would be necessary for a safe harbor determination under Section 3 of this Appendix. The limited information necessary for a one-year determination is on the current "Request for Natural Diversity Database (NDDB) State Listed Species Review" form on the Department's website. The form and instructions for seeking such a limited one-year determination are available at www.ct.gov/DEEP/nddbrequest.

Provided the registrant's information is accurate and the Department's Wildlife Division determines that the construction activity will not violate section 3(b)(2) of the GP, the registrant shall receive a limited one-year determination from the Department. Any such determination may indicate that the construction activity will not impact listed species or their associated habitat, or it may include specific conditions to be implemented to avoid or significantly minimize any impacts that may be encountered at the site of the construction activity. For purposes of submitting a registration for the GP, any such limited one-year determination can be relied upon by the person receiving such determination for one-year from the date of such determination. Like, however, the NDDB screening procedure in Section 1 of this Appendix, a limited one-year determination does not provide a registrant with an assurance that listed species or their associated habitat may not be encountered at the site of the construction activity. If a listed species is encountered, the registrant shall promptly contact the Department

and may need to take additional action to ensure that the construction activity does not violate section 3(b)(2) of the GP.

If a registrant receives a limited one-year determination from the Department, the registrant should check the limited one-year determination box on the GP registration form and include the Department's one-year limited determination letter if requested on the GP Registration form. Checking the limited one-year determination box on the registration form and failing to provide the determination letter from the Department's Wildlife Division, if requested on the GP Registration form, will delay and may prevent processing of a registration.

If based upon the information provided by a registrant seeking a limited one-year determination the Department's Wildlife Division determines that the construction activity could impact listed species or their associated habitat, or that the Department needs additional information to make a limited one-year determination, the registrant may still achieve compliance with section 3(b)(2) of the GP through providing additional information pursuant to Section 4 or developing a mitigation plan pursuant to Section 5 of this Appendix.

A registrant may request one or more one-year extensions to a limited one-year determination under this section. If the Department's Wildlife Division has prescribed a form for requesting an extension, any such request shall be made using the prescribed form. There is a presumption that requests for a one-year extension of a limited one-year determination shall be granted. However, this presumption can be rebutted if the Department determines that a change in any of the following has occurred since an initial limited one-year determination or any extension was granted: the construction activity affecting or potentially affecting listed species or their associated habitat; the NDDB maps for the site of the construction activity; the limited information upon which a limited one-year determination or any extension was granted; or other information indicative of a change in circumstance affecting listed species or their associated habitat. Any one-year extension granted under this paragraph shall run from the date the Department's Wildlife Division issues its determination to grant an extension and shall be treated as a limited one-year determination as provided for in this section. Any letter granting a one-year extension shall be included with a registration along with the original limited one-year determination as provided for in this section.

Section 3. Obtaining a Safe Harbor Determination

A registrant may seek a written determination from the Department's Wildlife Division, good for three years, with the potential to be extended for an additional year, that proposed construction activity complies with section 3(b)(2) of the GP. Any such determination shall constitute a "safe harbor" for purposes of section 3(b)(2) of the GP.

To obtain a safe harbor determination, a registrant must, in addition to conducting the NDDB review in section 1 of this Appendix, provide the Department's Wildlife Division with any reasonably available verifiable, scientific or other credible information about whether the construction activity could reasonably be expected to result in a violation of section 3(b)(2) of the GP and specific information about the site of the construction activity. The specific information necessary for a safe harbor determination is listed in Attachment A to this Appendix. This information must be sufficient to allow the Wildlife Division to adequately assess the site for potential risks to listed species and their associated habitat. While the Department recognizes certain information is necessary to make a safe harbor determination, it also recognizes that a registrant may need to obtain a safe harbor determination early in its project's approval process in order to make prudent business decisions about purchasing a site or proceeding to final project designs. The form and instructions for seeking a safe harbor determination are available at www.ct.gov/DEEP/nddbrequest.

Provided the registrant's information is accurate and the Department's Wildlife Division determines that the construction activity will not violate section 3(b)(2) of the GP, the registrant shall receive a safe harbor determination from the Department. A safe harbor determination may indicate that the construction activity will not impact listed species or their associated habitat, or it may include specific conditions to be implemented to avoid or significantly minimize any impacts that may be encountered at the site of the construction activity. The Department shall honor the safe harbor determination for three years from the date it is issued, meaning that unlike the NDDB review in Section 1 or the limited one-year determination in Section 2 of this Appendix, if the Department makes a safe harbor determination and a registrant remains in compliance with any conditions in any such determination, irrespective of what may be found at the site of the construction activity, a registrant shall be considered in compliance with section 3(b)(2) of the GP. However, a safe harbor determination shall not be effective if a construction activity may threaten the continued existence of any federally listed species or its critical habitat under federal law. If a federally listed species or its critical habitat is encountered on the site of the construction activity, the registrant shall promptly contact the Department and may need to take additional action to ensure that the construction activity does not violate federal law or section 3(b)(2) of the GP.

If a registrant receives a safe harbor determination from the Department, the registrant should check the safe harbor determination box on the GP registration form and include the Department's safe harbor determination if requested on the GP Registration form. Checking the safe harbor box on the registration form and failing to provide the safe harbor determination letter from the Department's Wildlife Division, if requested on the GP Registration form, will delay and may prevent processing of a registration.

If based upon the information provided by a registrant seeking a safe harbor determination the Department's Wildlife Division determines that the construction activity could impact listed species or their associated habitat, or that the Department needs additional information to make a safe harbor determination, the registrant may still achieve compliance with section 3(b)(2) of the GP through providing additional information pursuant to Section 4 or developing a mitigation plan pursuant to Section 5 of this Appendix.

If a registrant receives a safe harbor determination from the Department's Wildlife Division, anytime during the third year of such safe harbor, a registrant may request a one-year extension of that safe harbor. If the Department's Wildlife Division has prescribed a form for requesting an extension, any such request shall be made using the prescribed form. There is a presumption that a request for a one-year extension of a safe harbor shall be granted. However, this presumption can be rebutted if the Department determines that a change in any of the following has occurred since the safe harbor was granted: the construction activity affecting or potentially affecting listed species or their associated habitat; the NDDB maps for the site of the construction activity; the information upon which the safe harbor was granted; or other information indicative of a change in circumstance affecting listed species or their associated habitat. A registrant may seek only one extension, for one-year, to a safe harbor determination. Any one-year extension granted under this paragraph shall run from the date of the Department's Wildlife Division issues its determination to grant an extension and shall be honored by the Department in the same manner as a safe harbor determination noted above. Any letter granting a one-year extension shall be included with a registration along with the original limited safe harbor determination as provided for in this section.

Section 4. Providing Additional Information

For the Department's Wildlife Division to make a limited one-year determination under Section 2 or a safe harbor determination under section 3 of this Appendix, limited additional information may be required to determine if the construction activity would impact listed species or their associated habitat. If the species in question is a state listed endangered or threatened species under section 26-306 of the general statutes, a registrant shall, in consultation with the Department's Wildlife Division, provide the limited additional

information requested by the Department's Wildlife Division. Such information may include, but is not limited to, a survey of specific listed species in question. If the species in question is a federally listed threatened or endangered species, in addition to the Department's Wildlife Division, a registrant shall also consult with the U.S. Fish and Wildlife Service and shall provide any additional information requested by that agency. A registrant that initially sought or obtained a limited one-year determination may, after providing the additional information required under this section request a safe harbor determination under Section 3 of this Appendix.

At any time, as an alternative to proceeding under Section 2, 3 or 4 of this Appendix, a registrant may stipulate, in writing, to the presence of one or more listed species or their associated habitat. A registrant choosing this alternative shall proceed to develop a mitigation plan under Section 5 of this Appendix.

If based upon any additional information provided to the Department's Wildlife Division, and as applicable, the U.S. Fish & Wildlife Service, the Department's Wildlife division determines that construction activity will be in compliance with section 3(b)(2) of the GP, a registrant shall receive a limited one-year determination under Section 2 or a safe harbor determination under Section 3 of this Appendix, as applicable.

If the Department's Wildlife Division determines that additional information is necessary to determine if the construction activity has the potential to impact listed species or their associated habitat, and a registrant chooses to not provide such information, a registrant shall proceed with the self assessment through an NDDB review under Section 1 of this Appendix, or stipulate to the existence of a listed species or associated habitat and develop a mitigation plan under Section 5 or such registrant shall not be eligible to register under the GP.

Section 5. Developing a Mitigation Plan

The Department's Wildlife Division may determine that the construction activity has the potential to adversely impact listed species or their associated habitat. However, it may be possible to modify the construction activity or undertake certain on-site measures to avoid or significantly minimize such impacts. If the species or associated habitat in question is a state listed endangered or threatened species under section 26-306 of the general statutes, a registrant shall consult with the Department's Wildlife Division to determine if an acceptable mitigation plan can be developed so impacts can be avoided or minimized such that a registrant remains in compliance with section 3(b)(2). If the species in question is a federally listed threatened or endangered species, any such consultation shall also include the U.S. Fish and Wildlife Service.

If a registrant in consultation with the Department's Wildlife Division, and as applicable, the U.S. Fish & Wildlife Service, develops a mitigation plan that is approved by the Department's Wildlife Division, or as applicable, the U.S. Fish & Wildlife Service, the registrant shall receive a limited one-year determination under Section 2 or a safe harbor determination under Section 3 of this Appendix. In this situation, in addition to checking the one-year determination box or the safe harbor determination box, as applicable, on the registration form, the registrant shall also check the box on the registration form indicating that it has an approved mitigation plan and provide a status update on the registration form as to whether it has completed or is still in the process of implementing the approved mitigation plan.

If an approved mitigation plan has not been fully implemented by the time a registration is submitted, completing all remaining tasks in the plan shall become an enforceable condition of any registration issued to the registrant.

If the Department determines that the construction activity has the potential to adversely impact listed species or their associated habitat and the registrant and the Department, and as applicable, the U.S. Fish & Wildlife Service, are not able to agree on an acceptable mitigation plan that is approved by the Department, and as applicable, the U.S. Fish & Wildlife Service, any such registrant shall not be eligible to register under the GP.

APPENDIX A
ATTACHMENT A

Specific Information Needed to Apply for a Safe Harbor Determination

A Safe Harbor Determination will be made upon the submission of a detailed report that fully addresses the matters noted below. For the Department's Wildlife Division to make a safe harbor determination, the report should synthesize and analyze this information, not simply compile information. Those providing synthesis and analysis need appropriate qualifications and experience. A request for a safe harbor determination shall include:

1) Habitat Information, including GIS mapping overlays, identifying:

- wetlands, including wetland cover types;
- plant community types;
- topography;
- soils;
- bedrock geology;
- floodplains, if any;
- land use history; and
- water quality classifications/criteria.

2) Photographs - The report should also include photographs of the site, including all reasonably available aerial or satellite photographs and an analysis of such photographs.

3) Inspection - The report should include a visual inspection(s) of the site, preferably when the ground is visible. This inspection can also be helpful in confirming or further evaluating the items noted above.

4) Biological Surveys - The report should include all biological surveys of the site where construction activity will take place that are reasonably available to a registrant. A registrant shall notify the Department's Wildlife Division of biological studies of the site where construction activity will take place that a registrant is aware of but are not reasonably available to the registrant.

5) Based on items #1 through 4 above, the report shall include a Natural Resources Inventory of the site of the construction activity. This inventory should also include a review of reasonably available scientific literature and any recommendations for minimizing adverse impacts from the proposed construction activity on listed species or their associated habitat.

6) In addition, to the extent the following is available at the time a safe harbor determination is requested, a request for a safe harbor determination shall include and assess:

- Information on Site Disturbance Estimates/Site Alteration information

- Vehicular Use

- Construction Activity Phasing Schedules, if any; and

- Alternation of Drainage Patterns

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

APPENDIX B

Connecticut Department of Energy & Environmental Protection
Inland Water Resources Division Fact Sheet
Considering Low Impact Development Principles in Site Design

In order to reduce the impact of development and address stormwater quality issues, the Department strongly encourages the use of Low Impact Development (LID) measures. LID is a site design strategy intended to maintain or replicate predevelopment hydrology through the use of small-scale controls, integrated throughout the site, to manage stormwater runoff as close to its source as possible. Infiltration of stormwater through LID helps to remove sediments, nutrients, heavy metals, and other types of pollutants from runoff.

Key Strategies for LID

Key strategies for effective LID include: infiltrating, filtering, and storing as much stormwater as feasible, managing stormwater close to where the rain/snow falls, managing stormwater at multiple locations throughout the landscape, conserving and restoring natural vegetation and soils, preserving open space and minimizing land disturbance, designing the site to minimize impervious surfaces, and providing for maintenance and education. Water quality and quantity benefits are maximized when multiple techniques are grouped together. In areas of compacted and/or possibly contaminated soils, soil suitability should be further investigated prior to selecting optimum treatment and/or remediation measures. Where soil conditions permit, the DEEP encourages the utilization of one, or a combination of, the following measures:

- the use of pervious pavement or grid pavers (which are very compatible for parking lot and fire lane applications), or impervious pavement without curbs or with notched curbs to direct runoff to properly designed and installed infiltration areas;
- the use of vegetated swales, tree box filters, and/or infiltration islands to infiltrate and treat stormwater runoff (from building roofs, roads, and parking lots);
- the minimization of access road widths and parking lot areas to the maximum extent possible to reduce the area of impervious surface;
- the use of dry wells to manage runoff from building roofs;
- incorporation of proper physical barriers or operational procedures for special activity areas where pollutants could potentially be released (e.g. loading docks, maintenance and service areas, dumpsters, etc.);
- the installation of rainwater harvesting systems to capture stormwater from building roofs for the purpose of reuse for irrigation (i.e. - rain barrels for residential use and cisterns for larger developments);
- the use of residential rain gardens to manage runoff from roofs and driveways;
- the use of vegetated roofs (green roofs) to detain, absorb, and reduce the volume of roof runoff; and
- providing for pollution prevention measures to reduce the introduction of pollutants to the environment.

The 2004 Stormwater Quality Manual LID Appendix and the 2002 Erosion and Sediment Control Guidelines LID Appendix both provide guidance on implementing LID measures. A guide to LID resources can also be found in the DEEP Low Impact Development Resources Factsheet (PDF).

LID in Urban Areas

If the proposed site is located in a highly urbanized area, it is likely underlain by urban land complex soils. The Natural Resources Conservation Service (NRCS) Soil Web Survey (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm) provides information on soil textures, parent materials, slopes, height of seasonal high water table, depth to restrictive layer, and permeability. In highly developed areas, infiltration may be limited due to the high percentage of impervious cover. However, infiltration practices may be suitable at urban sites depending on:

- Potential contamination of soils in historically industrialized areas. The siting of areas for infiltration must consider any existing soil or groundwater contamination.

- Site specific soil conditions. NRCS mapping consists of a minimum 3 acres map unit and soils may vary substantially within each mapping unit. Test pits should be dug in areas
- planned for infiltration practices to verify soil suitability and/or limitations.

- Investigation of areas of compacted soils and the utilization of proper construction staging. Planning should insure that areas to be used for infiltration are not compacted during the construction process by vehicles or machinery.

Even if infiltration is limited at a site, it is still possible to implement LID practices. Specifically, potential exists for the installation of green roofs on buildings and/or the use of cisterns to capture and reuse rainwater.

LID in Areas with a High Seasonal Water Table or Hardpan Layer

- The impact of stormwater runoff to any streams and/or wetlands near the site should be considered. Water quality treatment is influenced by hydraulic conductivity and time of travel. If stormwater infiltration is limited by an impermeable layer close to the surface, the water may run laterally through the ground and discharge to the stream or wetlands, providing limited water quality treatment. However, a longer time of travel may provide sufficient treatment. Proper soil testing for infiltration potential will increase the likelihood of successful BMP design.

- In areas with a high seasonal water table, bioretention areas/rain gardens should be planted with water tolerant/wetland plants. The presence of a high seasonal water table suggests that water may drain slowly or not at all during certain parts of the year. Planting native wetland vegetation will help to ensure plant survival and increase the effectiveness of bioretention practices. Information on native plantings that are both drought tolerant and tolerant of wet conditions can be found in The UConn Cooperative Extension System's guide to building a rain garden at http://nemo.uconn.edu/publications/rain_garden_broch.pdf. Native plant lists for Connecticut can also be found at http://www.fhwa.dot.gov/environment/rdsduse/ct.htm.

LID Guidance for Federal Projects

- LID techniques have been utilized by Department of Defense (DoD) agencies during the last several years. The effectiveness of these projects in managing runoff as well as reducing construction and maintenance costs has created significant interest in LID. The DoD has created a Unified Facilities Criteria document, Low Impact Development that provides guidelines for integrating LID planning and design into a facility's regulatory and resource protection programs. It is available on-line at: http://www.wbdg.org/ccb/DOD/UFC/ufc_3_210_10.pdf.

- Section 438 of the Energy Independence and Security Act (EISA) of 2007 requires federal agencies to reduce stormwater runoff from federal development projects to protect water resources. In December 2009, the EPA developed a technical guidance document on implementing the stormwater runoff requirements for federal projects under Section 438 of EISA. The document contains guidance on how compliance with Section 438 can be achieved, measured and evaluated and can be found at: http://www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf.

For more information contact the CT DEEP Watershed Management/Low Impact Development Program:

Name	Area	Telephone
MaryAnn Nusom Haverstock	Program Oversight/ Low Impact Development	(860) 424-3347
Chris Malik	Watershed Manager	(860) 424-3959
Susan Peterson	Watershed Manager	(860) 424-3854
Eric Thomas	Watershed Manager	(860) 424-3548

List of Runoff Reduction/LID Practices

Re-Forestation
Disconnection of Rooftop Runoff
Disconnection of Non-Rooftop Runoff
Sheetflow to Conservation Areas
Green Roof
Permeable Pavement
Rainwater Harvesting
Submerged Gravel Wetlands
Micro-Infiltration
Rain Gardens
Bioretention
Landscape Infiltration
Grass Swales
Bio-swales
Wet Swales
Stormwater Ponds
Stormwater Wetlands
Stormwater Filtering Systems
Stormwater Infiltration

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

APPENDIX C

AQUIFER PROTECTION AREAS AND OTHER GROUNDWATER DRINKING SUPPLY AREAS GUIDANCE INFORMATION

The Pollution Control Plan ("the Plan") should consider measures to reduce or mitigate potential impacts to both ground water (aquifers) and surface waters, taking into consideration both quantity and quality of the runoff. The emphasis should be to minimize, to the extent possible, changes between pre-development and post-development runoff rates and volumes.

The basic stormwater principals for Aquifer Protection Areas (and other groundwater drinking supply areas) are to prevent inadvertent pollution discharges/releases to the ground, while encouraging recharge of stormwater where it does not endanger groundwater quality. Measures include:

- prevent illicit discharges to storm water, including fuel/chemical pollution releases to the ground;
- minimize impervious coverage and disconnect large impervious areas with natural or landscape areas;
- direct paved surface runoff to aboveground type land treatment structures – sheet flow, surface swales, depressed grass islands, detention/retention and infiltration basins, and wet basins. These provide an opportunity for volatilization of volatile organic compounds to the extent possible before the stormwater can infiltrate into the ground;
- provide necessary impervious pavement in high potential pollutant release areas. These "storm water hot spots" include certain land use types or storage and loading areas, fueling areas, intensive parking areas and roadways (see table below);
- only use subsurface recharge structures such as dry wells, galleries, or leaching trenches, to directly infiltrate clean runoff such as rooftops, or other clean surfaces. These structures do not adequately allow for attenuation of salts, solvents, fuels or other soluble compounds in groundwater that may be contained in runoff; and
- restrict pavement deicing chemicals, or use an environmentally suitable substitute such as sand only, or alternative de-icing agents such as calcium chloride or calcium magnesium.

Infiltration of stormwater should be **restricted** under the following site conditions:

- ***Land Uses or Activities with Potential for Higher Pollutant Loads:*** Infiltration of stormwater from these land uses or activities (refer to Table 7-5 below), also referred to as stormwater "hotspots," can contaminate public and private groundwater supplies. Infiltration of stormwater from these land uses or activities may be allowed by the review authority with appropriate pretreatment. Pretreatment could consist of one or a combination of the primary or secondary treatment practices described in the Stormwater Quality Manual provided that the treatment practice is designed to remove the stormwater contaminants of concern.

- ***Subsurface Contamination:*** Infiltration of stormwater in areas with soil or groundwater contamination such as brownfield sites and urban redevelopment areas can mobilize contaminants.

- ***Groundwater Supply and Wellhead Areas:*** Infiltration of stormwater can potentially contaminate groundwater drinking water supplies in immediate public drinking water wellhead areas.

Land Uses or Activities with Potential for Higher Pollutant Loads
Table 7-5 of the 2004 Stormwater Quality Manual

Land Use/Activities	
• Industrial facilities subject to the DEEP Industrial Stormwater General Permit or the U.S. EPA National Pollution Discharge Elimination System (NPDES) Stormwater Permit Program • Vehicle salvage yards and recycling facilities • Vehicle fueling facilities (gas stations and other facilities with on-site vehicle fueling) • Vehicle service, maintenance, and equipment cleaning facilities • Fleet storage areas (cars, buses, trucks, public works) • Commercial parking lots with high intensity use (shopping malls, fast food restaurants, convenience stores, supermarkets, etc.) • Public works storage areas	• Road salt storage facilities (if exposed to rainfall) • Commercial nurseries • Flat metal rooftops of industrial facilities • Facilities with outdoor storage and loading/unloading of hazardous substances or materials, regardless of the primary land use of the facility or development • Facilities subject to chemical inventory reporting under Section 312 of the Superfund Amendments and Reauthorization Act of 1986 (SARA), if materials or containers are exposed to rainfall • Marinas (service and maintenance) • Other land uses and activities as designated by the review authority

For further information regarding the design of stormwater collection systems in Aquifer Protection Areas, contact the Aquifer Protection Area Program at (860) 424-3020 or visit www.ct.gov/deep/aquiferprotection.

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

APPENDIX D

Coastal Management Act Determination Form

For sites within the Coastal Boundary, please attach this form and written approval from the local governing authority (or verification of exemption) to the Registration Form for the Discharge of Stormwater and Dewatering Wastewaters From Construction Activities.

SITE INFORMATION

Future Permittee _____

Mailing Address _____

Business Phone _____ ext.: _____ Fax: _____

Contact Person _____ Title: _____

Site Name _____

Site Address/ Location _____

Site Latitude and Longitude _____

Receiving Water (name, basin) _____

Project Description _____

_____

STATEMENT OF REVIEW:

The above referenced project is consistent with the goals and policies in section 22a-92 of the Connecticut General Statutes and will not cause adverse impacts to coastal resources as defined in section 22a-93(15) of the Connecticut General Statutes.

Date of Coastal Site Plan Approval: _____

☐ Copy of written approval attached, or

☐ Verification of exemption attached

APPENDIX E
(Exhibit 3 of District/DEEP Memorandum of Agreement)

Conservation Districts of Connecticut
Regional Delineations and Contact Information

Northwest Conservation District
1185 New Litchfield Street
Torrington, CT 06790
Ph: 860-626-7222
Fax: 860-626-7222
Email: ncd@conservect.org

Eastern Connecticut Conservation District
238 West Town Street
Norwich, CT 06360-2111
Ph**:** 860-887-4163 x 400 Fax**:** 860-887-4082
Email: kate.johnson.eccd@comcast.net

Connecticut River Coastal Conservation District, Inc.
deKoven House Community Center
27 Washington Street
Middletown, CT 06457
Ph: 860-346-3282 Fax: 860-346-3284
Email: ctrivercoastal@conservect.org

Southwest Conservation District
51 Mill Pond Road
Hamden, CT 06514
Ph: 203-287-8179 Fax: 203-288-5077
Email: swcd43@sbcglobal.net

North Central Conservation District
24 Hyde Avenue
Vernon, CT 06066
Ph: 860-875-3881 Fax: 860-870-8973
Email: tollandc@snet.net

NORTHWEST	SOUTHWEST	NORTH CENTRAL	CT RIVER COASTAL	EASTERN
Barkhamsted	Ansonia	Avon	Berlin	Andover
Bethel	Beacon Falls	Bloomfield	Chester	Ashford
Bethlehem	Bethany	Bolton	Clinton	Bozrah
Bridgewater	Branford	Bristol	Colchester	Brooklyn
Brookfield	Bridgeport	Burlington	Cromwell	Canterbury
Canaan	Cheshire	Canton	Deep River	Chaplin
Colebrook	Darien	Coventry	Durham	Columbia
Cornwall	Derby	East Granby	East Haddam	Eastford
Danbury	East Haven	East Hartford	East Hampton	East Lyme
Goshen	Easton	East Windsor	Essex	Franklin
Hartland	Fairfield	Ellington	Haddam	Griswold
Harwinton	Greenwich	Enfield	Hebron	Groton
Kent	Guilford	Farmington	Killingworth	Hampton
Litchfield	Hamden	Glastonbury	Lyme	Killingly
Morris	Meriden	Granby	Madison	Lebanon
New Fairfield	Middlebury	Hartford	Marlborough	Ledyard
New Hartford	Milford	Manchester	Middlefield	Lisbon
New Milford	Monroe	Plainville	Middletown	Mansfield
Newtown	Naugatuck	Simsbury	Newington	Montville
Norfolk	New Canaan	Somers	New Britain	New
North Canaan	New Haven	South Windsor	Old Lyme	London
Plymouth	North Branford	Stafford	Old Saybrook	North
Roxbury	North Haven	Suffield	Portland	Stonington
Salisbury	Norwalk	Tolland	Rocky Hill	Norwich
Sharon	Orange	Vernon	Salem	Plainfield
Sherman	Oxford	West Hartford	Westbrook	Pomfret
Southbury	Prospect	Wethersfield		Preston
Thomaston	Redding	Willington		Putnam
Torrington	Ridgefield	Windsor		Scotland
Warren	Seymour	Windsor Locks		Sprague
Washington	Shelton			Sterling
Watertown	Southington			Stonington
Winchester	Stamford			Thompson
Woodbury	Stratford			Union
	Trumbull			Voluntown
	Wallingford			Waterford
	Waterbury			Windham
	West Haven			Woodstock
	Weston			
	Westport			
	Wilton			
	Wolcott			
	Woodbridge			

APPENDIX F

Memorandum of Agreement
Between
The Connecticut Department of Energy & Environmental Protection
and the
Conservation Districts of Connecticut

WHEREAS, the Commissioner of the Department of Energy and Environmental Protection ("Department" or "DEEP ") is authorized by section 22a-6(2)(3) and (4) of the Connecticut General Statutes ("CGS") to enter into this Agreement; and

WHEREAS, the five Conservation Districts of Connecticut (collectively, the "Districts"), are not-for-profit corporations duly authorized, organized and existing under the laws of the State of Connecticut and are authorized by section 22a-315 of the CGS and section 22a-315-14 of the Regulations of Connecticut State Agencies to enter into this Agreement; and

WHEREAS, section 22a-430b of the Connecticut General Statutes requires the Department to regulate stormwater discharges from construction activities under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities ("the Construction General Permit" or "CGP"), which has been or shall be issued on October 1, 2013. The Construction General Permit requires the implementation of erosion and sedimentation controls to control the discharge of sediment from construction and post-construction discharges; and

WHEREAS, Construction General Permits require the preparation and implementation of a Stormwater Pollution Control Plan ("Plan" or "SWPCP") to prevent erosion and the discharge of sediment to the waters of the state; and

WHEREAS, pursuant to section 22a-315 of the CGS, soil and water conservation districts and boards were established to advise the Commissioner on matters of soil and water conservation and erosion and sedimentation control and to assist the Commissioner in implementing programs related to soil and water conservation and erosion and sediment control; and

WHEREAS, pursuant to section 22a-315 of the CGS, the soil and water conservation districts and boards may receive funds from private sources for services provided to promote soil and water conservation and to assist the Commissioner in the implementation of related programs; and

WHEREAS, section 22a-326 of the CGS declares the policy of the state "to strengthen and extend its erosion and sediment control activities and programs and to establish and implement, through the Council on Soil and Water Conservation, soil and water conservation districts, the municipalities and the Commissioner of Energy and Environmental Protection, a state-wide coordinated erosion and sediment control program which shall reduce the danger from storm water runoff, minimize nonpoint sediment pollution from land being developed and conserve and protect the land, water, air and other environmental resources of the state;" and

WHEREAS, the Districts have understanding and experience in reviewing erosion and sediment control plans because of their longstanding participation in the municipal approval process, as required by section 22a-329 of the CGS; and

WHEREAS, DEEP and the Districts are jointly dedicated to protecting the waters of the state by controlling the discharge of sediment and the pollution resulting from stormwater runoff.

NOW, THEREFORE, in consideration of the mutual covenants and conditions hereinafter stated, the Parties agree as follows:

I. RESPONSIBILITIES OF THE CONSERVATION DISTRICTS.

For locally approvable projects, as defined in the Construction General Permit, with five (5) or more acres of soil disturbance, the appropriate District (as specified in Appendix E of the Construction General Permit, appended hereto as Exhibit 3) shall review Stormwater Pollution Control Plans submitted to the District in accordance with Section 3(*b*)(10) of the CGP, shall determine whether each such SWPCP is consistent with the requirements of the CGP, and shall advise the Commissioner in writing of its determination regarding the SWPCP's consistency.

A. Components of the SWPCP Review by the Districts

1. Requirements for Conducting a Review:

(a) SWPCP review shall be conducted by a District representative having one or more of the following minimum qualifications: (i) a bachelor's degree in hydrology, engineering (agricultural, civil, environmental, or chemical), landscape architecture, geology, soil science, environmental science, natural resources management, or a related field and two years of professional and field experience, or (ii) the EnviroCert International, Inc. designation as a Certified Professional in Erosion and Sediment Control, or a Certified Professional in Storm Water Quality.

(b) All SWPCP reviews undertaken by a District shall be conducted in accordance with the guidelines and procedures established by DEEP in consultation with the Districts, as further described below, and shall include at least one inspection, and no more than 3 inspections, of the project site.

(c) The District shall begin a SWPCP review upon the receipt of the all of following: the developer's request for review, two copies of the proposed SWPCP, the payment of required fee in the amount specified in Exhibit 1 and the written permission of the developer to enter onto and inspect the project site. Once the District is in receipt of all the documents and the fee as delineated above, the developer's SWPCP shall be considered submitted to the District.

2. Determinations of Consistency by the District after Review of the SWPCP and Subsequent Procedures

(a) If the District determines the developer's SWPCP is:

(i) Consistent with the requirements of the Construction General Permit, the District shall issue an affirmative determination notice to both the developer or such developer's designee and to DEEP in order to advise them of the adequacy of the SWPCP. The District shall also provide a copy of the SWPCP to DEEP if requested by the Commissioner.

(ii) Not consistent with the requirements of the Construction General Permit, the District shall provide a written notice of such inconsistency to the developer or such developer's designee; such notice shall include a list of the SWPCP's deficiencies and any appropriate explanatory comments.

(b) If the developer's SWPCP is found to be inconsistent with the CGP, the developer may revise the SWPCP (the "Revised SWPCP") to address any deficiencies noted by the District and resubmit its Revised SWPCP to the District for review.

(c) If the District receives a Revised SWPCP in accordance with subsection (b) above, the District shall perform a review of the Revised SWPCP. If the Revised SWPCP is deemed:

(i) Consistent with the requirements of the Construction General Permit, the District shall (1) issue an affirmative determination notice to both the project developer or such project developer's designee and to DEEP to advise them of the adequacy of the SWPCP and (2) provide a copy of the SWPCP to the DEEP if requested by the Commissioner; or

(ii) Not consistent with the requirements of the CGP after this review, the District shall provide a written notice of such inconsistency to the developer or such developer's designee. This notice shall include a list of all remaining SWPCP deficiencies and any explanatory comments as appropriate.

(d) In the event the District determines after review of the Revised SWPCP in accordance with subsection (c), above, that the Revised SWPCP remains inconsistent with the requirements of the Construction General Permit, and the developer resubmits its Revised SWPCP *within 180 calendar days* of the District's original determination of inconsistency, the resubmitted Revised SWPCP shall be considered a Resubmission. As such, the resubmitted Revised SWPCP shall be reviewed by the District in accordance with the timeframes set forth in Section I.B., and other applicable sections of this document, and the fee shall be in accordance with Section II, below, and the Resubmission Fee in Exhibit 1.

(e) In the event the District determines after review of the Revised SWPCP in accordance with subsection (c), above, that the Revised SWPCP remains inconsistent with the requirements of the Construction General Permit, and the developer resubmits its Revised SWPCP *more than 180 calendar days after* the District's original determination of inconsistency, the resubmitted Revised SWPCP shall be considered a new submission. The newly submitted Revised SWPCP shall be reviewed by the District in accordance with the timeframes set forth in Section I.B., and other applicable sections of this document, and the fee shall be in accordance with Section II, below, and the SWPCP Review Fee in Exhibit 1.

(f) Revisions to a SWPCP subsequent to the District's prior approval of developer's SWPCP

(i) In the event the developer revises a SWPCP after the District has determined that the developer's SWPCP, prior to this revision, was consistent with the requirements of the Construction General Permit, and the developer submits the revised SWPCP to the District for review *within 180 calendar days* of the District's original determination of consistency, the SWPCP shall be considered a Post-Approval Resubmission. As a Post-Approval Resubmission, the SWPCP shall be reviewed by the District in accordance with the timeframes set forth in Section I.B., and other applicable sections of this document, and the fee shall be in accordance with Section II, below, and the Post-Approval Resubmission Fee in Exhibit 1.

(ii) In the event the developer revises a SWPCP after the District has determined that the developer's SWPCP, prior to this revision, was consistent with the requirements of the Construction General Permit, and the developer submits the revised SWPCP to the District for review *more than 180 calendar days after* the District's original determination of consistency, the SWPCP shall be considered a new submission. The newly submitted SWPCP shall be reviewed by the District in accordance with the timeframes set forth in Section I.B., and other applicable sections of this document, and the fee shall be in accordance with Section II, below, and the SWPCP Review Fee in Exhibit 1.

B. Plan Review Timeframes

1. The District shall review a new submission of a SWPCP submitted by a developer or such developer's designee and provide review comments within thirty (30) calendar days of the date of a complete submission as specified in Section I.A.1.(c).

2. If the District identifies deficiencies in the SWPCP, the District shall allow the developer or such developer's designee the opportunity to revise their SWPCP and resubmit it to the District within fifteen (15) calendar days after the date of mailing or delivery of the District's written comments to the developer or such developer's designee.

3. The District shall review any SWPCP revised in accordance with subsection I.B.2., above, and provide a written determination of the SWPCP's consistency or inconsistency within fifteen (15) calendar days after the submission of the revised SWPCP.

4. At the request of the District or the developer and with the agreement of both the District and the developer, the deadlines stated in subsections 1. – 3., above, may be extended. However, any such extensions shall be limited to no more than double the original amount of time allowed above for the relevant action.

5. Express review of a SWPCP may be requested by a developer. However, the Districts shall have complete discretion to accept or decline such request for an express review based on the District's circumstances, including, but not limited to: their existing workload, vacation schedules and staffing. If a District grants an express review, the timeframe shall be reduced to no more than one third of the timeframes noted in subsection 1. – 3., above, and the fee shall be in accordance with the Express Reviews fee in Exhibit 1.

6. In the event a District does not complete the review of the SWPCP within sixty (60) days (or within the time allowed under any authorized extension pursuant to subsection B.4, above, but in no circumstance later than 120 days) of the date the SWPCP was initially submitted to the District, and provided such delay is not the result of the developer's or such developer's designee's failure to address SWPCP deficiencies as noted in subsection B.2, above, the District shall:

(a) not later than three (3) days after the District's deadline, notify the DEEP that the developer shall be initiating the registration process for the Construction General Permit in accordance with section I.B of this Agreement, for completion of the SWPCP review, and;

(b) provide to the DEEP, upon request, the District's complete file, including supporting documentation the developer's SWPCP consistency determination, including, but not limited to, the SWPCP, any other documentation submitted to the District by or on behalf of a developer, and any analysis already performed by the District; and

(c) not later than seven (7) days after the District's deadline, in accordance with section I.B of this Agreement, for completion of the SWPCP review, transfer to the DEEP, up to a maximum of $4,500, the fees that were originally submitted by the developer.

C. Inspections of the Project Site

1. Prior to the commencement of project construction and during the course of the SWPCP review process, the District shall conduct at least one inspection of the project site.

2. Once the construction of the project has begun, a District shall make at least one, but not more than three, inspection(s) of the project site to verify that the developer's SWPCP is being

implemented as approved by the District. A District shall report the results of the inspection(s) to the developer or such developer's designee and to DEEP in a manner prescribed by the Commissioner.

3. Upon notification from the developer or developer's designee, in accordance with Section 6(a)(1) of the CGP, that construction of the stormwater collection and management system is complete, the District shall conduct one inspection of the project site to verify that the post-construction stormwater management measures were completed in accordance with the approved SWPCP. The District shall report the results of this inspection to DEEP in a manner prescribed by the Commissioner.

D. Audits

The District agrees that all records pertaining to this Agreement shall be maintained for a period of not less than five (5) years. Such records shall be made available to the DEEP and to the state auditors upon request. For the purposes of this Agreement, "Records" are all working papers and such information and materials as may have been accumulated by the District in performing the Agreement, including, but not limited to, documents, data, analysis, plans, books, computations, drawings, specifications, notes, reports, records, estimates, summaries and correspondence, kept or stored in any form.

II. FEE SCHEDULE.

A. A District may assess fees for the services it renders in conjunction with its SWPCP reviews. Such fees shall be paid as follows:

1. All fees, except those described in subsection II.A.2, below, shall be submitted by the developer to the District with the developer's request for review. These fees are non refundable.

2. The fee for Post-Approval Resubmission, as designated in Exhibit 1, shall be submitted by the developer to the District upon completion of the District's review, prior to release of the determination notice, and is non refundable.

B. The Fee Schedule shall be reviewed annually by the Parties. The Fee Schedule may be adjusted as warranted, without a formal amendment to this Agreement, by mutual agreement between the Districts and the Commissioner.

III. RESPONSIBILITIES OF DEEP.

A. In accordance with the Construction General Permit requirements for SWPCP reviews by a third party, DEEP shall conduct outreach to inform the development community that a District may review SWPCPs for consistency with the requirements of the Construction General Permit. DEEP shall also inform the development community that a registration form for authorization under the Construction General Permit may only be submitted to DEEP if: the District, or other third party in accordance with Section 3(b)(11) of the CGP, determines that the SWPCP is consistent with the requirements of the CGP, or in the event the time schedule is exceeded for a District review as described in section I.B.6, above.

B. In order to institute standard SWPCP review guidelines and procedures, DEEP shall coordinate with the Districts to prepare a SWPCP checklist. The standard review guidelines and procedures established shall be consistent with the requirements of the Construction General Permit, the 2002 CT Guidelines for Soil Erosion and Sedimentation Control, and the 2004 Stormwater Quality Manual. The Commissioner shall have final approval of the review guidelines and procedures.

C. DEEP shall provide initial training regarding SWPCP requirements for District staff involved in SWPCP reviews. The frequency of subsequent training shall be determined by the Commissioner.

D. DEEP shall retain final decision making authority regarding the determination that a SWPCP is or is not consistent with the requirements of the Construction General Permit and shall oversee the permitting process for Construction General Permit coverage.

E. Once a SWPCP has been approved, DEEP shall oversee any subsequent compliance and/or enforcement matters related to a developer's adherence to the requirements of the Construction General Permit.

F. DEEP shall have the discretion to review any of the Districts' records pertaining to any aspect this Agreement.

IV. POINTS OF CONTACT.

The following shall be points of contact for this Agreement unless otherwise agreed to by all Parties, notwithstanding section VI. All notices, demands, requests, consents, approvals or other communications required or permitted to be given or which are given with respect to this Agreement (for the purpose of this section collectively called "Notices") shall be deemed to have been effected at such time as the notice is placed in the U.S. mail, first class and postage prepaid, return receipt requested, or, placed with a recognized, overnight express delivery service that provides for a return receipt. All such Notices shall be in writing and shall be addressed as follows:

A. DEEP
Director
Water Permitting & Enforcement Division
Bureau of Material Management & Compliance Assurance
Department of Energy & Environmental Protection
79 Elm St.
Hartford, CT 06106
Phone: 860-424-3018
Fax: 860-424-4074

B. Conservation District
Board Chairperson
Address & Phone of appropriate District:

Northwest Conservation District
1185 New Litchfield Street
Torrington, CT 06790
Ph: 860-626-7222
Fax: 860-626-7222
Email: ncd@conservect.org

Eastern Connecticut Conservation District
238 West Town Street
Norwich, CT 06360-2111
Ph**:** 860-887-4163 x 400 Fax**:** 860-887-4082
Email: kate.johnson.eccd@comcast.net

Connecticut River Coastal Conservation District, Inc.
deKoven House Community Center
27 Washington Street
Middletown, CT 06457
Ph: 860-346-3282 Fax 860-346-3284
Email: ctrivercoastal@conservect.org

Southwest Conservation District
51 Mill Pond Road
Hamden, CT 06514
Ph: 203-287-8179 Fax: 203-288-5077
Email: swcd43@sbcglobal.net

North Central Conservation District
24 Hyde Avenue
Vernon, CT 06066
Ph: 860-875-3881 Fax: 860-870-8973
Email: tollandc@snet.net

V. EXECUTIVE ORDERS AND ANTI-DISCRIMINATION. The Districts shall comply with the additional terms and conditions hereto attached as Exhibit 2.

VI. AMENDMENTS. Either the DEEP or the Districts may recommend revisions to this Agreement as circumstances may warrant; however, any revisions must be upon mutual agreement of DEEP and all five Conservation Districts. Unless otherwise stated in this Agreement, formal written amendment is required for changes to any of the terms and conditions specifically stated in the Agreement, including Exhibit 2 of the Agreement, any prior amendments to the Agreement, and any other Agreement revisions determined material by the Department.

VII. SEVERABILITY. The provisions of this Agreement are severable. If any part of it is found unenforceable, all other provisions shall remain fully valid and enforceable, unless the unenforceable provision is an essential element of the bargain.

VIII. SOVEREIGN IMMUNITY. The Parties acknowledge and agree that nothing in the Agreement shall be construed as a modification, compromise or waiver by the State of any rights or defenses of any immunities provided by federal law or the laws of the State of Connecticut to the State or any of the State's, which they may have had, now have or shall have with respect to all matters arising out of the Agreement. To the extent that this section conflicts with any other section, this section shall govern.

IX. FORUM AND CHOICE OF LAW. The Agreement shall be deemed to have been made in the City of Hartford, State of Connecticut. Both Parties agree that it is fair and reasonable for the validity and construction of the Agreement to be, and it shall be, governed by the laws and court decisions of the State of Connecticut, without giving effect to its principles of conflicts of laws. To the extent that any immunities provided by federal law or the laws of the State of Connecticut do not bar an action against the State or the Districts, and to the extent that these courts are courts of competent jurisdiction, for the purpose of venue, the complaint shall be made returnable to the Judicial District of Hartford only or shall be brought in the United States District Court for the District of Connecticut only, and shall not be transferred to any other court, provided, however, that nothing here constitutes a waiver or compromise of the sovereign immunity of the State of Connecticut. The Districts waive any objection which they may now have or shall have to the laying of venue of any Claims in any forum and further irrevocably submits to such jurisdiction in any suit, action or proceeding.

X. TERMINATION. Notwithstanding any provisions in this Agreement, DEEP, through a duly

authorized employee, may terminate the Agreement whenever the Agency makes a written determination that such Termination is in the best interests of the State. The Agency shall notify the Districts in writing sent by certified mail, return receipt requested, which notice shall specify the effective date of Termination and the extent to which the Districts must complete its Performance under the Agreement prior to such date; or (b) The Districts may terminate the Agreement for good cause. The Districts shall notify DEEP by written notice at least one hundred eighty (180) days prior to the effective date of termination. In order for the Districts to terminate this Agreement, (1) there must be a consensus between all five Conservation Districts that each District shall be terminating this Agreement with the DEEP; (2) such proof of consensus shall be submitted to the DEEP in the form of a letter signed by the duly authorized agent for each District by certified mail, return receipt requested, at least one hundred eighty (180) days prior to the Districts' intention to cancel or terminate. Upon the Termination of this Agreement by either Party, the Districts shall deliver to the Agency copies of all Records no later than thirty (30) days after the Termination of the Agreement, or fifteen (15) days after the Non-terminating Party receives a written request from the Terminating Party for the Records. The Districts shall deliver those Records that exist in electronic, magnetic or other intangible form in a non-proprietary format, such as, but not limited to, PDF, ASCII or .TXT. Upon receipt of a written notice of Termination from the Agency, the Districts shall cease operations as the Agency directs in the notice, and take all actions that are necessary or appropriate, or that the Agency may reasonably direct, for the protection, and preservation of records. Except for any work which the Agency directs the Districts to Perform in the notice prior to the effective date of Termination, and except as otherwise provided in the notice, the Districts shall terminate or conclude all existing subcontracts and purchase orders and shall not enter into any further subcontracts, purchase orders or commitments. Upon Termination of the Agreement, all rights and obligations shall be null and void, so that no Party shall have any further rights or obligations to any other Party, except with respect to the sections which survive Termination. All representations, warranties, agreements and rights of the Parties under the Agreement shall survive such Termination to the extent not otherwise limited in the Agreement and without each one of them having to be specifically mentioned in the Agreement. Termination of the Agreement pursuant to this section shall not be deemed to be a breach of Agreement by the Agency.

XI. DURATION OF AGREEMENT. This Agreement shall be effective on July 1, 2013 or on the date of the last signature below, whichever is later, and shall continue in force unless canceled or terminated by either party in accordance with paragraph X above.

XII. VOID AB INITIO. Notwithstanding paragraphs X and XI, the Agreement shall be void *ab initio* if the Construction General Permit is reissued, revoked or modified to eliminate the need for the Districts to review the SWPCP pursuant to such general permit's terms and conditions or if the Construction General Permit expires and is not reissued.

XIII. INTERPRETATION. The Agreement contains numerous references to statutes and regulations. For purposes of interpretation, conflict resolution and otherwise, the content of those statutes and regulations shall govern over the content of the reference in the Agreement to those statutes and regulations.

XIV. ENTIRETY OF AGREEMENT. This Agreement is the entire agreement between the Parties with respect to its subject matter, and supersedes all prior agreements, proposals, offers, counteroffers and understandings of the Parties, whether written or oral. The Agreement has been entered into after full investigation, neither Party relying upon any statement or representation by the other unless such statement or representation is specifically embodied in the Agreement.

XV. PROTECTION OF STATE CONFIDENTIAL INFORMATION. *(mandatory language required for all PSAs effective 12/1/11)*

A. The Districts or District Parties, at their own expense, have a duty to and shall protect from a

Confidential Information Breach any and all Confidential Information which they come to possess or control, wherever and however stored or maintained, in a commercially reasonable manner in accordance with current industry standards.

B. Each District or District Party shall develop, implement and maintain a comprehensive data-security program for the protection of Confidential Information. The safeguards contained in such program shall be consistent with and comply with the safeguards for protection of Confidential Information, and information of a similar character, as set forth in all applicable federal and state law and written policy of the Department or State concerning the confidentiality of Confidential Information. Such data-security program shall include, but not be limited to, the following:

1. A security policy for employees related to the storage, access and transportation of data containing Confidential Information;

2. Reasonable restrictions on access to records containing Confidential Information, including access to any locked storage where such records are kept;

3. A process for reviewing policies and security measures at least annually;

4. Creating secure access controls to Confidential Information, including but not limited to passwords; and

5. Encrypting of Confidential Information that is stored on laptops, portable devices or being transmitted electronically.

C. The District and District Parties shall notify the Department and the Connecticut Office of the Attorney General as soon as practical, but no later than twenty-four (24) hours, after they become aware of or suspect that any Confidential Information which Parties have come to possess or control has been subject to a Confidential Information Breach. If a Confidential Information Breach has occurred, the District shall, within three (3) business days after the notification, present a credit monitoring and protection plan to the Commissioner of Administrative Services, the Department and the Connecticut Office of the Attorney General, for review and approval. Such credit monitoring or protection plan shall be made available by the District at its own cost and expense to all individuals affected by the Confidential Information Breach. Such credit monitoring or protection plan shall include, but is not limited to, reimbursement for the cost of placing and lifting one (1) security freeze per credit file pursuant to Connecticut General Statutes §36a-701a. Such credit monitoring or protection plans shall be approved by the State in accordance with this Section and shall cover a length of time commensurate with the circumstances of the Confidential Information Breach. The District's costs and expenses for the credit monitoring and protection plan shall not be recoverable from the Department, any State of Connecticut entity or any affected individuals.

D. The District shall incorporate the requirements of this Section in all subAgreements requiring each District Party to safeguard Confidential Information in the same manner as provided for in this Section.

E. Nothing in this Section shall supersede in any manner the District's and/ or the District Parties' obligations pursuant to HIPAA or the provisions of this Agreement concerning the obligations of the District as a Business Associate of the Department.

XVI. AMERICANS WITH DISABILITIES ACT *(Mandatory)*. The Districts shall be and remain in compliance with the Americans with Disabilities Act of 1990 ("Act"), to the extent applicable, during the term of the Agreement. The DEEP may cancel the Agreement if the District and District Parties fail to comply with the Act.

XVII. ADA PUBLICATION STATEMENT. The following statement shall be incorporated into all **publications** prepared under the terms of this Agreement:

"The Department of Energy and Environmental Protection is an affirmative action/equal opportunity employer and service provider. In conformance with the Americans with Disabilities Act, DEEP makes every effort to provide equally effective services for persons with disabilities. Individuals with disabilities who need this information in an alternative format, to allow them to benefit and/or participate in the agency's programs and services, should call DEEP's Human Resources Office at (860) 424-3006, send a fax to (860) 424-3896, or email DEEP.MedRecs@ct.gov. Persons who are hearing impaired should call the State of Connecticut relay number 711."

When advertising any **public meetings** conducted under the terms of this Agreement, the above publications language should be used as well as the following statement:

"Requests for accommodations must be made at least two weeks prior to the program date."

All **videos** produced under the terms of this Agreement must be made available with closed captioning.

XVIII. PUBLICATION OF MATERIALS. The District must obtain written approval from the State of Connecticut prior to distribution or publication of any printed material prepared under the terms of this Agreement. Unless specifically authorized in writing by the State, on a case by case basis, the District shall have no right to use, and shall not use, the name of the State of Connecticut, its officials, agencies, or employees or the seal of the State of Connecticut or its agencies: (1) in any advertising, publicity, promotion; or (2) to express or to imply any endorsement of District's products or services; or (3) to use the name of the State of Connecticut, its officials agencies, or employees or the seal of the State of Connecticut or its agencies in any other manner (whether or not similar to uses prohibited by (1) and (2) above), except only to manufacture and deliver in accordance with this Agreement such items as are hereby contracted for by the State. In no event may the Districts use the State Seal in any way without the express written consent of the Secretary of State.

XIX. CHANGES IN PRINCIPAL PROJECT STAFF. Any changes in the principal project staff must be requested in writing and approved in writing by the Commissioner at the Commissioner's sole discretion. In the event of any unapproved change in principal project staff, the Commissioner may, in the Commissioner's sole discretion, terminate this Agreement.

XX. FURTHER ASSURANCES. The Parties shall provide such information, execute and deliver any instruments and documents and take such other actions as may be necessary or reasonably requested by the other Party which are not inconsistent with the provisions of this Agreement and which do not involve the vesting of rights or assumption of obligations other than those provided for in the Agreement, in order to give full effect to the Agreement and to carry out the intent of the Agreement.

XXI. ASSIGNMENT. The Districts shall not assign any of their rights or obligations under the Agreement, voluntarily or otherwise, in any manner without the prior written consent of the Agency. The Agency may void any purported assignment in violation of this section and declare the District in breach of this Agreement. Any termination by the Agency for a breach is without prejudice to the Agency's or the State's rights or possible Claims.

XXII. EXHIBITS. All exhibits referred to in, and attached to, this Agreement are incorporated in this Agreement by such reference and shall be deemed to be a part of it as if they had been fully set forth in it.

XXIII. FORCE MAJEUR. Events that materially affect the cost of the Goods or Services or the time schedule within which to Perform and are outside the control of the party asserting that such an event has

occurred, including, but not limited to, labor troubles unrelated to District(s), failure of or inadequate permanent power, unavoidable casualties, fire not caused by a District, extraordinary weather conditions, disasters, riots, acts of God, insurrection or war.

XXIV. INDEMNIFICATION. The Districts shall indemnify, defend and hold harmless the State and its officers, representatives, agents, servants, employees, successors and assigns from and against any and all (1) Claims arising, directly or indirectly, in connection with the Agreement, including the acts of commission or omission (collectively, the "Acts") of the District or District Parties; and (2) liabilities, damages, losses, costs and expenses, including but not limited to, attorneys' and other professionals' fees, arising, directly or indirectly, in connection with Claims, Acts or the Agreement. The Districts obligations under this section to indemnify, defend and hold harmless against Claims includes Claims concerning confidentiality of any part of or all of the Districts' Records, any intellectual property rights, other proprietary rights of any person or entity, copyrighted or uncopyrighted compositions, secret processes, patented or unpatented inventions, articles or appliances furnished or used in the Performance. The Districts shall not be responsible for indemnifying or holding the State harmless from any liability arising due to the negligence of the State or any other person or entity acting under the direct control or supervision of the State. The Districts shall reimburse the State for any and all damages to the real or personal property of the State caused by the Acts of the Districts or any District Parties. The State shall give the Districts reasonable notice of any such Claims. The Districts shall carry and maintain at all times during the term of the Agreement, and during the time that any provisions survive the term of the Agreement, sufficient general liability insurance to satisfy its obligations under this Agreement. The Districts shall name the State as an additional insured on the policy and shall provide a copy of the policy to the Agency prior to the effective date of the Agreement. The Districts shall not begin Performance until the delivery of the policy to the Agency. The Agency shall be entitled to recover under the insurance policy even if a body of competent jurisdiction determines that the Agency or the State is contributorily negligent. This section shall survive the Termination of the Agreement and shall not be limited by reason of any insurance coverage.

XXV. DISTRICT PARTIES. A District's members, directors, officers, shareholders, partners, managers, principal officers, representatives, agents, servants, consultants, employees or any one of them or any other person or entity with whom the District is in privity of oral or written contract and the District intends for such other person or entity to Perform under the Agreement in any capacity

XXVI. CAMPAIGN CONTRIBUTION RESTRICTION. For all State contracts as defined in P.A. 07-1 having a value in a calendar year of $50,000 or more or a combination or series of such agreements or contracts having a value of $100,000 or more, the authorized signatory to this Agreement expressly acknowledges receipt of the State Elections Enforcement Commission's notice advising state contractors of state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the notice. See SEEC Form 11.

Authorizing Signatures

For DEEP: _____ 8/21/13
Commissioner — Date

For Northwest Conservation District: _____ 6/5/13
Signature — Date

Chairman
Title

For Eastern Connecticut Conservation District: _____ 6/12/13
Signature — Date

Chair
Title

For Connecticut River Coastal Conservation District, Inc.: _____ 5/22/13
Signature — Date

Chair
Title

For Southwest Conservation District: _____ 5/13/13
Signature — Date

Vice-Chairperson SWCD
Title

For North Central Conservation District: _____ 5/23/13
Signature — Date

Chairman
Title

EXHIBIT 1

Connecticut Conservation District
Stormwater Pollution Control Plan Review Fee Schedule

Single Family Residential Developments Disturbing 5 or more Acres

Number of Lots	Standard Fee
1	$1,500
2	$1,665
3	$1,830
4	$1,995
5	$2,160
6	$2,325
7	$2,490
8	$2,655
9	$2,820
10	$2,985
11	$3,150
12	$3,315
13	$3,480
14	$3,645
15	$3,810
16	$3,975
17	$4,140
18	$4,305
19	$4,470
20	$4,635
21	$4,800
22	$4,965
23	$5,130
24	$5,295
25	$5,460

Number of Lots	Standard Fee
26	$5,625
27	$5,790
28	$5,955
29	$6,120
30	$6,285
31	$6,450
32	$6,615
33	$6,780
34	$6,945
35	$7,110
36	$7,275
37	$7,440
38	$7,605
39	$7,770
40	$7,935
41	$8,100
42	$8,265
43	$8,430
44	$8,595
45	$8,760
46	$8,925
47	$9,090
48	$9,255
49	$9,420
50	$9,585

Over 50 lots:
$9,585 + $20 x number of lots over 50

SW PCP Review: Standard Fee (as shown above)

Resubmission: Standard Fee minus 50%

Post-Approval Resubmission: $85 per hour, up to a maximum of the Standard Fee minus 50%

Express Reviews: The specified fee for an SW PCP Review, a Resubmission, or a Post-Approval Resubmission; plus 50% of the applicable fee and/or limit

Policies:

1. Payment due upon submission of SW PCP, with the exception of Post-Approval Resubmissions.
2. Payment for Post-Approval Resubmission review is due upon completion of review.
3. Written permission to enter onto and inspect the site: Due upon submission of SW PCP.

EXHIBIT 1

Connecticut Conservation District
Stormwater Pollution Control Plan Review Fee Schedule

Commercial and Multi Family Developments

Number of Disturbed Acres	Standard Fee
5	$2,200
6	$2,365
7	$2,530
8	$2,695
9	$2,860
10	$3,025
11	$3,190
12	$3,355
13	$3,520
14	$3,685
15	$3,850
16	$4,015
17	$4,180
18	$4,345
19	$4,510
20	$4,675
21	$4,840
22	$5,005
23	$5,170
24	$5,335
25	$5,500
26	$5,665
27	$5,830

Number of Disturbed Acres	Standard Fee
28	$5,995
29	$6,160
30	$6,325
31	$6,490
32	$6,655
33	$6,820
34	$6,985
35	$7,150
36	$7,315
37	$7,480
38	$7,645
39	$7,810
40	$7,975
41	$8,140
42	$8,305
43	$8,470
44	$8,635
45	$8,800
46	$8,965
47	$9,130
48	$9,295
49	$9,460
50	$9,625

Over 50 acres:
$9,625 + $25 x number of disturbed acres over 50

SW PCP Review: Standard Fee (as shown above)

Resubmission: Standard Fee minus 50%

Post-Approval Resubmission: $85 per hour, up to a maximum of the Standard Fee minus 50%

Express Reviews: The specified fee for an SW PCP Review, a Resubmission, or a Post-Approval Resubmission; plus 50% of the applicable fee and/or limit

Policies:

1. Payment due upon submission of SW PCP, with the exception of Post-Approval Resubmissions.
2. Payment for Post-Approval Resubmission review is due upon completion of review.
3. Written permission to enter onto and inspect the site: Due upon submission of SW PCP.

EXHIBIT 2

EXECUTIVE ORDERS

The Agreement is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the Contract as if they had been fully set forth in it. At the Districts' request, the Client Agency shall provide a copy of these orders to the Districts. The Agreement may also be subject to Executive Order No. 7C of Governor M. Jodi Rell, promulgated July 13, 2006, concerning contracting reforms and Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services, in accordance with their respective terms and conditions.

NONDISCRIMINATION

(a) For purposes of this Section, the following terms are defined as follows:

i. "Commission" means the Commission on Human Rights and Opportunities;
ii. "Contract" and "contract" include any extension or modification of this Agreement or contract;
iii. "Districts" and "districts" include the Districts and any successors or assigns of the Districts or districts;
iv. "Gender identity or expression" means a person's gender-related identity, appearance or behavior, whether or not that gender-related identity, appearance or behavior is different from that traditionally associated with the person's physiology or assigned sex at birth, which gender-related identity can be shown by providing evidence including, but not limited to, medical history, care or treatment of the gender-related identity, consistent and uniform assertion of the gender-related identity or any other evidence that the gender-related identity is sincerely held, part of a person's core identity or not being asserted for an improper purpose.
v. "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations;
vi. "good faith efforts" shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements;
vii. "marital status" means being single, married as recognized by the State of Connecticut, widowed, separated or divorced;
viii. "mental disability" means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders;
ix. "minority business enterprise" means any small contractor, District or supplier of materials fifty-one percent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) who are active in the daily affairs of the enterprise, (2) who have the power to direct the management and policies of the enterprise, and (3) who are members of a minority, as such term is defined in subsection (a) of Connecticut General Statutes § 32-9n; and
x. "public works contract" means any agreement between any individual, firm or corporation and the State or any political subdivision of the State other than a municipality for construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, or which is financed in whole or in part by the State, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees.

For purposes of this Section, the terms "Contract" and "contract" do not include a contract where each District is (1) a political subdivision of the state, including, but not limited to, a municipality, (2) a quasi-public agency, as defined in Conn. Gen. Stat. Section 1-120, (3) any other state, including but not limited to any federally recognized Indian tribal governments, as defined in Conn. Gen. Stat. Section 1-267, (4) the federal government, (5) a foreign government, or (6) an agency of a subdivision, agency, state or government described in the immediately preceding enumerated items (1), (2), (3), (4) or (5).

(b) (1) The Districts agree and warrant that in the performance of the Agreement such Districts will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, mental retardation, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such Districts that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut; and the Districts further agree to take affirmative action to insure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, mental retardation, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by the Districts that such disability prevents performance of the work involved; (2) the Districts agree, in all solicitations or advertisements for employees placed by or on behalf of the Districts, to state that it is

an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission; (3) the Districts agree to provide each labor union or representative of workers with which the Districts have a collective bargaining Agreement or other contract or understanding and each vendor with which the Districts have a contract or understanding, a notice to be provided by the Commission, advising the labor union or workers' representative of the Districts' commitments under this section and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the Districts agree to comply with each provision of this Section and Connecticut General Statutes §§ 46a-68e and 46a-68f and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes §§ 46a-56, 46a-68e and 46a-68f; and (5) the Districts agree to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Districts as relate to the provisions of this Section and Connecticut General Statutes § 46a-56. If the contract is a public works contract, the Districts agree and warrant that they will make good faith efforts to employ minority business enterprises as Districts and suppliers of materials on such public works projects.

(c) Determination of the Districts' good faith efforts shall include, but shall not be limited to, the following factors: The Districts' employment and subcontracting policies, patterns and practices; affirmative advertising, recruitment and training; technical assistance activities and such other reasonable activities or efforts as the Commission may prescribe that are designed to ensure the participation of minority business enterprises in public works projects.

(d) The Districts shall develop and maintain adequate documentation, in a manner prescribed by the Commission, of its good faith efforts.

(e) The Districts shall include the provisions of subsection (b) of this Section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on the Districts, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Districts shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes §46a-56; provided if such Districts become involved in, or is threatened with, litigation with the Districts or vendor as a result of such direction by the Commission, the Districts may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.

(f) The Districts agree to comply with the regulations referred to in this Section as they exist on the date of this Agreement and as they may be adopted or amended from time to time during the term of this Agreement and any amendments thereto.

(g) (1) The Districts agree and warrant that in the performance of the Agreement such Districts will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or the State of Connecticut, and that employees are treated when employed without regard to their sexual orientation; (2) the Districts agree to provide each labor union or representative of workers with which such Districts have a collective bargaining Agreement or other contract or understanding and each vendor with which such Districts have a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the Districts' commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (3) the Districts agree to comply with each provision of this section and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes § 46a-56; and (4) the Districts agree to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Districts which relate to the provisions of this Section and Connecticut General Statutes § 46a-56.

(h) The Districts shall include the provisions of the foregoing paragraph in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on the Districts, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Districts shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes § 46a-56; provided, if such Districts become involved in, or is threatened with, litigation with the Districts or vendor as a result of such direction by the Commission, the Districts may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to the Connecticut Department of Energy and Environmental Protection (DEEP)."

Note: *Place on official Letterhead. Need to document registered name with CT Secretary of State C.O.N.C.O.R.D.*

CERTIFICATION

I, xxxxxxxxxxxxxxx, Chair of the xxxxxxxxxxxxxxx an entity lawfully organized and existing under the laws of Connecticut, do hereby certify that the following is a true and correct copy of a resolution adopted on the >>>>day of >>>>, 2011, by the governing body of the xxxxxx in accordance with all of its documents of governance and management and the laws of Connecticut and further certify that such resolution has not been modified, rescinded or revoked, and is a present in full force and effect.

RESOLVED: That the xxxxxxxxxxxx hereby adopts as its policy to support the nondiscrimination agreements and warranties required under Conn. Gen. Stat. § 4a-60(a)(1) and § 4a-60a(a)(1), as amended in State of Connecticut Public Act 07-245 and sections 9(a)(1) and 10(a)(1) of Public Act 07-142, as those statutes may be amended from time to time.

IN WITNESS WHEREOF, the undersigned has executed this certificate this >>>day of >>>>>, 2013.

_____

Signature

_____

Date

CONSERVATION DISTRICT PLAN REVIEW CERTIFICATION

Registrations submitted to DEEP for which a Conservation District has performed the Plan review pursuant to Section 3(*b*)(10) of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities shall include the following certification:

"I hereby certify that I am an employee of the [INSERT NAME OF DISTRICT] Conservation District and that I meet the qualifications to review Stormwater Pollution Control Plans as specified in the Memorandum of Agreement between the Connecticut Department of Energy & Environmental Protection and the Connecticut Conservation Districts. I am making this certification in connection with a registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY]. I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I certify, based on my review of the requirements of such general permit and on the standard of care for such projects, that the Plan is in compliance with the requirements of the general permit. I understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

Registrations submitted to DEEP for which the District review was begun but ***could not be completed*** within the time limits specified in the Memorandum of Agreement shall include the following statement:

"I hereby certify that I am an employee of the [INSERT NAME OF DISTRICT] Conservation District and that I meet the qualifications to review Stormwater Pollution Control Plans as specified in the Memorandum of Agreement between the Connecticut Department of Energy & Environmental Protection and the Connecticut Conservation Districts. I am making this statement in connection with a registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, submitted to the commissioner by [INSERT NAME OF REGISTRANT] for an activity located at [INSERT ADDRESS OF PROJECT OR ACTIVITY]. I hereby state that the review of the Stormwater Pollution Control Plan (Plan) for such registration was not completed within the time frames specified in the Memorandum of Agreement. Consequently, I cannot certify that the Plan is in compliance with the requirements of the general permit."

General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities

APPENDIX G

Historic Preservation Review

Pursuant to Chapter 184a, Section 10-387 of the Connecticut General Statutes, the Department of Energy & Environmental Protection (DEEP) shall review, in consultation with the Connecticut Commission on Culture and Tourism, its policies and practices for consistency with the preservation and study of CT's archaeological and historical sites. Pursuant to this requirement, DEEP has outlined the following process for assessing the potential for and the presence of historic and/or archaeological resources at a proposed development site. DEEP advises a review for the resources identified below ***be initiated up to one year*** prior to registration for this permit *(or prior to property purchase if possible)* and in conjunction with the local project approval process. However, a review conducted for an Army Corps of Engineers Section 404 wetland permit would meet this requirement.

Step 1: Determine if the proposed site is within an area of significance by consulting the following resources:

1. CT Register of Historic Places found at the link below:
   http://www.nationalregisterofhistoricplaces.com/CT/state.html#pickem

2. The municipality of the proposed development site for its designations of local historic districts, including but not limited to, local Historic District and/or Property Statutes.

Step 2: Assess site characteristics to determine the presence of a potential archaeological site, sacred site, and/ or sacred object as described below:

Definitions:

1. "Archaeological site" means a location where there exists material evidence that is not less than fifty years old of the past life and culture of human beings in the state.

2. "Sacred site" or "sacred land" means any space, including an archaeological site, of ritual or traditional significance in the culture and religion of Native Americans that is listed or eligible for listing on the National Register of Historic Places (16 USC 470a, as amended) or the state register of historic places defined in section 10-410, including, but not limited to, marked and unmarked human burials, burial areas and cemeteries, monumental geological or natural features with sacred meaning or a meaning central to a group's oral traditions; sites of ceremonial structures, including sweat lodges; rock art sites, and sites of great historical significance to a tribe native to this state.

3. "Sacred object" means any archaeological artifact or other object associated with a sacred site.

Site Prescreening Criteria:

1. Does the proposed development site include lands within 300 feet of surface water features, such as streams, brooks, lakes, or marshes?
If "yes", proceed to Criterion 2. If the answer to Criterion 1 is "no", then there is a low potential for prehistoric period archaeological resources - Proceed to Criterion 3.

2. Does the area of anticipated construction or ground disturbance include soils classified by the Natural Resource Conservation Service as "Sandy Loam/ Loamy sand" or "Sandy Gravel Loam" not including "Fine Sandy Loam/ Loamy sand" with slopes less than or equal to 15%? (Soil mapping information is available for free from: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx)

If the answer to Criterion 2 is no, then there is a low potential for prehistoric period archaeological resources - Proceed to Criterion 3. If yes, the project site may contain significant prehistoric period archaeological resources

– *assess all other criteria and proceed to Step 3.*

3. Are there buildings or structures over 150 years in age with the project site?
If no, proceed to Criterion 4. If yes, the project site may contain significant historic period archaeological resources – assess all other criteria and proceed to Step 3.

4. Are there buildings or structures shown within or immediately adjacent to the project site on the 1850's Connecticut County maps?
Historic County maps are here:
Fairfield - http://www.flickr.com/photos/uconnlibrariesmagic/3387034755/
Hartford - http://www.flickr.com/photos/uconnlibrariesmagic/3386955421/
Litchfield - http://www.flickr.com/photos/uconnlibrariesmagic/3387765290/
Middlesex - http://www.flickr.com/photos/uconnlibrariesmagic/3386956185/
New Haven - http://www.flickr.com/photos/uconnlibrariesmagic/3386956345/
New London - http://www.flickr.com/photos/uconnlibrariesmagic/3387766080/
Tolland - http://www.flickr.com/photos/uconnlibrariesmagic/3386957013/
Windham - http://www.flickr.com/photos/uconnlibrariesmagic/3387766950/

To look for buildings and structures click on the appropriate county map link. From the "Actions" drop-down menu choose "View all sizes". On the "Photo/All sizes" page, choose "Original" to view the county map at an enlarged scale.

If no, there is a low potential for significant historic period archaeological resources. If yes, the site may contain significant historic period archaeological resources- assess all other criteria and proceed to Step 3.

Step 3: If you answered yes to Criterion 2, 3, or 4, please contact Daniel Forrest (860-256-2761 or daniel.forrest@ct.gov) or the current environmental review coordinator at the State Historic Preservation Office, Department of Economic and Community Development for additional guidance.

Step 4: Report in the Registration Form for the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities that a review has been conducted and the results of the review (i.e. the proposed site does not have the potential for historic/ archaeological resources, or that such potential exists and is being or has been reviewed by the Connecticut Commission on Culture and Tourism).

Please note that DEEP will refer all proposed sites with a historic/ archaeological resource potential (as identified in Steps 1 & 2 above) to the State Historic Preservation Office at the Department of Economic and Community Development..

Appendix H
Wild & Scenic Rivers Guidance

Overview: Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act (WSRA) charges administration of rivers in the National Wild and Scenic Rivers System (National System) to four federal land management agencies (Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service). However, to protect and enhance river values as directed in the WSRA, it is essential to use the authorities of a number of other federal agencies in administering the water column, river bed/bank, and upland river corridor.

Congress declared a policy to protect selected rivers in the nation through the WSRA. The river-administering agencies are to protect the river's identified values, free-flowing condition, and associated water quality. Specifically, each component is to be "administered in such manner as to protect and enhance the (outstandingly remarkable) values (**ORVs**) which caused it to be included in said system. . . ."

The WSRA also directs other federal agencies to protect river values. It explicitly recognizes the Federal Energy Regulatory Commission, Environmental Protection Agency, Army Corps of Engineers and any other federal department or agency with lands on or adjacent to designated (or congressionally authorized study) rivers or that permit or assist in the construction of water resources projects.

Pertinent Sections of the Wild and Scenic Rivers Act

The full Wild and Scenic Rivers Act can be found at the website: www.rivers.gov
Pertinent Sections related to the mandate to protect river values through coordinated federal actions is found in several sections of the WSRA:

Section 1(b)	Section 7(a)	Section 10(a)
Section 12(a)	Section 12(c)	

Designated Rivers under the Wild and Scenic Rivers Act and Contact Information

The full listing of designated rivers can be found on the website www.rivers.gov
As of the date of this publication, there are two designated rivers in Connecticut, both of which are managed under the Partnership Wild and Scenic Rivers Program, through a Coordinating Committee consisting of representatives from local communities and organizations, state government and the National Park Service. More information about these rivers, their watersheds, approved management plans, the Wild and Scenic Coordinating Committees and specific contact information can be found on the websites.

1. West Branch of the Farmington River: www.farmingtonriver.org
2. Eightmile River: www.eightmileriver.org

APPENDIX K
SITE DEVELOPMENT DRAWINGS

CPV TOWANTIC ENERGY CENTER

SITE DEVELOPMENT
OXFORD, CT
SITING COUNCIL - D&M PLAN SUBMISSION SET

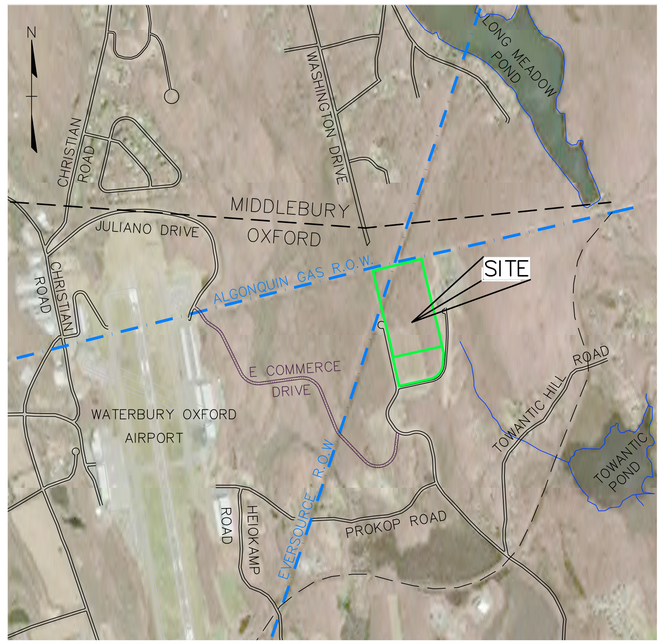
DRAWING INDEX

CIVIL DRAWINGS

DRAWING NO.	REVISION	TITLE
C001	–	COVER
C300	–	EXISTING CONDITIONS
C305	–	SITE PLAN
C310	–	STORMWATER MANAGEMENT & GRADING PLAN
C315	–	EROSION CONTROL PLAN – PHASE 1
C316	–	EROSION CONTROL PLAN – PHASE 2
C317	–	EROSION CONTROL PLAN – PHASE 3
C318	–	DEWATERING PLAN & DETAILS
C320	–	DETAILS
C321	–	DETAILS
C322	–	DETAILS
C325	–	STORMWATER RENOVATION AREA CROSS SECTIONS & PLANTING SCHEDULES
C330	–	EROSION CONTROL NARRATIVE & CONSTRUCTION SEQUENCE
C331	–	EROSION CONTROL NARRATIVE & CONSTRUCTION SEQUENCE

MECHANICAL DRAWINGS

DRAWING NO.	REVISION	TITLE
M301	B	GENERAL ARRANGEMENT ELEVATION LOOKING EAST



SITE MAP LOCATION
APPROXIMATE SCALE: 1"=1000'

CIVIL C1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266 - 0778 CONNECTICUT

Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr

Drawing Control

Purpose	Approved By	Date	Released By	Date
For Information				
For Comment				
For Bid				
For Fabrication				
For Construction				

Engineering Review

Disc	Engr	Date
Mech		
Elec		
Civil		
Arch		
Instr		

Drawn | Designed | Checked

Lead Engineer | Date 6/30/15 | Scale NONE

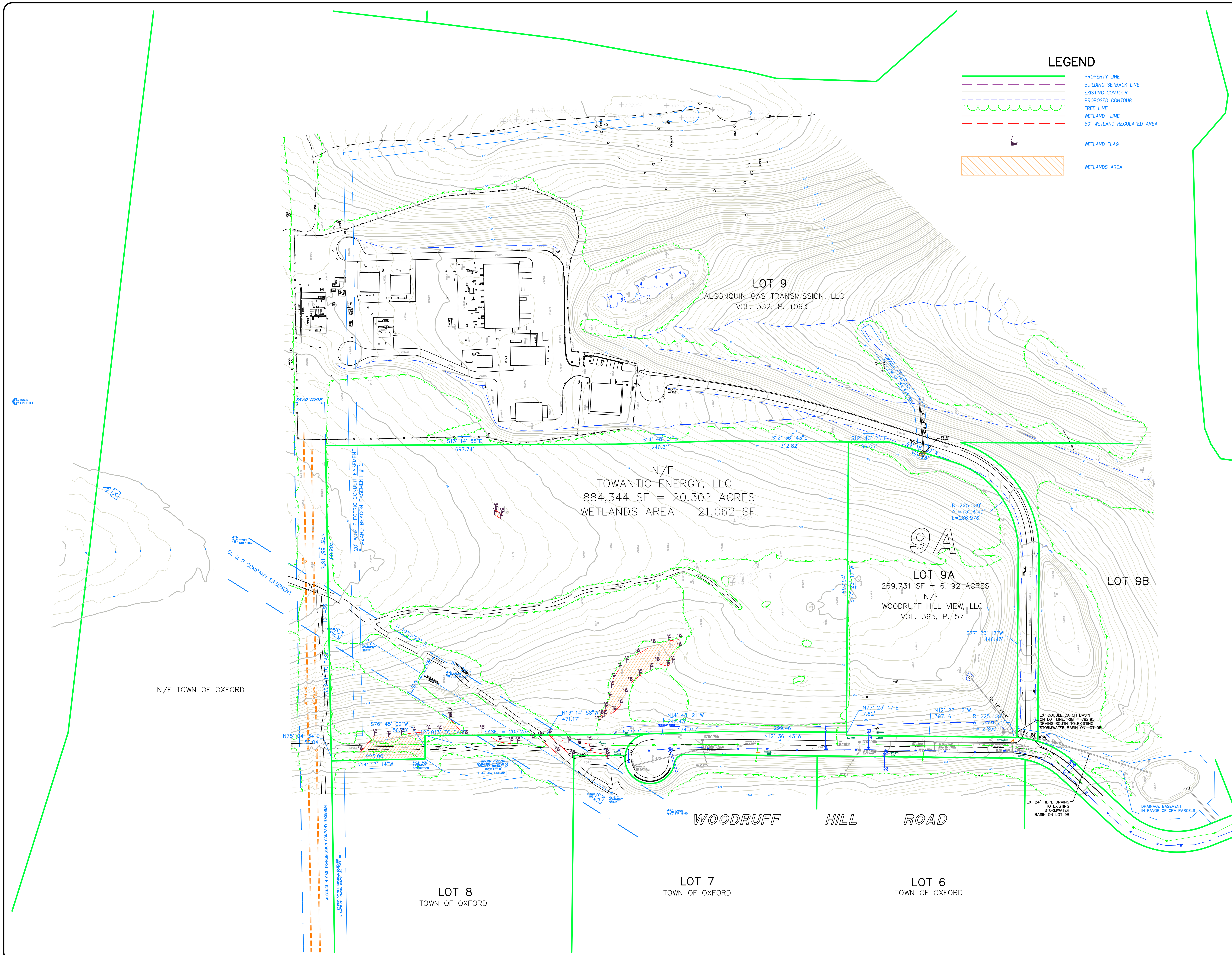
CPV TOWANTIC ENERGY CENTER
OXFORD, CONNECTICUT

TITLE SHEET AND DRAWING LIST

BURNS AND ROE ENTERPRISES, INC.
Engineers and Constructors - Oradell, NJ
Connecticut License No. PEC 39

Approved for Construction
Chief Civil Engineer

Work Order	Drawing No	Sh	Rev
3328	C001		


LEGEND
PROPERTY LINE
BUILDING SETBACK LINE
EXISTING CONTOUR
PROPOSED CONTOUR
TREE LINE
WETLAND LINE
50' WETLAND REGULATED AREA
WETLAND FLAG
WETLANDS AREA
LOT 9
ALGONQUIN GAS TRANSMISSION, LLC
VOL. 332, P. 1093
N/F
TOWANTIC ENERGY, LLC
884,344 SF = 20.302 ACRES
WETLANDS AREA = 21,062 SF
9A
LOT 9A
269,731 SF = 6.192 ACRES
N/F
WOODRUFF HILL VIEW, LLC
VOL. 365, P. 57
LOT 9B
N/F TOWN OF OXFORD
WOODRUFF HILL ROAD
LOT 8
TOWN OF OXFORD
LOT 7
TOWN OF OXFORD
LOT 6
TOWN OF OXFORD
CL & P COMPANY EASEMENT
20' WIDE ELECTRIC CONDUIT EASEMENT
HAZARD BEACON EASEMENT # 2
S13° 14' 58"E
697.74'
S14° 48' 21"E
246.31'
S12° 36' 43"E
312.82'
S12° 40' 20"E
99.06'
R=225.000'
L=286.976'
S77° 23' 17"W
446.43'
N77° 23' 17"E
7.62'
N12° 22' 12"W
397.16'
N13° 14' 58"W
471.17'
N14° 48' 21"W
242.43'
N12° 36' 43"W
S76° 45' 02"W
225.00'
N14° 13' 14"W
N75° 04' 34"E
EX. DOUBLE CATCH BASIN ON LOT LINE. RIM = 782.95 DRAINS SOUTH TO EXISTING STORMWATER BASIN ON LOT 9B
EX. 24" HDPE DRAINS TO EXISTING STORMWATER BASIN ON LOT 9B
DRAINAGE EASEMENT IN FAVOR OF CPV PARCELS

NO.	REVISION	DATE

Previous Editions Obsolete

100 0 50 100 200

1 inch = 100 ft.

EXISTING CONDITIONS

CPV TOWANTIC ENERGY CENTER

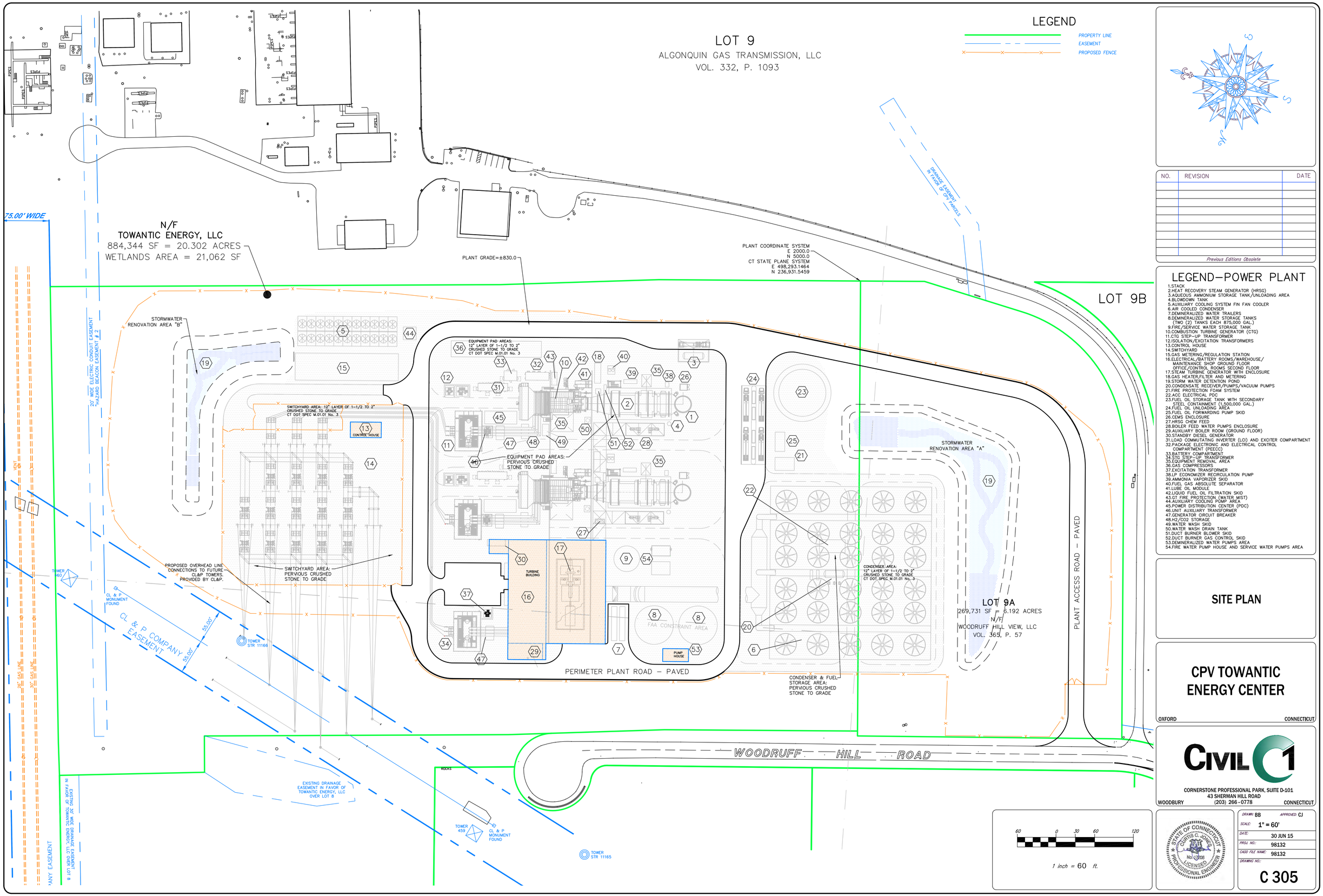
OXFORD CONNECTICUT

CIVIL 1

CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266 - 0778 CONNECTICUT

STATE OF CONNECTICUT ★ CURTIS C. JONES ★ No. 17206 LICENSED PROFESSIONAL ENGINEER

DRAWN: SC	*APPROVED:* CJ
SCALE:	1" = 100'
DATE:	30 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132 Base Map
DRAWING NO.:	C 300



NO.	REVISION	DATE

Previous Editions Obsolete

LEGEND–POWER PLANT

1. STACK
2. HEAT RECOVERY STEAM GENERATOR (HRSG)
3. AQUEOUS AMMONIUM STORAGE TANK/UNLOADING AREA
4. BLOWDOWN TANK
5. AUXILIARY COOLING SYSTEM FIN FAN COOLER
6. AIR COOLED CONDENSER
7. DEMINERALIZED WATER TRAILERS
8. DEMINERALIZED WATER STORAGE TANKS (TWO (2) TANKS EACH 875,000 GAL.)
9. FIRE/SERVICE WATER STORAGE TANK
10. COMBUSTION TURBINE GENERATOR (CTG)
11. CTG STEP-UP TRANSFORMER
12. ISOLATION/EXCITATION TRANSFORMERS
13. CONTROL HOUSE
14. SWITCHYARD
15. GAS METERING/REGULATION STATION
16. ELECTRICAL/BATTERY ROOMS/WAREHOUSE/ MAINTENANCE SHOP GROUND FLOOR OFFICE/CONTROL ROOMS SECOND FLOOR
17. STEAM TURBINE GENERATOR WITH ENCLOSURE
18. GAS HEATER/FILTER AND METERING
19. STORM WATER DETENTION POND
20. CONDENSATE RECEIVER/PUMPS/VACUUM PUMPS
21. FIRE PROTECTION FOAM SYSTEM
22. ACC ELECTRICAL PDC
23. FUEL OIL STORAGE TANK WITH SECONDARY STEEL CONTAINMENT (1,500,000 GAL.)
24. FUEL OIL UNLOADING AREA
25. FUEL OIL FORWARDING PUMP SKID
26. CEMS ENCLOSURE
27. HRSG CHEM FEED
28. BOILER FEED WATER PUMPS ENCLOSURE
29. AUXILIARY BOILER ROOM (GROUND FLOOR)
30. STANDBY DIESEL GENERATOR
31. LOAD COMMUTATING INVERTER (LCI) AND EXCITER COMPARTMENT
32. PACKAGE ELECTRONIC AND ELECTRICAL CONTROL COMPARTMENT (PEECC)
33. BATTERY COMPARTMENT
34. STG STEP-UP TRANSFORMER
35. EQUIPMENT REMOVAL AREA
36. GAS COMPRESSORS
37. EXCITATION TRANSFORMER
38. LP ECONOMIZER RECIRCULATION PUMP
39. AMMONIA VAPORIZER SKID
40. FUEL GAS ABSOLUTE SEPARATOR
41. LUBE OIL MODULE
42. LIQUID FUEL OIL FILTRATION SKID
43. GT FIRE PROTECTION (WATER MIST)
44. AUXILIARY COOLING PUMP AREA
45. POWER DISTRIBUTION CENTER (PDC)
46. UNIT AUXILIARY TRANSFORMER
47. GENERATOR CIRCUIT BREAKER
48. H2/CO2 STORAGE
49. WATER WASH SKID
50. WATER WASH DRAIN TANK
51. DUCT BURNER BLOWER SKID
52. DUCT BURNER GAS CONTROL SKID
53. DEMINERALIZED WATER PUMPS AREA
54. FIRE WATER PUMP HOUSE AND SERVICE WATER PUMPS AREA

SITE PLAN

CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

CIVIL 1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

60 0 30 60 120

1 inch = 60 ft.

STATE OF CONNECTICUT CURTIS C. JONES No. 17208 LICENSED PROFESSIONAL ENGINEER

DRAWN:	BB
APPROVED:	CJ
SCALE:	1" = 60'
DATE:	30 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	C 305

LOT 9
ALGONQUIN GAS TRANSMISSION, LLC
VOL. 332, P. 1093

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- +829.6 PROPOSED SPOT ELEVATION
- TREE LINE
- PROPOSED STORM DRAINAGE
- WETLAND LINE
- WETLAND FLAG
- WETLANDS AREA
- EASEMENT
- EXISTING FENCE
- PROPOSED FENCE

NOTES
1. TOPOGRAPHICAL MAPPING, PROPERTY SURVEY AND EXISTING FEATURES ARE BASED ON A SURVEY PREPARED BY RIORDAN LAND SURVEYING DATED 5/10/14.
2. WETLANDS LOCATIONS AS SHOWN WERE FLAGGED BY DEAN GUSTAFSON, SOIL SCIENTIST AND LOCATED BY RIORDAN LAND SURVEYING.
3. VERTICAL DATUM IS NAVD88.
4. HORIZONTAL DATUM IS NAD83/87 COORDINATE SYSTEM.

NO.	REVISION	DATE

Previous Editions Obsolete

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1. STACK
2. HEAT RECOVERY STEAM GENERATOR (HRSG)
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STORMWATER MANAGEMENT & GRADING PLAN

CPV TOWANTIC ENERGY CENTER
OXFORD CONNECTICUT

CIVIL C1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266 - 0778 CONNECTICUT

N/F
TOWANTIC ENERGY, LLC
884,344 SF = 20.302 ACRES
WETLANDS AREA = 21,062 SF

LOT 9B

LOT 9A
269,731 SF = 6.192 ACRES
N/F
WOODRUFF HILL VIEW, LLC
VOL. 365, P. 57

75.00' WIDE

20' WIDE ELECTRIC CONDUIT EASEMENT "HAZARD BEACON EASEMENT #2"

CL & P COMPANY EASEMENT 55.00'

EXISTING 30' WIDE DRAINAGE EASEMENT IN FAVOR OF TOWANTIC ENERGY, LLC OVER LOT 8

EXISTING DRAINAGE EASEMENT IN FAVOR OF TOWANTIC ENERGY, LLC OVER LOT 8

STORMWATER RENOVATION AREA "B"
EXTENDED DETENTION SHALLOW WETLAND
POOL ELEVATION 821.00
BERM ELEVATION 829.9
100 YEAR ELEVATION 824.86

STORMWATER RENOVATION AREA "A"
EXTENDED DETENTION SHALLOW WETLAND
POOL ELEVATION 820.00
BERM ELEVATION 824.00
100 YEAR ELEVATION 822.63

WETLAND 4 IMPACT AREA = 178 SF

WETLAND 1 IMPACT AREA = 10,322 SF

PERMANENT WETLAND IMPACTS

WETLANDS ID	IMPACT AREA (SF)
1	10,322
4	178
TOTAL	10,500 (0.24 AC.)

WOODRUFF HILL ROAD

PERIMETER PLANT ROAD

PLANT ACCESS ROAD – MAX GRADE 6.5%

PLANT PARKING AREA

TURBINE BUILDING

CONTROL HOUSE

SWITCHYARD AREA: 12" LAYER OF 1–1/2" TO 2" CRUSHED STONE TO GRADE CT DOT SPEC M.01.01 No. 3

EQUIPMENT PAD AREAS: 12" LAYER OF 1–1/2" TO 2" CRUSHED STONE TO GRADE CT DOT SPEC M.01.01 No. 3

CONDENSER AREA: 12" LAYER OF 1–1/2" TO 2" CRUSHED STONE TO GRADE CT DOT SPEC M.01.01 No. 3

NOTE–TYPE CL BASINS SET IN INTERIOR EQUIPMENT AREAS & INSIDE OF DRIVEWAY LOOP TO BE SET AT SUBGRADE TO CATCH DRAINAGE FROM CRUSHED STONE PAD AREAS.

REFER TO BASIN B PLANTING SCHEDULE ON SHEET C–325 FOR WETLANDS PLANTINGS IN FOREBAY, MICRO–POOL, LOW MARSH AND HIGH MARSH AREAS

REFER TO BASIN A PLANTING SCHEDULE ON SHEET C–325 FOR WETLANDS PLANTINGS IN FOREBAY, MICRO–POOL, LOW MARSH AND HIGH MARSH AREAS

SEED UPPER SLOPES W/ N.E. CONSERVATION/WILDLIFE MIX

SEED RAIN LOW SLOPES W/ N.E. EROSION CONTROL MIX FOR DETENTION BASINS AND MOIST SITES

SEED AND LOW SLOPES W/ N.E. EROSION CONTROL MIX FOR DETENTION BASINS AND MOIST SITES

3' W LOW MARSH: SINUOUS CHANNEL – EL. 819.5 – 820.0

HIGH MARSH EL. 820.75

HIGH MARSH EL. 819.75

SEDIMENT FOREBAY BOT. EL. 817.0

SEDIMENT FOREBAY BOT. EL. 816.0

MICRO–POOL BOT. EL. 817.0

MICRO–POOL BOT. EL. 815.0

PROPOSED OVERHEAD LINE CONNECTIONS TO FUTURE CL&P TOWERS, PROVIDED BY CL&P.

CREST TRANSMISSION OVERHEAD CONDUCTOR CLEARANCE

CURB EAST SIDE DRIVE STATION 4+80 TO 15+25

CURB WEST SIDE DRIVE STATION 19+00 TO 24+75

WATER QUALITY SWALE C (2' DEEP)

WATER QUALITY SWALE D1 (2' DEEP)

WATER QUALITY SWALE E1

WATER QUALITY SWALE E2 (TYP.)

MODIFIED RIPRAP OVERFLOW SPILLWAY ELEVATION EL. 823.0

3.0:1 FINISHED GRADE

CONNECT WATER SERVICE AND SANITARY SEWER LATERALS TO PROPOSED FACILITY FROM EXISTING LOCATIONS THAT HAVE BEEN STUBBED OUT INTO THE SITE

PR. T'D ROADSIDE SWALE OVER EX. CURTAIN DRAIN TO PROVIDE ADDITIONAL RECHARGE FOR WL3

EXISTING 6" CURTAIN DRAIN

DRAIN OUTLET

PR. 10'W x 12'L x 1'D INTERMEDIATE RIPRAP PREFORMED SCOUR HOLE BOTTOM EL. 758.0

11'W x 12'L INTERMEDIATE RIPRAP

6'W x 10'L INTERMEDIATE RIPRAP

12.5'W x 16'L INTERMEDIATE RIPRAP

EX. INT. RIPRAP

8'W x 10'L MODIFIED RIPRAP

5'W x 12'L INTERMEDIATE RIPRAP

12'W x 14'L MODIFIED RIPRAP

LINE OUTLET AREA 20'W x 25'L x 12"D WITH MODIFIED RIPRAP

OUTLET B1 INV: 821.0

OUTLET B2 INV: 825.00

OUTLET STRUCTURE INV: 820.0

PUMP HOUSE

TRANS

TOWER 460

TOWER STR 11166

TOWER 459

TOWER STR 11165

CL & P MONUMENT FOUND

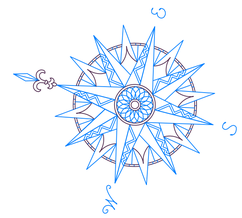
DMH B1 RIM: 830.00 INV: 820.18
DMH B2 RIM: 829.25 INV: 822.87
DMH B3 RIM: 829.25 INV: 824.42
DMH B4 RIM: 829.25 INV: 822.21
DMH B5 RIM: 830.0 INV: 820.83 (18") INV: 824.5 (24")
DMH B6 RIM: 830.0 INV: 820.45
DMH B7 RIM: 830.0 INV: 818.76
DMH B8 RIM: 820.0 INV: 816.0
DMH B9 RIM: 803.0 INV: 797.5
DMH B10 RIM: 791.0 INV: 787.0(IN) INV: 780.6(OUT)
DMH C1 RIM: 794.0 INV: 790.75(N) INV: 788.0(OUT)
DMH C2 RIM: 803.0 INV: 800.0(IN) INV: 796.72(OUT)
DMH A1 RIM: 829.15 INV: 824.25
DMH A2 RIM: 830.50 INV: 823.45
DMH A3 RIM: 830.10 INV: 823.06
DMH E1 RIM: 800.00 INV: 793.84
DMH C1 RIM: 822.50 INV: 819.25
DMH E1 RIM: 791.00 INV: 787.00

CB A1 RIM: 829.25 INV: 825.85
CB A2 RIM: 829.25 INV: 825.85
CB A3 RIM: 829.25 INV: 824.32
CB A4 RIM: 829.25 INV: 824.32
CB A5 RIM: 829.25 INV: 824.07
CB A6 RIM: 828.95 INV: 822.37
CB A7 RIM: 828.95 INV: 822.24
CB A8 RIM: 829.25 INV: 826.00
CB A9 RIM: 829.25 INV: 825.85
CB A10 RIM: 829.25 INV: 826.00
CB A11 RIM: 829.15 INV: 824.25
CB A12 RIM: 829.25 INV: 826.00
CB A13 RIM: 829.40 INV: 826.15
CB A14 RIM: 829.25 INV: 825.95(S) INV: 823.20(WNE)
CB A15 RIM: 829.70 INV: 826.45
CB A16 RIM: 829.70 INV: 824.38
CB A17 RIM: 829.75 INV: 826.50
CB A18 RIM: 829.50 INV: 823.60
CB A20 RIM: 829.25 INV: 821.95
CB A21 RIM: 829.25 INV: 821.59
CB B1 RIM: 829.25 INV: 826.00
CB B2 RIM: 829.25 INV: 821.40
CB B3 RIM: 829.20 INV: 824.32
CB B4 RIM: 829.20 INV: 823.29
CB B5 RIM: 829.45 INV: 826.20
CB B6 RIM: 829.45 INV: 826.05
CB B7 RIM: 828.75 INV: 825.50
CB B8 RIM: 828.75 INV: 825.35
CB B10 RIM: 829.20 INV: 823.79
CB B11 RIM: 829.20 INV: 822.59
CB C1 RIM: 808.0 INV: 804.75
CB C2 RIM: 809.0 INV: 804.45
CB D1 RIM: 804.0 INV: 800.75
CB E1 RIM: 790.25 INV: 787.0

INV: 821.00

INV: 820.00

INV: 800.35



1 inch = 60 ft.

60 0 30 60 120

STATE OF CONNECTICUT CURTIS C. JONES No. 17208 LICENSED PROFESSIONAL ENGINEER

DRAWN: BB APPROVED: CJ
SCALE: 1" = 60'
DATE: 30 JUN 15
PROJ. NO.: 98132
CADD FILE NAME: 98132
DRAWING NO.: C 310

CONSTRUCTION SEQUENCE

PHASE I: (30 – 60 DAY DURATION)

1. FIELD STAKEOUT THE LIMITS OF ALL CONSTRUCTION ACTIVITIES ASSOCIATED WITH PHASE I.

2. INSTALL ANTI–TRACKING PAD AT CONSTRUCTION ENTRANCE AS SHOWN ON THE PLAN. INSTALL WATER BARS AND HAYBALE BARRIERS AS NECESSARY TO CONTROL DRAINAGE ALONG THE ENTRY DRIVE. AT THE END OF EACH WORKING DAY, ANY ACCUMULATED SILT SHALL BE SWEPT FROM THE EXISTING TOWN ROADS.

3. CLEAR ALL VEGETATION WITHIN THE CONSTRUCTION AREA. DO NOT REMOVE STUMPS UNTIL EROSION CONTROL MEASURES ARE IN PLACE.

4. HAYBALES AND/OR SILTATION FENCE AND OTHER EROSION CONTROL FEATURES WILL BE PLACED AS SHOWN ON THE ENCLOSED PHASE 1 PLAN PRIOR TO THE START OF ANY CONSTRUCTION.

5. INSTALL TEMPORARY FILTER BERM IN EXISTING STORMWATER BASIN ON LOT 9B PER DETAILS.

6. REMOVE STUMPS ONLY FROM CONSTRUCTION AREA FOR PHASE 1.

7. STRIP & STOCKPILE TOPSOIL (+/– 8,000 CUBIC YARDS) AS SHOWN ON PLANS. EXCESS MATERIAL MAY BE STOCKPILED OFF–SITE.

8. CREATE TEMPORARY CLEAN WATER DIVERSIONS AS NECESSARY TO MINIMIZE OVERLAND FLOW.

9. CONSTRUCT TEMPORARY SEDIMENT TRAPS 1A AND 1B AT THE DRIVEWAY ENTRANCE.

10. BEGIN MASS EARTH EXCAVATION INTO THE SITE WORKING EAST THEN NORTH INTO THE SITE. CUT MATERIAL WILL BE USED TO FILL EASTERN SIDE OF DRIVEWAY, EXCESS CUT MATERIAL WILL BE REMOVED FROM THE SITE.

11. INSTALL STORM DRAINAGE STRUCTURES IN THE PHASE 1 CONSTRUCTION AREA BUT DO NOT ALLOW DRAINAGE INTO STRUCTURES UNTIL AREA IS STABILIZED. CONSTRUCTION STORMWATER MUST FLOW TO TSTs LOCATED AT BOTTOM OF DRIVEWAY AS INDICATED ON THE SITE PLANS.

12. ROUGH GRADE STORMWATER RENOVATION AREA "A" SO THAT IT CAN BE USED AS A TST DURING THE CONSTRUCTION ASSOCIATED WITH PHASE 2. INSTALL TEMPORARY BERM IN THE MIDDLE OF THE BASIN TO CREATE TSTs 2A & 2B.

13. CONSTRUCT OUTLETS TO TSTs AND PERFORATED RISER ON THE OUTLET STRUCTURE PER THE DETAIL ON SHEET C321. A TEMPORARY PERFORATED RISER OUTLET WILL BE PROVIDED FOR TST 2B AS INDICATED ON THE SITE PLANS.

14. CONSTRUCT EMERGENCY MODIFIED RIPRAP OVERFLOW SWALE FROM BASIN.

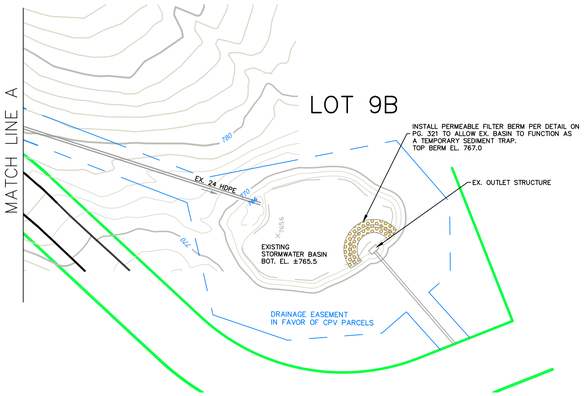
15. PLACE STORMWATER FILTRATION TRAILER INTO POSITION AS NECESSARY.

16. PLACE BINDER COURSE ON DRIVEWAY FROM STATION 0+00 TO 10+50.

17. PLACE TOPSOIL AND SEED ALL DISTURBED AREAS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE.

18. INSTALL EROSION CONTROL BLANKETS ON ANY SLOPES STEEPER THAN 3:1 AND HYDRO–SEED ALL DISTURBED AREAS WITH SLOPES OF 3:1 OR LESS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE. ALL EROSION & SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL THE PHASE 1 CONSTRUCTION AREA IS PERMANENTLY STABILIZED.

19. REMOVE EROSION CONTROL MEASURES AND DIRECT STORMWATER INTO CATCH BASINS ALONG ACCESS DRIVEWAY AFTER THE AREA IS FULLY STABILIZED AND TRIBUTARY VEGETATION IS ESTABLISHED.

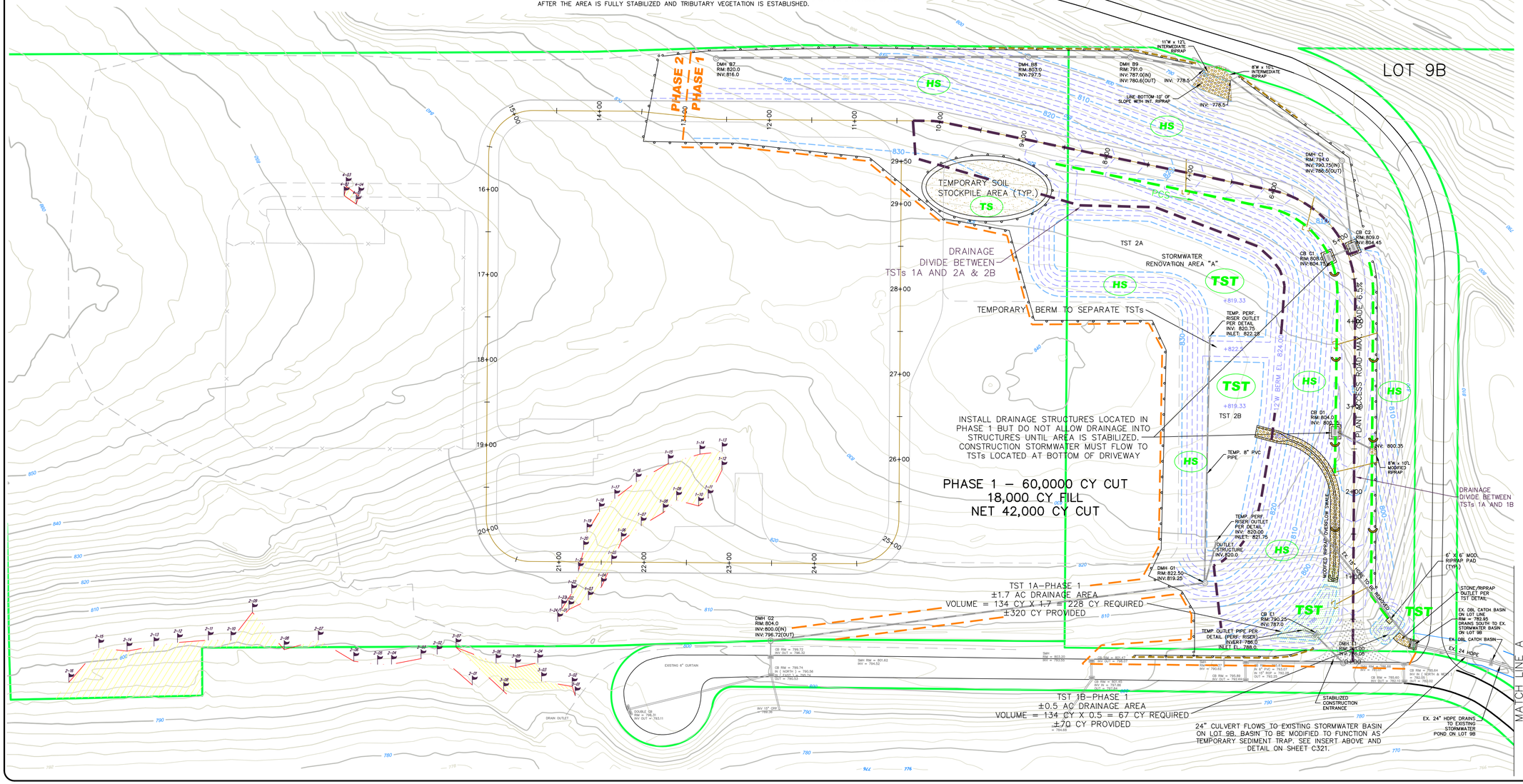


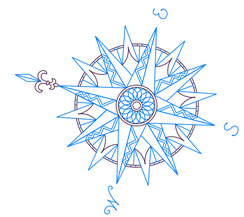
EXISTING STORMWATER BASIN–LOT 9B

LEGEND

PROPERTY LINE
EXISTING CONTOUR
PROPOSED CONTOUR–CURRENT PHASE
FINISHED GRADE–PREVIOUS PHASE
PROPOSED STORM DRAINAGE
WETLAND LINE
WETLAND FLAG
WETLANDS AREA
EASEMENT
EXISTING FENCE
STONE CHECK DAM
WATER BAR WITH HAYBALES TRAP
PERM. WATER QUALITY SWALE

TEMP. WATER DIVERSION SWALE
CONSTRUCTION ENTRANCE
LIMITS OF CLEARING/CONSTRUCTION FULL PROJECT LIMITS
SILT FENCE
STAKED HAY BALES
BALED FILTER AND SILT SACK
TEMPORARY SOIL STOCKPILE
TEMPORARY SEDIMENT TRAP
TEMPORARY SEEDING
EROSION CONTROL BLANKET
AREAS TO BE HYDRO–SEEDED





NO.	REVISION	DATE

Previous Editions Obsolete

60 0 30 60 120

1 inch = 60 ft.

EROSION & SEDIMENT CONTROL PLAN PHASE 1

CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

CIVIL C1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

STATE OF CONNECTICUT CHRISTOPHER JONES No. 21208 LICENSED PROFESSIONAL ENGINEER

DRAWN: BB	APPROVED: CJ
SCALE:	1" = 60'
DATE:	10 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	C 315

CONSTRUCTION SEQUENCE

PHASE II: (270 – 365 DAY DURATION)

1. FIELD STAKEOUT THE LIMITS OF ALL CONSTRUCTION ACTIVITIES ASSOCIATED WITH PHASE 2.

2. INSTALL HAYBALES AND/OR SILTATION FENCE AROUND BOUNDARY OF THE CONSTRUCTION AREA AS SHOWN ON THE ENCLOSED PHASE 2 PLAN.

3. CREATE TEMPORARY CLEAN WATER DIVERSION TO MINIMIZE OVERLAND FLOW ONTO THE CONSTRUCTION AREA AS INDICATED ON THE SITE PLANS.

4. REMOVE STUMPS ONLY FROM THE CONSTRUCTION AREA FOR PHASE 2.

5. STRIP & STOCKPILE TOPSOIL (+/–14,000 CUBIC YARDS) AS SHOWN ON PLANS. MATERIAL MAY BE STOCKPILED IN PHASE 2. EXCESS MATERIAL MAY BE STOCKPILED OFF–SITE.

6. COMMENCE EARTHWORK AND GRADING FOR TEMPORARY SEDIMENTATION TRAP 2C (NOTE TSTs 2A AND 2B WERE CONSTRUCTED IN PHASE 1).

7. CONSTRUCT TEMPORARY DIVERSION SWALES AND INSTALLED STORM DRAINAGE STRUCTURES AS INDICATED ON SITE PLANS TO DIVERT STORMWATER FROM THE CONSTRUCTION AREAS INTO TSTs 2A, 2B AND 2C.

8. BEGIN MASS EARTH EXCAVATION INTO THE SITE WORKING FROM SOUTH TO NORTH. CUT MATERIAL WILL BE USED TO FILL EASTERN SIDE AND WESTERN FILL AREAS OF THE SITE, EXCESS CUT MATERIAL WILL BE REMOVED FROM THE SITE.

9. INSTALL STAFF PARKING AREA AND OFFICE TRAILERS.

10. BEGIN MASS EARTH EXCAVATION OF THE POWER BLOCK AREA. THIS AREA WILL BE CUT APPROXIMATELY 7' BELOW THE FINISHED GRADE ELEVATION OF THE PLANT CREATING A DEPRESSION WHICH WILL TRAP STORMWATER. THIS AREA WILL BE DEWATERED BY INSTALLING SUMPS ON NORTHEAST AND WEST SIDES OF THE EXCAVATION THAT WILL BE PUMPED INTO TSTs AFTER STORM EVENTS.

11. MATERIAL FROM THE POWER BLOCK EXCAVATION WILL BE STOCKPILED AND THEN REDEPOSITED & COMPACTED INTO THE EXCAVATION AREA AFTER THE ASSOCIATED FOUNDATION AND UTILITY WORK HAS BEEN COMPLETED.

12. INSTALL STORM DRAINAGE STRUCTURES WHERE FEASIBLE IN THE PHASE 2 CONSTRUCTION AREA. THE MAJORITY OF STORM DRAINAGE STRUCTURES IN THE PHASE 2 AREA WILL BE INSTALLED AFTER THE DEEPER FOUNDATION AND UTILITY WORK ASSOCIATED WITH THE POWER BLOCK CONSTRUCTION ARE COMPLETED.

13. PLACE TOPSOIL AND SEED ALL DISTURBED AREAS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE.

14. INSTALL EROSION CONTROL BLANKETS ON ANY SLOPES STEEPER THAN 3-1 AND HYDRO–SEED ALL DISTURBED AREAS WITH SLOPES OF 3:1 OR LESS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE. ALL EROSION & SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL THE PHASE 2 CONSTRUCTION AREA IS PERMANENTLY STABILIZED.

15. PLACE BINDER COURSE ON DRIVEWAY AREA AFTER ALL OTHER IMPROVEMENTS ARE COMPLETE.

16. WHEN THE EXISTING STORMWATER BASIN ON LOT 9B IS NO LONGER NEEDED TO OPERATE AS A TEMPORARY SEDIMENT TRAP, REMOVE THE PERMEABLE FILER BERM, REMOVE ANY SEDIMENT BUILD–UP. REESTABLISH BOTTOM OF BASIN AT ORIGINAL GRADE AND SEED WITH N.E. EROSION CONTROL MIX FOR DETENTION BASINS AND MOIST SITES.

17. REMOVE EROSION CONTROL MEASURES AND DIRECT STORMWATER INTO CATCH BASINS AFTER THE AREA IS FULLY STABILIZED AND TRIBUTARY VEGETATION IS ESTABLISHED.

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR–CURRENT PHASE
- FINISHED GRADE–PREVIOUS PHASE
- PROPOSED STORM DRAINAGE
- WETLAND LINE
- WETLAND FLAG
- WETLANDS AREA
- EASEMENT
- EXISTING FENCE
- STONE CHECK DAM
- WATER BAR WITH HAYBALES TRAP
- PERM. WATER QUALITY SWALE
- TEMP. WATER DIVERSION SWALE
- CONSTRUCTION ENTRANCE
- LIMITS OF CLEARING/CONSTRUCTION FULL PROJECT LIMITS
- SILT FENCE
- STAKED HAY BALES
- BALED FILTER AND SILT SACK
- TEMPORARY SOIL STOCKPILE
- TST — TEMPORARY SEDIMENT TRAP
- TS — TEMPORARY SEEDING
- ECB — EROSION CONTROL BLANKET
- HS — AREAS TO BE HYDRO–SEEDED

INSTALL DRAINAGE STRUCTURES WHERE FEASIBLE IN PHASE 2A TO ALLOW CONSTRUCTION STORMWATER TO FLOW TO TST 2A AS SHOWN

6' X 6' MOD. RIPRAP PAD W/ 20 LF EARTHEN LEVEL SPREADER

DMH B7 RIM: 830.0 INV: 818.76

DMH B8 RIM: 820.0 INV: 816.0

DMH B9 RIM: 803.0 INV: 797.5

CB A5 RIM: 826.25 INV: 824.07

CB A6 RIM: 828.95 INV: 822.37

CB A7 RIM: 828.95 INV: 822.24

CB A8 RIM: 829.25 INV: 824.32

CB A20 RIM: 829.25 INV: 821.95

CB A21 RIM: 829.25 INV: 821.59

DMH B10 RIM: 791.0 INV: 787.0(IN) INV: 780.6(OUT)

11'W x 12'L INTERMEDIATE RIPRAP

6'W x 10'L INTERMEDIATE RIPRAP

INV: 778.5

LINE BOTTOM–10' OF SLOPE WITH INT. RIPRAP

DMH C1 RIM: 794.0 INV: 790.75(IN) INV: 786.5(OUT)

CB C1 RIM: 808.0 INV: 804.75

CB C2 RIM: 809.0 INV: 804.45

STAFF PARKING

OFFICE TRAILERS

SWALE TO 2A

CLEAN WATER TO

SUMP PIT

POWER BLOCK EXCAVATION BOTTOM ELEVATION: 823.0

SUMP PITS TO BE INSTALLED AND AREA TO BE DEWATERED INTO TSTs 2A AND 2B (SEE DEWATERING PLAN SHEET C318)

PHASE 1

PHASE 2

PHASE 3

TEMPORARY SOIL STOCKPILE AREA (TYP.)

DRAINAGE DIVIDE BETWEEN TSTs 2A AND 2C

DRAINAGE DIVIDE BETWEEN TSTs 2B AND 2C

DRAINAGE DIVIDE BETWEEN TSTs 2A AND 2B

PHASE 2 – 88,000 CY CUT
68,000 CY FILL
NET 20,000 CY CUT

NOTE: ±20,000 CY OF THIS AMOUNT IS CUT AND THEN REFILL FOR THE POWER BLOCK AREA

TST 2A – PHASE 2
±2.85 AC DRAINAGE AREA
VOLUME = 134 CY X 2.85 = 382 CY REQUIRED
±1,785 CY PROVIDED

TST 2B–PHASE 2
±3.8 AC DRAINAGE AREA
VOLUME=134 CY/AC X 3.8=509 CY REQUIRED
±925 CY PROVIDED

TST 2C – PHASE 2
±2.20 AC DRAINAGE AREA
VOLUME = 134 CY X 2.2 = 295 CY REQUIRED
300 CY PROVIDED

TEMPORARY BERM TO SEPARATE TSTs

STORMWATER RENOVATION AREA "A"

TEMP. PERF. RISER OUTLET PER DETAIL INV: 820.75 INLET: 822.25

FILTRATION TRAILER

12'W BERM EL 822.00

TEMP. 8" PVC PIPE

MODIFIED RIPRAP OVERFLOW SWALE

MODIFIED RIPRAP OVERFLOW EL. 823.0

TEMP. PERF. RISER OUTLET PER DETAIL INV: 820.00 INLET: 821.75

OUTLET STRUCTURE INV: 820.0

TEMP OUTLET PIPE PER DETAIL (PERF. RISER) INVERT: 786.0 INLET EL. 788.0

CB E1 RIM: 790.25 INV: 787.0

DMH E1 RIM: 789.00 INV: 786.05

DMH G1 RIM: 822.50 INV: 819.25

CB G1 RIM: 804.0 INV: 800.25

INV: 800.35

6'W x 10'L MODIFIED RIPRAP

STABILIZED CONSTRUCTION ENTRANCE

EX. 24" HDPE

INITIAL SWALE LOCATION

FINAL SWALE LOCATION TO 2B

FINAL SWALE LOCATION TO 2C

STONE/RIPRAP OUTLET PER TST DETAIL

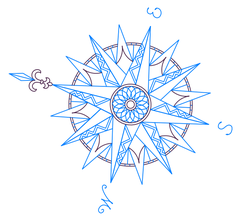
3.0:1 FINISHED GRADE

DMH G2 RIM: 804.0 INV: 800.0(IN) INV: 796.72(OUT)

PR. TD ROADSIDE SWALE OVER EX. CURTAIN DRAIN TO PROVIDE ADDITIONAL RECHARGE FOR WL3

EXISTING 6" CURTAIN DRAIN

LOT 9B



NO.	REVISION	DATE

Previous Editions Obsolete

60 0 30 60 120

1 inch = 60 ft.

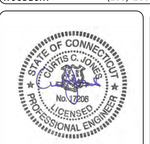
EROSION & SEDIMENT CONTROL PLAN PHASE 2

CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

CIVIL 1

CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266 - 0778 CONNECTICUT



DRAWN: BB	APPROVED: CJ
SCALE:	1" = 60'
DATE:	30 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	C 316

CONSTRUCTION SEQUENCE

PHASE III: (180 – 270 DAY DURATION)

1. FIELD STAKEOUT THE LIMITS OF ALL CONSTRUCTION ACTIVITIES ASSOCIATED WITH PHASE 3.

2. INSTALL HAYBALES AND/OR SILTATION FENCE AROUND BOUNDARY OF THE CONSTRUCTION AREA AS SHOWN ON THE ENCLOSED PHASE 3 PLAN.

3. CREATE TEMPORARY CLEAN WATER DIVERSION TO MINIMIZE OVERLAND FLOW ONTO THE CONSTRUCTION AREA AS INDICATED ON THE SITE PLANS.

4. REMOVE STUMPS ONLY FROM THE CONSTRUCTION AREA FOR PHASE 3.

5. STRIP & STOCKPILE TOPSOIL (+/–5,600 CUBIC YARDS) EXCESS MATERIAL MAY BE STOCKPILED OFF–SITE.

6. COMMENCE EARTHWORK AND GRADING FOR TEMPORARY SEDIMENTATION TRAP 3A2 (NOTE TSTs 2C FROM PHASE 2 WILL BE CLEANED OUT AND REUSED AS TST 3A1 FOR PHASE 3).

7. CONSTRUCT TEMPORARY DIVERSION SWALES AND INSTALLED STORM DRAINAGE STRUCTURES AS INDICATED ON SITE PLANS TO DIVERT STORMWATER FROM THE CONSTRUCTION AREAS INTO TSTs 3A1 & 3A2.

8. BEGIN MASS EARTH EXCAVATION INTO THE SITE WORKING NORTH INTO THE SITE. EXCESS CUT MATERIAL WILL BE REMOVED FROM THE SITE.

9. ROUGH GRADE STORMWATER RENOVATION AREA "B" SO THAT IT CAN BE USED AS A TST 3B ONCE PHASE 3 HAS REACHED SUBGRADE AND DRAINAGE WILL PITCH TO THE NORTH TOWARDS THE RENOVATION AREA.

10. CONSTRUCT THE RENOVATION AREA OUTLETS AND PERFORATED RISER ON THE OUTLET STRUCTURE PER THE DETAIL ON SHEET C321. CONSTRUCT POND DISCHARGE OUTLET PIPING TO STORM DRAINAGE ALONG THE EASTERN PROPERTY LINE PREVIOUSLY INSTALLED IN PHASE 2.

11. PLACE TOPSOIL AND SEED ALL DISTURBED AREAS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE.

12. INSTALL EROSION CONTROL BLANKETS ON ANY SLOPES STEEPER THAN 3:1 AND HYDRO–SEED ALL DISTURBED AREAS WITH SLOPES OF 3:1 OR LESS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE. ALL EROSION & SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL THE PHASE 3 CONSTRUCTION AREA IS PERMANENTLY STABILIZED.

13. PLACE BINDER COURSE ON DRIVEWAY AREA AFTER ALL OTHER SUBSURFACE IMPROVEMENTS ARE COMPLETE.

14. REMOVE EROSION CONTROL MEASURES AND DIRECT STORMWATER INTO CATCH BASINS AFTER THE AREA IS FULLY STABILIZED AND TRIBUTARY VEGETATION IS ESTABLISHED.

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR–CURRENT PHASE
- FINISHED GRADE–PREVIOUS PHASE
- PROPOSED STORM DRAINAGE
- WETLAND LINE
- WETLAND FLAG
- WETLANDS AREA
- EASEMENT
- EXISTING FENCE
- STONE CHECK DAM
- WATER BAR WITH HAYBALES TRAP
- PERM. WATER QUALITY SWALE
- TD — TEMP. WATER DIVERSION SWALE
- CONSTRUCTION ENTRANCE
- LIMITS OF CLEARING/CONSTRUCTION FULL PROJECT LIMITS
- SILT FENCE
- STAKED HAY BALES
- BALED FILTER AND SILT SACK
- TEMPORARY SOIL STOCKPILE
- TST — TEMPORARY SEDIMENT TRAP
- TS — TEMPORARY SEEDING
- ECB — EROSION CONTROL BLANKET
- HS — AREAS TO BE HYDRO–SEEDED

TST 3A2 – PHASE 3
±2.25 AC DRAINAGE AREA
VOLUME = 134 CY X 2.25 = 302 CY REQUIRED
310 CY PROVIDED

PHASE 3 – 124,000 CY CUT
0 CY FILL
NET 124,000 CY CUT

TST 3B – PHASE 3
±4.45 AC DRAINAGE AREA
VOLUME = 134 CY X 4.45 = 596 CY REQUIRED
4,600 CY PROVIDED
NOTE: THIS AREA WILL BE USED AS A TST AFTER EXCAVATION TO SUBGRADE IS COMPLETE AND SWITCHYARD AREA IS PITCHED TO THE NORTH.

TST 3A1 (FORMERLY 2C) – PHASE 3
±2.20 AC DRAINAGE AREA
VOLUME = 134 CY X 2.2 = 295 CY REQUIRED
300 CY PROVIDED

INSTALL DRAINAGE STRUCTURES LOCATED IN PHASE 3 AFTER AREA HAS BEEN BROUGHT TO SUBGRADE TO ALLOW RENOVATION AREA B TO FUNCTION AS A TST.

INSTALL DRAINAGE STRUCTURES LOCATED IN PHASE 2 AFTER FOUNDATION WORK AND UTILITY PIPING FOR POWER PLANT ARE COMPLETE. REMOVE TEMPORARY BERM & TEMPORARY OUTLET STRUCTURES FOR TSTs AFTER ENTIRE DRAINAGE AREA IS STABILIZED.

LOT 9B

STORMWATER RENOVATION AREA "A"

STORMWATER RENOVATION AREA "B"

NO.	REVISION	DATE

Previous Editions Obsolete

60 0 30 60 120

1 inch = 60 ft.

EROSION & SEDIMENT CONTROL PLAN PHASE 3

CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

CIVIL C1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

STATE OF CONNECTICUT — CHRISTOPHER JONES — No. 17208 — LICENSED PROFESSIONAL ENGINEER

DRAWN: BB	APPROVED: CJ
SCALE:	1" = 60'
DATE:	30 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	C 317

DEWATERING PLAN

THE FOLLOWING GENERAL PRINCIPLES SHALL BE ADHERED TO WHEN DEWATERING OF AREAS OF THE CONSTRUCTION SITE IS NECESSARY:

DEWATERING METHODS SHALL FOLLOW THE GENERAL PRINCIPLES AND GUIDELINES CONTAINED IN THE 2002 CT EROSION & SEDIMENT CONTROL MANUAL.

WHEN DEWATERING OF AN EXCAVATED SITE IS REQUIRED SUMP PITS SHALL BE INSTALLED IN ACCORDANCE WITH ENCLOSED DETAILS TO MINIMIZE THE SEDIMENT BEING PUMPED FROM THE EXCAVATED AREA.

THE BOTTOM ELEVATION OF SUMP PITS SHALL BE A MINIMUM OF 2 FEET BELOW THE ELEVATION OF THE ADJACENT WORK AREA.

SURFACE WATERS SHALL BE DIVERTED AWAY FROM AREAS NEEDING DEWATERING.

PUMPS AND INTAKE SUMPS SHALL BE LOCATED IN AREAS WHICH WILL NOT REQUIRE CONSTANT MOVING.

LOCATE PUMP DISCHARGE FACILITIES (PORTABLE, PERMANENT OR BIO-FILTERING STRUCTURES) SUCH THAT A MINIMUM DISTURBANCE OF EXISTING WETLANDS AND WATERCOURSES IS INCURRED.

PROVIDE PROTECTION AT OUTLETS FROM PUMPING OPERATIONS TO DISSIPATE PUMPING SURGES AND PREVENT EROSION AT THE POINT OF DISCHARGE.

INSPECT THE PUMPING SUMP, PUMP INTAKE PROTECTION AND PUMP DISCHARGE CONDITIONS FREQUENTLY FOR PROPER FUNCTIONING OF EQUIPMENT.

THE FOLLOWING SITE SPECIFIC METHODS SHALL BE ADHERED TO WHEN DEWATERING OF AREAS OF THE CONSTRUCTION SITE IS NECESSARY:

THE LARGEST AREA ANTICIPATED TO REQUIRE DEWATERING IS THE POWER BLOCK EXCAVATION AREA SHOWN ON SHEET C316. SUMP PITS WILL BE PLACED IN THE SOUTHEAST AND SOUTHWEST CORNERS OF THE EXCAVATION AS INDICATED ON THE SITE PLANS.

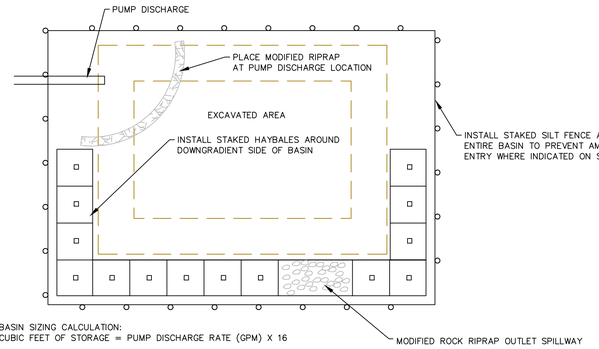
GROUNDWATER WILL BE PUMPED FROM THE SUMP PITS INTO TEMPORARY SEDIMENT TRAPS 2A AND 2B WHICH WILL ACT AS PUMPING SETTLING BASINS DURING DEWATERING ACTIVITIES. DEWATERING ACTIVITIES SHALL OCCUR WHEN THERE IS NO RAINFALL OCCURING AS THE BASINS ARE TO FUNCTION ONLY AS TEMPORARY SEDIMENT TRAPS DURING RAINFALL EVENTS.

SHOULD ADDITIONAL DEWATERING OF THE CONSTRUCTION SITE BE REQUIRED THEN ADDITIONAL DEWATERING BASINS SHALL BE SIZED AND CONSTRUCTED IN ACCORDANCE WITH THE ENCLOSED DETAIL ON SHEET C321 AND SHALL BE LOCATED ON THE SITE BY THE DESIGN ENGINEER.

DURING DEWATERING ACTIVITIES AND STORM EVENTS RESULTING IN ANY DISCHARGE FROM THE TEMPORARY SEDIMENT TRAPS THE TURBIDITY OF THE WATER LEAVING THE SITE SHALL BE MONITORED.

AT THE DISCRETION OF THE CERTIFIED PROFESSIONAL IN CHARGE OF EROSION CONTROL INSPECTIONS, ADDITIONAL MEASURES SHALL BE IMPLEMENTED TO REDUCED TURBIDITY IF NECESSARY. THESE MEASURES MAY INCLUDE:

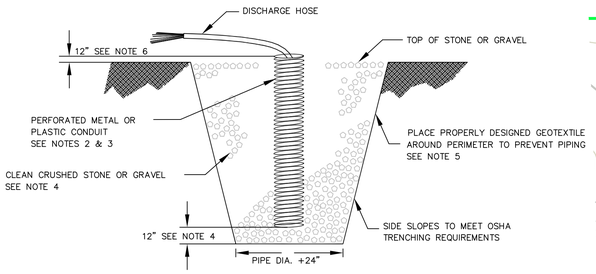
- FLOCCULANTS
- PORTABLE FILTRATION SYSTEMS
- PORTABLE SEDIMENT TANKS
- ADDITIONAL E&S MEASURES SUCH AS STRAW WATTLE LOGS
- JET-SPRAY HYDRAULIC EROSION CONTROL PRODUCTS



BASIN SIZING CALCULATION:
CUBIC FEET OF STORAGE = PUMP DISCHARGE RATE (GPM) X 16

DEWATERING SETTLING BASIN

N.T.S.



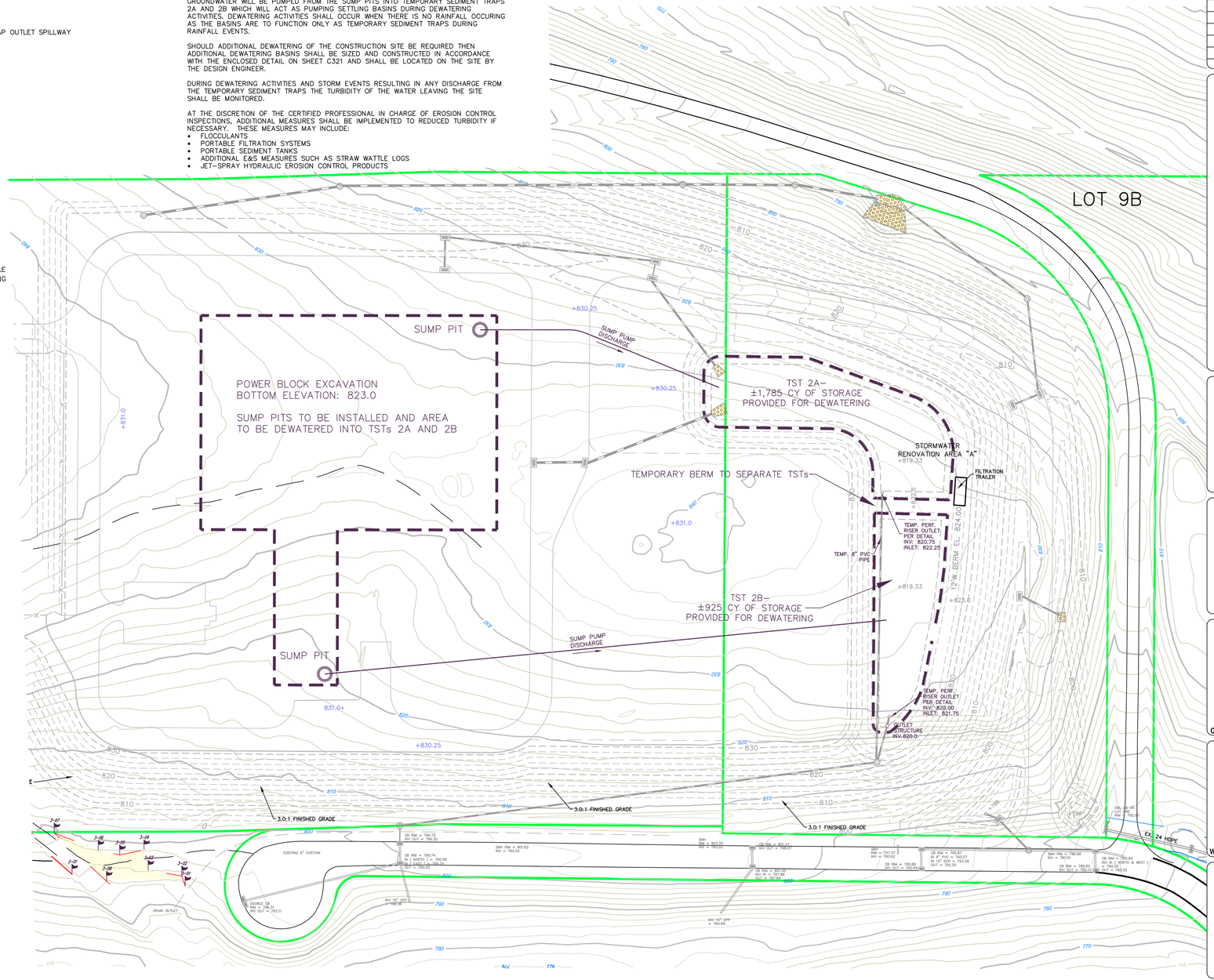
TYPICAL SECTION OF SUMP PIT

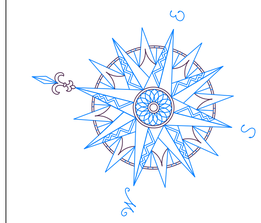
N.T.S.

1. OVERALL SUMP PIT DIMENSIONS SHALL BE COMPATIBLE WITH ANTICIPATED SEEPAGE RATES AND PUMP SIZE TO BE USED.
2. THE STANDPIPE DIAMETER AND NUMBER OF PERFORATIONS SHALL BE COMPATIBLE WITH THE PUMP SIZE BEING USED.
3. PERFORATIONS IN THE STANDPIPE SHALL BE EITHER CIRCULAR OR SLOTS. PERFORATION SIZE SHALL NOT EXCEED 1/2" IN DIAMETER.
4. CRUSHED STONE OR GRAVEL SHALL BE NO SMALLER THAN CT DOT #67 SIZE NOR LARGER THAN CT DOT #3 SIZE. CRUSHED STONE SHALL EXTEND A MINIMUM OF 12" BELOW THE BOTTOM OF THE STANDPIPE.
5. IF EXCESSIVE MOVEMENT OF FINE SOIL PARTICLES FROM THE SURROUNDING EXISTING SOILS IS ANTICIPATED, A PROPERLY DESIGNED GEOTEXTILE SHALL BE PLACED BETWEEN THE EXISTING SOILS AND THE CRUSHED STONE OR GRAVEL BACKFILL.
6. THE STANDPIPE SHALL EXTEND A MINIMUM OF 12" ABOVE THE SURROUNDING GROUND.

LEGEND

PROPERTY LINE
EXISTING CONTOUR
FINISHED GRADE
PROPOSED STORM DRAINAGE
WETLAND LINE
WETLANDS AREA
EASEMENT
EXISTING FENCE





NO.	REVISION	DATE

Previous Editions Obsolete

60 0 30 60 120

1 inch = 60 ft.

DEWATERING PLAN & DETAILS

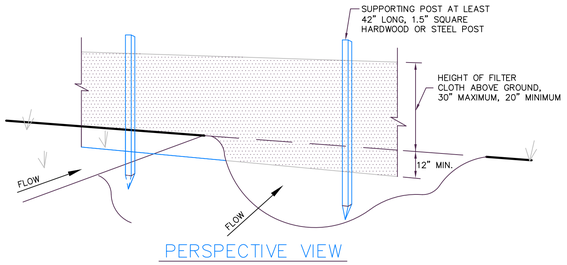
CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

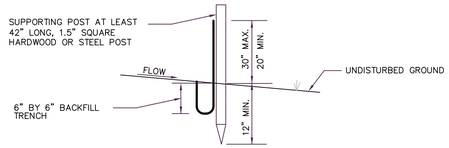
CIVIL 1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

STATE OF CONNECTICUT · COURTNEY G. JONES · No. 22208 · LICENSED PROFESSIONAL ENGINEER

DRAWN:	BB
APPROVED:	CJ
SCALE:	1" = 60'
DATE:	30 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	C 318



PERSPECTIVE VIEW



SECTION

CONSTRUCTION NOTES FOR SILT FENCE

1. EXCAVATE A TRENCH A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE ON THE UP SIDE OF THE FENCE LOCATION.

2. DRIVE SUPPORT POSTS ON THE DOWN SLOPE SIDE OF THE TRENCH TO A DEPTH OF AT LEAST 12 INCHES INTO ORIGINAL GROUND.

3. STAPLE OR SECURE THE GEOTEXTILE TO THE SUPPORT POSTS PER MANUFACTURER'S INSTRUCTIONS SUCH THAT AT LEAST 6 INCHES OF GEOTEXTILE LIES WITHIN THE TRENCH.

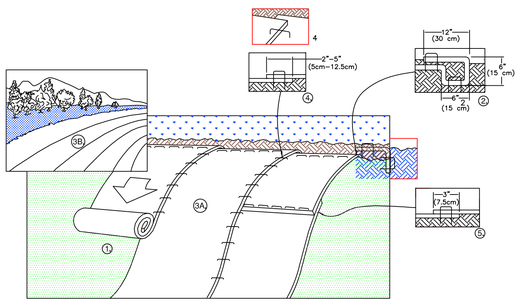
4. BACKFILL THE TRENCH WITH TAMPED SOIL OR AGGREGATE OVER THE GEOTEXTILE.

POSTS: 1.5" SQUARE HARDWOOD OR STEEL

FILTER CLOTH: MIRAFI 100X, ENVIROFENCE OR APPROVED EQUAL

SILT FENCE DETAIL

N.T.S.



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15cm) DEEP X 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5cm-12.5cm) OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH™ ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5cm) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE BLANKET WIDTH.

NOTE:
*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15cm) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

EROSION CONTROL BLANKETS

SC150BN: Material:
70% straw matrix, 30% coconut sewn into a bio-degradable jute net.
0.5 lbs/sq. yd.
Net: Lightweight degradable (Top side only)

S150: Material:

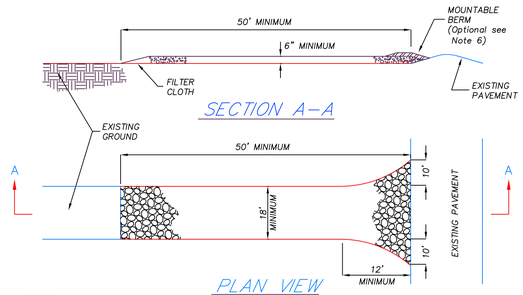
Straw fiber matrix sewn between two photo-degradable nets.
Straw: 5 lbs/sq. yd.
Net: Bio-degradable (Both sides)

CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTE
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.
** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS IN EXCESS OF 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

EROSION CONTROL BLANKET

N.T.S.



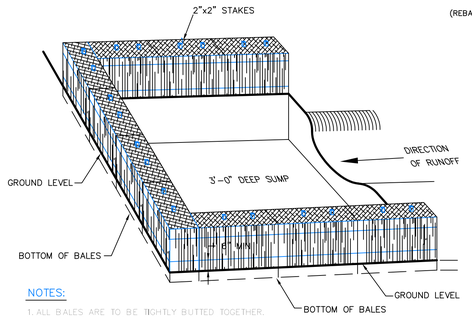
PLAN VIEW

NOTES:

1. *STONE SIZE – USE 1" – 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.*
2. *LENGTH – AS REQUIRED, BUT NOT LESS THAN 50 FEET.*
3. *THICKNESS – NOT LESS THAN SIX (6) INCHES.*
4. *WIDTH – 12 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24 FOOT MINIMUM IF SINGLE ENTRANCE TO SITE.*
5. *FILTER CLOTH – TO BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.*
6. *SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED 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 OF FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURE USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DRIPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.*
   WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO
8. *PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.*

STABILIZED CONSTRUCTION ENTRANCE

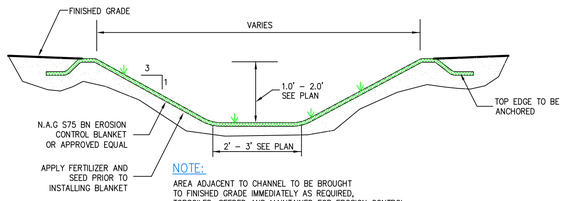
N.T.S.



NOTES:
1. ALL BALES ARE TO BE TIGHTLY BUTTED TOGETHER.
2. BALES SHALL BE EITHER STRAW OR HAY.
3. PROVIDE FREQUENT INSPECTION AND MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AND REPLACE CLOGGED BALES TO RESTORE EFFECTIVENESS OF INSTALLATION.

WATER BAR – TEMPORARY DIVERSION DITCH WITH HAYBALE TRAP

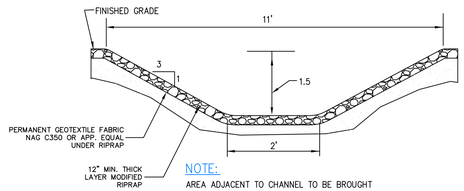
N.T.S.



NOTE:
AREA ADJACENT TO CHANNEL TO BE BROUGHT TO FINISHED GRADE IMMEDIATELY AS REQUIRED, TOPSOILED, SEEDED AND MAINTAINED FOR EROSION CONTROL

WATER QUALITY & GRASS LINED CONVEYANCE SWALES

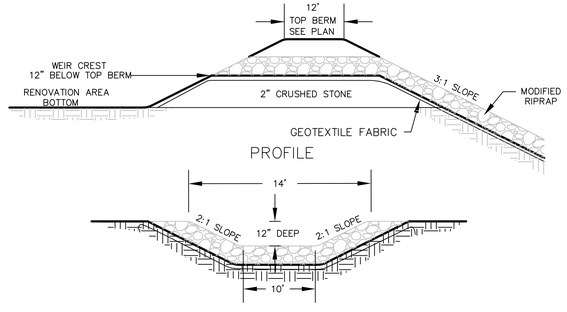
N.T.S



NOTE:
AREA ADJACENT TO CHANNEL TO BE BROUGHT TO FINISHED GRADE IMMEDIATELY AS REQUIRED, TOPSOILED, SEEDED AND MAINTAINED FOR EROSION CONTROL.

RIPRAP SWALE

N.T.S.

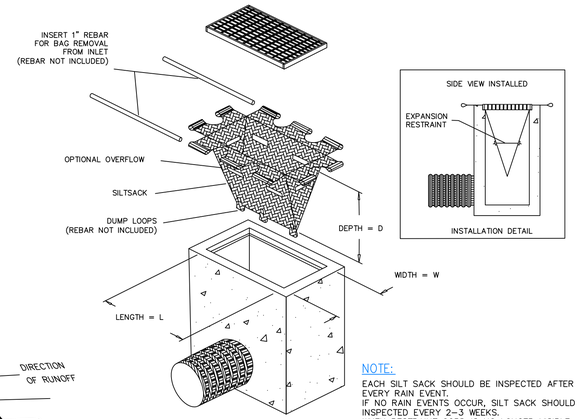


PROFILE

CROSS SECTION

EMERGENCY SPILLWAY SWALE FOR STORMWATER RENOVATION AREA A

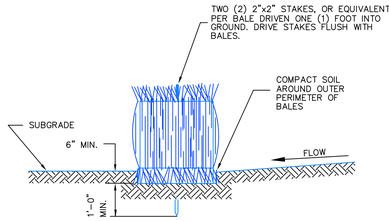
N.T.S



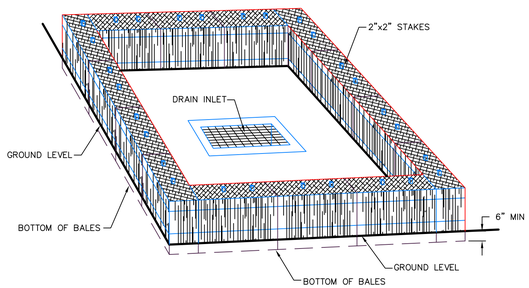
NOTE:
EACH SILT SACK SHOULD BE INSPECTED AFTER EVERY RAIN EVENT.
IF NO RAIN EVENTS OCCUR, SILT SACK SHOULD BE INSPECTED EVERY 2-3 WEEKS.
WHEN RESTRAINT CORD IS NO LONGER VISIBLE, SILT SACK IS FULL AND SHOULD BE EMPTIED.

SILT SACK DETAIL

N.T.S.



SECTION

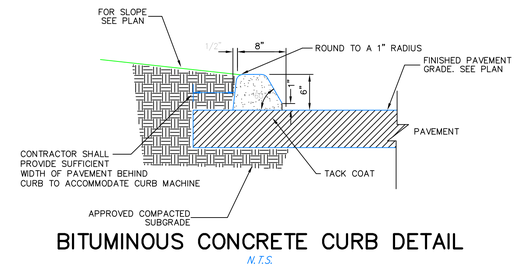


PERSPECTIVE VIEW

NOTES:
1. *ALL BALES ARE TO BE TIGHTLY BUTTED TOGETHER.*
2. *BALES SHALL BE EITHER STRAW OR HAY.*
3. *PROVIDE FREQUENT INSPECTION AND MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AND REPLACE CLOGGED BALES TO RESTORE EFFECTIVENESS OF INSTALLATION.*

BALED FILTER

N.T.S.



BITUMINOUS CONCRETE CURB DETAIL

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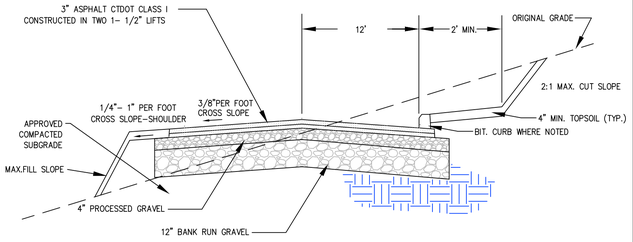

TYPICAL ACCESS DRIVE SECTION

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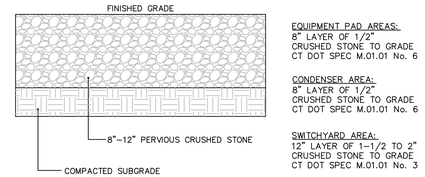


EQUIPMENT PAD AREAS:
8" LAYER OF 1/2"
CRUSHED STONE TO GRADE
CT DOT SPEC M.01.01 No. 6

CONDENSER AREA:
8" LAYER OF 1/2"
CRUSHED STONE TO GRADE
CT DOT SPEC M.01.01 No. 6

SWITCHYARD AREA:
12" LAYER OF 1-1/2 TO 2"
CRUSHED STONE TO GRADE
CT DOT SPEC M.01.01 No. 3

PERVIOUS CRUSHED STONE SURFACE TREATMENT

N.T.S.

NO.	REVISION	DATE

Previous Editions Obsolete

DETAILS

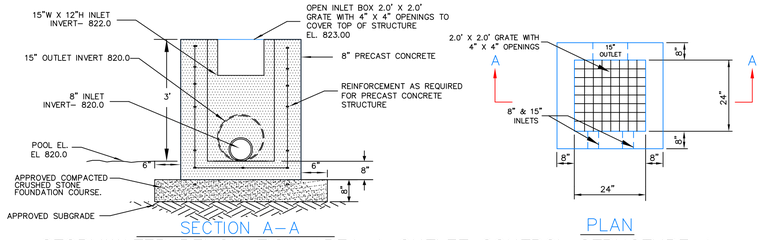
CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

CIVIL C1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

STATE OF CONNECTICUT
CURTIS C. JOSEPH
No. 17208
LICENSED
PROFESSIONAL ENGINEER

DRAWN:	BB
APPROVED:	CJ
SCALE:	N.T.S.
DATE:	30 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	C 320



STORMWATER RENOVATION AREA A OUTLET CONTROL STRUCTURE A

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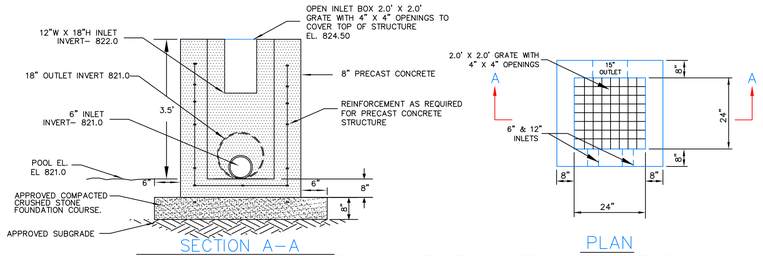

STORMWATER RENOVATION AREA B OUTLET CONTROL STRUCTURE B1

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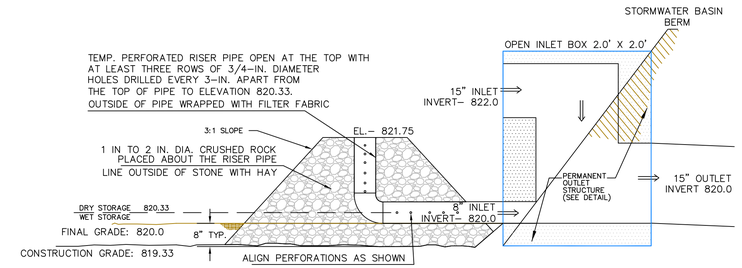

TEMPORARY OUTLET PIPE FOR SEDIMENT CONTAINMENT RENOVATION AREA A – TST 2B

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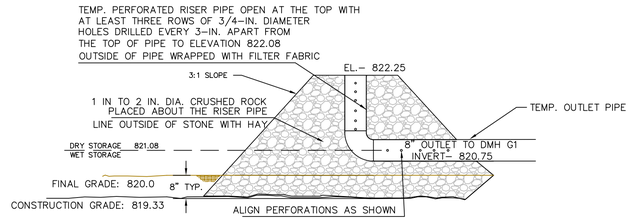

TEMPORARY OUTLET PIPE FOR SEDIMENT CONTAINMENT RENOVATION AREA A – TST 2A

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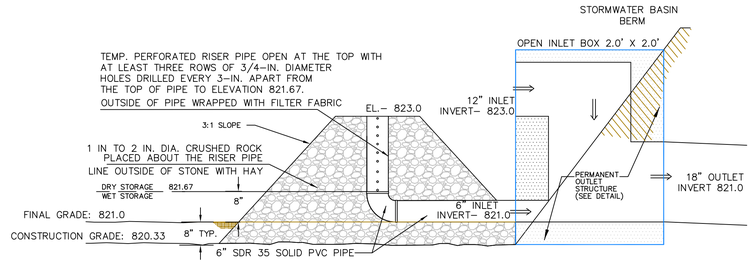

TEMPORARY OUTLET PIPE FOR SEDIMENT CONTAINMENT RENOVATION AREA B – TST 3B

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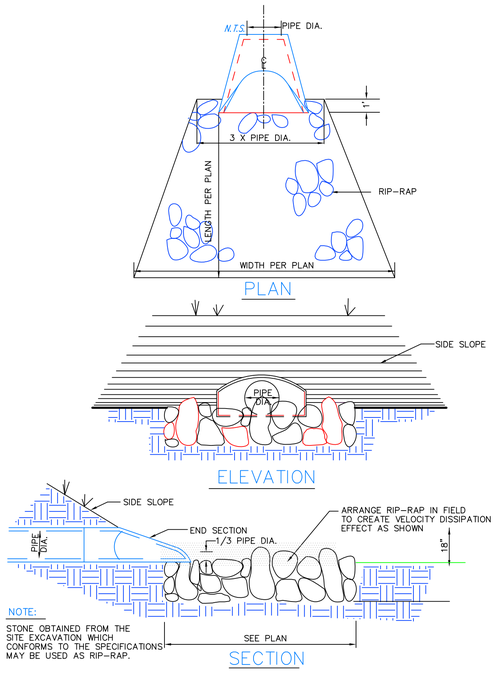
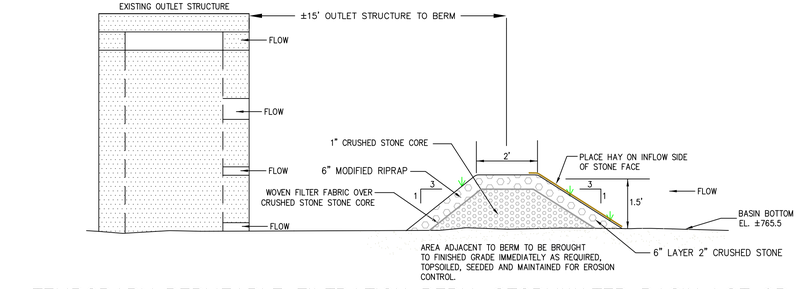


RIP-RAP OUTLET PROTECTION

N.T.S.



TEMPORARY PERMEABLE FILTRATION BERM–STORMWATER BASIN LOT 9B

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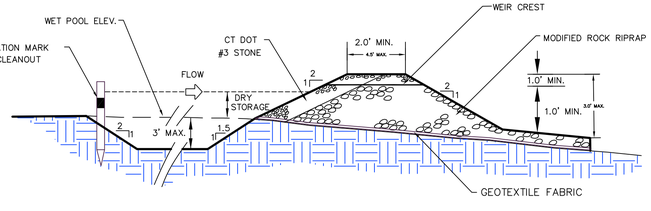

TEMPORARY SEDIMENT TRAP

N.T.S

NO.	REVISION	DATE

Previous Editions Obsolete

STORM DRAINAGE DETAILS

CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

CIVIL C1

CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
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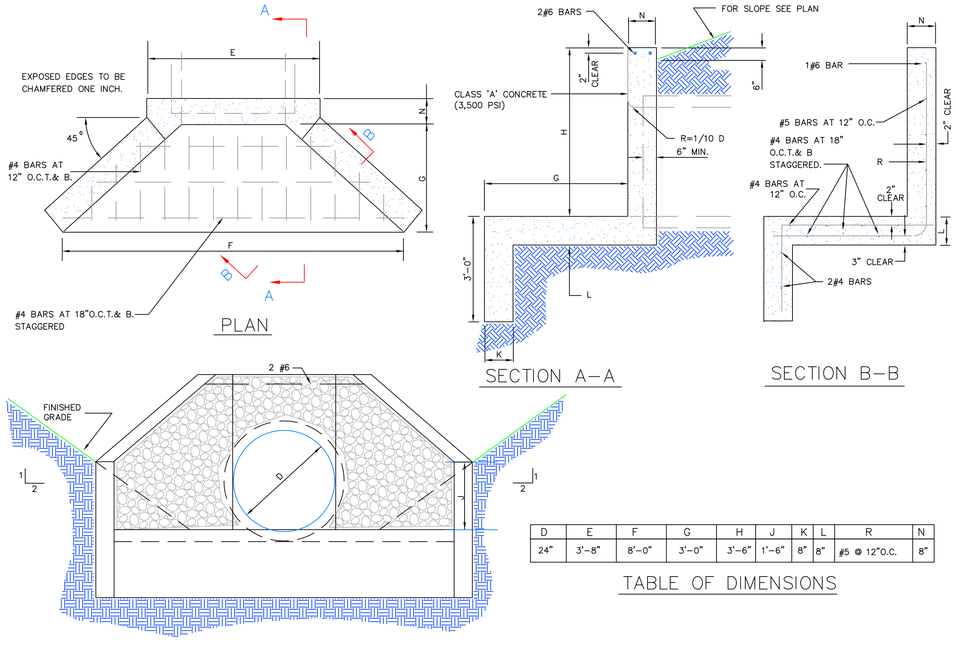
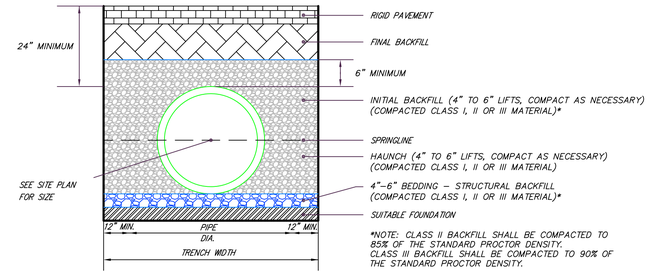


D	E	F	G	H	J	K	L	R	N
24"	3'-8"	8'-0"	3'-0"	3'-6"	1'-6"	8"	8"	#5 @ 12"O.C.	8"

TABLE OF DIMENSIONS

STORMWATER RENOVATION AREA B OUTLET STRUCTURE B2

N.T.S.



STORM DRAINAGE PIPE BEDDING DETAIL

N.T.S.

NO.	REVISION	DATE

Previous Editions Obsolete

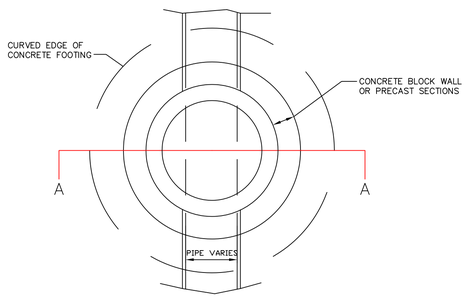
DETAILS

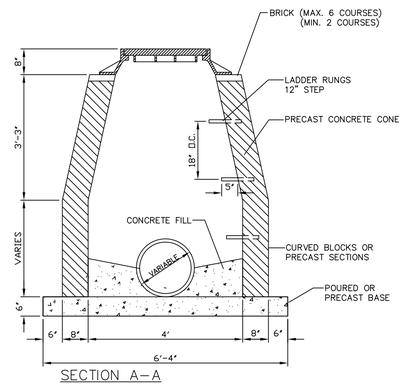
CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

CIVIL 1

CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

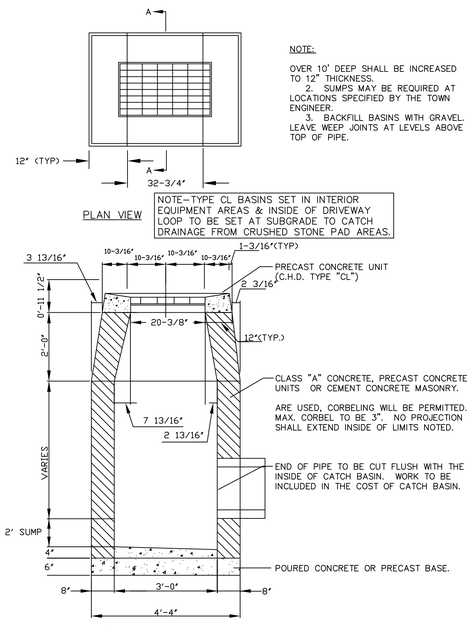




SECTION A-A

DRAINAGE MANHOLE

without sump



SECTION A-A

STANDARD TYPE "CL" CATCH BASIN

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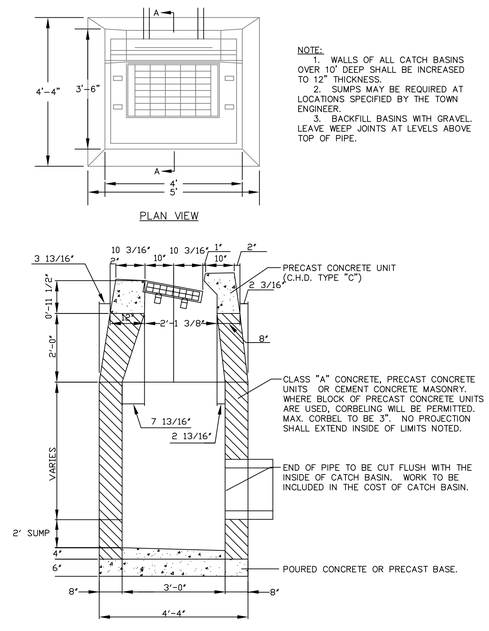
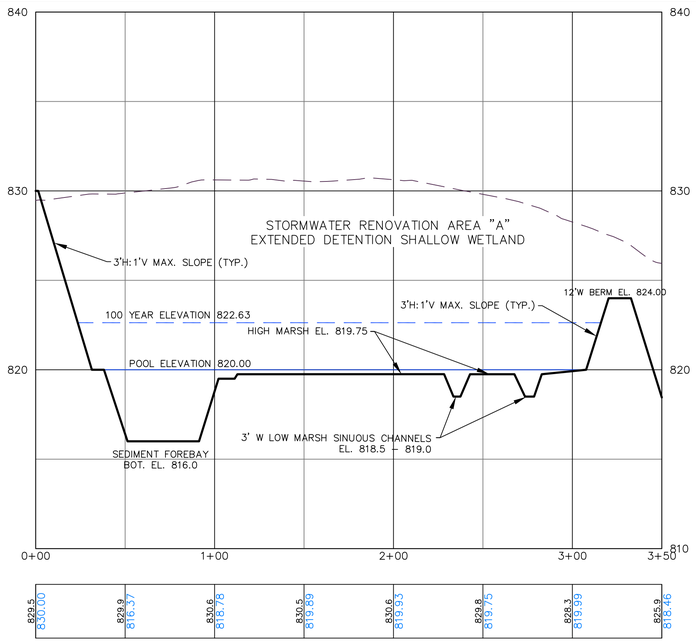


SECTION A-A

STANDARD TYPE "C" CATCH BASIN

N.T.S.

DRAWN: BB	APPROVED: CJ
SCALE:	N.T.S.
DATE:	30 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	C 322



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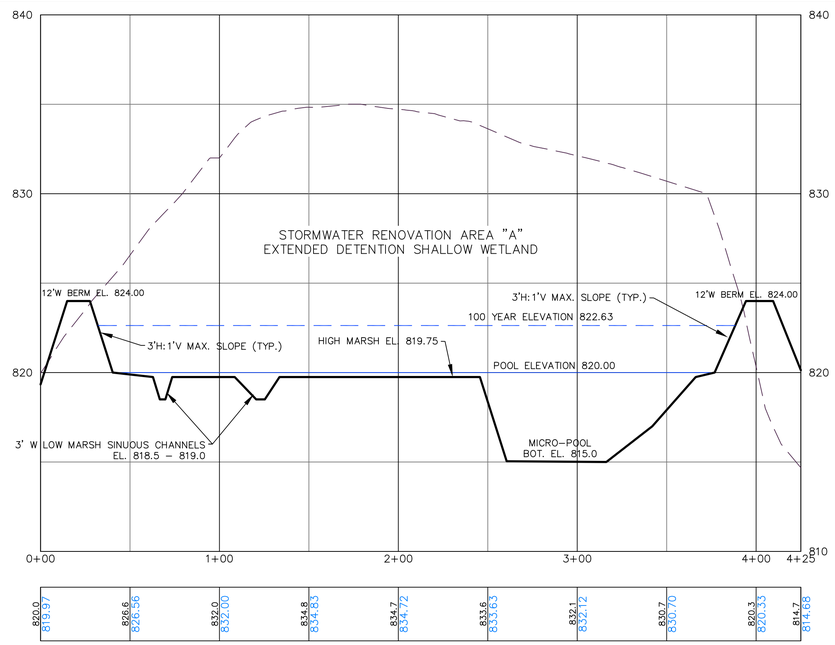

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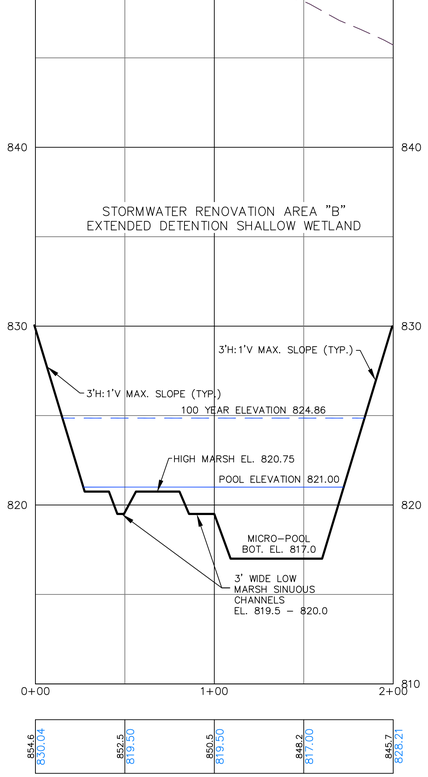
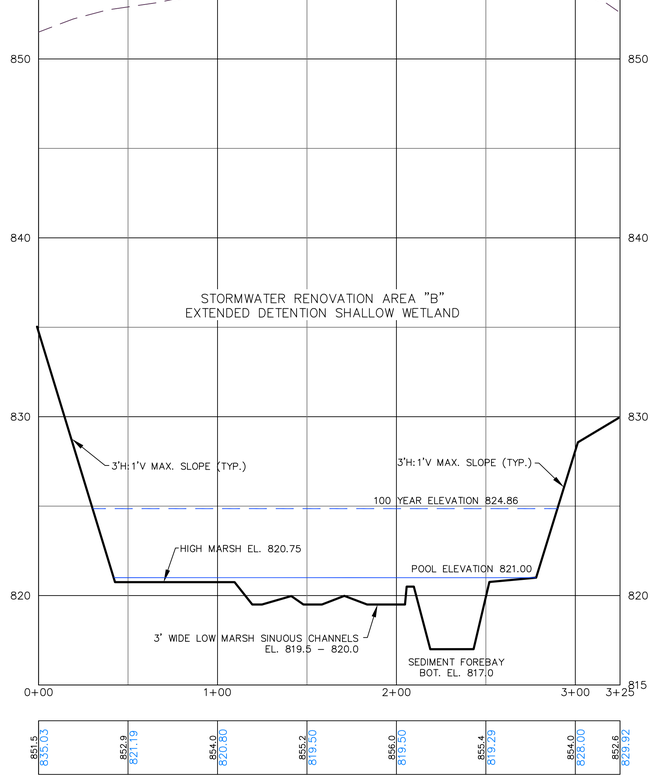


SECTION C–C



SECTION D–D

PLANTING SCHEDULE FOR EXTENDED DETENTION SHALLOW WETLAND BASIN A

Quantity	Botanical Name	Common Name	Size	Spacing
Low Marsh				
250	Peltandra virginica[2]	Arrow Arum	2"plug	2 ft on center
250	Pontederia cordata[2]	Pickerelweed	2"plug	2 ft on center
300	Sagittaria latifolia[1]	Northern Arrowhead	2"plug	2 ft on center
300	Schoenoplectus acutus[3]	Hardstem Bulrush	2"plug	2 ft on center
High Marsh				
850	Carex comosa	Bearded Sedge	2"plug	2 ft on center
850	Juncus effuses	Soft Rush	2"plug	2 ft on center
850	Panicum virgatum	Switchgrass	2"plug	2 ft on center
850	Schoenoplectus pungens	Three Square Bulrush	2"plug	2 ft on center
Forebay				
75	Peltandra virginica[2]	Arrow Arum	2"plug	2 ft on center
75	Pontederia cordata[2]	Pickerelweed	2"plug	2 ft on center
75	Sagittaria latifolia[1,2]	Northern Arrowhead	2"plug	2 ft on center
75	Schoenoplectus acutus[3]	Hardstem Bulrush	2"plug	2 ft on center
Micropool				
100	Peltandra virginica[2]	Arrow Arum	2"plug	2 ft on center
100	Pontederia cordata[2]	Pickerelweed	2"plug	2 ft on center
100	Sagittaria latifolia[1,2]	Northern Arrowhead	2"plug	2 ft on center
100	Schoenoplectus acutus[3]	Hardstem Bulrush	2"plug	2 ft on center

Notes:
1. Don't plant in Fall.
2. Plant in areas of inundation up to 12"deep.
3. Plant in areas of inundation up to 36"deep.
4. Marsh areas and a 5–foot wide shelf around the outer perimeter of the forebay and micropool shall consist of a minimum of 10 inches of topsoil with at least 8 percent organic carbon by weight.

PLANTING SCHEDULE FOR EXTENDED DETENTION SHALLOW WETLAND BASIN B

Quantity	Botanical Name	Common Name	Size	Spacing
Low Marsh				
200	Peltandra virginica[2]	Arrow Arum	2"plug	2 ft on center
200	Pontederia cordata[2]	Pickerelweed	2"plug	2 ft on center
150	Sagittaria latifolia[1]	Northern Arrowhead	2"plug	2 ft on center
150	Schoenoplectus acutus[3]	Hardstem Bulrush	2"plug	2 ft on center
High Marsh				
250	Carex comosa	Bearded Sedge	2"plug	2 ft on center
250	Juncus effuses	Soft Rush	2"plug	2 ft on center
250	Panicum virgatum	Switchgrass	2"plug	2 ft on center
200	Schoenoplectus pungens	Three Square Bulrush	2"plug	2 ft on center
Forebay				
50	Peltandra virginica[2]	Arrow Arum	2"plug	2 ft on center
50	Pontederia cordata[2]	Pickerelweed	2"plug	2 ft on center
50	Sagittaria latifolia[1,2]	Northern Arrowhead	2"plug	2 ft on center
50	Schoenoplectus acutus[3]	Hardstem Bulrush	2"plug	2 ft on center
Micropool				
100	Peltandra virginica[2]	Arrow Arum	2"plug	2 ft on center
50	Pontederia cordata[2]	Pickerelweed	2"plug	2 ft on center
50	Sagittaria latifolia[1,2]	Northern Arrowhead	2"plug	2 ft on center
50	Schoenoplectus acutus[3]	Hardstem Bulrush	2"plug	2 ft on center

Notes:
1. Don't plant in Fall.
2. Plant in areas of inundation up to 12"deep.
3. Plant in areas of inundation up to 36"deep.
4. Marsh areas and a 5–foot wide shelf around the outer perimeter of the forebay and micropool shall consist of a minimum of 10 inches of topsoil with at least 8 percent organic carbon by weight.

NO.	REVISION	DATE

Previous Editions Obsolete

STORMWATER RENOVATION AREA CROSS SECTIONS & PLANTING SCHEDULES

CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

CIVIL C1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

STATE OF CONNECTICUT · COURTNEY C. JOHNSON · No. 22208 · LICENSED PROFESSIONAL ENGINEER

DRAWN: BB	APPROVED: CJ
SCALE:	1" = 40' HOR. 1" = 4' VER.
DATE:	30 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	C 325

EROSION CONTROL NARRATIVE

GENERAL PRINCIPLES

THE FOLLOWING GENERAL PRINCIPLES SHALL BE MAINTAINED AS EFFECTIVE MEANS OF MINIMIZING EROSION AND SEDIMENTATION DURING THE DEVELOPMENT PROCESS.

STRIPPING AWAY OF VEGETATION, REGRADING OR OTHER DEVELOPMENT SHALL BE DONE IN SUCH A WAY AS TO MINIMIZE EROSION.

GRADING AND DEVELOPMENT PLANS SHALL PRESERVE IMPORTANT NATURAL FEATURES, KEEP CUT AND FILL OPERATIONS TO A MINIMUM, AND INSURE CONFORMITY WITH TOPOGRAPHY SO AS TO CREATE THE LEAST EROSION POTENTIAL AND ADEQUATELY HANDLE THE VOLUME AND VELOCITY OF SURFACE WATER RUNOFF.

WHENEVER FEASIBLE, NATURAL VEGETATION SHALL BE RETAINED, PROTECTED AND SUPPLEMENTED WHEREVER INDICATED ON THE SITE DEVELOPMENT PLAN.

THE UNDISTURBED AREA AND THE DURATION OF EXPOSURE SHALL BE KEPT TO A PRACTICAL MINIMUM.

DISTURBED SOILS SHALL BE STABILIZED AS QUICKLY AS POSSIBLE.

TEMPORARY VEGETATION AND/OR MULCHING SHALL BE USED TO PROTECT EXPOSED CRITICAL AREAS DURING DEVELOPMENT WHEN EXPECTED TO BE EXPOSED IN EXCESS OF 30 DAYS.

THE PERMANENT (FINAL) VEGETATION AND MECHANICAL EROSION CONTROL MEASURES SHALL BE INSTALLED AS SOON AS PRACTICAL DURING CONSTRUCTION.

SEDIMENT IN THE RUNOFF WATER SHALL BE TRAPPED UNTIL THE DISTURBED AREAS IS STABILIZED BY THE USE OF DEBRIS BASINS, SEDIMENT BASINS, SILT TRAPS OR SIMILAR MEASURES.

ALL TRACTS OR DEVELOPMENTS SHALL BE FINALLY GRADED TO PROVIDE PROPER DRAINAGE AWAY FROM BUILDINGS AND DISPOSE OF IT WITHOUT PONDING; AND ALL LAND WITHIN A DEVELOPMENT SHALL BE GRADED TO DRAIN AND DISPOSE OF SURFACE WATER WITHOUT PONDING.

WHERE DRAINAGE SWALES ARE USED TO DIVERT SURFACE WATERS AWAY FROM BUILDINGS, THEY SHALL BE SODDED OR PLANTED.

CONCENTRATION OF SURFACE RUNOFF SHALL BE ONLY PERMITTED BY PIPING AND/OR THROUGH DRAINAGE SWALES OR NATURAL WATERCOURSES.

EXCAVATION AND FILLS --

SLOPES CREATED BY CUTS OR FILLS SHALL NOT BE STEEPER THAN 2:1 AND SHALL BE RESTABILIZED BY TEMPORARY OR PERMANENT MEASURES, AS REQUIRED DURING THE DEVELOPMENT PROCESS.

ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SURFACE WATER FROM DAMAGING THE CUT FACE OF EXCAVATIONS OR THE SLOPING SURFACES OF FILLS.

CUT AND FILLS SHALL NOT ENDANGER ADJOINING PROPERTY.

ALL FILLS SHALL BE COMPACTED TO PROVIDE STABILITY OF MATERIAL AND TO PREVENT UNDESIRABLE SETTLEMENT. THE FILL SHALL BE SPREAD IN A SERIES OF LAYERS EACH NOT EXCEEDING TWELVE (12) INCHES IN THICKNESS AND SHALL BE COMPACTED BY A SHEEP ROLLER OR OTHER APPROVED METHOD AFTER EACH LAYER IS SPREAD.

FILLS SHALL NOT ENCROACH ON NATURAL WATERCOURSES, CONSTRUCTED CHANNELS OR REGULATED FLOOD PLAIN AREAS, UNLESS PERMITTED BY LICENSE OR PERMIT FROM AUTHORITY HAVING JURISDICTION.

FILLS PLACED ADJACENT TO NATURAL WATERCOURSES, CONSTRUCTED CHANNELS OR FLOOD PLAINS SHALL HAVE SUITABLE PROTECTION AGAINST EROSION DURING PERIODS OF FLOODING.

GRADING SHALL NOT BE DONE IN SUCH A WAY AS TO DIVERT WATER ONTO THE PROPERTY OF ANOTHER LANDOWNER WITHOUT THEIR EXPRESS WRITTEN CONSENT.

DURING GRADING OPERATIONS, NECESSARY MEASURES FOR DUST CONTROL SHALL BE EXERCISED.

SEDIMENTATION AND EROSION CONTROL SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL (2002) – STATE OF CONNECTICUT DEP BULLETIN 34 OR MOST RECENT EDITION.

RESPONSIBILITY FOR THE PLAN

WHENEVER SEDIMENTATION IS CAUSED BY STRIPPING VEGETATION AND/OR GRADING, IT SHALL BE THE RESPONSIBILITY OF THE PERSON, CORPORATION OR OTHER ENTITY HAVING RESPONSIBILITY TO REMOVE SEDIMENTATION FROM ALL LOWER PROPERTIES, DRAINAGE SYSTEMS AND WATERCOURSES AND TO REPAIR ANY DAMAGE AT THEIR EXPENSE AS QUICKLY AS POSSIBLE.

MAINTENANCE OF ALL DRAINAGE FACILITIES AND WATERCOURSES WITHIN ANY SUBDIVISION OR LAND DEVELOPMENT SHALL BE THE RESPONSIBILITY OF THE CONNECTICUT POWER VENTURES PROJECT MANAGER UNTIL THEY ARE ACCEPTED BY THE TOWN. ALL CONTROL MEASURES WILL BE MAINTAINED IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. SURFACE INLETS SHALL BE KEPT OPEN AND FREE OF SEDIMENT AND DEBRIS. THE SYSTEM SHALL BE CHECKED AFTER EVERY MAJOR STORM AND SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED LOCATION CONSISTENT WITH THE PLAN.

IT SHALL BE THE RESPONSIBILITY OF ANY PERSON, CORPORATION OR OTHER ENTITY ENGAGING IN ANY ACT ON OR NEAR ANY STREAM, WATERCOURSE OR SWALE OR UPON THE FLOOD PLAIN OR RIGHT-OF-WAY THEREOF TO MAINTAIN AS NEARLY AS POSSIBLE IN ITS PRESENT STATE THAT SAME STREAM, WATERCOURSE, SWALE, FLOOD PLAIN OR RIGHT-OF-WAY FOR THE DURATION OF THE ACTIVITY AND TO RETURN IT TO ITS ORIGINAL OR EQUAL CONDITION AFTER SUCH ACTIVITY IS COMPLETED.

MAINTENANCE OF DRAINAGE FACILITIES OR WATERCOURSES ORIGINATING AND COMPLETELY ON PRIVATE PROPERTY SHALL BE THE RESPONSIBILITY OF THE CONNECTICUT POWER VENTURES, INC. THEIR POINT OF OPEN DISCHARGE AT THE PROPERTY LINE OR AT A COMMUNAL WATERCOURSE WITHIN PROPERTY.

NO PERSON, CORPORATION OR OTHER ENTITY SHALL BLOCK, IMPEDE THE FLOW OF, ALTER, CONSTRUCT ANY STRUCTURE OR DEPOSIT ANY MATERIAL OR THING OR COMMIT ANY ACT WHICH AFFECTS NORMAL OR FLOOD FLOW IN ANY COMMUNAL STREAM OR WATERCOURSE WITHOUT HAVING OBTAINED PRIOR APPROVAL FROM THE TOWN.

AN ADEQUATE RIGHT-OF-WAY AND/OR EASEMENT SHALL BE PROVIDED FOR ALL DRAINAGE FACILITIES AND WATERCOURSES WHICH ARE PROPOSED EITHER FOR ACCEPTANCE BY THE TOWN OR PROVIDED BY OTHER PROPERTY OWNERS FOR THE CONVENIENCE OF THE OWNER.

SEEDBED PREPARATION

FINE GRADE AND RAKE SURFACE TO REMOVE STONES LARGER THAN 2" IN DIAMETER. INSTALL NEEDED EROSION CONTROL DEVICES SUCH AS SURFACE WATER DIVERSIONS. GRADE STABILIZATION STRUCTURES, SEDIMENT BASINS OR DRAINAGE CHANNELS TO MAINTAIN GRASSED AREAS. APPLY LIMESTONE AT A RATE OF 2 TONS/AC. OR 90 LBS/1000 SF UNLESS OTHERWISE REQUIRED ACCORDING TO SOIL TEST RESULTS. APPLY FERTILIZERS WITH 10-10-10 AT A RATE OF 300 LBS./AC. OR 7.5 LBS/1000 SF. AT LEAST 50% OF THE NITROGEN SHALL BE FROM ORGANIC SOURCES. WORK LIME AND FERTILIZER INTO SOIL UNIFORMITY TO A DEPTH OF 4" WITH A WHISK, SPRINGTOOTH HARROW OR OTHER SUITABLE EQUIPMENT FOLLOWING THE CONTOUR LINES.

SEED APPLICATION

APPLY GRASS MIXTURES AT RATES SPECIFIED BY HAND, CYCLONE SEEDER OR HYDROSEEDER. INCREASE SEED MIXTURE BY 10% IF HYDROSEEDER IS USED. LIGHTLY DRAG OR ROLL THE SEEDED SURFACE TO COVER SEED. SEEDING FOR SELECTED FINE GRASSES SHOULD BE DONE BETWEEN APRIL 1 AND JUNE 1 OR BETWEEN AUGUST 15 AND OCTOBER 15. IF SEEDING CANNOT BE DONE DURING THESE TIMES, REPEAT MULCHING PROCEDURE BELOW UNTIL SEEDING CAN TAKE PLACE OR SEED WITH A QUICK GERMINATING SEED MIXTURE TO STABILIZE SLOPES. A QUICK GERMINATING SEED MIXTURE (DOMESTIC RYE) CAN BE APPLIED BETWEEN JUNE 15 THROUGH AUGUST 15 AS APPROVED BY THE ARCHITECT OR ENGINEER.

MULCHING

IMMEDIATELY FOLLOWING SEEDING, MULCH THE SEEDED SURFACE WITH STRAW, HAY OR WOOD FIBER AT A RATE OF 1.5 TO 2 TONS/AC. EXCEPT AS OTHERWISE SPECIFIED ELSEWHERE. MULCHES SHOULD BE FREE OF WEEDS AND COARSE MATTER. SPREAD MULCH BY HAND OR MULCH BLOWER. PUNCH MULCH INTO SOIL SURFACE WITH TRACK MACHINE OR DISK HARROW SET STRAIGHT UP. MULCH MATERIAL SHOULD BE "TUCKED" APPROXIMATELY 2– 3" INTO THE SOIL SURFACE. CHEMICAL MULCH BINDERS OR NETTING, IN COMBINATION WITH THE STRAW, HAY OR WOOD FIBERS, WILL BE USED WHERE DIFFICULT SLOPES DO NOT ALLOW HARROWING BY MACHINES.

GRASS SEED MIXTURES

TEMPORARY COVERS		PERMANENT COVERS	
PERENNIAL RYEGRASS	20 LBS/AC.	CREEPING RED FESCUE	40 LBS/AC.
ANNUAL RYEGRASS	20 LBS/AC.	CANADA BLUEGRASS	20 LBS/AC.

GENERAL NOTES

1. A PROJECT MANAGER FROM COMPETITIVE POWER VENTURES, INC. IS THE RESPONSIBLE PARTY FOR IMPLEMENTING THE EROSION AND SEDIMENT CONTROL PLAN. THE RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES AND INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN. THE ON-SITE CONSTRUCTION MANAGER SHALL BE RESPONSIBLE FOR HAVING THE EROSION CONTROL MEASURES CHECKED WEEKLY AND AFTER EVERY STORM. ALL ITEMS IDENTIFIED DURING INSPECTION AS THOSE REQUIRING MAINTENANCE/REPLACEMENT SHALL BE COMPLETED IMMEDIATELY.

2. PRIOR TO INITIATING CONSTRUCTION, A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED AND CONDUCTED INCLUDING THE FOLLOWING ATTENDEES: THE PROJECT MANAGER FROM COMPETITIVE POWER VENTURES, INC, ON-SITE CONSTRUCTION MANAGER, SITE CONTRACTOR, TOWN ENGINEER, AND OTHERS AS MAY BE REQUIRED BY THE CT SITING COUNCIL.

3. THE CUMULATIVE POST PEAK DEVELOPMENT RUN-OFF RATES WILL BE KEPT TO LESS THAN THE PRE-DEVELOPMENT RUN-OFF RATES FROM THE SITE THROUGH THE USE OF ON-SITE DETENTION BASINS.

4. EXISTING WETLANDS AND WATERCOURSES DOWN SLOPE FROM THE PROJECT SITE SHALL BE PROTECTED FROM SEDIMENT POLLUTION BY INSTALLING APPROPRIATE EROSION AND SEDIMENT CONTROL DEVICES, AS INDICATED ON THE VARIOUS EROSION CONTROL PLANS.

5. THE CONTRACTOR SHALL PRESERVE EXISTING VEGETATION. TEMPORARY MULCHING AND SEEDING SHALL BE USED TO PREVENT AND MINIMIZE EROSION.

6. TO REDUCE EROSION HAZARDS, CONSTRUCTION SHALL BE PHASED AS INDICATED ON THIS SHEET AND CONTRACT DRAWINGS TO MINIMIZE LAND DISTURBANCE AT ANY GIVEN TIME. WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED OR HAVE TEMPORARILY BEEN SUSPENDED FOR MORE THAN SEVEN DAYS, SOIL STABILIZATION MUST BE IMPLEMENTED WITHIN THREE DAYS. AREAS WHICH REMAIN INACTIVE FOR AT LEAST THIRTY DAYS SHALL RECEIVE TEMPORARY SEEDING IN ACCORDANCE WITH THE GUIDELINES.

7. THE CONTRACTOR MUST INSTALL ANY ADDITIONAL TEMPORARY AND/OR PERMANENT MEASURES WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION ON- AND OFF-SITE DEPENDING ON WEATHER CONDITIONS AND WORK SEQUENCE.

8. THE PAVED AREAS SHALL BE KEPT TO A MINIMUM TO MINIMIZE IMPERVIOUS AREAS.

9. DEWATERING WASTEWATERS SHALL BE DISCHARGED BY INFILTRATION INTO THE GROUND WHERE POSSIBLE AND DEWATERING SHALL BE DONE IN ACCORDANCE WITH THE DETAILS AND NOTES CONTAINED IN THIS PLAN SET AND IN ACCORDANCE WITH THE GUIDELINES.

10. THE CONTRACTOR MUST ENSURE THAT NO LITTER, DEBRIS, BUILDING MATERIALS OR SIMILAR MATERIALS ARE DISCHARGED IN THE WATERS OF THE STATE.

TEMPORARY SEDIMENT TRAPS

1. TEMPORARY SEDIMENTATION TRAPS WILL BE INSTALLED DURING CONSTRUCTION AS INDICATED ON SHEETS C315-C317 OF THE PLAN SET. EACH SEDIMENTATION TRAP SHALL BE FITTED WITH A TEMPORARY OUTLET EITHER IN THE FORM OF A PERFORATED RISER PIPE OR A STONE FILTRATION WEIR IN ACCORDANCE WITH THE DETAILS PROVIDED IN THE PLAN SET.

2. SEDIMENT WHICH HAS ACCUMULATED IN THE TEMPORARY SEDIMENT TRAPS SHALL BE REMOVED AFTER REACHING A DEPTH OF 6" OR GREATER.

3. AFTER TRIBUTARY DRAINAGE AREAS HAVE BEEN STABILIZED, THE ACCUMULATED SEDIMENT WITHIN THE BASINS SHALL BE REMOVED. TEMPORARY SEDIMENTATION TRAPS 2A/2B & 3B SHALL BE CONVERTED INTO PERMANENT STORMWATER RENOVATION BASINS.

PERMANENT EROSION CONTROL MEASURES

ALL PERMANENT EROSION CONTROL MEASURES SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE "GUIDELINES". THE FOLLOWING PERMANENT EROSION CONTROL MEASURES HAVE BEEN DESIGNED AS PART OF THE EROSION AND SEDIMENT CONTROL PLAN:

1. PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON ALL EXPOSED/DISTURBED AREAS THAT ARE NOT SUBJECT TO OTHER RESTORATION (PAVING, RIPRAP, ETC). INSTALLATION AND MAINTENANCE REQUIREMENTS OF CHAPTER 6 OF THE "GUIDELINES" SHALL BE FOLLOWED. EXPOSED AREAS SHALL BE LOAMED, LIMED, FERTILIZED AND SEEDED. LIMESTONE AND FERTILIZER SHALL BE APPLIED IN ACCORDANCE WITH THE RESULTS OF SOIL TESTING OR AS RECOMMENDED BY THE "GUIDELINES". ALL PERMANENT SEEDING WILL BE DONE IN THE SPRING OR LATE SUMMER (BEFORE OCTOBER 31). ANY AREAS TO BE SEEDED OUTSIDE THIS TIME FRAME SHALL BE COVERED WITH AN EROSION CONTROL BLANKET OR OTHERWISE STABILIZED UNTIL GROWTH CAN BE ESTABLISHED. SEEDING MIXTURES SHALL BE SELECTED IN ACCORDANCE WITH FIGURES 6-2 OR 6-3 OF THE "GUIDELINES" OR AS RECOMMENDED BY THE SOIL CONSERVATION SERVICE. HYDROSEEDING SHALL BE USED WHERE INDICATED ON THE PLANS AND IN CRITICAL AREAS. MULCH SHALL BE APPLIED AND ANCHORED AS RECOMMENDED UNDER "EROSION AND SEDIMENT CONTROL DEVICES" ABOVE. SLOPES STEEPER THAN 3:1 SHALL RECEIVE NORTH AMERICAN GREEN SC150BN STRAW/COCNUT TURF REINFORCEMENT BLANKET OR APPROVED EQUAL.

2. THE RIPRAP APRONS AND PLUNGE POOLS SHALL BE CONSTRUCTED AND STABILIZED AT THE PIPE OUTLETS PRIOR TO DIRECTING RUNOFF TO EITHER STORMWATER RENOVATION AREA AND AT ALL STORM DRAINAGE OUTLETS.

TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

THE FOLLOWING ARE PLANNED AS TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES DURING CONSTRUCTION:

1. A CRUSHED STONE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PLACED AT THE SITE ACCESS ONTO WOODRUFF HILL ROAD.

2. FILTER FABRIC SILT FENCE SHALL BE INSTALLED ALONG THE DOWN GRADIENT SIDE OF ALL FILL SECTIONS. SILT FENCE WILL BE MAINTAINED IN PLACE UNTIL THE TRIBUTARY AREA PROTECTED BY THE FENCE IS REVEGETATED OR STABILIZED BY PERMANENT MEASURES. SYNTHETIC FILTER FABRIC, POST MATERIAL, SPACING AND EMBEDMENT, AND TRENCH DETAILS, SHALL BE AS SHOWN ON THE DRAWINGS. FILTER BARRIER SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL GREATER THAN 0.1 INCH AND AT LEAST DAILY DURING PROLONGED RAINFALL. REFER TO THE CHAPTER 7 OF THE "GUIDELINES" FOR ADDITIONAL MAINTENANCE REQUIREMENTS.

3. DUST CONTROL SHALL BE USED TO PREVENT BLOWING AND MOVEMENT OF DUST FROM EXPOSED SOIL SURFACES AND REDUCE THE PRESENCE OF DUST WHICH MAY CAUSE OFF-SITE DAMAGE, BE A HEALTH HAZARD TO HUMANS, WILDLIFE AND PLANT LIFE. THE NEED FOR DUST CONTROL WILL BE MINIMIZED BY REDUCING AREA OF LAND DISTURBANCE AT ANY ONE TIME, MAINTAINING AS MUCH VEGETATION AS PRACTICABLE, USE OF MULCHING AND TEMPORARY VEGETATIVE COVER. THE CONTRACTOR SHALL USE MECHANICAL SWEEPERS ON PAVED AREAS AND UTILIZE FINE WATER SPRAYS NEAR SOURCES OF DUST. THE EXPOSED SOIL AREAS SHALL BE PERIODICALLY MOISTENED. SPRAY-ON ADHESIVES DILUTED IN WATER MAY BE USED.

4. TEMPORARY SOIL STOCKPILES SHALL BE PROTECTED BY A SEDIMENT BARRIER. SIDE SLOPES OF THE STOCKPILES SHALL NOT EXCEED 2 TO 1. THE STOCKPILES SHALL BE STABILIZED WITHIN THIRTY DAYS OF FORMATION OF THE STOCKPILE BY TEMPORARY SEEDING OR COVERING WITH MULCH.

5. ORGANIC MULCHES (HAY OR STRAW), OR NETTING AND MATS ARE TO BE USED TO PREVENT EROSION BY PROTECTING THE EXPOSED SOIL, AND TO PROMOTE THE GROWTH OF VEGETATION. ORGANIC MULCH MATERIALS AND APPLICATION RATES SHALL BE IN ACCORDANCE WITH FIGURE 7-1 OF THE 2002 GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL OF THE STATE OF CONNECTICUT ("GUIDE"). STRAW OR HAY MULCH MUST BE ANCHORED IMMEDIATELY AFTER SPREADING USING A TRACTOR-DRAWN MULCH ANCHORING TOOL, LIQUID MULCH BINDERS, NETTING OR OTHER MEANS OF ANCHORING ALLOWED BY THE "GUIDE". MULCHES MUST BE INSPECTED PERIODICALLY AND, IN PARTICULAR, AFTER RAINSTORMS, AND RE-APPLIED IMMEDIATELY IF EROSION IS OBSERVED.

6. TEMPORARY VEGETATIVE COVERS SHALL BE INSTALLED ON ALL DISTURBED AREAS NOT INTENDED FOR PRIMARY CONSTRUCTION AND HAVING THE POTENTIAL TO PRODUCE SEDIMENT AND CAUSE ON- AND OFF-SITE DAMAGES. SUCH AREAS BASED ON RECOMMENDATIONS SHALL BE COVERED WITH TOPSOIL AND SEEDED OF FIGURE 6-1 OF THE "GUIDELINES". FOR ADDITIONAL SEEDING REQUIREMENTS REFER TO CHAPTER 6 OF THE "GUIDELINES".

7. STONE CHECK DAMS SHALL BE INSTALLED AT ANY EVIDENT CONCENTRATED FLOW DISCHARGE POINTS.

8. STORM DRAIN CATCH BASIN INLET PROTECTION SHALL BE PROVIDED THROUGH THE USE OF FILTER FABRIC FENCE OR STONE BARRIERS AROUND THE CATCH BASINS AS INDICATED ON THE SEDIMENT AND EROSION CONTROL DRAWINGS. THE BARRIERS SHALL ONLY BE REMOVED WHEN THE TRIBUTARY DRAINAGE AREA HAS BEEN STABILIZED.

9. SILT SACK SHALL BE INSTALLED UNDER THE CATCH BASIN GRATE AS INDICATED ON THE DETAIL. WHEN THE RESTRAINT CORD IS NO LONGER VISIBLE, THE SILT SACK IS FULL AND SHOULD BE EMPTIED. SILT SACK SHOULD BE INSPECTED EVERY 2-3 WEEKS AND AFTER EVERY RAIN EVENT OCCURS.

STORM DRAINAGE SYSTEM MAINTENANCE

STORMWATER RENOVATION AREAS (EXTENDED DETENTION SHALLOW WETLANDS):
SEMIANNUAL:
1. CUT OR MOW GRASS LINED SWALES IN SPRING & FALL. SWALES ADJACENT TO THE PROPOSED ROADWAY OR UNITS MAY BE MOWED MORE FREQUENTLY.
2. CLEAN AND REMOVE DEBRIS FROM INLET AND OUTLET STRUCTURES.

ANNUAL:
1. INSPECT SEDIMENT FOREBAY AREA. REMOVE SEDIMENT ONCE IT HAS BUILT UP TO A DEPTH 12" OR GREATER IN THE FOREBAYS FOR BASINS A & B.
2. REMOVE EXCESS LEAVES AND DEBRIS. PLANT MATTER SHALL BE LEFT IN PLACE OVER WINTER MONTHS TO INSULATE THE SOIL AND ADD ORGANIC MATTER TO THE SOIL. REMOVAL CRITERIA SHALL INCLUDE WHEN PLANT MATTER IS SMOTHERING OR KILLING VEGETATION AND AESTHETICS.
3. PRUNE TREES AND SHRUBS AS NEEDED.
4. FOR ADDITIONAL MAINTENANCE REQUIREMENTS OF BASIN PLANTINGS AND REMOVAL OF INVASIVE SPECIES FROM THE STORMWATER RENOVATION AREAS PLEASE REFER TO NOTES ENTITLED "EXTENDED DETENTION SHALLOW WETLANDS BASIN" ON SHEET C331).

CATCH BASINS, PIPING, SWALES AND LEVEL SPREADERS:
CATCH BASINS, STORM DRAINAGE PIPING, SWALES AND LEVEL SPREADERS WILL BE INSPECTED ON AN ANNUAL BASIS. ANY FLOATABLES, TRASH, DEBRIS OR SEDIMENT BUILD UP SHALL BE REMOVED BY A LICENSED CONTRACTOR. GRASS-LINED SWALES AND LEVEL SPREADERS WILL BE MOWED.

THE ON-SITE CATCH BASINS, STORM DRAINAGE MANHOLES, SWALES, STORMWATER RENOVATION BASINS AND ALL ASPECTS OF THE STORM DRAINAGE SYSTEM MUST BE MAINTAINED IN GOOD WORKING CONDITION IN ACCORDANCE WITH THE INTENT OF THESE PLANS.

RESPONSIBILITY:
THE OWNER OF THE PROPERTY WILL BE RESPONSIBLE FOR THE LONG TERM MAINTENANCE OF THE STORM DRAINAGE SYSTEM AS LISTED ABOVE. MAINTENANCE REPORTS INDICATING THAT THE SYSTEM HAS BEEN MAINTAINED IN ACCORDANCE WITH THE INTENT OF THE PLAN SHALL BE SUBMITTED TO THE TOWN LAND USE OFFICES & ON A SEMIANNUAL BASIS AFTER THE MAINTENANCE & INSPECTIONS HAVE OCCURRED.

CONSTRUCTION OF STORMWATER RENOVATION AREA BERMS

A. MATERIALS

1. FILL MATERIAL SHALL BE FREE OF FROZEN MATERIAL, SOD, BRUSH, ROOTS, STUMPS AND OTHER ORGANIC MATERIAL. EARTH EMBANKMENTS SHALL CONTAIN NO STONES OVER SIX INCHES IN DIAMETER. THE MATERIAL USED IN THE CORE PORTION OF THE EMBANKMENT SHALL BE THE MOST IMPERVIOUS MATERIAL OBTAINED FROM THE BORROW AREAS, AS REQUIRED. THE MORE PERVIOUS MATERIALS SHALL BE USED IN THE OUTER FILL PORTION OF THE EMBANKMENT AS SHOWN ON THE PLANS.

2. THE IMPERVIOUS CORE FILL MATERIAL SHALL BE GLACIAL TILL, TO BE PROVIDED IN SUFFICIENT QUANTITIES TO COMPLETE THE WORK. FILL TO BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT. GLACIAL TILL TO CONSIST OF HARD AND DURABLE PARTICLES OR FRAGMENTS AND SHALL BE FREE FROM ORGANIC MATTER AND OTHER OBJECTIONABLE MATERIALS. GLACIAL TILL SHALL CONFORM TO THE FOLLOWING GRADATION REQUIREMENTS.

U. S. Standard Sieve Size	Percentage Passing By Weight
3 inch	100
No. 4	60– 95
No. 10	50– 95
No. 40	30– 95
No. 100	20– 65
No. 200	10– 40

B. BERM FOUNDATION PREPARATION

1. ALL TREE CLEARING SHALL BE FLAGGED PRIOR TO ANY CUTTING OR CLEARING.

2. THE AREA WHERE THE BERM IS TO BE CONSTRUCTED SHALL BE CLEARED AND GRUBBED OF ALL TOPSOIL AND OTHER ORGANIC MATERIALS TO A DEPTH OF AT LEAST 24". UNLESS OTHERWISE SPECIFIED ON THE PLANS, BERM FOUNDATION AREAS SHALL BE SCARIFIED TO A MINIMUM DEPTH OF THREE INCHES PRIOR TO PLACEMENT OF FILL MATERIAL.

C. PLACEMENT OF FILL

1. ALL EROSION CONTROL MEASURES SHALL BE ERECTED PRIOR TO PLACEMENT/EXCAVATION OF MATERIAL.

2. NO FILL SHALL BE PLACED UNTIL THE FOUNDATION PREPARATION AND EXCAVATIONS IN THE FOUNDATION HAVE BEEN COMPLETED AND APPROVED BY THE ENGINEER. NO FILL SHALL BE PLACED ON A FROZEN SURFACE NOR SHALL FROZEN MATERIAL BE INCORPORATED.

3. EMBANKMENT MATERIAL SHALL BE PLACED IN HORIZONTAL LAYERS IN 12 INCH LOOSE LIFTS. DURING CONSTRUCTION, THE SURFACE OF THE FILL SHALL BE SLOPED TO DRAIN. EACH LAYER OR LIFT SHALL EXTEND OVER THE ENTIRE AREA OF THE FILL.

4. THE FILL SHALL BE FREE FROM LENSES, POCKETS, STREAKS, OR LAYERS OF MATERIAL DIFFERING SUBSTANTIALLY IN TEXTURE OR GRADATION FROM THE SURROUNDING MATERIAL. THE MORE PERVIOUS MATERIAL SHALL BE PLACED IN THE OUTSIDE PORTION OF THE BERM OR AS INDICATED ON THE DRAWINGS. THE FINISHED FILL SHALL BE SHAPED AND GRADED TO THE LINES AND GRADE SHOWN ON THE DRAWINGS.

5. PIPE BACKFILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED 6– 8 INCH LOOSE LIFTS AND SHALL BE BROUGHT UP UNIFORMLY AROUND THE OUTLET PIPE AND FLARED END SECTION.

D. MOISTURE CONTROL

1. THE MOISTURE CONTENT OF MATERIALS IN THE BERM SHALL BE CONTROLLED TO MEET THE REQUIREMENTS OF SECTION E "COMPACTION OF BERM". WHEN NECESSARY, MOISTURE SHALL BE ADDED BY THE USE OF APPROVED SPRINKLING EQUIPMENT. WATER SHALL BE ADDED UNIFORMLY AND EACH LAYER SHALL BE THOROUGHLY DISKED OR HARROWED TO PROVIDE PROPER MIXING. ANY LAYER FOUND TOO WET FOR COMPACTION SHALL BE ALLOWED TO DRY BEFORE ROLLING. PLACING OR ROLLING OF MATERIALS ON EARTH FILLS WILL NOT BE PERMITTED DURING OR IMMEDIATELY AFTER RAINFALLS WHICH INCREASE THE MOISTURE CONTENT BEYOND THE LIMIT OF SATISFACTORY COMPACTION. THE EARTH FILL SHALL BE BROUGHT UP UNIFORMLY AND ITS TOP SHALL BE KEPT GRADED AND SLOPED SO THAT A MINIMUM OF RAIN WATER WILL BE RETAINED THEREON. COMPACTED EARTH FILL DAMAGED BY RUNOFF SHALL BE REPLACED IMMEDIATELY BY THE CONTRACTOR.

E. COMPACTION

1. BERM MATERIAL SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR DENSITY AT OR NEAR OPTIMUM MOISTURE CONTENT AND BY THE COMPACTION EQUIPMENT SPECIFIED HEREIN. THE COMPACTION EQUIPMENT SHALL TRAVERSE THE ENTIRE SURFACE OF EACH LAYER OF FILL MATERIAL.

2. APPROVED TAMPING ROLLERS SHALL BE USED FOR COMPACTING ALL PARTS OF THE BERM. THE CONTRACTOR SHALL DEMONSTRATE THE EFFECTIVENESS OF THE ROLLER BY ACTUAL SOIL COMPACTION TEST RESULTS OF THE SOIL TO BE USED IN THE BERM WITH LABORATORY WORK PERFORMED BY AN APPROVED SOIL TESTING LABORATORY. COMPACTION TESTS SHALL INCLUDE MODIFIED PROCTOR AND NUCLEAR DENSITY TESTS MADE AT THE ENGINEER'S DISCRETION. A MINIMUM OF THREE PROCTOR TESTS SHALL BE PERFORMED AND DENSITY TESTS SHALL BE PERFORMED EVERY 1500 SQUARE FEET.

3. PIPE BACKFILL SHALL BE COMPACTED BY HAND TAMPING WITH MECHANICAL TAMPERS. HEAVY EQUIPMENT SHALL NOT BE OPERATED WITHIN THREE FEET OF ANY STRUCTURE. EQUIPMENT SHALL NOT BE ALLOWED TO OPERATE OVER THE OUTLET CULVERTS UNTIL THERE IS AT LEAST TWO FEET OF COVER OVER THE PIPES.

F. FINISHING EMBANKMENTS

1. THE BERM SHALL BE CONSTRUCTED TO THE ELEVATIONS, LINES AND GRADES AND CROSS SECTIONS AS SHOWN ON THE PLANS. THE BERM SHALL BE MAINTAINED IN A MANNER SATISFACTORY TO THE ENGINEER AND THE TOWN AND SURFACES SHALL BE COMPACT AND AND ACCURATELY GRADED BEFORE TOPSOIL IS PLACED ON THEM.

2. THE TOPSOIL SHALL BE PLACED AT A DEPTH OF 5–6" OVER THE DISTURBED AREA AFTER COMPLETION OF CONSTRUCTION.

3. DISTURBED AREAS SHALL BE SEEDED WITH "NEW ENGLAND ENVIRONMENTAL EROSION CONTROL MIX FOR DETENTION BASINS AND MOIST SITES" OR APPROVED EQUAL AT A RATE OF 1 LB. PER 5000 SQUARE FEET OR AT A RATE RECOMMENDED BY THE MANUFACTURER.

4. SEEDED AREAS SHALL BE STABILIZED WITH HAY OR MULCH UNTIL VEGETATION IS FIRMLY ESTABLISHED.

5. SEEDED AREAS SHALL BE MONITORED WEEKLY FOR EROSION AND ANY AREAS THAT REQUIRE RESEEDING SHALL BE RESEED COMPLETELY AND IMMEDIATELY.

NO.	REVISION	DATE

Previous Editions Obsolete

EROSION CONTROL NARRATIVE & CONSTRUCTION SEQUENCE

CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

CIVIL C1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

STATE OF CONNECTICUT · COURTNEY C. JONES · No. 12208 · LICENSED PROFESSIONAL ENGINEER

DRAWN:	BB
APPROVED:	CJ
SCALE:	N.T.S.
DATE:	30 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	C 330

CONSTRUCTION SEQUENCE

PHASE I: (30 – 60 DAY DURATION)

1. FIELD STAKEOUT THE LIMITS OF ALL CONSTRUCTION ACTIVITIES ASSOCIATED WITH PHASE I.

2. INSTALL ANTI–TRACKING PAD AT CONSTRUCTION ENTRANCE AS SHOWN ON THE PLAN. INSTALL WATER BARS AND HAYBALE BARRIERS AS NECESSARY TO CONTROL DRAINAGE ALONG THE ENTRY DRIVE. AT THE END OF EACH WORKING DAY, ANY ACCUMULATED SILT SHALL BE SWEPT FROM THE EXISTING TOWN ROADS.

3. CLEAR ALL VEGETATION WITHIN THE CONSTRUCTION AREA. DO NOT REMOVE STUMPS UNTIL EROSION CONTROL MEASURES ARE IN PLACE.

4. HAYBALES AND/OR SILTATION FENCE AND OTHER EROSION CONTROL FEATURES WILL BE PLACED AS SHOWN ON THE ENCLOSED PHASE 1 PLAN PRIOR TO THE START OF ANY CONSTRUCTION.

5. INSTALL TEMPORARY FILTER BERM IN EXISTING STORMWATER BASIN ON LOT 9B PER DETAILS.

6. REMOVE STUMPS ONLY FROM CONSTRUCTION AREA FOR PHASE 1.

7. STRIP & STOCKPILE TOPSOIL (+/– 8,000 CUBIC YARDS) AS SHOWN ON PLANS. EXCESS MATERIAL MAY BE STOCKPILED OFF–SITE.

8. CREATE TEMPORARY CLEAN WATER DIVERSIONS AS NECESSARY TO MINIMIZE OVERLAND FLOW.

9. CONSTRUCT TEMPORARY SEDIMENT TRAPS 1A AND 1B AT THE DRIVEWAY ENTRANCE.

10. BEGIN MASS EARTH EXCAVATION INTO THE SITE WORKING EAST THEN NORTH INTO THE SITE. CUT MATERIAL WILL BE USED TO FILL EASTERN SIDE OF DRIVEWAY, EXCESS CUT MATERIAL WILL BE REMOVED FROM THE SITE.

11. INSTALL STORM DRAINAGE STRUCTURES IN THE PHASE 1 CONSTRUCTION AREA BUT DO NOT ALLOW DRAINAGE INTO STRUCTURES UNTIL AREA IS STABILIZED. CONSTRUCTION STORMWATER MUST FLOW TO TSTs LOCATED AT BOTTOM OF DRIVEWAY AS INDICATED ON THE SITE PLANS.

12. ROUGH GRADE STORMWATER RENOVATION AREA "A" SO THAT IT CAN BE USED AS A TST DURING THE CONSTRUCTION ASSOCIATED WITH PHASE 2. INSTALL TEMPORARY BERM IN THE MIDDLE OF THE BASIN TO CREATE TSTs 2A & 2B.

13. CONSTRUCT OUTLETS TO TSTs AND PERFORATED RISER ON THE OUTLET STRUCTURE PER THE DETAIL ON SHEET C.321. A TEMPORARY PERFORATED RISER OUTLET WILL BE PROVIDED FOR TST 2B AS INDICATED ON THE SITE PLANS.

14. CONSTRUCT EMERGENCY MODIFIED RIPRAP OVERFLOW SWALE FROM BASIN.

15. PLACE STORMWATER FILTRATION TRAILER INTO POSITION AS NECESSARY.

16. PLACE BINDER COURSE ON DRIVEWAY FROM STATION 0+00 TO 10+50.

17. PLACE TOPSOIL AND SEED ALL DISTURBED AREAS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE.

18. INSTALL EROSION CONTROL BLANKETS ON ANY SLOPES STEEPER THAN 3:1 AND HYDRO–SEED ALL DISTURBED AREAS WITH SLOPES OF 3:1 OR LESS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE. ALL EROSION & SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL THE PHASE 1 CONSTRUCTION AREA IS PERMANENTLY STABILIZED.

19. REMOVE EROSION CONTROL MEASURES AND DIRECT STORMWATER INTO CATCH BASINS ALONG ACCESS DRIVEWAY AFTER THE AREA IS FULLY STABILIZED AND TRIBUTARY VEGETATION IS ESTABLISHED.

PHASE II: (270 – 365 DAY DURATION)

1. FIELD STAKEOUT THE LIMITS OF ALL CONSTRUCTION ACTIVITIES ASSOCIATED WITH PHASE 2.

2. INSTALL HAYBALES AND/OR SILTATION FENCE AROUND BOUNDARY OF THE CONSTRUCTION AREA AS SHOWN ON THE ENCLOSED PHASE 2 PLAN.

3. CREATE TEMPORARY CLEAN WATER DIVERSION TO MINIMIZE OVERLAND FLOW ONTO THE CONSTRUCTION AREA AS INDICATED ON THE SITE PLANS.

4. REMOVE STUMPS ONLY FROM THE CONSTRUCTION AREA FOR PHASE 2.

5. STRIP & STOCKPILE TOPSOIL (+/–14,000 CUBIC YARDS) AS SHOWN ON PLANS. MATERIAL MAY BE STOCKPILED IN PHASE 2. EXCESS MATERIAL MAY BE STOCKPILED OFF–SITE.

6. COMMENCE EARTHWORK AND GRADING FOR TEMPORARY SEDIMENTATION TRAP 2C (NOTE TSTs 2A AND 2B WERE CONSTRUCTED IN PHASE 1).

7. CONSTRUCT TEMPORARY DIVERSION SWALES AND INSTALLED STORM DRAINAGE STRUCTURES AS INDICATED ON SITE PLANS TO DIVERT STORMWATER FROM THE CONSTRUCTION AREAS INTO TSTs 2A, 2B AND 2C.

8. BEGIN MASS EARTH EXCAVATION INTO THE SITE WORKING FROM SOUTH TO NORTH. CUT MATERIAL WILL BE USED TO FILL EASTERN SIDE AND WESTERN FILL AREAS OF THE SITE, EXCESS CUT MATERIAL WILL BE REMOVED FROM THE SITE.

9. INSTALL STAFF PARKING AREA AND OFFICE TRAILERS.

10. BEGIN MASS EARTH EXCAVATION OF THE POWER BLOCK AREA. THIS AREA WILL BE CUT APPROXIMATELY 7' BELOW THE FINISHED GRADE ELEVATION OF THE PLANT CREATING A DEPRESSION WHICH WILL TRAP STORMWATER. THIS AREA WILL BE DEWATERED BY INSTALLING SUMPS ON NORTHEAST AND WEST SIDES OF THE EXCAVATION THAT WILL BE PUMPED INTO TSTs AFTER STORM EVENTS.

11. MATERIAL FROM THE POWER BLOCK EXCAVATION WILL BE STOCKPILED AND THEN REDEPOSITED & COMPACTED INTO THE EXCAVATION AREA AFTER THE ASSOCIATED FOUNDATION AND UTILITY WORK HAS BEEN COMPLETED.

12. INSTALL STORM DRAINAGE STRUCTURES WHERE FEASIBLE IN THE PHASE 2 CONSTRUCTION AREA. THE MAJORITY OF STORM DRAINAGE STRUCTURES IN THE PHASE 2 AREA WILL BE INSTALLED AFTER THE DEEPER FOUNDATION AND UTILITY WORK ASSOCIATED WITH THE POWER BLOCK CONSTRUCTION ARE COMPLETED.

13. PLACE TOPSOIL AND SEED ALL DISTURBED AREAS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE.

14. INSTALL EROSION CONTROL BLANKETS ON ANY SLOPES STEEPER THAN 3:1 AND HYDRO–SEED ALL DISTURBED AREAS WITH SLOPES OF 3:1 OR LESS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE. ALL EROSION & SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL THE PHASE 2 CONSTRUCTION AREA IS PERMANENTLY STABILIZED. SPECIAL ATTENTION SHALL BE GIVEN TO AREAS WHERE PROPOSED GRADING IS STEEPER THAN 3:1, SPECIFICALLY IN THE AREA EAST OF THE WOODRUFF HILL ROAD CUL DE SAC.

15. PLACE BINDER COURSE ON DRIVEWAY AREA AFTER ALL OTHER IMPROVEMENTS ARE COMPLETE.

16. WHEN THE EXISTING STORMWATER BASIN ON LOT 9B IS NO LONGER NEEDED TO OPERATE AS A TEMPORARY SEDIMENT TRAP, REMOVE THE PERMEABLE FILER BERM, REMOVE ANY SEDIMENT BUILD–UP. REESTABLISH BOTTOM OF BASIN AT ORIGINAL GRADE AND SEED WITH N.E. EROSION CONTROL MIX FOR DETENTION BASINS AND MOIST SITES.

17. REMOVE EROSION CONTROL MEASURES AND DIRECT STORMWATER INTO CATCH BASINS AFTER THE AREA IS FULLY STABILIZED AND TRIBUTARY VEGETATION IS ESTABLISHED.

PHASE III: (180 – 270 DAY DURATION)

1. FIELD STAKEOUT THE LIMITS OF ALL CONSTRUCTION ACTIVITIES ASSOCIATED WITH PHASE 3.

2. INSTALL HAYBALES AND/OR SILTATION FENCE AROUND BOUNDARY OF THE CONSTRUCTION AREA AS SHOWN ON THE ENCLOSED PHASE 3 PLAN.

3. CREATE TEMPORARY CLEAN WATER DIVERSION TO MINIMIZE OVERLAND FLOW ONTO THE CONSTRUCTION AREA AS INDICATED ON THE SITE PLANS.

4. REMOVE STUMPS ONLY FROM THE CONSTRUCTION AREA FOR PHASE 3.

5. STRIP & STOCKPILE TOPSOIL (+/–5,600 CUBIC YARDS) EXCESS MATERIAL MAY BE STOCKPILED OFF–SITE.

6. COMMENCE EARTHWORK AND GRADING FOR TEMPORARY SEDIMENTATION TRAP 3A2 (NOTE TSTs 2C FROM PHASE 2 WILL BE CLEANED OUT AND REUSED AS TST 3A1 FOR PHASE 3).

7. CONSTRUCT TEMPORARY DIVERSION SWALES AND INSTALLED STORM DRAINAGE STRUCTURES AS INDICATED ON SITE PLANS TO DIVERT STORMWATER FROM THE CONSTRUCTION AREAS INTO TSTs 3A1 & 3A2.

8. BEGIN MASS EARTH EXCAVATION INTO THE SITE WORKING NORTH INTO THE SITE. EXCESS CUT MATERIAL WILL BE REMOVED FROM THE SITE.

9. ROUGH GRADE STORMWATER RENOVATION AREA "B" SO THAT IT CAN BE USED AS A TST 3B ONCE PHASE 3 HAS REACHED SUBGRADE AND DRAINAGE WILL PITCH TO THE NORTH TOWARDS THE RENOVATION AREA.

10. CONSTRUCT THE RENOVATION AREA OUTLETS AND PERFORATED RISER ON THE OUTLET STRUCTURE PER THE DETAIL ON SHEET C321. CONSTRUCT POND DISCHARGE OUTLET PIPING TO STORM DRAINAGE ALONG THE EASTERN PROPERTY LINE PREVIOUSLY INSTALLED IN PHASE 2.

11. PLACE TOPSOIL AND SEED ALL DISTURBED AREAS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE.

12. INSTALL EROSION CONTROL BLANKETS ON ANY SLOPES STEEPER THAN 3:1 AND HYDRO–SEED ALL DISTURBED AREAS WITH SLOPES OF 3:1 OR LESS THAT ARE NOT SUBJECT TO FUTURE CONSTRUCTION DISTURBANCE. ALL EROSION & SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL THE PHASE 3 CONSTRUCTION AREA IS PERMANENTLY STABILIZED.

13. PLACE BINDER COURSE ON DRIVEWAY AREA AFTER ALL OTHER SUBSURFACE IMPROVEMENTS ARE COMPLETE.

14. REMOVE EROSION CONTROL MEASURES AND DIRECT STORMWATER INTO CATCH BASINS AFTER THE AREA IS FULLY STABILIZED AND TRIBUTARY VEGETATION IS ESTABLISHED.

CONSTRUCTION SEQUENCE (CONT.)

PHASE IV: (180 – 270 DAYS)

1. COMPLETE ANY OUTSTANDING EARTHWORK OPERATIONS.

2. LOAM, MULCH SEED AND FERTILIZE ALL REMAINING DISTURBED AREAS.

3.. PROVIDE PAINT STRIPING FOR PARKING AS INDICATED ON THE DRAWINGS. INSTALL SIGNS.

4. CONVERT TEMPORARY SEDIMENTATION TRAPS "A" & "B" INTO STORMWATER RENOVATION AREAS BY REMOVING THE BASIN OUTLET RISER AND CLEANING THE BASIN OF DEPOSITED MATERIALS AND CONSTRUCTION STORMWATER WETLANDS IN ACCORDANCE WITH THE SITE PLANS.

5. REMOVE ANY SILTATION FENCE, HAY BALES AND OTHER EROSION CONTROL MEASURES ONCE THE SITE IS PERMANENTLY STABILIZED.

6. INSTALL CHAIN LINK SECURITY FENCE AND GATES AROUND THE SITE.

7. INSTALL CHAIN LINK SECURITY FENCE AND GATES AROUND SWITCHYARD.

WILDLIFE MITIGATION NOTES

TURTLE CONSERVATION: TO LIMIT THE POTENTIAL FOR IMPACTS TO EASTERN BOX TURTLES (A CONNECTICUT SPECIES OF SPECIAL CONCERN) RESULTING FROM THE CONSTRUCTION OF THE CPV TOWANTIC PROJECT, THE PERMITTEE SHALL ADHERE TO THE FOLLOWING PRECAUTIONARY MEASURES AT ANY TIME THAT WORK IS DONE DURING THE TURTLE'S ACTIVE PERIOD OF APRIL 1 TO NOVEMBER 1:

PRIOR TO CONSTRUCTION:
A. SILT FENCING SHALL BE INSTALLED AROUND THE WORK AREA PRIOR TO CONSTRUCTION AND PRIOR TO THE BEGINNING OR AFTER THE CONCLUSION OF THE TURTLE HIBERNATION PERIOD NOVEMBER 1 TO APRIL 1.
B. THE AREA WITHIN THE PERIMETER OF THE SILT FENCE SHALL BE CANVASSED DAILY FOR A PERIOD OF 2 WEEKS FOR THE PRESENCE OF TURTLES AND ANY TURTLES FOUND WITHIN THE BOUNDS OF THE SILT FENCE SHALL BE RELOCATED OUTSIDE OF THE BOUNDS OF THE SILT FENCE.

DURING CONSTRUCTION:
C. WORK CREWS SHALL BE APPRAISED OF THE SPECIES DESCRIPTION AND POSSIBLE PRESENCE PRIOR TO CONSTRUCTION.
D. WORK CREWS SHALL SEARCH THE WORK AREA FOR EASTERN BOX TURTLES PRIOR TO THE START OF EACH CONSTRUCTION DAY.
E. ANY EASTERN BOX TURTLES ENCOUNTERED DURING THE WORK SHALL BE MOVED UNHARMED TO AN AREA IMMEDIATELY OUTSIDE OF THE FENCED WORK AREA AND ORIENTED IN THE SAME DIRECTION IT WAS WALKING WHEN FOUND.
F. ALL PRECAUTIONARY MEASURES SHOULD BE TAKEN TO AVOID DEGRADATION TO WETLAND HABITATS INCLUDING ANY WET MEADOWS AND SEASONAL POOLS.
G. WORK CONDUCTED IN THESE HABITATS DURING THE EARLY MORNING AND EVENING HOURS SHOULD OCCUR WITH SPECIAL CARE NOT TO HARM BASKING OR FORAGING INDIVIDUALS.
H. NO HEAVY MACHINERY OR VEHICLES SHALL BE PARKED IN ANY TURTLE HABITAT AND PRECAUTIONS SHALL BE TAKEN WHEN THE MACHINERY IS TRAVELING TO THE WORK AREA TO AVOID TURTLES.
I. ALL SILT FENCING SHALL BE REMOVED AFTER WORK IS COMPLETED WHEN SOILS ARE STABLE SO THAT REPTILE AND AMPHIBIAN MOVEMENT BETWEEN UPLANDS AND WETLANDS IS NOT RESTRICTED.

BAT CONSERVATION: TO LIMIT THE POTENTIAL FOR IMPACTS TO THE THE RED BAT, THE HOARY BAT AND THE SILVERHAIRED BAT. (THREE CONNECTICUT SPECIES OF SPECIAL CONCERN) RESULTING FROM THE CONSTRUCTION OF THE CPV TOWANTIC PROJECT, THE PERMITTEE SHALL ADHERE TO THE FOLLOWING PRECAUTIONARY MEASURES :

TREE CLEARING: TREE CLEARING ACTIVITIES SHALL BE COMPLETED BETWEEN AUGUST 16 AND APRIL 30 TO AVOID POTENTIAL IMPACT TO BAT ROOST HABITAT THROUGH THE REMOVAL OF POSSIBLE ROOSTING TREES PRIOR TO THE START OF THE BATS' ACTIVE ROOSTING SEASON (MAY 1 TO AUGUST 15).

EXTENDED DETENTION SHALLOW WETLAND BASINS

BOTH STORMWATER RENOVATION AREAS HAVE BEEN DESIGNED AS EXTENDED DETENTION SHALLOW WETLAND BASIN SYSTEMS IN ACCORDANCE WITH THE RECOMMENDATIONS FOUND IN THE 2004 CONNECTICUT STORMWATER QUALITY MANUAL. THE EXTENDED DETENTION SHALLOW WETLAND BASINS ALSO PROVIDE MITIGATION FOR THE PROJECT'S UNAVOIDABLE WETLAND IMPACTS.

CONSTRUCTION MONITORING

1. THE PROJECT WETLAND MONITOR WITH EXPERIENCE IN WETLAND MITIGATION AND EXTENDED DETENTION SHALLOW WETLAND BASIN CONSTRUCTION MONITORING WILL SUPERVISE PLACEMENT OF TOPSOIL AND PLANTING ELEMENTS OF THE EXTENDED DETENTION SHALLOW WETLAND BASINS. ALL–POINTS TECHNOLOGY CORPORATION, P.C. ('APT') WILL SERVE AS THE PROJECT WETLAND MONITOR FOR THIS PROJECT TO ENSURE THAT PLACEMENT OF TOPSOIL AND PLANTING OF THE EXTENDED DETENTION SHALLOW WETLAND BASINS ARE IMPLEMENTED PROPERLY. THE CONTRACTOR SHALL CONTACT DEAN GUSTAFSON, SENIOR WETLAND SCIENTIST AT APT, AT LEAST 5 BUSINESS DAYS PRIOR TO THE PRE–CONSTRUCTION MEETING. MR. GUSTAFSON CAN BE REACHED BY PHONE AT (860) 663–1697 EXT. 201 OR VIA EMAIL AT DGUSTAFSON@ALLPOINTSTECH.COM.
2. THE PROJECT WETLAND MONITOR SHALL BE NOTIFIED A MINIMUM OF SEVEN (7) BUSINESS DAYS PRIOR TO ANY PHASE OF THE EXTENDED DETENTION SHALLOW WETLAND BASINS PROJECT INCLUDING EXCAVATION AND GRADING, SOIL TRANSFER AND PLANTING.
3. A PRE–CONSTRUCTION MEETING WILL BE HELD ON SITE BETWEEN THE PROJECT WETLAND MONITOR AND CONTRACTOR(S) PERFORMING ALL ASPECTS OF THE EXTENDED DETENTION SHALLOW WETLAND BASINS CONSTRUCTION. THE PRIMARY INTENT OF THE PRE–APPLICATION MEETING IS TO DISCUSS THE GOALS OF THE EXTENDED DETENTION SHALLOW WETLAND BASINS AND IMPLEMENTATION OF REQUIRED ELEMENTS NECESSARY TO ACHIEVE PERMIT–REQUIRED GOALS AND SEQUENCE OF ELEMENTS.

GENERAL NOTES

CONSTRUCTION OF THE EXTENDED DETENTION SHALLOW WETLAND BASINS HAS BEEN DESIGNED TO MINIMIZE EROSION AND MAXIMIZE THE ESTABLISHMENT OF PLANTED NATIVE VEGETATION. THE BASINS WILL BE CONSTRUCTED PER THE FOLLOWING:

1. PRIOR TO ALL WORK, EROSION CONTROL MEASURES SHALL BE ESTABLISHED AS INDICATED ON SITE PLANS AND AS DETERMINED TO BE NECESSARY IN RESPONSE TO SITE CONDITIONS.
2. THE EXTENDED DETENTION SHALLOW WETLAND BASINS SHALL ONLY BE CONSTRUCTED AFTER THE CONTRIBUTING DRAINAGE AREAS HAVE BEEN COMPLETELY STABILIZED SINCE THESE AREAS WILL BE USED AS TEMPORARY SEDIMENT BASINS DURING THE CONSTRUCTION PHASE OF THE PROJECT. THESE BASINS SHALL BE DE–WATERED, DREDGED AND RE–GRADED AS NECESSARY TO DESIGN DIMENSIONS AFTER THE CONTRIBUTING DRAINAGE AREAS HAVE BEEN COMPLETELY STABILIZED.
3. EXTENDED DETENTION SHALLOW WETLAND BASINS SHALL BE COVERED WITH A MINIMUM OF 10 INCHES OF TOPSOIL WITHIN THE LOW MARSH AND HIGH MARSH PLANTING AREAS AND A 5–FOOT WIDE SHELF AROUND THE PERIMETER OF THE FOREBAY AND MICROPOOL. TOPSOIL FOR USE IN THE EXTENDED DETENTION SHALLOW WETLAND BASINS SHALL ONLY BE SOURCED FROM THE PROJECT SITE. TOPSOIL SHALL ONLY BE RECOVERED FROM WETLAND 1 AND FORESTED AREAS FROM THE PROJECT SITE, SEGREGATED SEPARATELY ON THE PROJECT SITE DURING CONSTRUCTION, AND AMENDED WITH ORGANIC MATTER SO THAT IT CONTAINS AT MINIMUM OF 8 PERCENT ORGANIC CARBON CONTENT BY WEIGHT. RECOVERED TOPSOIL SHALL BE FREE OF STUMPS AND LARGE ROCKS; SMALLER ROOT MATERIALS CAN REMAIN TO MINIMIZE SOIL COMPACTION. THE PROJECT WETLAND MONITOR WILL BE PROVIDED WITH LABORATORY TESTING RESULTS TO CONFIRM ORGANIC MATTER CONTENT OF TOPSOIL PRIOR TO PLACEMENT IN THE EXTENDED DETENTION SHALLOW WETLAND BASINS.
4. TOPSOIL ORGANIC MATTER AMENDMENTS SHALL CONSIST OF CLEAN COMMERCIALLY AVAILABLE COMPOST (FREE OF PHYSICAL/CHEMICAL CONTAMINANTS AND WEED SEEDS) AS THE PREFERRED ORGANIC MATTER AMENDMENT TO ACHIEVE THIS ORGANIC MATTER CONTENT STANDARD, THOUGH OTHER MATERIALS MAY BE USED IF APPROVED BY THE PROJECT WETLAND MONITOR.
5. TOPSOIL SHALL BE PLACED WITHIN THE EXTENDED DETENTION SHALLOW WETLAND BASINS IN SUCH A MANNER AS TO MINIMIZE COMPACTION. NO MACHINERY SHOULD BE ALLOWED TO TRAVERSE OVER THE PLANTING SOIL FOLLOWING FINAL GRADING.
6. FOLLOWING COMPLETION OF FINAL GRADING OF THE TOPSOIL, AN EROSION CONTROL BLANKET SHALL BE PROPERLY INSTALLED OVER THE ENTIRE PLANTABLE AREA IN THE EXTENDED DETENTION SHALLOW WETLAND BASINS BOTTOM TO STABILIZE THE TOPSOIL AND PREPARE IT FOR PLANTING.
7. SOME ROCKS AND BOULDERS, UNCOVERED DURING THE EXCAVATION, MAY BE LEFT IN PLACE PROVIDED THAT THEY DO NOT SIGNIFICANTLY DECREASE THE PLANTABLE AREA OF THE EXTENDED DETENTION SHALLOW WETLANDS. THESE ROCKS AND BOULDERS WILL BE PLACED IN SUCH A WAY AS TO PROVIDE BASKING AREA, CREVICES AND CAVITIES THAT ENHANCE WILDLIFE HABITAT.
8. SIX TO EIGHT INCHES OF TOPSOIL SHALL BE PLACED ON THE SIDE SLOPES ADJACENT TO THE EXTENDED DETENTION SHALLOW WETLAND BASINS AND PLANTED WITH A NATIVE SEED MIX CONTAINING VARIOUS GRASSES AND FORBS SUITED FOR STEEP SLOPES, QUICK ESTABLISHMENT OF PERMANENT VEGETATION TO STABILIZE SOILS AND LOW MAINTENANCE.
9. EXTENDED DETENTION SHALLOW WETLAND BASINS PLANTINGS WILL TAKE PLACE ONCE THE ABOVE LISTED TASKS HAVE BEEN COMPLETED. THE SPECIES, SIZE, QUANTITY AND SPACING OF THE PLANTINGS WILL FOLLOW THE PLANTING SCHEDULES.
10. THE PROJECT WETLAND MONITOR SHALL INSPECT THE PLANTING STOCK SPECIMENS FOR HEALTH, PEST, AND SUITABLE FOR USE WITHIN THE EXTENDED DETENTION SHALLOW WETLAND BASINS. UNSUITABLE SPECIMENS WILL BE REJECTED AND REPLACED WITH SUITABLE SPECIMENS. ANY PLANTING SUBSTITUTIONS MUST BE APPROVED BY THE PROJECT WETLAND MONITOR. PLANTING WITHIN THE EXTENDED DETENTION SHALLOW WETLAND BASINS AND ADJACENT SIDE SLOPES SHALL CONFORM TO THE PLANS OR WILL BE COMPLETED IN ACCORDANCE WITH DIRECTIONS PROVIDED IN THE FIELD BY THE PROJECT WETLAND MONITOR. ONLY PLANT MATERIALS NATIVE AND INDIGENOUS TO CONNECTICUT SHALL BE USED. NO CULTIVARS SHALL BE USED.
11. ALL PLANT MATERIALS INSTALLED SHALL MEET OR EXCEED THE SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING DATE OF FINAL ACCEPTANCE.
12. TEMPORARY DEVICES AND STRUCTURES TO CONTROL EROSION AND SEDIMENTATION IN AND AROUND THE EXTENDED DETENTION SHALLOW WETLAND BASINS AND SIDE SLOPES SHALL BE PROPERLY MAINTAINED AT ALL TIMES. THE DEVICES AND STRUCTURES SHALL BE DISASSEMBLED AND PROPERLY DISPOSED OF AS SOON AS THE SITE IS STABLE BUT NO LATER THAN THE END OF THE THIRD GROWING SEASON. SEDIMENT COLLECTED BY THESE DEVICES WILL BE REMOVED AND PLACED UPLAND IN A MANNER THAT PREVENTS ITS EROSION AND TRANSPORT TO A WATERWAY OR WETLAND. IF MINOR GRADING IS REQUIRED IN THIS ZONE TO PROVIDE SURFACE HYDROLOGIC CONNECTION BETWEEN THE AREAS, IT WILL BE DONE BY HAND AND STABILIZED WITH MULCH.
13. WATERFOWL PROTECTION SHALL BE INSTALLED AS NECESSARY TO PROTECT NEWLY PLANTED VEGETATION. THIS IS PARTICULARLY CRITICAL FOR NEWLY ESTABLISHED EMERGENTS AND HERBACEOUS PLANTS, AS PREDATION BY WATERFOWL (E.G., CANADA GEESE) CAN QUICKLY DECIMATED WETLAND VEGETATION. WATERFOWL PROTECTION MAY CONSIST OF NETTING, WEBBING, OR STRING INSTALLED IN A CRISSCROSS PATTERN OVER THE SURFACE AREA OF THE EXTENDED DETENTION SHALLOW WETLAND BASINS, ABOVE THE LEVEL OF THE EMERGENT PLANTS.
14. THE USE OF FERTILIZER AND PESTICIDES IN THE EXTENDED DETENTION SHALLOW WETLAND BASINS IS PROHIBITED. HERBICIDE USAGE IN THE EXTENDED DETENTION SHALLOW WETLAND BASINS WILL ONLY OCCUR AS NECESSARY FOR THE CONTROL OF INVASIVE SPECIES. IN SUCH CASES, HERBICIDES APPROPRIATE FOR USAGE IN SENSITIVE WETLAND AND AQUATIC ENVIRONMENTS WILL BE USED BY A STATE–LICENSED PROFESSIONAL.

POST–CONSTRUCTION MONITORING REQUIREMENTS

1. IN ACCORDANCE WITH SECTION 401 WATER QUALITY CERTIFICATION UNDER CATEGORY 2 OF THE GENERAL PERMIT AUTHORIZATION ISSUED ON MARCH 12, 2015 BY THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION ('DEEP': PGP–201409826/NAE–2014–2062) AND THE NEW ENGLAND DISTRICT COMPENSATORY MITIGATION GUIDANCE (2010), THE EXTENDED DETENTION SHALLOW WETLAND BASINS SHALL BE MONITORED BY THE PROJECT WETLAND MONITOR DURING CONSTRUCTION AND FOR A PERIOD OF FIVE GROWING SEASONS FOLLOWING CONSTRUCTION.
2. POST CONSTRUCTION INSPECTIONS OF THE EXTENDED DETENTION SHALLOW WETLAND BASINS WILL BE PERFORMED BY THE PROJECT WETLAND MONITOR TWICE EACH YEAR: LATE SPRING/EARLY SUMMER AND LATE SUMMER/EARLY FALL. THE EXTENDED DETENTION SHALLOW WETLAND BASINS WILL BE INSPECTED GENERALLY IN ACCORDANCE WITH THE CORPS' MITIGATION GUIDANCE TO ASSESS THE GENERAL HEALTH OF PLANTINGS, SOIL STABILIZATION AND PRESENCE OF INVASIVE PLANTS. INVASIVE PLANTS WILL INCLUDE SUCH SPECIES AS NOTED IN APPENDIX D OF THE CORPS' MITIGATION GUIDANCE.
3. MONITORING REPORTS FOLLOWING THE CORPS' MITIGATION GUIDANCE FORMAT WILL BE SUBMITTED BY THE PROJECT WETLAND MONITOR TO THE CORPS OF ENGINEERS NEW ENGLAND DISTRICT, DEEP AND CONNECTICUT SITING COUNCIL NO LATER THAN DECEMBER 15 OF EACH YEAR. THE REPORTS WILL PROVIDE DETAILS ON THE FOUR SUCCESS STANDARDS DESCRIBED BELOW. IF THERE ARE PROBLEMS THAT NEED TO BE ADDRESSED AND IF THE MEASURES TO CORRECT THEM REQUIRE PRIOR APPROVAL FROM THE CORPS OF ENGINEERS NEW ENGLAND DISTRICT, DEEP AND/OR CONNECTICUT SITING COUNCIL, CPV TOWANTIC, LLC WILL CONTACT THESE AGENCIES AS SOON AS THE NEED FOR CORRECTIVE ACTION IS DISCOVERED.
4. THE MITIGATION AREAS WILL BE ASSESS USING FOUR SUCCESS STANDARDS, AS DESCRIBED AS FOLLOWS: 1) AT LEAST 80% OF THE AERIAL SURFACE OF THE EXTENDED DETENTION SHALLOW WETLANDS PLANTING AREAS (HIGH MARSH, LOW MARSH AND 5–FOOT FRINGES OF FOREBAY AND MICROPOOL) SHALL BE ESTABLISHED WITH NATIVE HYDROPHYTES; 2) DOCUMENTED PRESENCE OF WETLAND HYDROLOGY APPROPRIATE FOR EXTENDED DETENTION SHALLOW WETLAND BASINS (SOIL SATURATION WITHIN 12 INCHES OF THE SURFACE FOR A MINIMUM OF TWO CONSECUTIVE WEEKS DURING THE GROWING SEASON IN THE HIGH MARSH AND LOW MARSH AREAS); 3) CONTROL OF NON–NATIVE SPECIES WITH LESS THAN 10% TOTAL AERIAL COVERAGE BY END OF MONITORING PERIOD; AND, 4) ALL SLOPES AND SOILS WITHIN AND ADJACENT TO THE EXTENDED DETENTION SHALLOW WETLAND BASINS ARE PERMANENTLY STABILIZED WITH VEGETATION AND ANY EROSION CONTROL BARRIERS REMOVED NO LATER THAN THE END OF THE THIRD GROWING SEASON.
5. MITIGATION AS SET FORTH IN CONDITION 2 OF THE SECTION 401 WATER QUALITY CERTIFICATION AUTHORIZATION ISSUED ON MARCH 12, 2015 BY THE DEEP (PGP–201409826/NAE–2014–2062) WILL NOT BE CONSIDERED FULFILLED UNTIL MITIGATION SUCCESS HAS BEEN DEMONSTRATED THROUGH ATTAINMENT OF THE FOUR (4) SUCCESS STANDARDS AND WRITTEN VERIFICATION FROM DEEP HAS BEEN RECEIVED.

NO.	REVISION	DATE

Previous Editions Obsolete

EROSION CONTROL NARRATIVE & CONSTRUCTION SEQUENCE

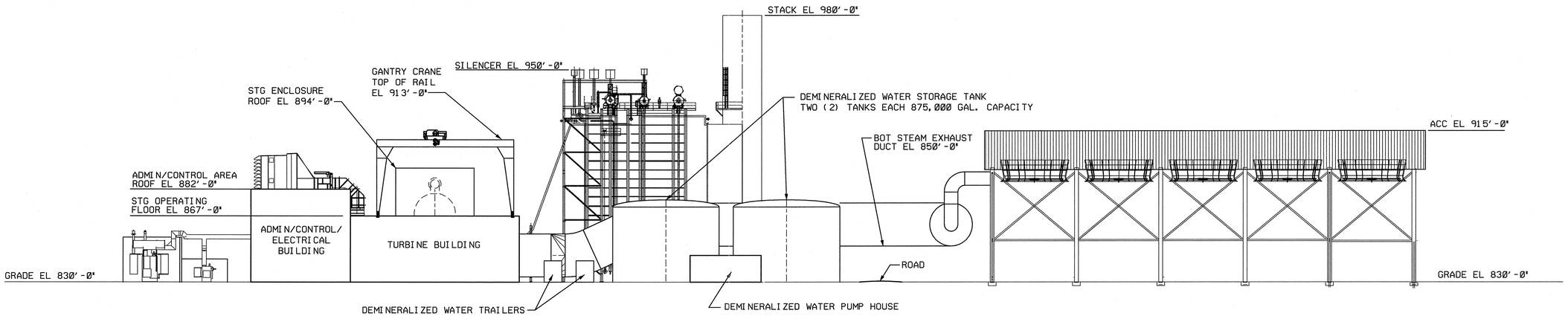
CPV TOWANTIC ENERGY CENTER

OXFORD CONNECTICUT

CIVIL C1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

STATE OF CONNECTICUT
CURTIS C. JONES
No. 17208
LICENSED PROFESSIONAL ENGINEER

DRAWN:	BB
APPROVED:	CJ
SCALE:	N.T.S.
DATE:	30 JUN 15
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	C 331



ELEVATION LOOKING EAST

M202

GRAPHIC SCALE

0 15' 30' 60' 90'

1" = 30.0'

Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr

Drawing Control				
Purpose	Approved By	Date	Released By	Date
For Information	[illegible]	9/8/14	[illegible]	9/8/14
For Comment				
For Bid				
For Fabrication				
For Construction				

Engineering Review		
Disc	Engr	Date
Mech		
Elec		
Civil		
Arch		
Instr		

Drawn	Designed	Checked
JGF	JGF	

Lead Engineer — Date — Scale 1"=30'-0"

CPV TOWANTIC ENERGY CENTER
OXFORD, CONNECTICUT

GENERAL ARRANGEMENT
ELEVATION LOOKING EAST

BURNS AND ROE ENTERPRISES, INC.
Engineers and Constructors - Oradell, NJ
Connecticut License No. PEC 39

Approved for Construction	Work Order	Drawing No	Sh	Rev
Chief MECHANICAL Engineer	3328	M301		B

M301.DGN 11:12 08-SEP-2014

STORMWATER POLLUTION CONTROL PLAN
VOLUME 2

CPV TOWANTIC ENERGY CENTER

OXFORD, CONNECTICUT

Prepared by:

CIVIL 1
43 Sherman Hill Road
Suite D-101
Woodbury, CT 06798

JUNE 30, 2015

APPENDIX L
SUPPORTING CALCULATIONS

SUPPORTING CALCULATIONS

CPV TOWANTIC ENERGY CENTER
OXFORD, CONNECTICUT

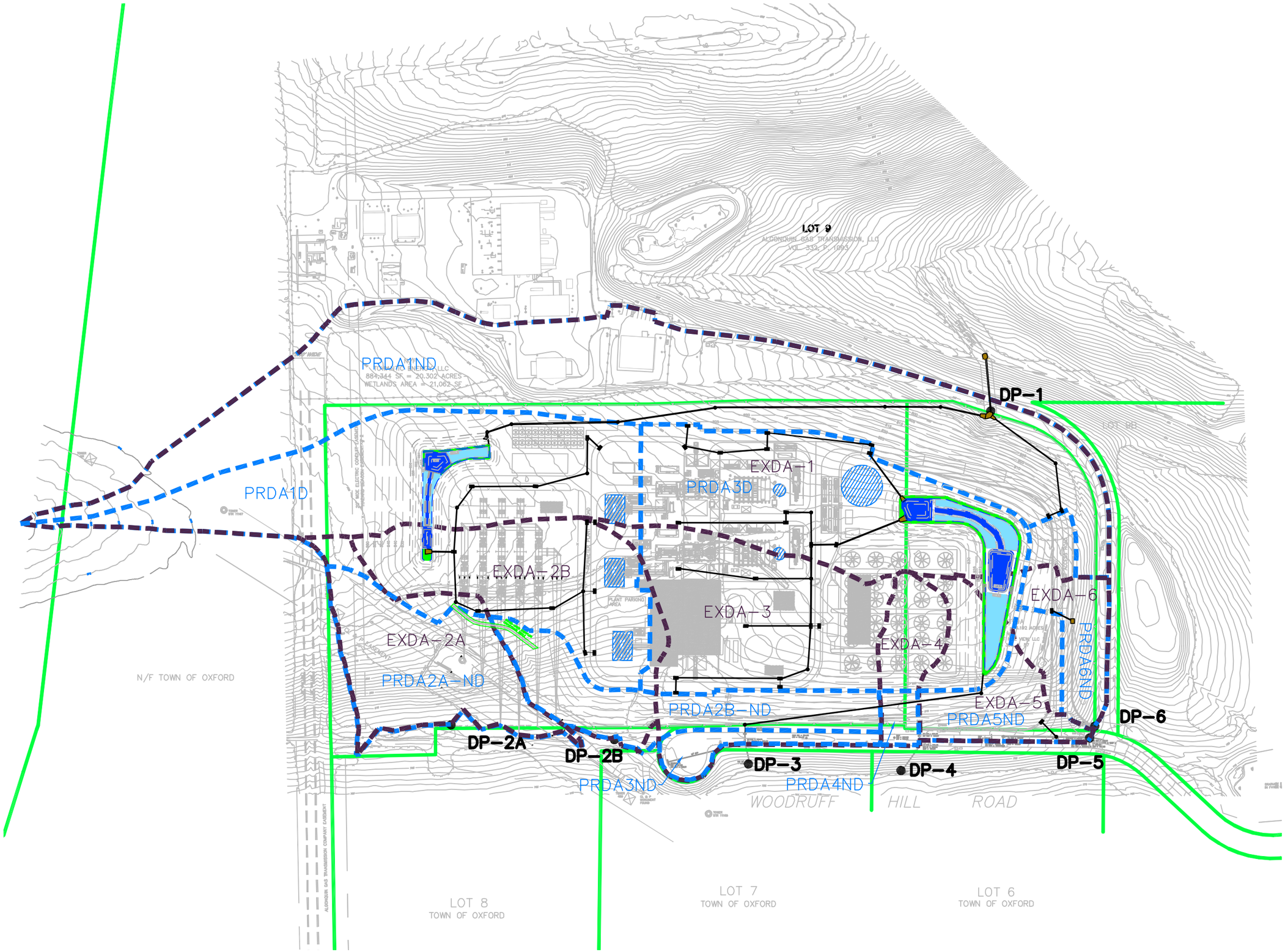
Prepared by:

CIVIL 1
43 Sherman Hill Road
Suite D-101
Woodbury, CT 06798

June 30, 2015

TABLE OF CONTENTS

Attachment A – Drainage Area Map



NO.	REVISION	DATE
1	DRAINAGE AREA REVISED	13 FEB 15

Previous Editions Obsolete

0 100 200

1 inch = 200 ft.

DRAINAGE AREA MAP

CPV TOWANTIC ENERGY CENTER

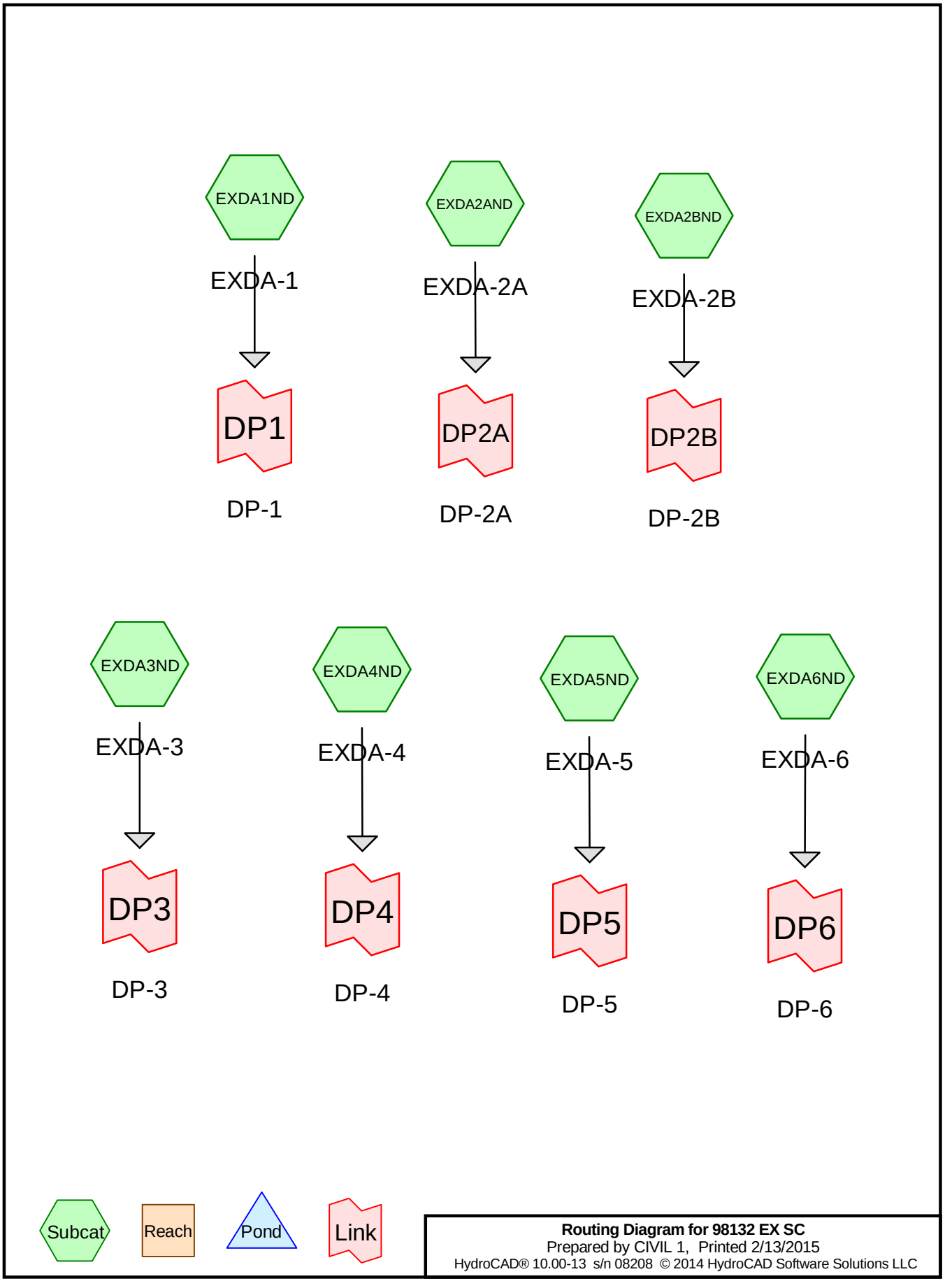
OXFORD CONNECTICUT

CIVIL C1

CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266 - 0778 CONNECTICUT

DRAWN: SC	APPROVED: CJ
SCALE:	1" = 200'
DATE:	26 SEP 14
PROJ. NO.:	98132
CADD FILE NAME:	98132
DRAWING NO.:	1 OF 1

Atatchment B – Existing Conditions HydroCAD Routing



Routing Diagram for 98132 EX SC
Prepared by CIVIL 1, Printed 2/13/2015

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.046	98	Impervious (EXDA4ND)
1.755	98	Impervious, HSG C (EXDA1ND, EXDA3ND, EXDA5ND, EXDA6ND)
3.797	71	Meadow, non-grazed, HSG C (EXDA1ND, EXDA3ND, EXDA4ND)
8.518	74	Pasture/grassland/range, Good, HSG C (EXDA1ND, EXDA2AND, EXDA2BND, EXDA3ND, EXDA4ND, EXDA5ND, EXDA6ND)
21.393	70	Woods, Good, HSG C (EXDA1ND, EXDA2AND, EXDA2BND, EXDA3ND)
35.509	72	TOTAL AREA

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
35.463	HSG C	EXDA1ND, EXDA2AND, EXDA2BND, EXDA3ND, EXDA4ND, EXDA5ND, EXDA6ND
0.000	HSG D	
0.046	Other	EXDA4ND
35.509		TOTAL AREA

Ground Covers (selected 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	1.755	0.000	0.046	1.801	Impervious	EXDA1ND, EXDA3ND, EXDA4ND, EXDA5ND, EXDA6ND
0.000	0.000	3.797	0.000	0.000	3.797	Meadow, non-grazed	EXDA1ND, EXDA3ND, EXDA4ND
0.000	0.000	8.518	0.000	0.000	8.518	Pasture/grassland/range, Good	EXDA1ND, EXDA2AND, EXDA2BND, EXDA3ND, EXDA4ND, EXDA5ND, EXDA6ND
0.000	0.000	21.393	0.000	0.000	21.393	Woods, Good	EXDA1ND, EXDA2AND, EXDA2BND, EXDA3ND
0.000	0.000	35.463	0.000	0.046	35.509	TOTAL AREA	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 EXDA1ND: EXDA-1 Runoff Area=850,940 sf 5.77% Impervious Runoff Depth>0.97"
Flow Length=2,225' Tc=61.0 min CN=72 Runoff=8.15 cfs 1.587 af

Subcatchment EXDA2AND: EXDA-2A Runoff Area=117,366 sf 0.00% Impervious Runoff Depth>0.98"
Flow Length=450' Tc=28.5 min CN=72 Runoff=1.68 cfs 0.221 af

Subcatchment EXDA2BND: EXDA-2B Runoff Area=183,271 sf 0.00% Impervious Runoff Depth>0.87"
Flow Length=1,050' Tc=46.7 min CN=70 Runoff=1.79 cfs 0.307 af

Subcatchment EXDA3ND: EXDA-3 Runoff Area=216,972 sf 7.60% Impervious Runoff Depth>1.04"
Flow Length=610' Tc=34.5 min CN=73 Runoff=3.04 cfs 0.431 af

Subcatchment EXDA4ND: EXDA-4 Runoff Area=38,901 sf 5.13% Impervious Runoff Depth>1.10"
Flow Length=400' Tc=13.0 min CN=74 Runoff=0.87 cfs 0.082 af

Subcatchment EXDA5ND: EXDA-5 Runoff Area=76,831 sf 11.76% Impervious Runoff Depth>1.28"
Flow Length=500' Tc=11.3 min CN=77 Runoff=2.15 cfs 0.188 af

Subcatchment EXDA6ND: EXDA-6 Runoff Area=62,500 sf 2.87% Impervious Runoff Depth>1.16"
Flow Length=350' Tc=8.3 min CN=75 Runoff=1.69 cfs 0.139 af

Link DP1: DP-1 Inflow=8.15 cfs 1.587 af
Primary=8.15 cfs 1.587 af

Link DP2A: DP-2A Inflow=1.68 cfs 0.221 af
Primary=1.68 cfs 0.221 af

Link DP2B: DP-2B Inflow=1.79 cfs 0.307 af
Primary=1.79 cfs 0.307 af

Link DP3: DP-3 Inflow=3.04 cfs 0.431 af
Primary=3.04 cfs 0.431 af

Link DP4: DP-4 Inflow=0.87 cfs 0.082 af
Primary=0.87 cfs 0.082 af

Link DP5: DP-5 Inflow=2.15 cfs 0.188 af
Primary=2.15 cfs 0.188 af

Link DP6: DP-6 Inflow=1.69 cfs 0.139 af
Primary=1.69 cfs 0.139 af

Total Runoff Area = 35.509 ac Runoff Volume = 2.954 af Average Runoff Depth = 1.00"
94.93% Pervious = 33.708 ac 5.07% Impervious = 1.801 ac

Summary for Subcatchment EXDA1ND: EXDA-1

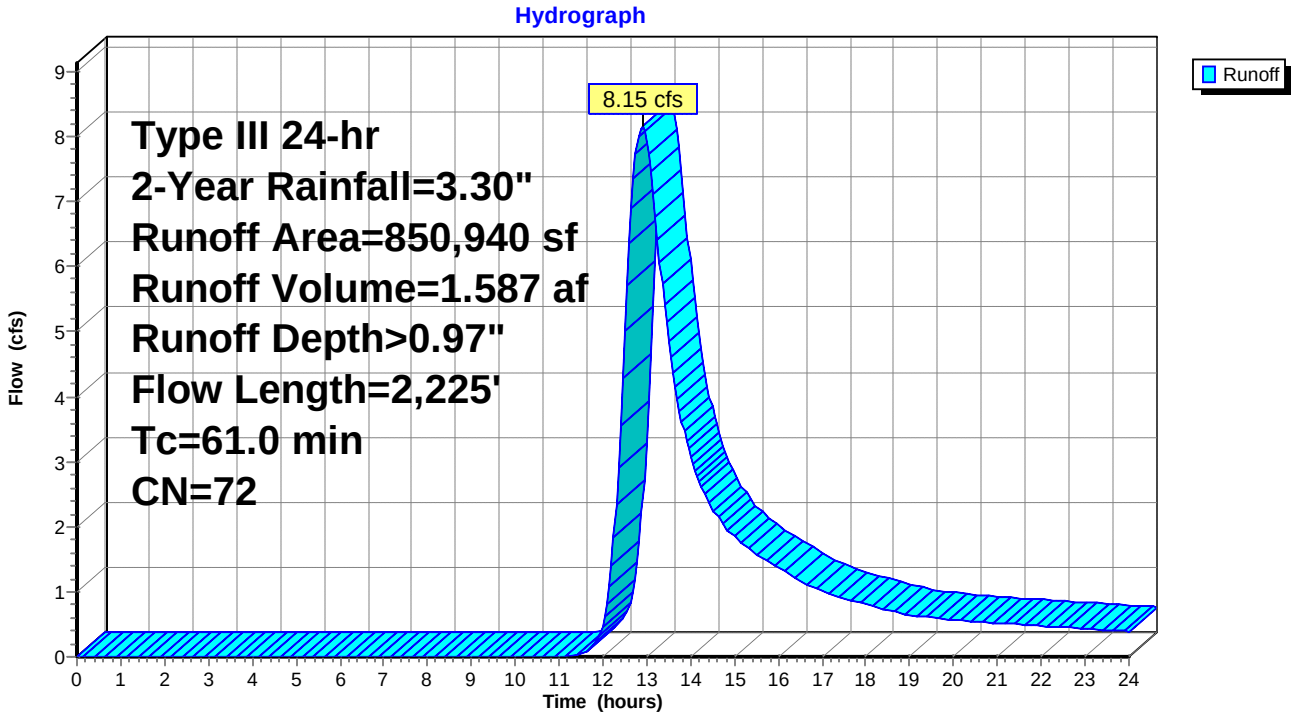
Runoff = 8.15 cfs @ 12.90 hrs, Volume= 1.587 af, Depth> 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
635,511	70	Woods, Good, HSG C
148,147	74	Pasture/grassland/range, Good, HSG C
18,170	71	Meadow, non-grazed, HSG C
49,112	98	Impervious, HSG C
850,940	72	Weighted Average
801,828		94.23% Pervious Area
49,112		5.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
23.0	1,450	0.0440	1.05		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.0	525	0.0570	8.87	53.22	Channel Flow, Area= 6.0 sf Perim= 6.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides
61.0	2,225	Total			

Subcatchment EXDA1ND: EXDA-1



Summary for Subcatchment EXDA2AND: EXDA-2A

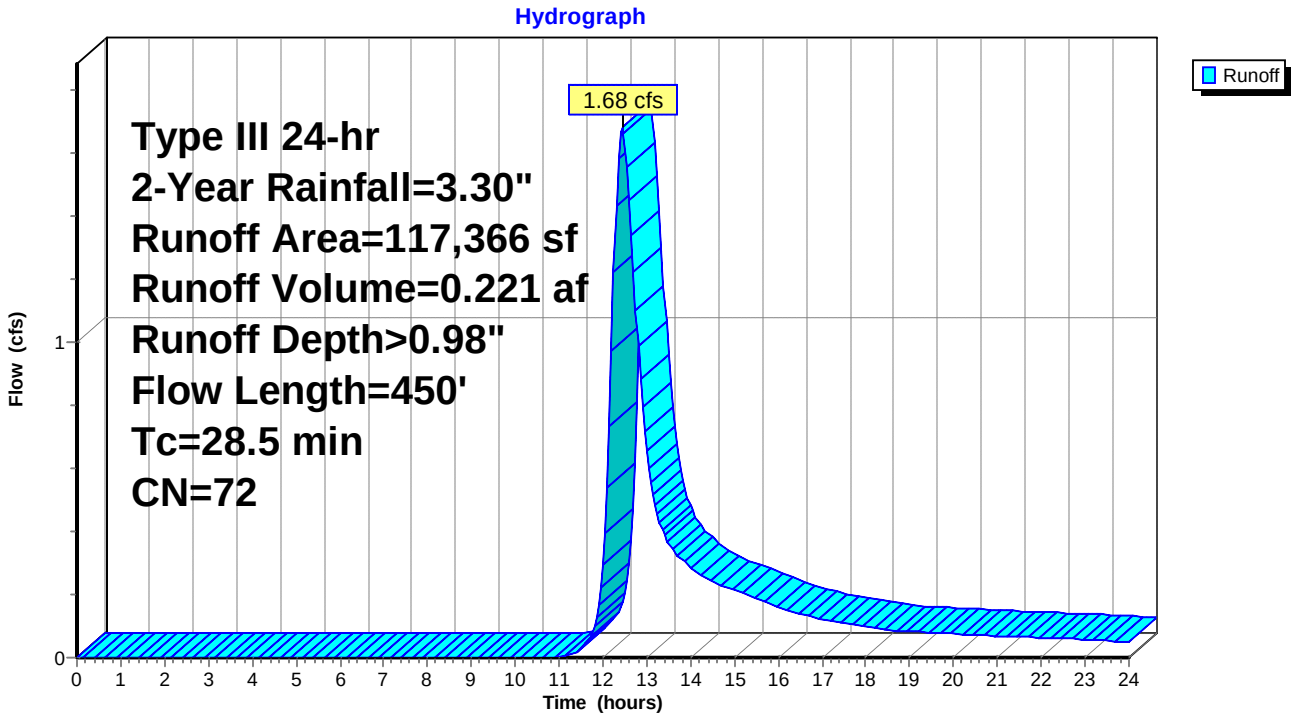
Runoff = 1.68 cfs @ 12.44 hrs, Volume= 0.221 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
60,051	70	Woods, Good, HSG C
57,315	74	Pasture/grassland/range, Good, HSG C
117,366	72	Weighted Average
117,366		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.1	250	0.0700	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.4	200	0.2150	2.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
28.5	450	Total			

Subcatchment EXDA2AND: EXDA-2A



Summary for Subcatchment EXDA2BND: EXDA-2B

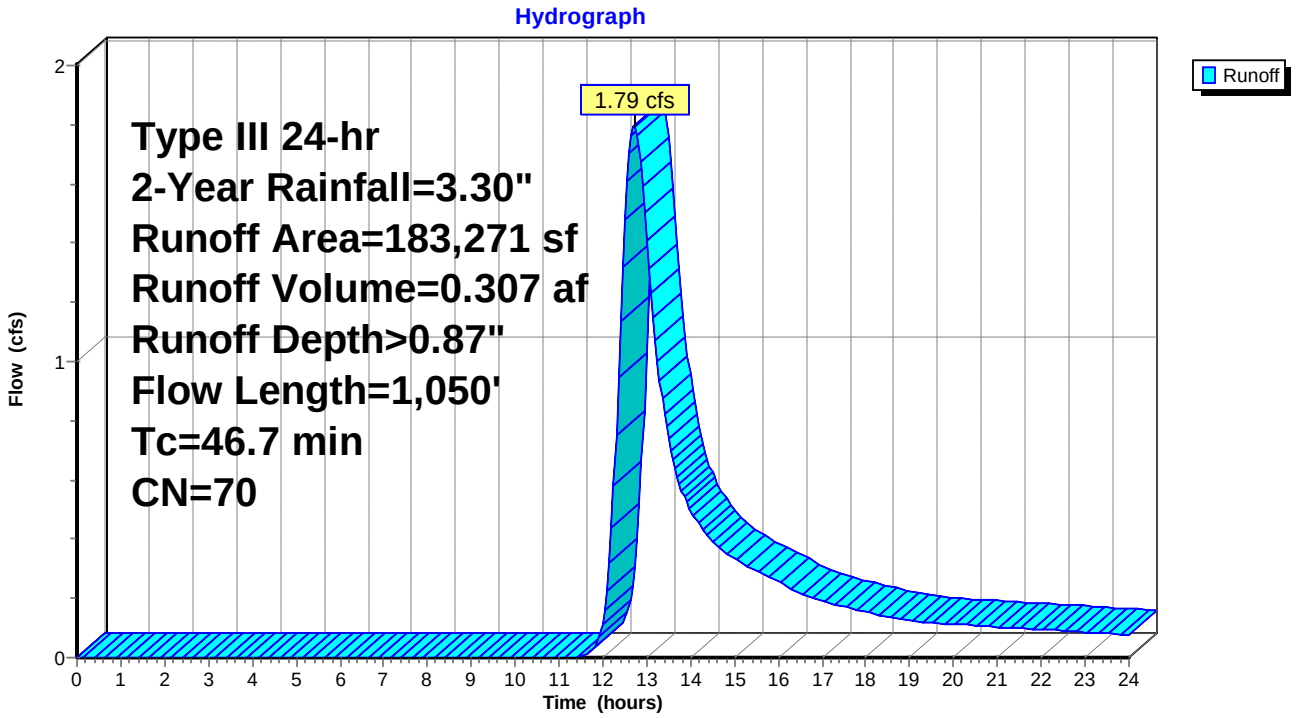
Runoff = 1.79 cfs @ 12.71 hrs, Volume= 0.307 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
179,894	70	Woods, Good, HSG C
3,377	74	Pasture/grassland/range, Good, HSG C
183,271	70	Weighted Average
183,271		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.1	250	0.0340	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
10.6	800	0.0637	1.26		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
46.7	1,050	Total			

Subcatchment EXDA2BND: EXDA-2B



Summary for Subcatchment EXDA3ND: EXDA-3

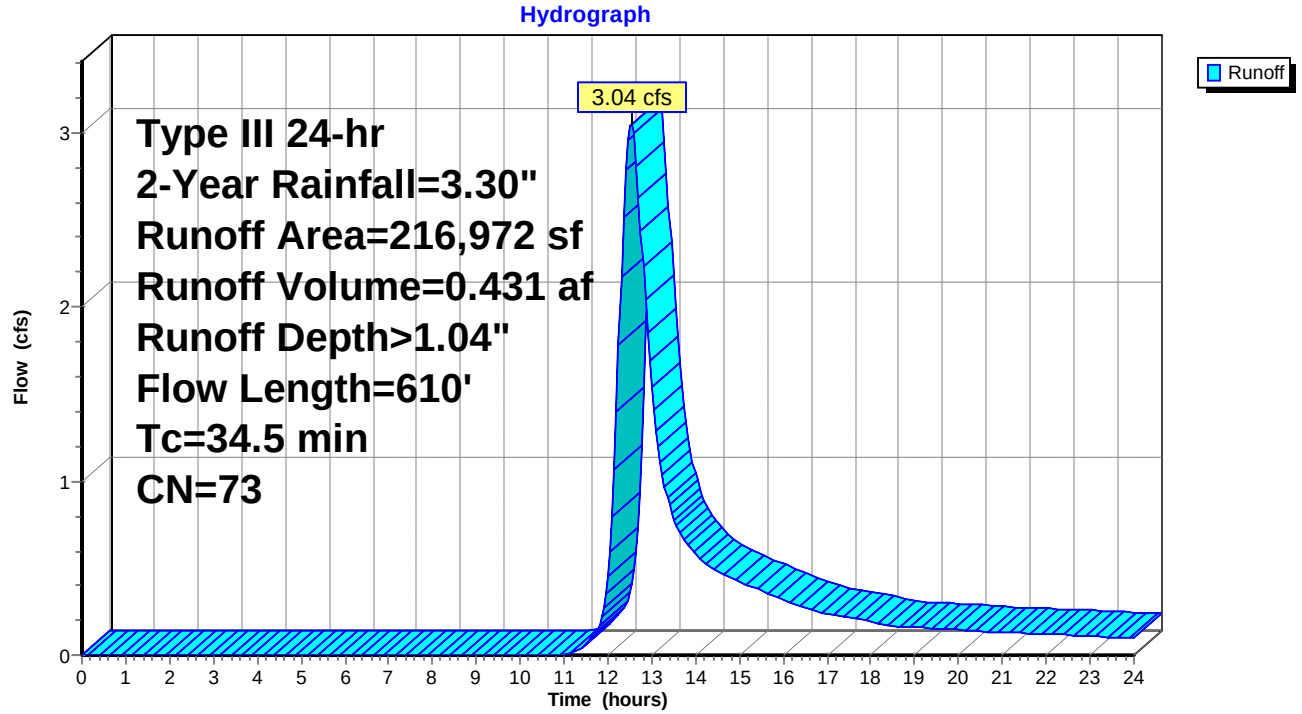
Runoff = 3.04 cfs @ 12.52 hrs, Volume= 0.431 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
56,418	70	Woods, Good, HSG C
132,061	71	Meadow, non-grazed, HSG C
11,996	74	Pasture/grassland/range, Good, HSG C
16,497	98	Impervious, HSG C
216,972	73	Weighted Average
200,475		92.40% Pervious Area
16,497		7.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.5	250	0.0520	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	360	0.0889	1.49		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
34.5	610	Total			

Subcatchment EXDA3ND: EXDA-3



Summary for Subcatchment EXDA4ND: EXDA-4

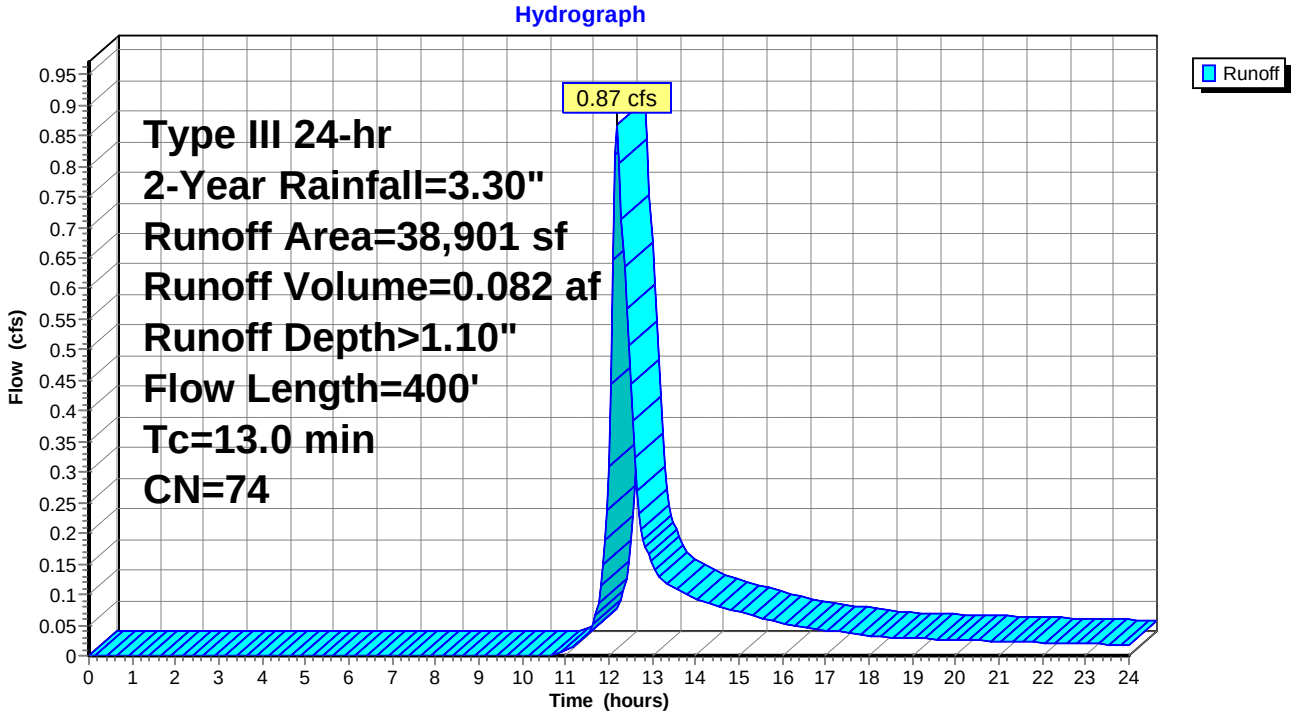
Runoff = 0.87 cfs @ 12.20 hrs, Volume= 0.082 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

	Area (sf)	CN	Description
	21,726	74	Pasture/grassland/range, Good, HSG C
	15,178	71	Meadow, non-grazed, HSG C
*	1,997	98	Impervious
	38,901	74	Weighted Average
	36,904		94.87% Pervious Area
	1,997		5.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	200	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.2	200	0.1500	2.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.0	400	Total			

Subcatchment EXDA4ND: EXDA-4



Summary for Subcatchment EXDA5ND: EXDA-5

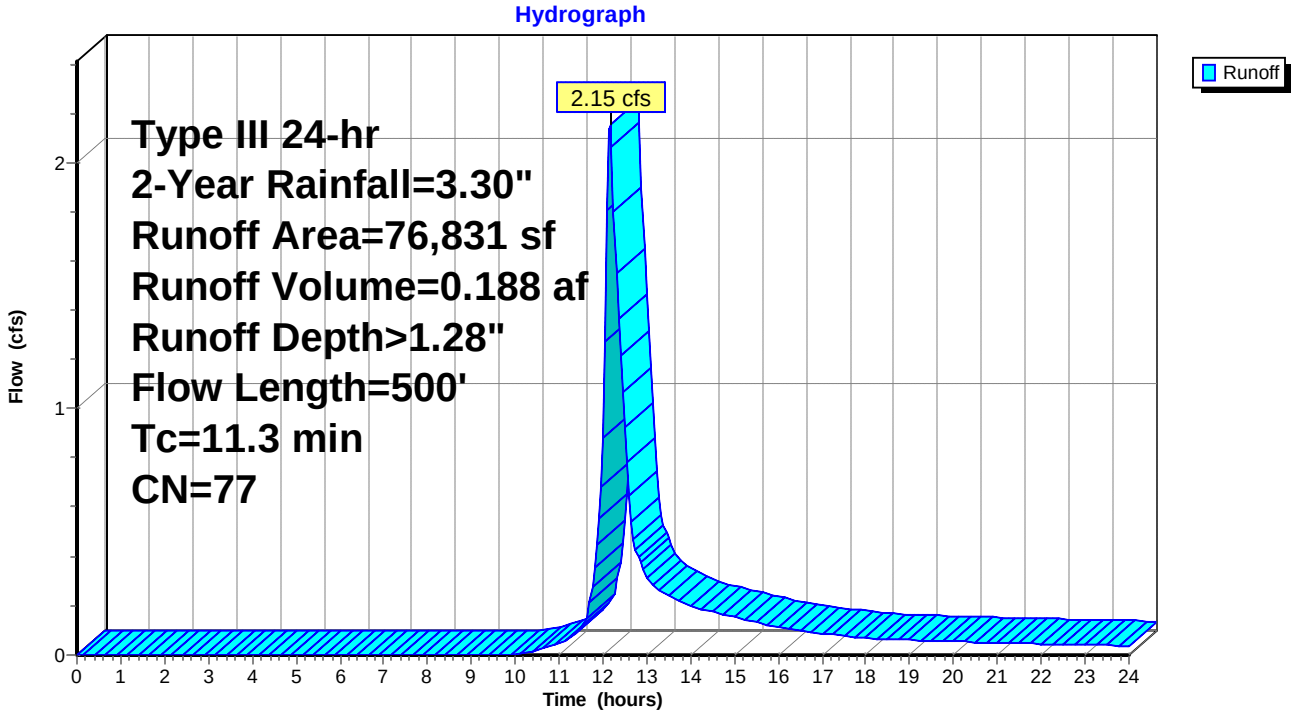
Runoff = 2.15 cfs @ 12.17 hrs, Volume= 0.188 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
9,039	98	Impervious, HSG C
67,792	74	Pasture/grassland/range, Good, HSG C
76,831	77	Weighted Average
67,792		88.24% Pervious Area
9,039		11.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0400	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.0	350	0.1350	5.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.3	500	Total			

Subcatchment EXDA5ND: EXDA-5



Summary for Subcatchment EXDA6ND: EXDA-6

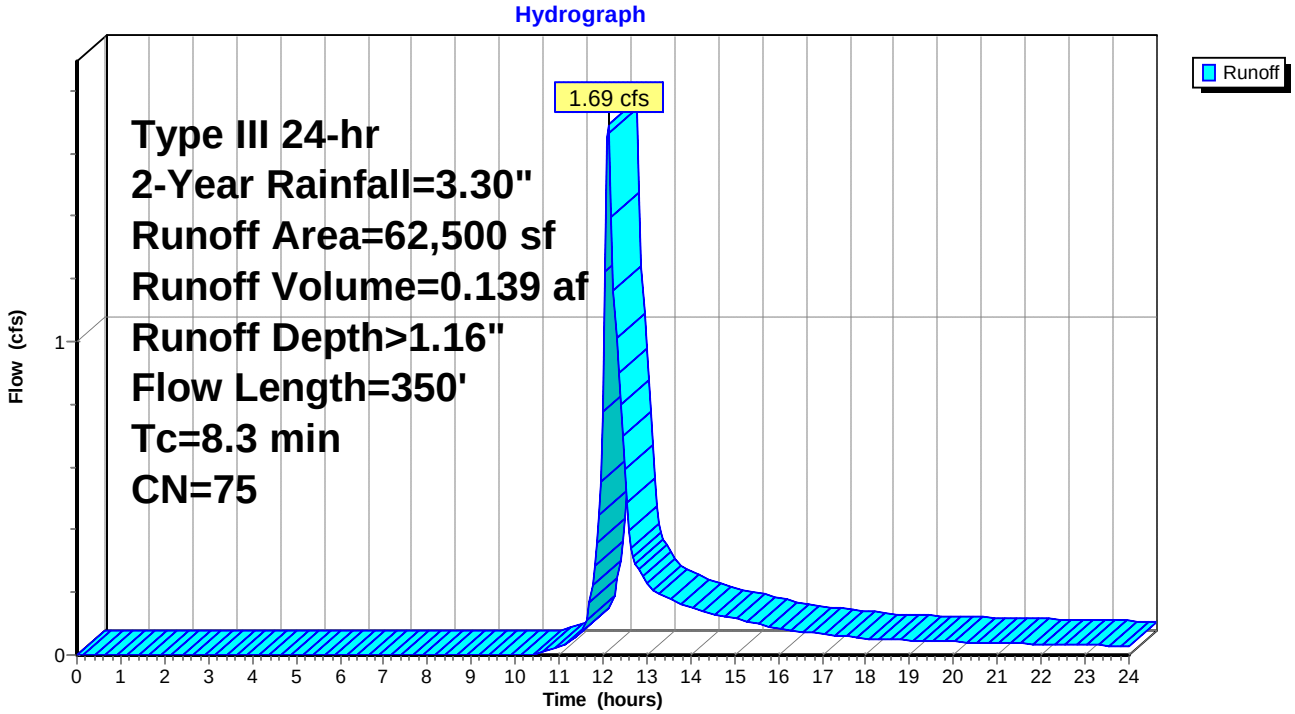
Runoff = 1.69 cfs @ 12.13 hrs, Volume= 0.139 af, Depth> 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
60,704	74	Pasture/grassland/range, Good, HSG C
1,796	98	Impervious, HSG C
62,500	75	Weighted Average
60,704		97.13% Pervious Area
1,796		2.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0360	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
0.6	250	0.2050	7.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
8.3	350	Total			

Subcatchment EXDA6ND: EXDA-6

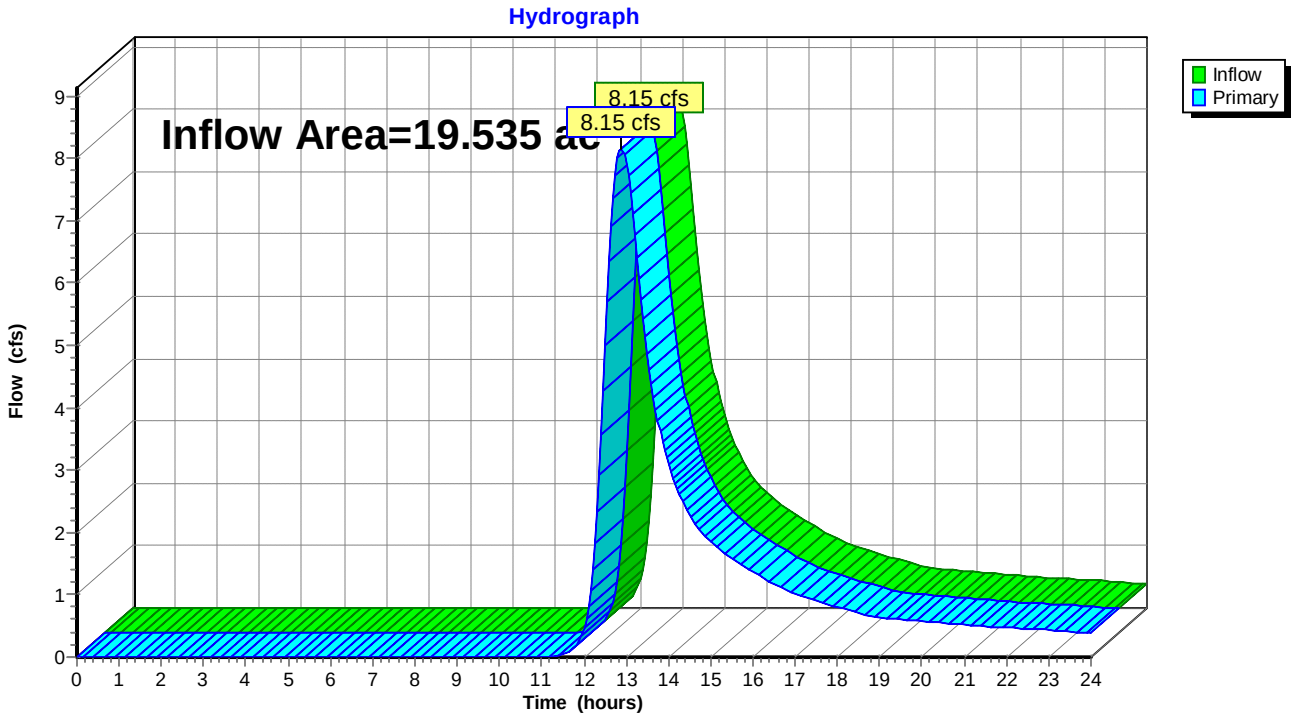


Summary for Link DP1: DP-1

Inflow Area = 19.535 ac, 5.77% Impervious, Inflow Depth > 0.97" for 2-Year event
Inflow = 8.15 cfs @ 12.90 hrs, Volume= 1.587 af
Primary = 8.15 cfs @ 12.90 hrs, Volume= 1.587 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DP-1

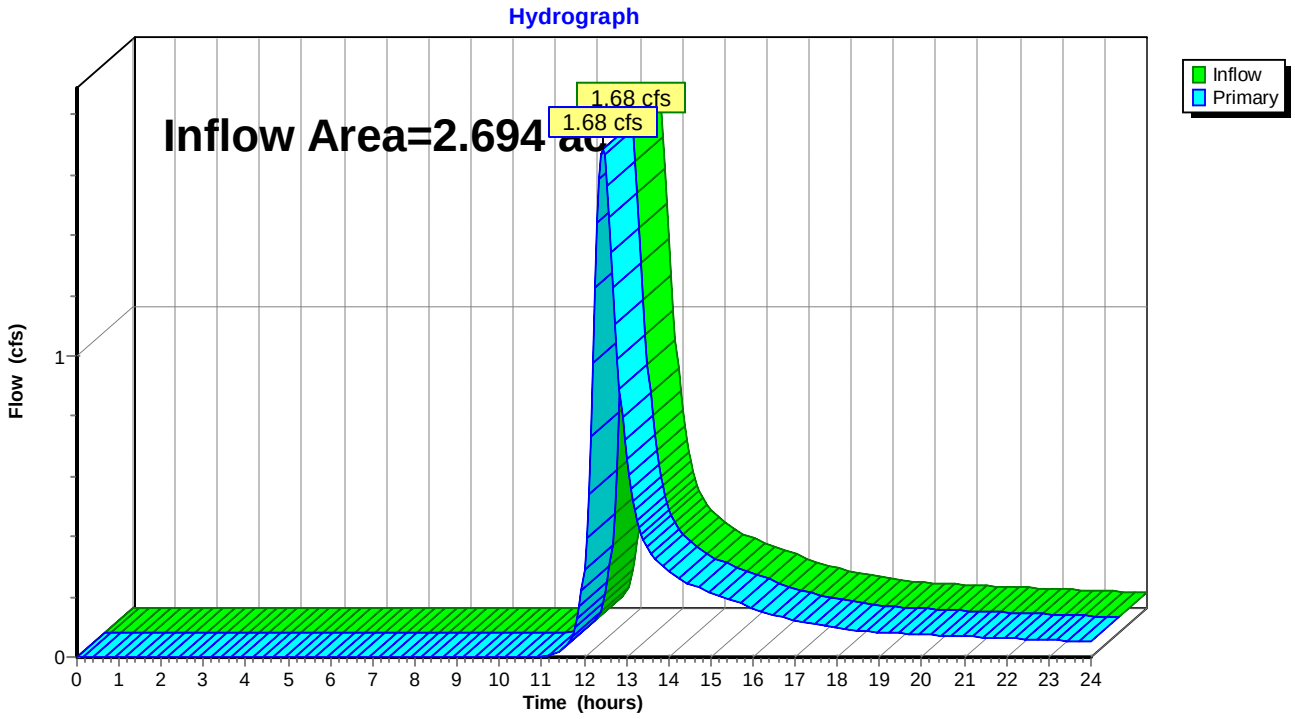


Summary for Link DP2A: DP-2A

Inflow Area = 2.694 ac, 0.00% Impervious, Inflow Depth > 0.98" for 2-Year event
Inflow = 1.68 cfs @ 12.44 hrs, Volume= 0.221 af
Primary = 1.68 cfs @ 12.44 hrs, Volume= 0.221 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2A: DP-2A

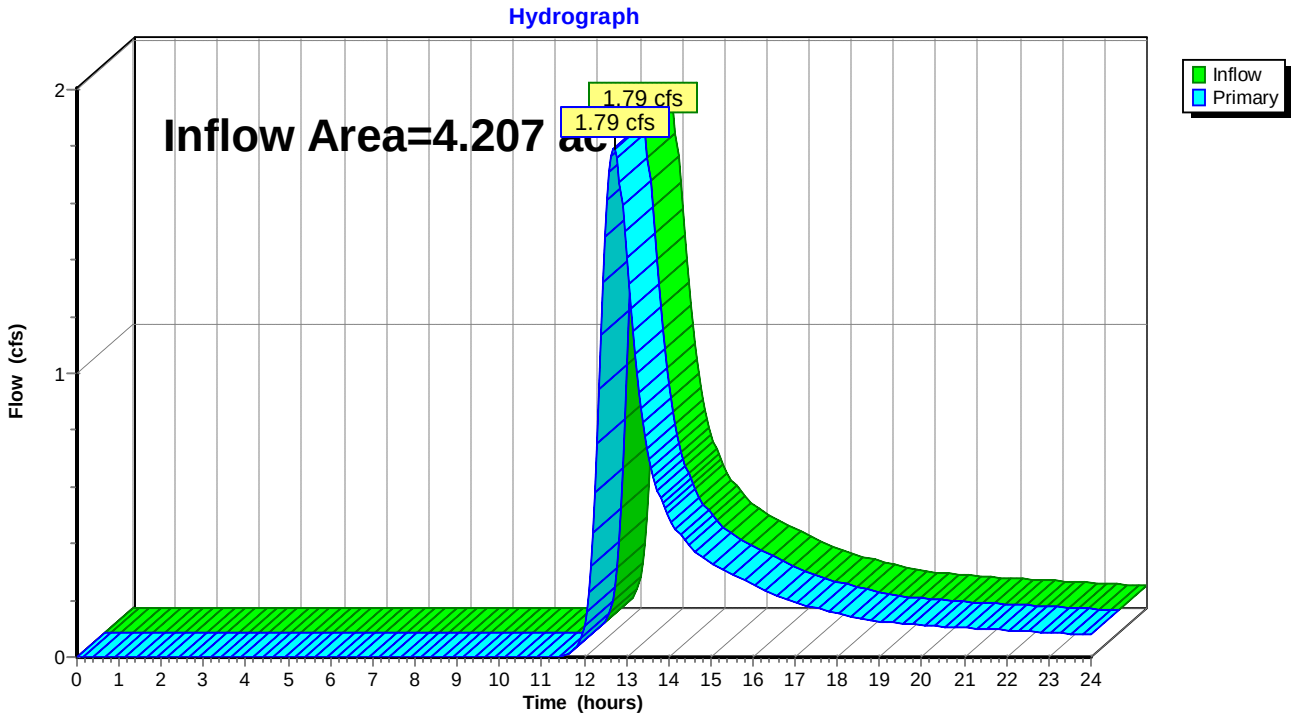


Summary for Link DP2B: DP-2B

Inflow Area = 4.207 ac, 0.00% Impervious, Inflow Depth > 0.87" for 2-Year event
Inflow = 1.79 cfs @ 12.71 hrs, Volume= 0.307 af
Primary = 1.79 cfs @ 12.71 hrs, Volume= 0.307 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2B: DP-2B

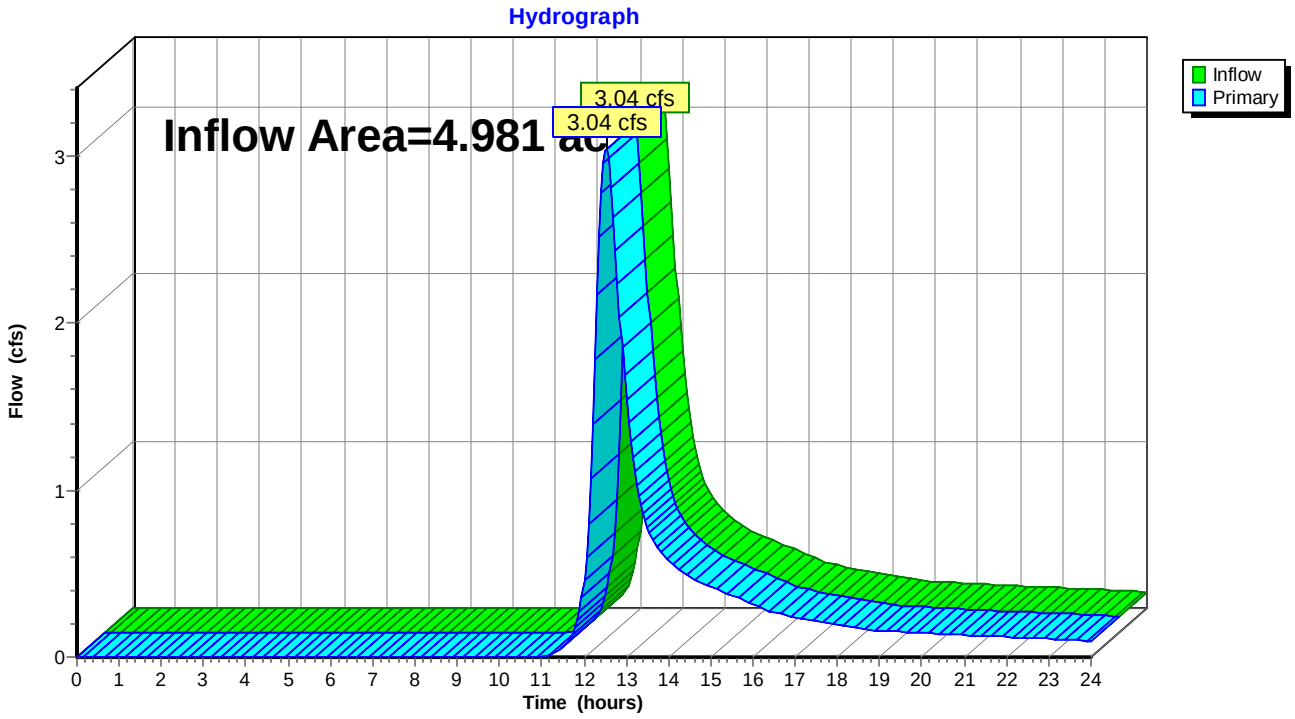


Summary for Link DP3: DP-3

Inflow Area = 4.981 ac, 7.60% Impervious, Inflow Depth > 1.04" for 2-Year event
Inflow = 3.04 cfs @ 12.52 hrs, Volume= 0.431 af
Primary = 3.04 cfs @ 12.52 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: DP-3

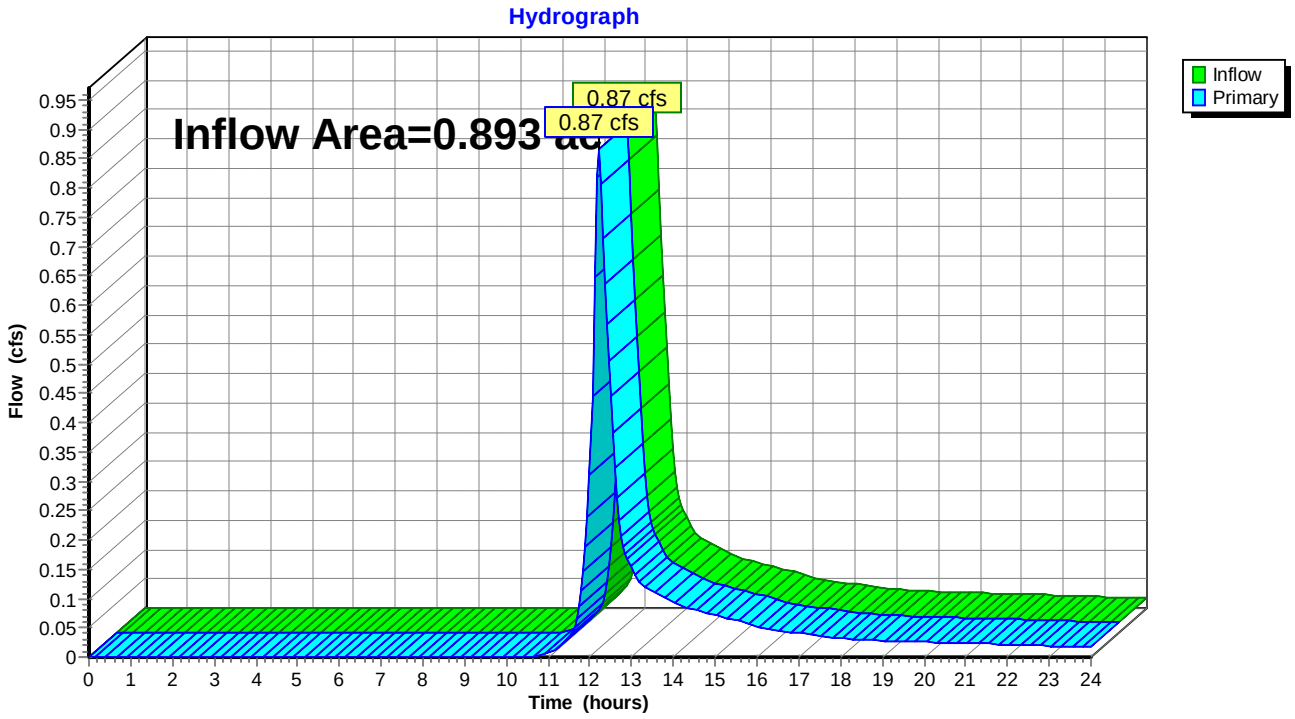


Summary for Link DP4: DP-4

Inflow Area = 0.893 ac, 5.13% Impervious, Inflow Depth > 1.10" for 2-Year event
Inflow = 0.87 cfs @ 12.20 hrs, Volume= 0.082 af
Primary = 0.87 cfs @ 12.20 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP4: DP-4

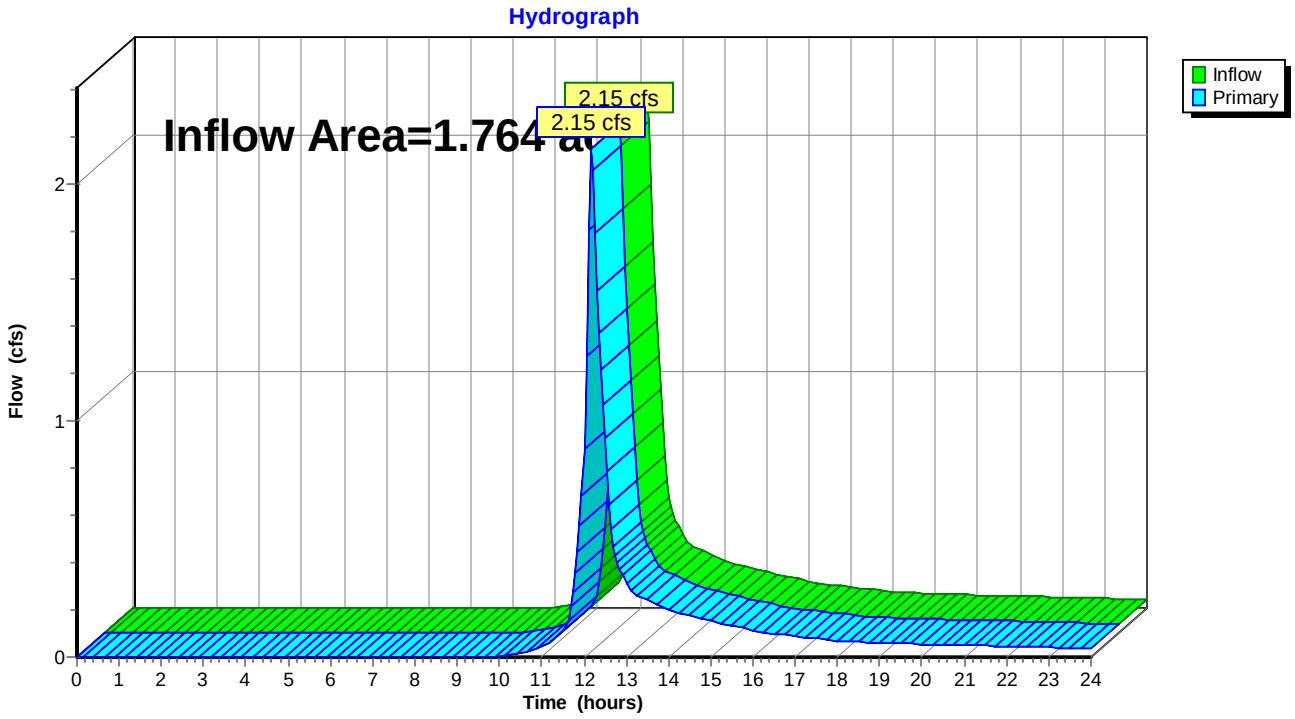


Summary for Link DP5: DP-5

Inflow Area = 1.764 ac, 11.76% Impervious, Inflow Depth > 1.28" for 2-Year event
Inflow = 2.15 cfs @ 12.17 hrs, Volume= 0.188 af
Primary = 2.15 cfs @ 12.17 hrs, Volume= 0.188 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP5: DP-5

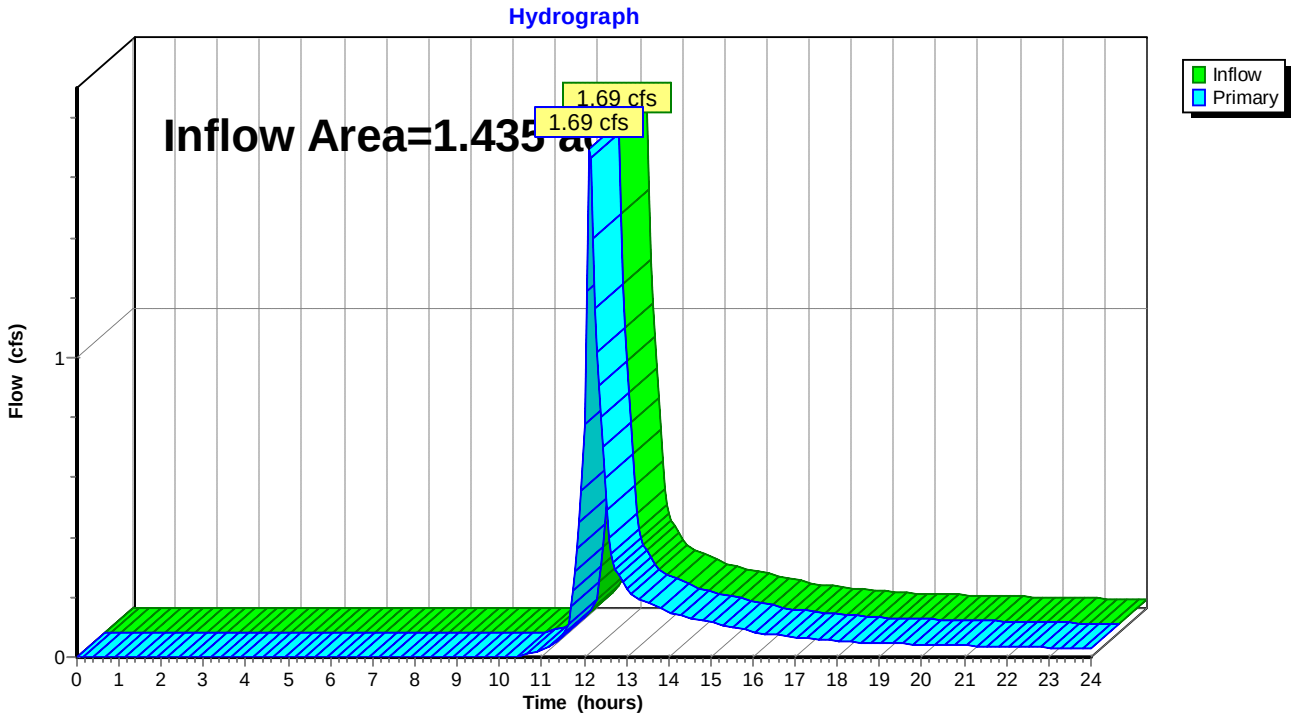


Summary for Link DP6: DP-6

Inflow Area = 1.435 ac, 2.87% Impervious, Inflow Depth > 1.16" for 2-Year event
Inflow = 1.69 cfs @ 12.13 hrs, Volume= 0.139 af
Primary = 1.69 cfs @ 12.13 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP6: DP-6



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 EXDA1ND: EXDA-1 — Runoff Area=850,940 sf 5.77% Impervious Runoff Depth>2.17"
Flow Length=2,225' Tc=61.0 min CN=72 Runoff=19.28 cfs 3.525 af

Subcatchment EXDA2AND: EXDA-2A — Runoff Area=117,366 sf 0.00% Impervious Runoff Depth>2.18"
Flow Length=450' Tc=28.5 min CN=72 Runoff=3.96 cfs 0.490 af

Subcatchment EXDA2BND: EXDA-2B — Runoff Area=183,271 sf 0.00% Impervious Runoff Depth>2.01"
Flow Length=1,050' Tc=46.7 min CN=70 Runoff=4.45 cfs 0.706 af

Subcatchment EXDA3ND: EXDA-3 — Runoff Area=216,972 sf 7.60% Impervious Runoff Depth>2.26"
Flow Length=610' Tc=34.5 min CN=73 Runoff=6.97 cfs 0.939 af

Subcatchment EXDA4ND: EXDA-4 — Runoff Area=38,901 sf 5.13% Impervious Runoff Depth>2.36"
Flow Length=400' Tc=13.0 min CN=74 Runoff=1.94 cfs 0.175 af

Subcatchment EXDA5ND: EXDA-5 — Runoff Area=76,831 sf 11.76% Impervious Runoff Depth>2.62"
Flow Length=500' Tc=11.3 min CN=77 Runoff=4.52 cfs 0.385 af

Subcatchment EXDA6ND: EXDA-6 — Runoff Area=62,500 sf 2.87% Impervious Runoff Depth>2.45"
Flow Length=350' Tc=8.3 min CN=75 Runoff=3.74 cfs 0.292 af

Link DP1: DP-1 — Inflow=19.28 cfs 3.525 af
Primary=19.28 cfs 3.525 af

Link DP2A: DP-2A — Inflow=3.96 cfs 0.490 af
Primary=3.96 cfs 0.490 af

Link DP2B: DP-2B — Inflow=4.45 cfs 0.706 af
Primary=4.45 cfs 0.706 af

Link DP3: DP-3 — Inflow=6.97 cfs 0.939 af
Primary=6.97 cfs 0.939 af

Link DP4: DP-4 — Inflow=1.94 cfs 0.175 af
Primary=1.94 cfs 0.175 af

Link DP5: DP-5 — Inflow=4.52 cfs 0.385 af
Primary=4.52 cfs 0.385 af

Link DP6: DP-6 — Inflow=3.74 cfs 0.292 af
Primary=3.74 cfs 0.292 af

Total Runoff Area = 35.509 ac Runoff Volume = 6.514 af Average Runoff Depth = 2.20"
94.93% Pervious = 33.708 ac 5.07% Impervious = 1.801 ac

Summary for Subcatchment EXDA1ND: EXDA-1

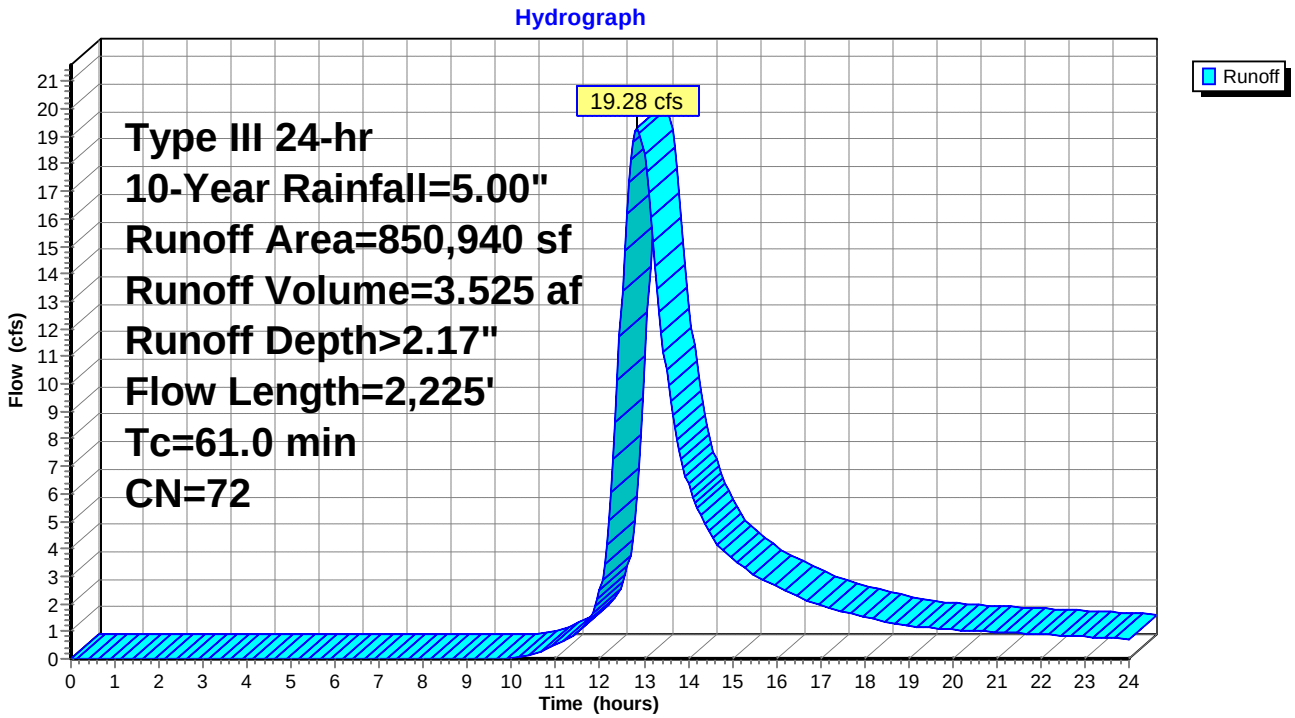
Runoff = 19.28 cfs @ 12.84 hrs, Volume= 3.525 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
635,511	70	Woods, Good, HSG C
148,147	74	Pasture/grassland/range, Good, HSG C
18,170	71	Meadow, non-grazed, HSG C
49,112	98	Impervious, HSG C
850,940	72	Weighted Average
801,828		94.23% Pervious Area
49,112		5.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
23.0	1,450	0.0440	1.05		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.0	525	0.0570	8.87	53.22	Channel Flow, Area= 6.0 sf Perim= 6.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides
61.0	2,225	Total			

Subcatchment EXDA1ND: EXDA-1



Summary for Subcatchment EXDA2AND: EXDA-2A

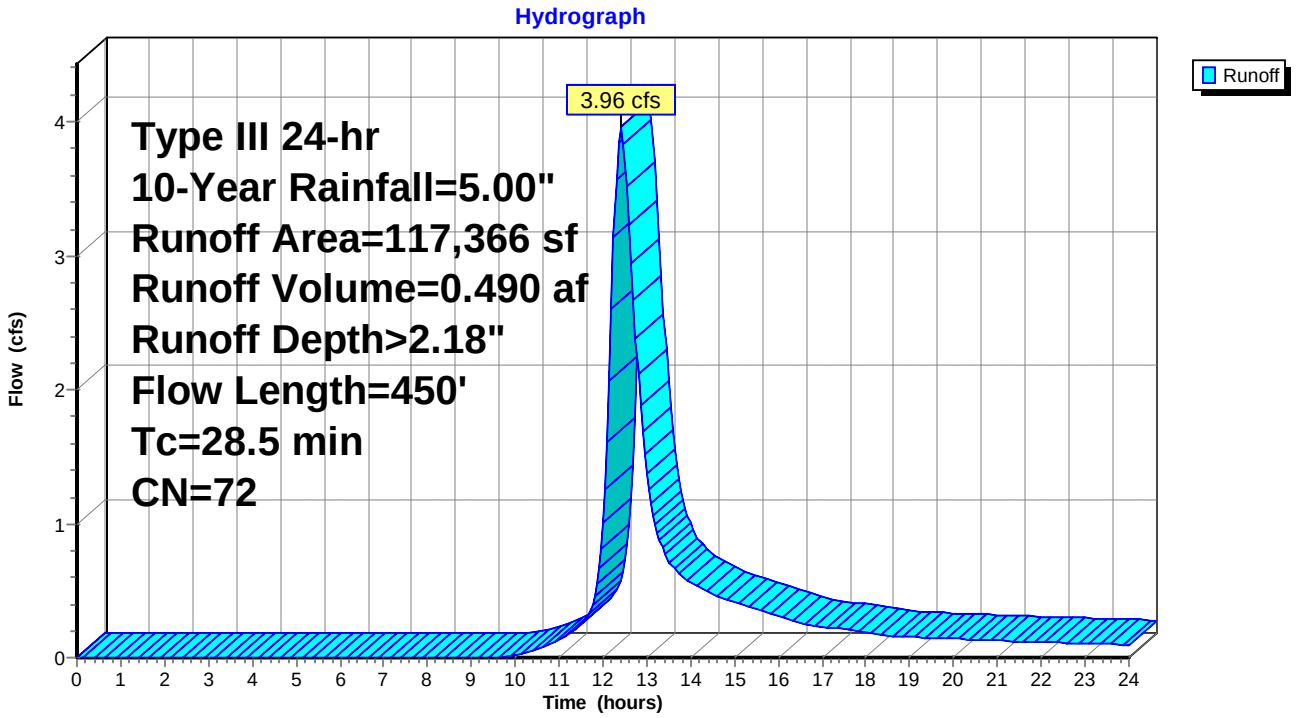
Runoff = 3.96 cfs @ 12.41 hrs, Volume= 0.490 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
60,051	70	Woods, Good, HSG C
57,315	74	Pasture/grassland/range, Good, HSG C
117,366	72	Weighted Average
117,366		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.1	250	0.0700	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.4	200	0.2150	2.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
28.5	450	Total			

Subcatchment EXDA2AND: EXDA-2A



Summary for Subcatchment EXDA2BND: EXDA-2B

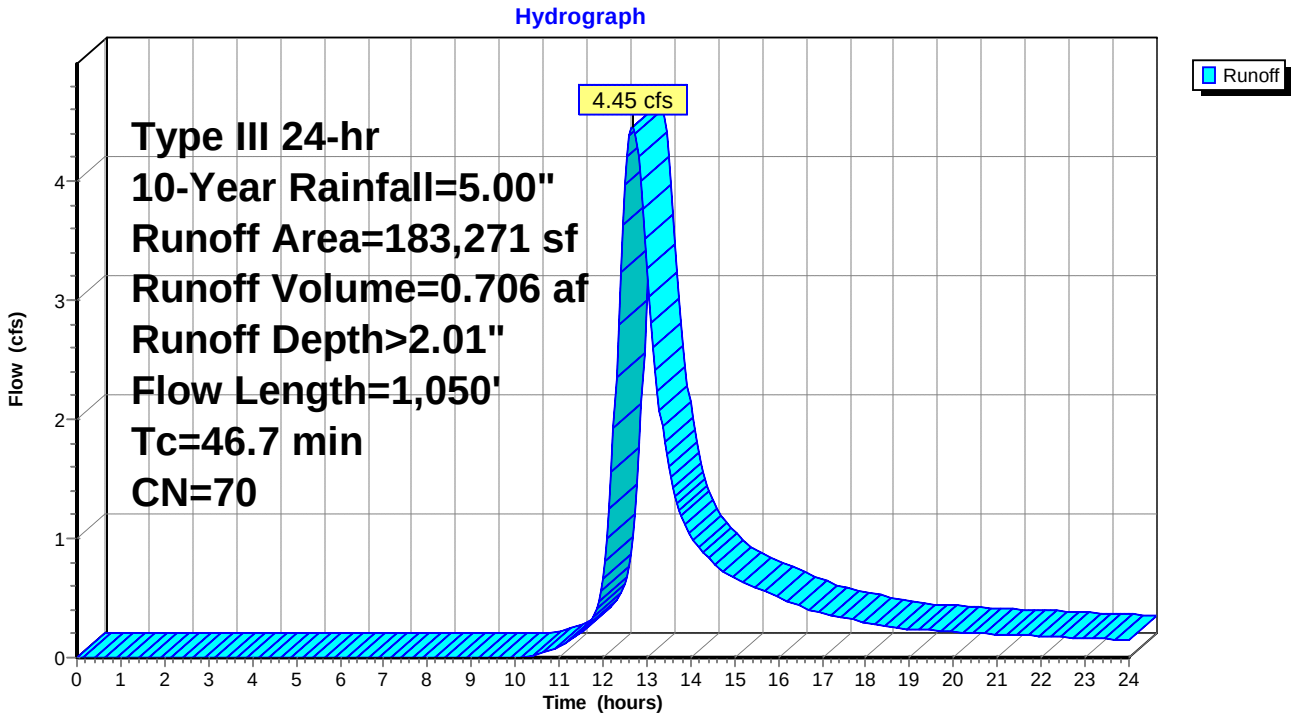
Runoff = 4.45 cfs @ 12.67 hrs, Volume= 0.706 af, Depth> 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
179,894	70	Woods, Good, HSG C
3,377	74	Pasture/grassland/range, Good, HSG C
183,271	70	Weighted Average
183,271		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.1	250	0.0340	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
10.6	800	0.0637	1.26		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
46.7	1,050	Total			

Subcatchment EXDA2BND: EXDA-2B



Summary for Subcatchment EXDA3ND: EXDA-3

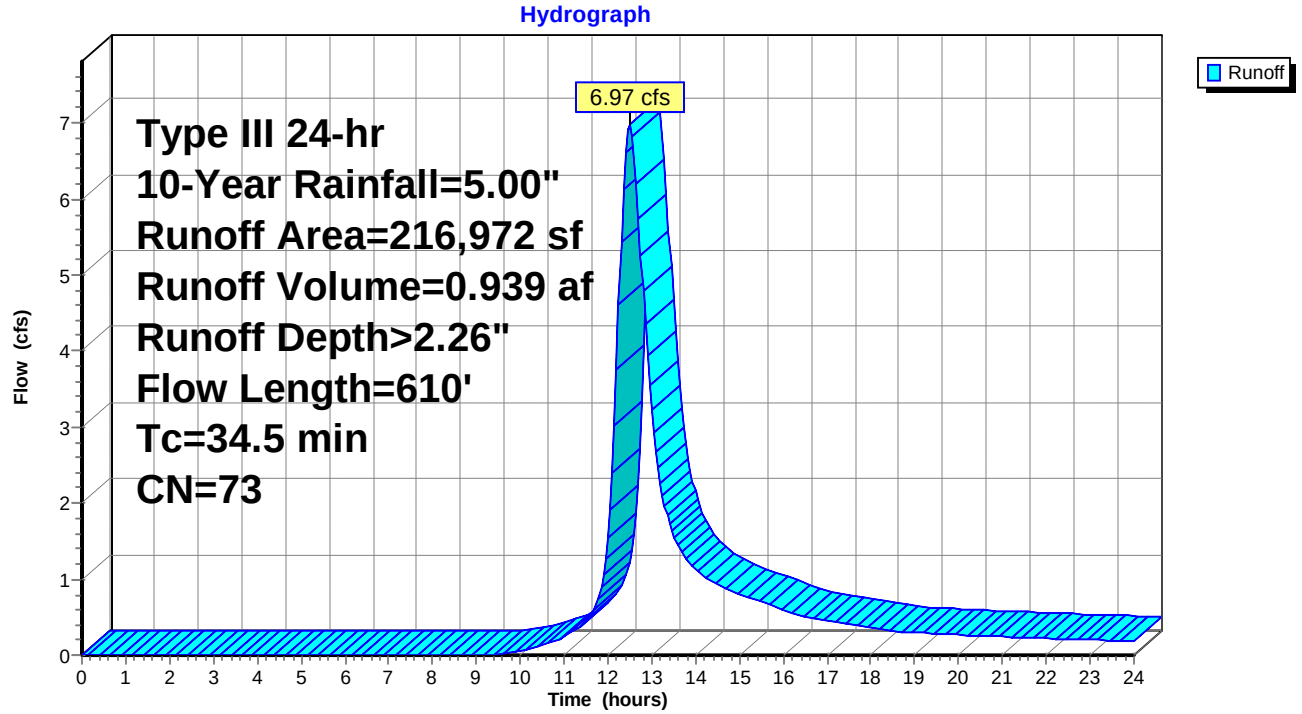
Runoff = 6.97 cfs @ 12.49 hrs, Volume= 0.939 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
56,418	70	Woods, Good, HSG C
132,061	71	Meadow, non-grazed, HSG C
11,996	74	Pasture/grassland/range, Good, HSG C
16,497	98	Impervious, HSG C
216,972	73	Weighted Average
200,475		92.40% Pervious Area
16,497		7.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.5	250	0.0520	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	360	0.0889	1.49		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
34.5	610	Total			

Subcatchment EXDA3ND: EXDA-3



Summary for Subcatchment EXDA4ND: EXDA-4

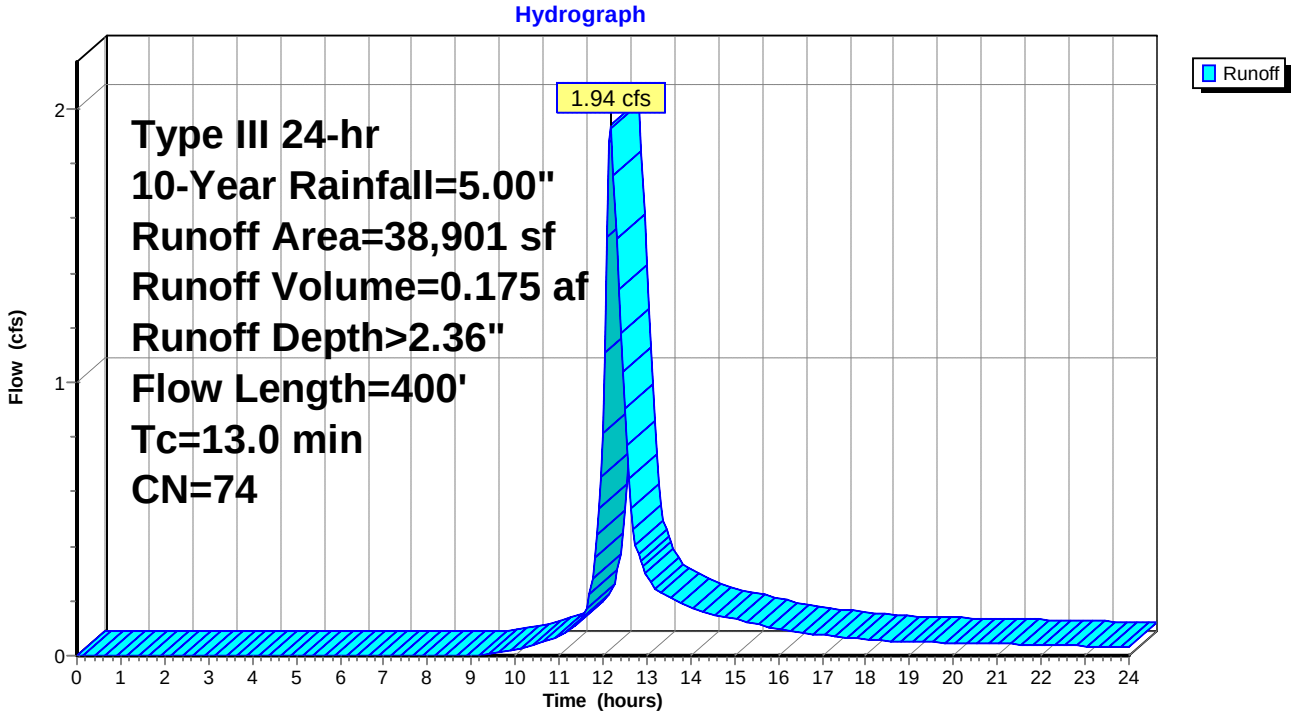
Runoff = 1.94 cfs @ 12.19 hrs, Volume= 0.175 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

	Area (sf)	CN	Description
	21,726	74	Pasture/grassland/range, Good, HSG C
	15,178	71	Meadow, non-grazed, HSG C
*	1,997	98	Impervious
	38,901	74	Weighted Average
	36,904		94.87% Pervious Area
	1,997		5.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	200	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.2	200	0.1500	2.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.0	400	Total			

Subcatchment EXDA4ND: EXDA-4



Summary for Subcatchment EXDA5ND: EXDA-5

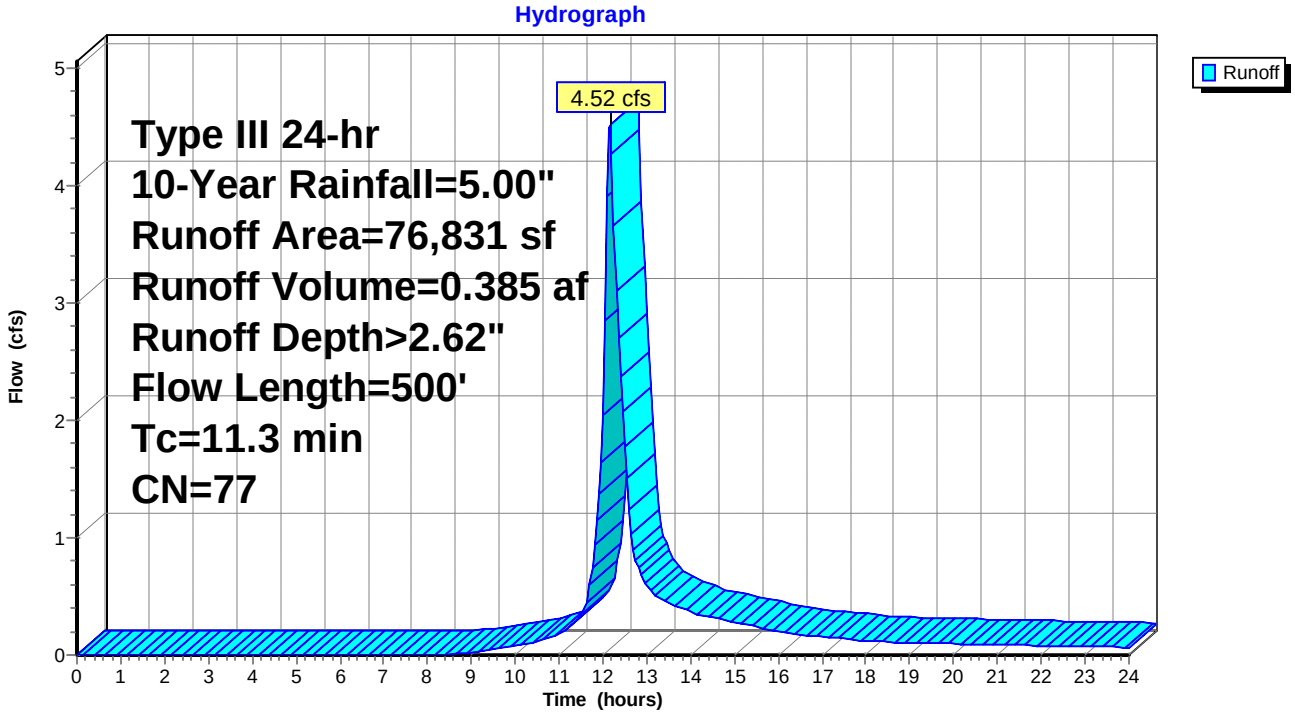
Runoff = 4.52 cfs @ 12.16 hrs, Volume= 0.385 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
9,039	98	Impervious, HSG C
67,792	74	Pasture/grassland/range, Good, HSG C
76,831	77	Weighted Average
67,792		88.24% Pervious Area
9,039		11.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0400	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.0	350	0.1350	5.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.3	500	Total			

Subcatchment EXDA5ND: EXDA-5



Summary for Subcatchment EXDA6ND: EXDA-6

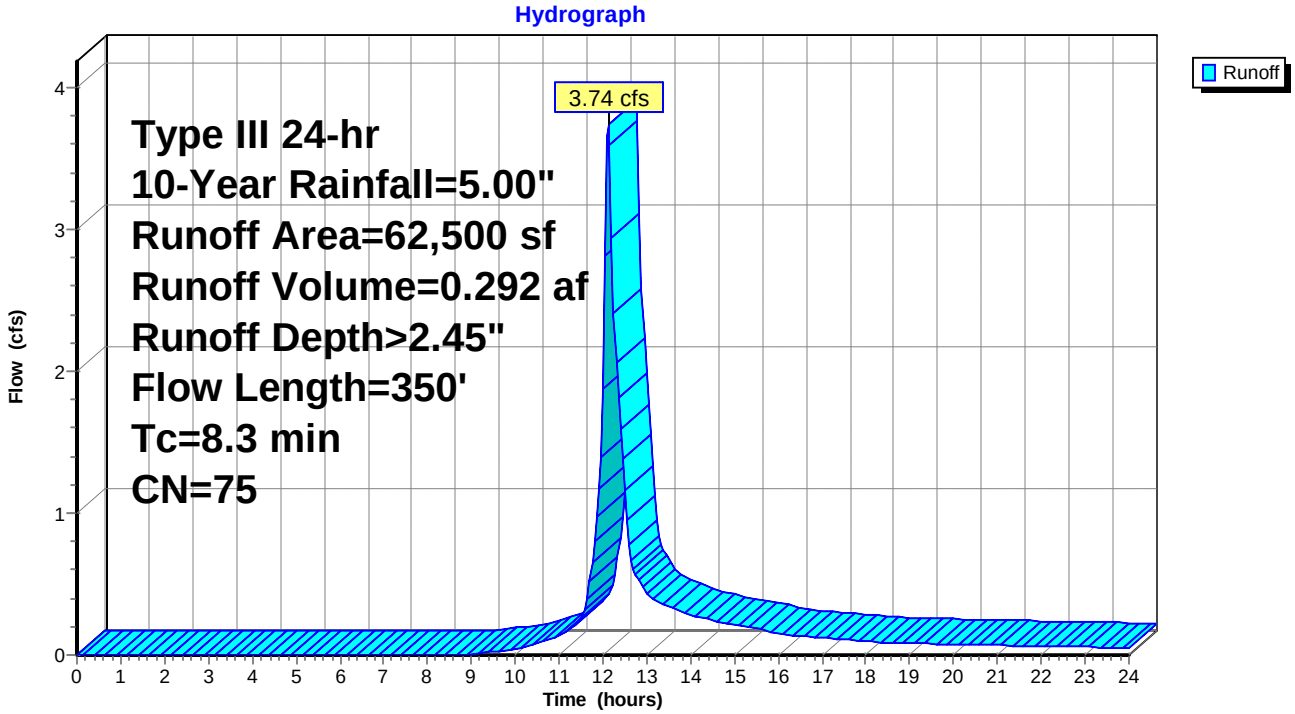
Runoff = 3.74 cfs @ 12.12 hrs, Volume= 0.292 af, Depth> 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
60,704	74	Pasture/grassland/range, Good, HSG C
1,796	98	Impervious, HSG C
62,500	75	Weighted Average
60,704		97.13% Pervious Area
1,796		2.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0360	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
0.6	250	0.2050	7.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
8.3	350	Total			

Subcatchment EXDA6ND: EXDA-6

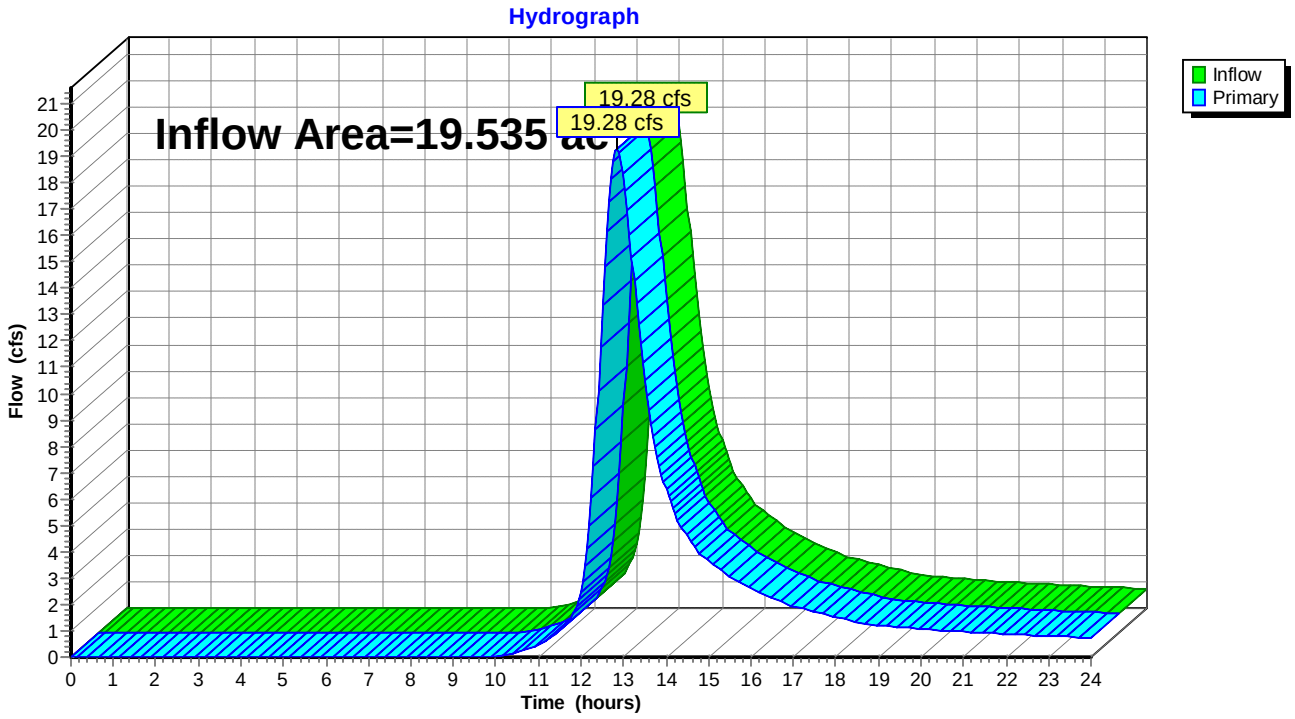


Summary for Link DP1: DP-1

Inflow Area = 19.535 ac, 5.77% Impervious, Inflow Depth > 2.17" for 10-Year event
Inflow = 19.28 cfs @ 12.84 hrs, Volume= 3.525 af
Primary = 19.28 cfs @ 12.84 hrs, Volume= 3.525 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DP-1

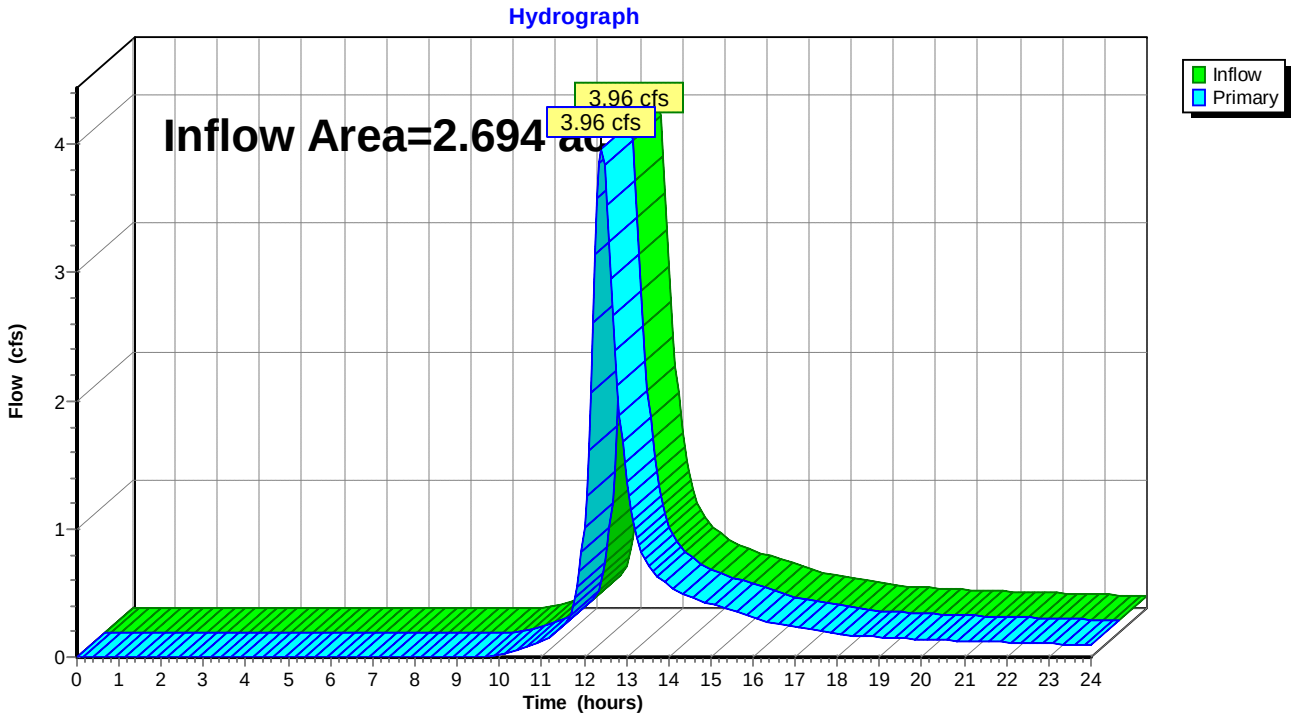


Summary for Link DP2A: DP-2A

Inflow Area = 2.694 ac, 0.00% Impervious, Inflow Depth > 2.18" for 10-Year event
Inflow = 3.96 cfs @ 12.41 hrs, Volume= 0.490 af
Primary = 3.96 cfs @ 12.41 hrs, Volume= 0.490 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2A: DP-2A

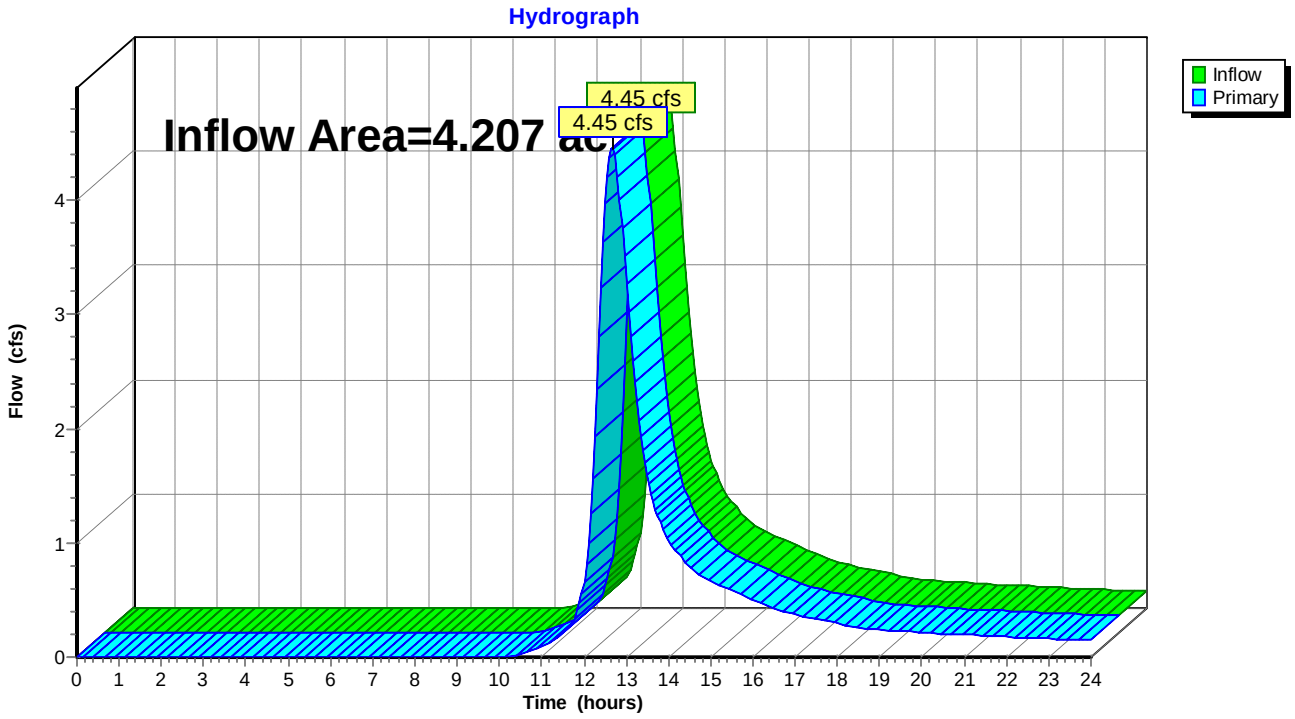


Summary for Link DP2B: DP-2B

Inflow Area = 4.207 ac, 0.00% Impervious, Inflow Depth > 2.01" for 10-Year event
Inflow = 4.45 cfs @ 12.67 hrs, Volume= 0.706 af
Primary = 4.45 cfs @ 12.67 hrs, Volume= 0.706 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2B: DP-2B

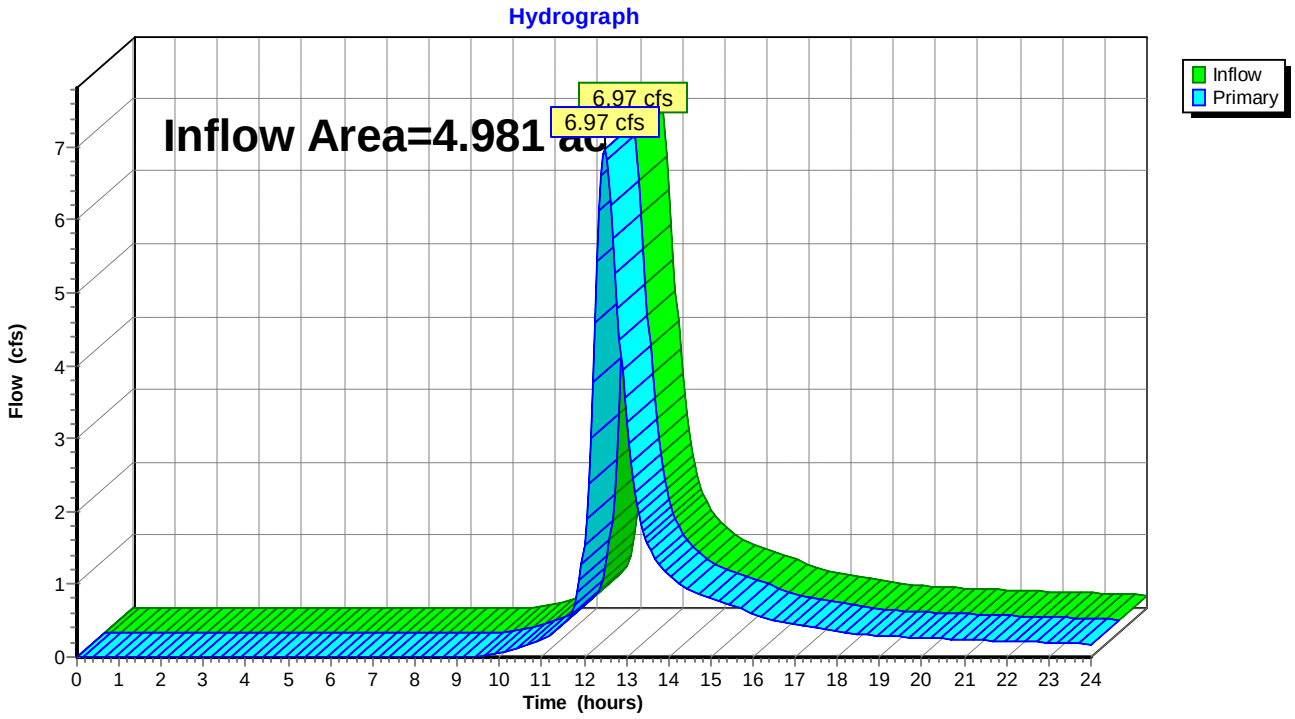


Summary for Link DP3: DP-3

Inflow Area = 4.981 ac, 7.60% Impervious, Inflow Depth > 2.26" for 10-Year event
Inflow = 6.97 cfs @ 12.49 hrs, Volume= 0.939 af
Primary = 6.97 cfs @ 12.49 hrs, Volume= 0.939 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: DP-3

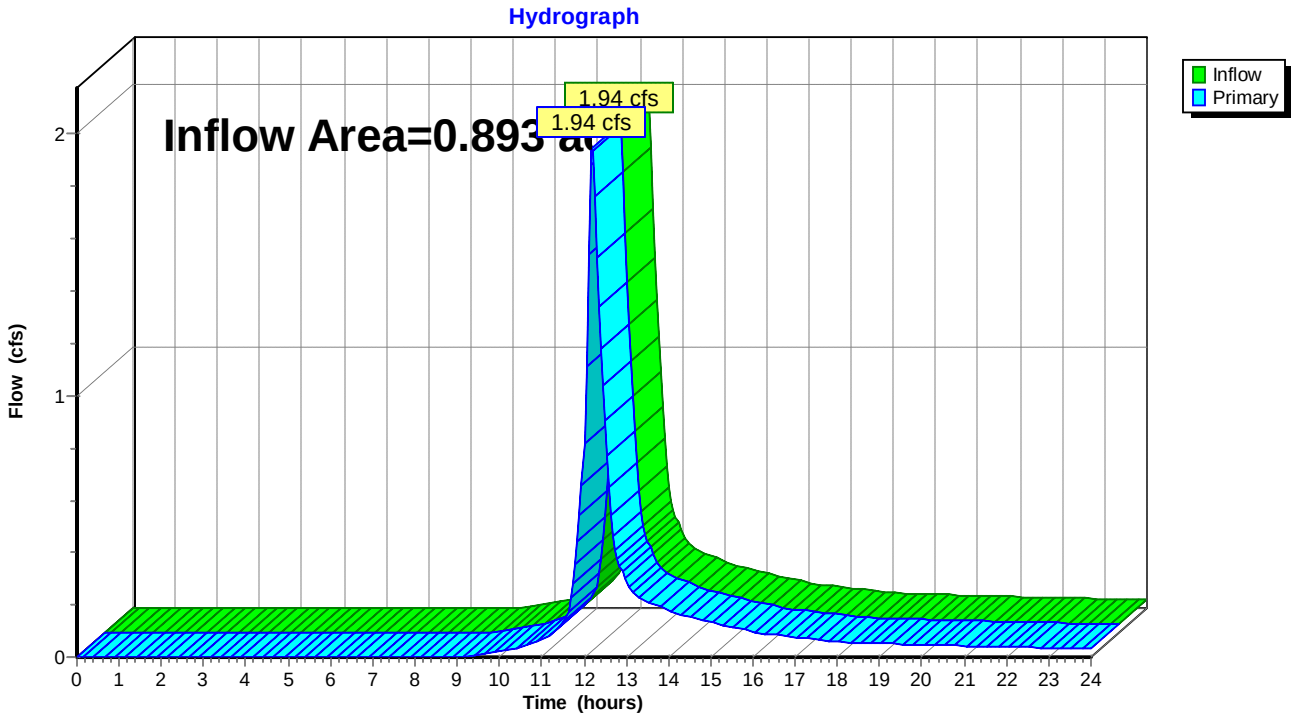


Summary for Link DP4: DP-4

Inflow Area = 0.893 ac, 5.13% Impervious, Inflow Depth > 2.36" for 10-Year event
Inflow = 1.94 cfs @ 12.19 hrs, Volume= 0.175 af
Primary = 1.94 cfs @ 12.19 hrs, Volume= 0.175 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP4: DP-4

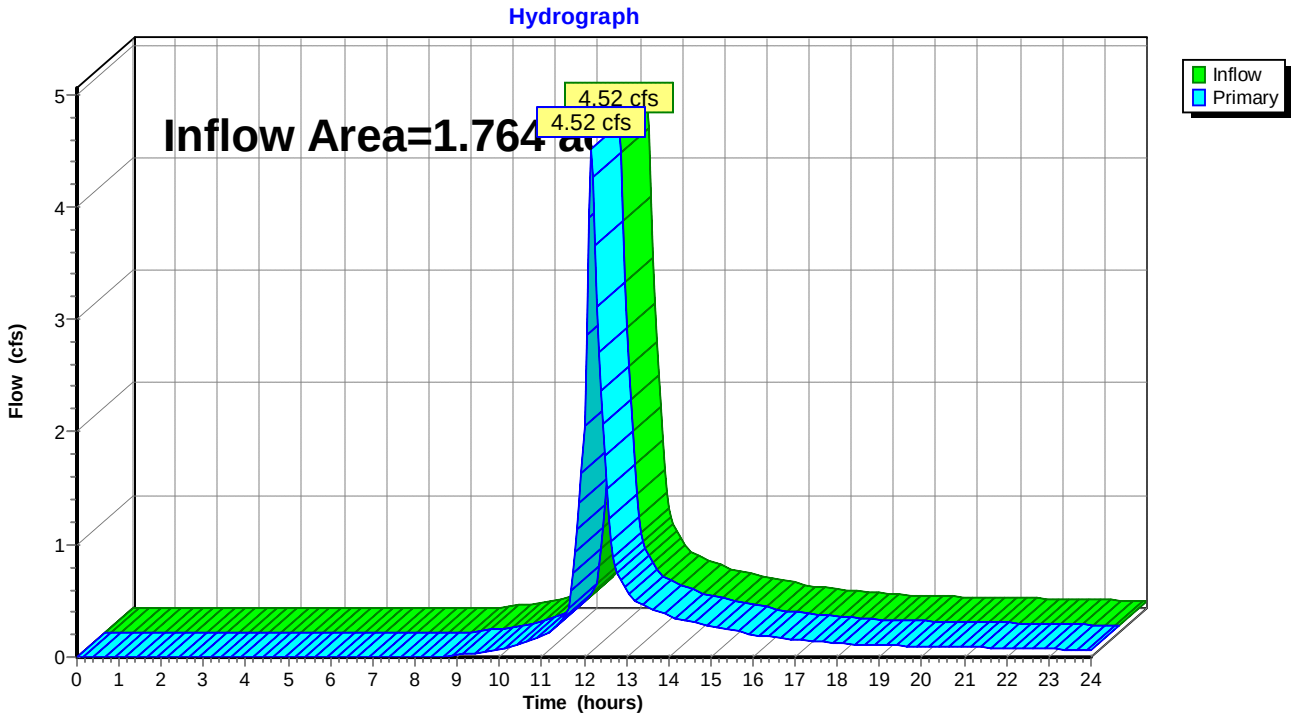


Summary for Link DP5: DP-5

Inflow Area = 1.764 ac, 11.76% Impervious, Inflow Depth > 2.62" for 10-Year event
Inflow = 4.52 cfs @ 12.16 hrs, Volume= 0.385 af
Primary = 4.52 cfs @ 12.16 hrs, Volume= 0.385 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP5: DP-5

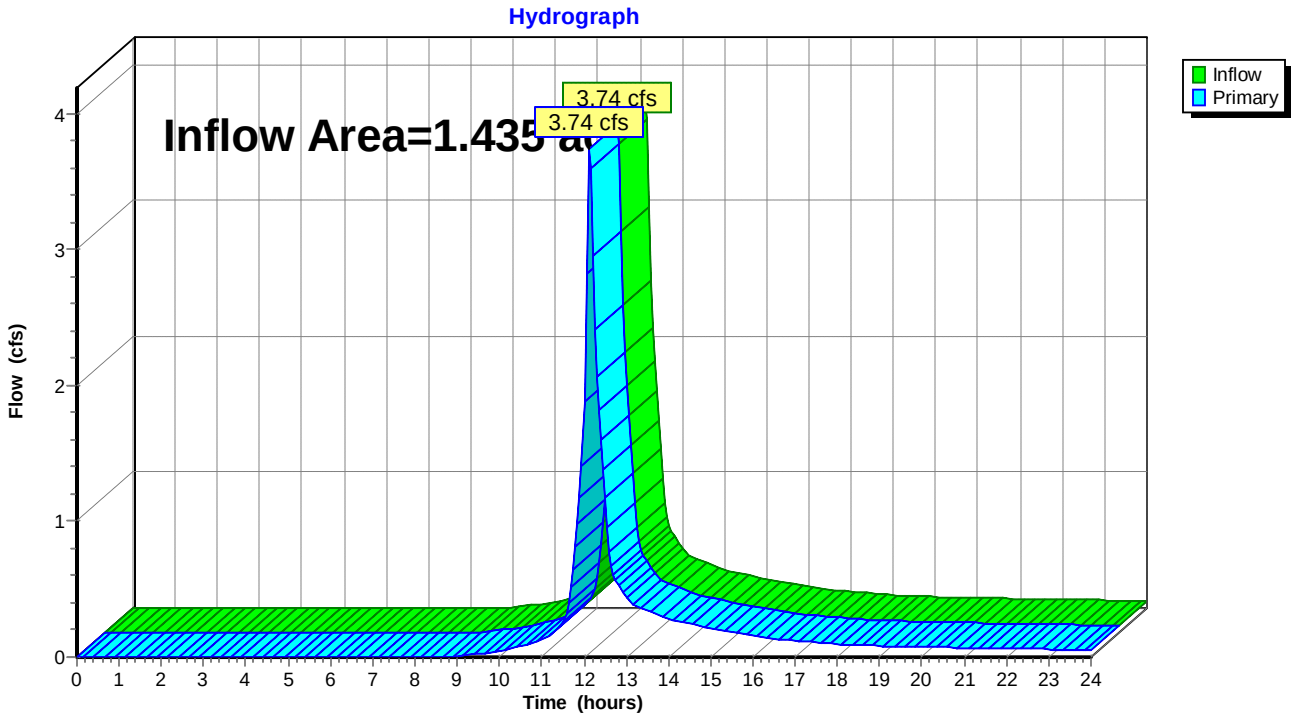


Summary for Link DP6: DP-6

Inflow Area = 1.435 ac, 2.87% Impervious, Inflow Depth > 2.45" for 10-Year event
Inflow = 3.74 cfs @ 12.12 hrs, Volume= 0.292 af
Primary = 3.74 cfs @ 12.12 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP6: DP-6



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 EXDA1ND: EXDA-1 — Runoff Area=850,940 sf 5.77% Impervious Runoff Depth>2.63"
Flow Length=2,225' Tc=61.0 min CN=72 Runoff=23.60 cfs 4.284 af

Subcatchment EXDA2AND: EXDA-2A — Runoff Area=117,366 sf 0.00% Impervious Runoff Depth>2.65"
Flow Length=450' Tc=28.5 min CN=72 Runoff=4.84 cfs 0.596 af

Subcatchment EXDA2BND: EXDA-2B — Runoff Area=183,271 sf 0.00% Impervious Runoff Depth>2.46"
Flow Length=1,050' Tc=46.7 min CN=70 Runoff=5.50 cfs 0.864 af

Subcatchment EXDA3ND: EXDA-3 — Runoff Area=216,972 sf 7.60% Impervious Runoff Depth>2.74"
Flow Length=610' Tc=34.5 min CN=73 Runoff=8.48 cfs 1.137 af

Subcatchment EXDA4ND: EXDA-4 — Runoff Area=38,901 sf 5.13% Impervious Runoff Depth>2.84"
Flow Length=400' Tc=13.0 min CN=74 Runoff=2.35 cfs 0.212 af

Subcatchment EXDA5ND: EXDA-5 — Runoff Area=76,831 sf 11.76% Impervious Runoff Depth>3.13"
Flow Length=500' Tc=11.3 min CN=77 Runoff=5.40 cfs 0.459 af

Subcatchment EXDA6ND: EXDA-6 — Runoff Area=62,500 sf 2.87% Impervious Runoff Depth>2.94"
Flow Length=350' Tc=8.3 min CN=75 Runoff=4.51 cfs 0.352 af

Link DP1: DP-1 — Inflow=23.60 cfs 4.284 af
Primary=23.60 cfs 4.284 af

Link DP2A: DP-2A — Inflow=4.84 cfs 0.596 af
Primary=4.84 cfs 0.596 af

Link DP2B: DP-2B — Inflow=5.50 cfs 0.864 af
Primary=5.50 cfs 0.864 af

Link DP3: DP-3 — Inflow=8.48 cfs 1.137 af
Primary=8.48 cfs 1.137 af

Link DP4: DP-4 — Inflow=2.35 cfs 0.212 af
Primary=2.35 cfs 0.212 af

Link DP5: DP-5 — Inflow=5.40 cfs 0.459 af
Primary=5.40 cfs 0.459 af

Link DP6: DP-6 — Inflow=4.51 cfs 0.352 af
Primary=4.51 cfs 0.352 af

Total Runoff Area = 35.509 ac Runoff Volume = 7.904 af Average Runoff Depth = 2.67"
94.93% Pervious = 33.708 ac 5.07% Impervious = 1.801 ac

Summary for Subcatchment EXDA1ND: EXDA-1

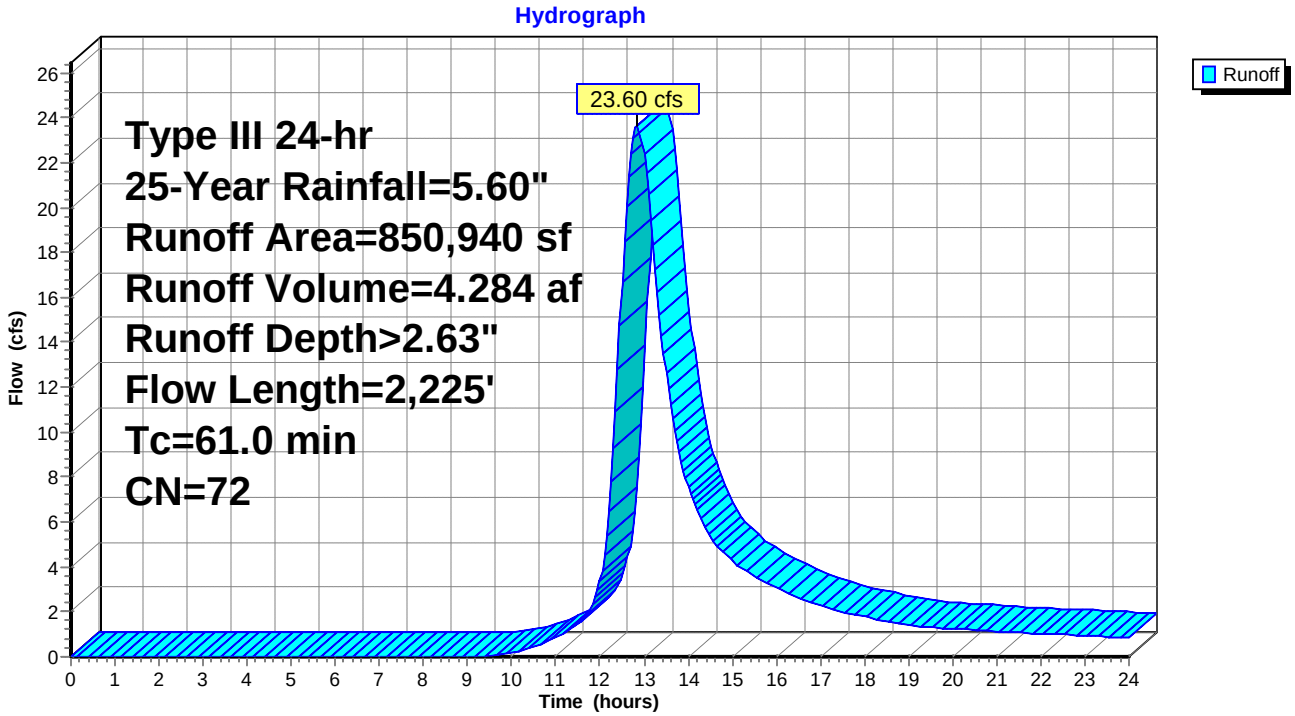
Runoff = 23.60 cfs @ 12.84 hrs, Volume= 4.284 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
635,511	70	Woods, Good, HSG C
148,147	74	Pasture/grassland/range, Good, HSG C
18,170	71	Meadow, non-grazed, HSG C
49,112	98	Impervious, HSG C
850,940	72	Weighted Average
801,828		94.23% Pervious Area
49,112		5.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
23.0	1,450	0.0440	1.05		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.0	525	0.0570	8.87	53.22	Channel Flow, Area= 6.0 sf Perim= 6.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides
61.0	2,225	Total			

Subcatchment EXDA1ND: EXDA-1



Summary for Subcatchment EXDA2AND: EXDA-2A

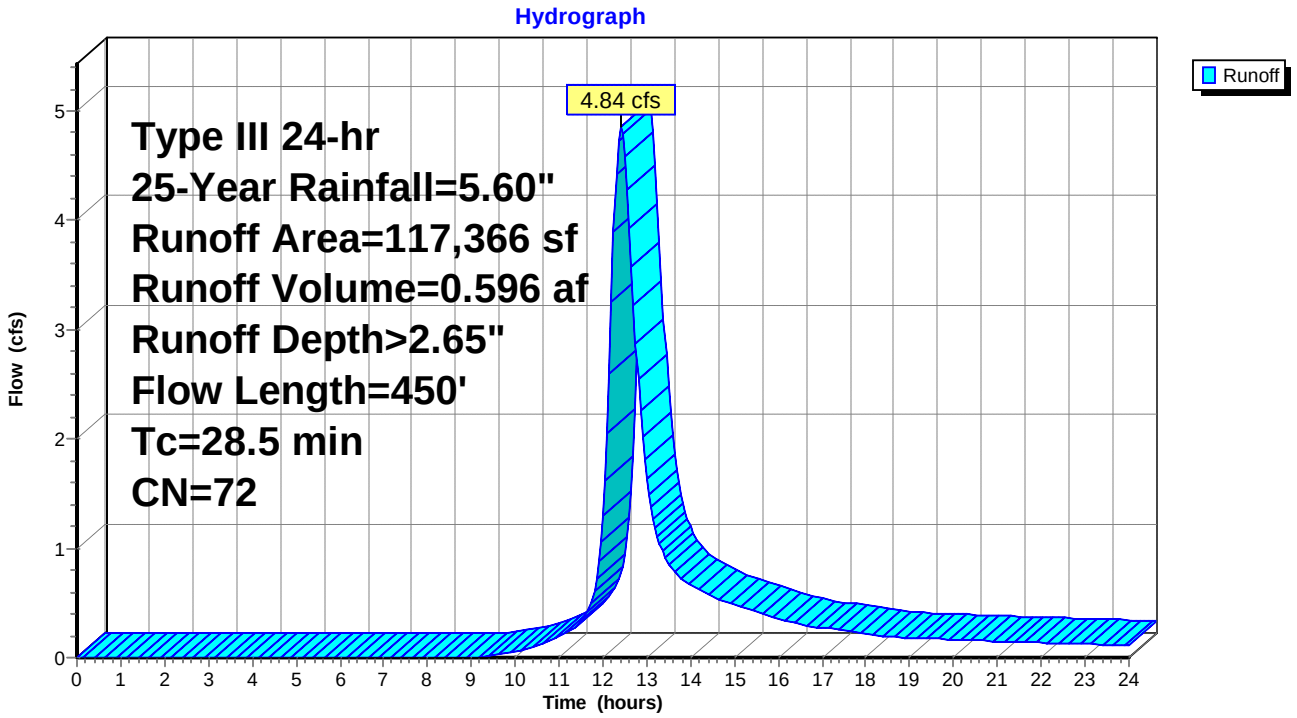
Runoff = 4.84 cfs @ 12.41 hrs, Volume= 0.596 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
60,051	70	Woods, Good, HSG C
57,315	74	Pasture/grassland/range, Good, HSG C
117,366	72	Weighted Average
117,366		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.1	250	0.0700	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.4	200	0.2150	2.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
28.5	450	Total			

Subcatchment EXDA2AND: EXDA-2A



Summary for Subcatchment EXDA2BND: EXDA-2B

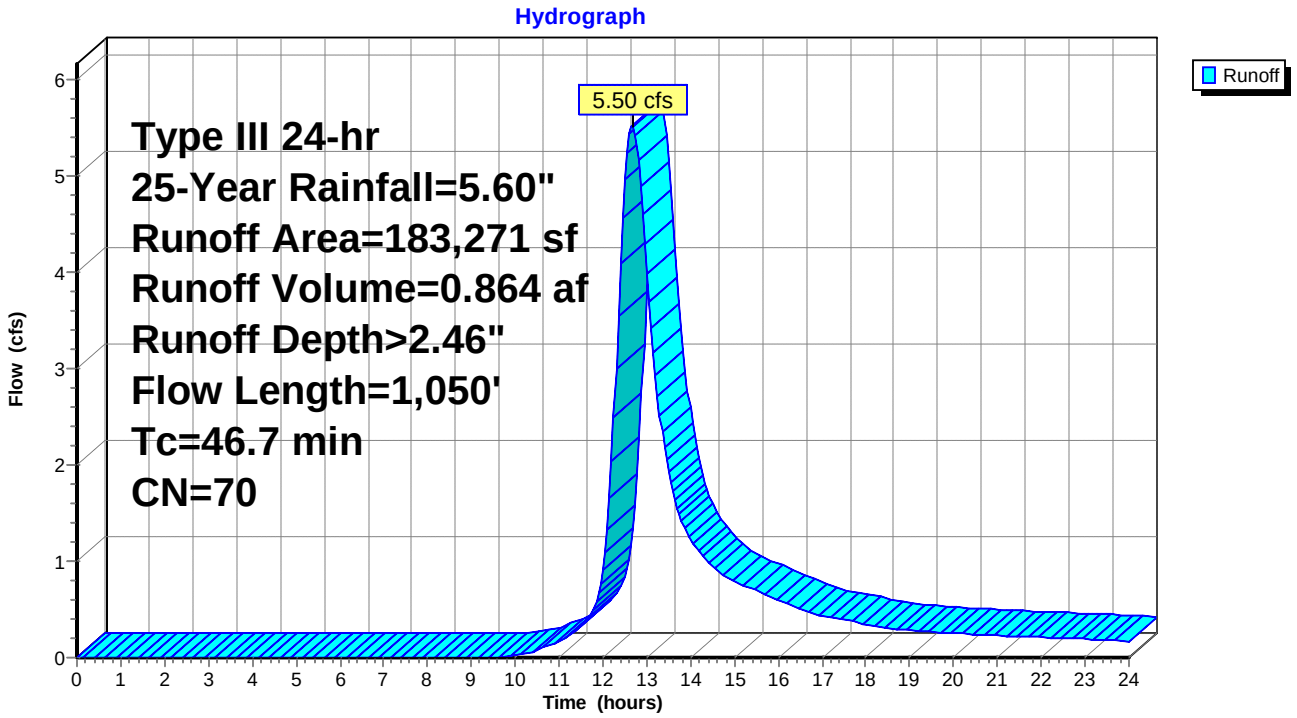
Runoff = 5.50 cfs @ 12.66 hrs, Volume= 0.864 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
179,894	70	Woods, Good, HSG C
3,377	74	Pasture/grassland/range, Good, HSG C
183,271	70	Weighted Average
183,271		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.1	250	0.0340	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
10.6	800	0.0637	1.26		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
46.7	1,050	Total			

Subcatchment EXDA2BND: EXDA-2B



Summary for Subcatchment EXDA3ND: EXDA-3

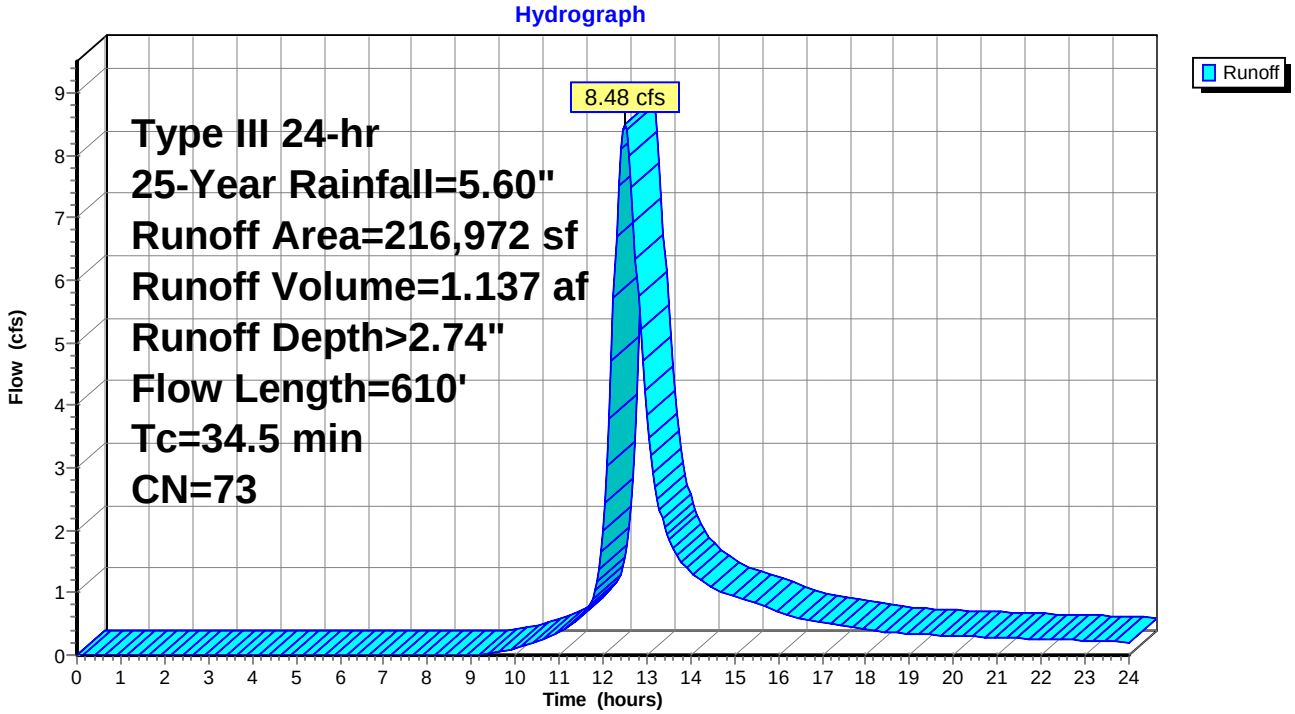
Runoff = 8.48 cfs @ 12.49 hrs, Volume= 1.137 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
56,418	70	Woods, Good, HSG C
132,061	71	Meadow, non-grazed, HSG C
11,996	74	Pasture/grassland/range, Good, HSG C
16,497	98	Impervious, HSG C
216,972	73	Weighted Average
200,475		92.40% Pervious Area
16,497		7.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.5	250	0.0520	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	360	0.0889	1.49		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
34.5	610	Total			

Subcatchment EXDA3ND: EXDA-3



Summary for Subcatchment EXDA4ND: EXDA-4

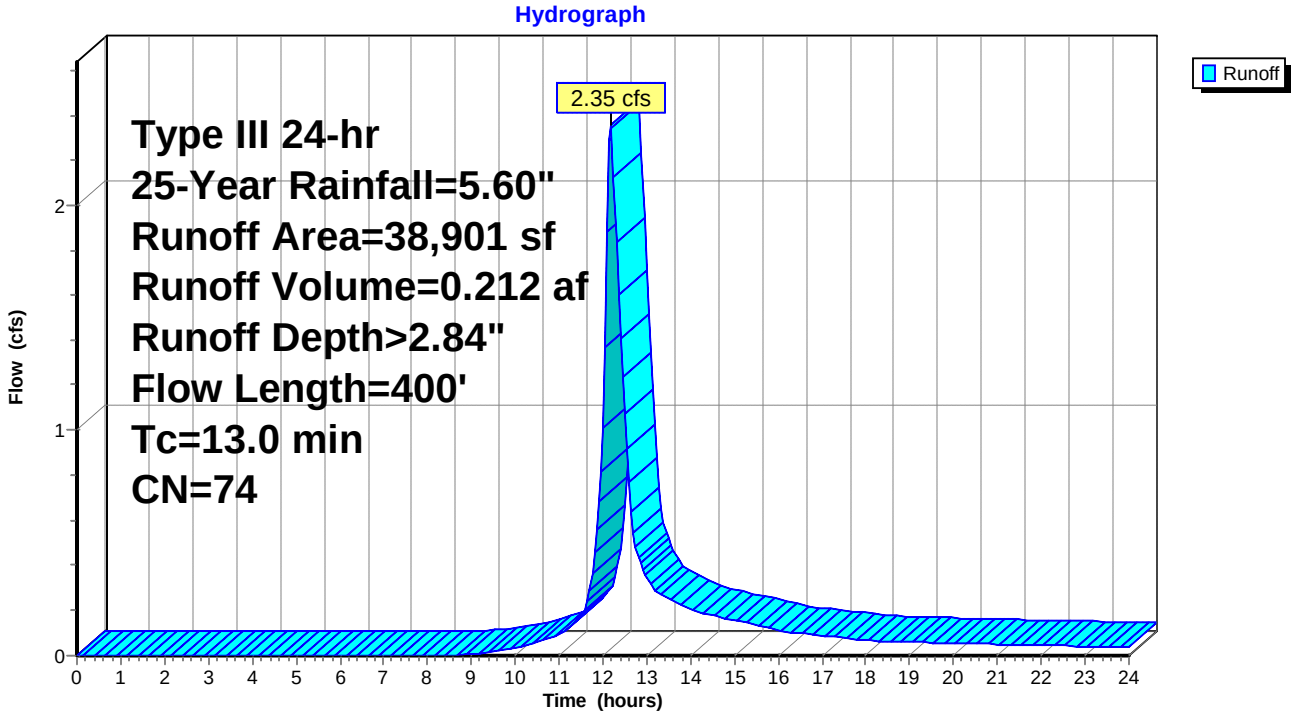
Runoff = 2.35 cfs @ 12.19 hrs, Volume= 0.212 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
	21,726	74	Pasture/grassland/range, Good, HSG C
	15,178	71	Meadow, non-grazed, HSG C
*	1,997	98	Impervious
	38,901	74	Weighted Average
	36,904		94.87% Pervious Area
	1,997		5.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	200	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.2	200	0.1500	2.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.0	400	Total			

Subcatchment EXDA4ND: EXDA-4



Summary for Subcatchment EXDA5ND: EXDA-5

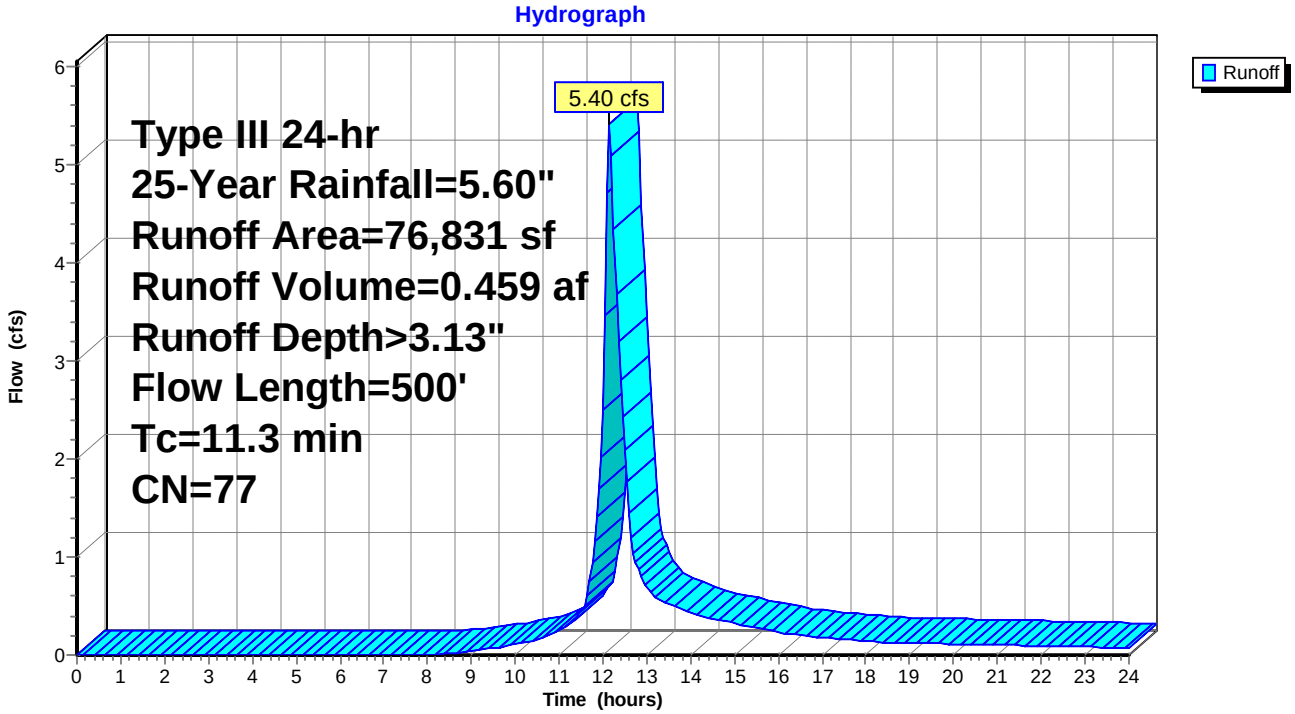
Runoff = 5.40 cfs @ 12.16 hrs, Volume= 0.459 af, Depth> 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
9,039	98	Impervious, HSG C
67,792	74	Pasture/grassland/range, Good, HSG C
76,831	77	Weighted Average
67,792		88.24% Pervious Area
9,039		11.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0400	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.0	350	0.1350	5.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.3	500	Total			

Subcatchment EXDA5ND: EXDA-5



Summary for Subcatchment EXDA6ND: EXDA-6

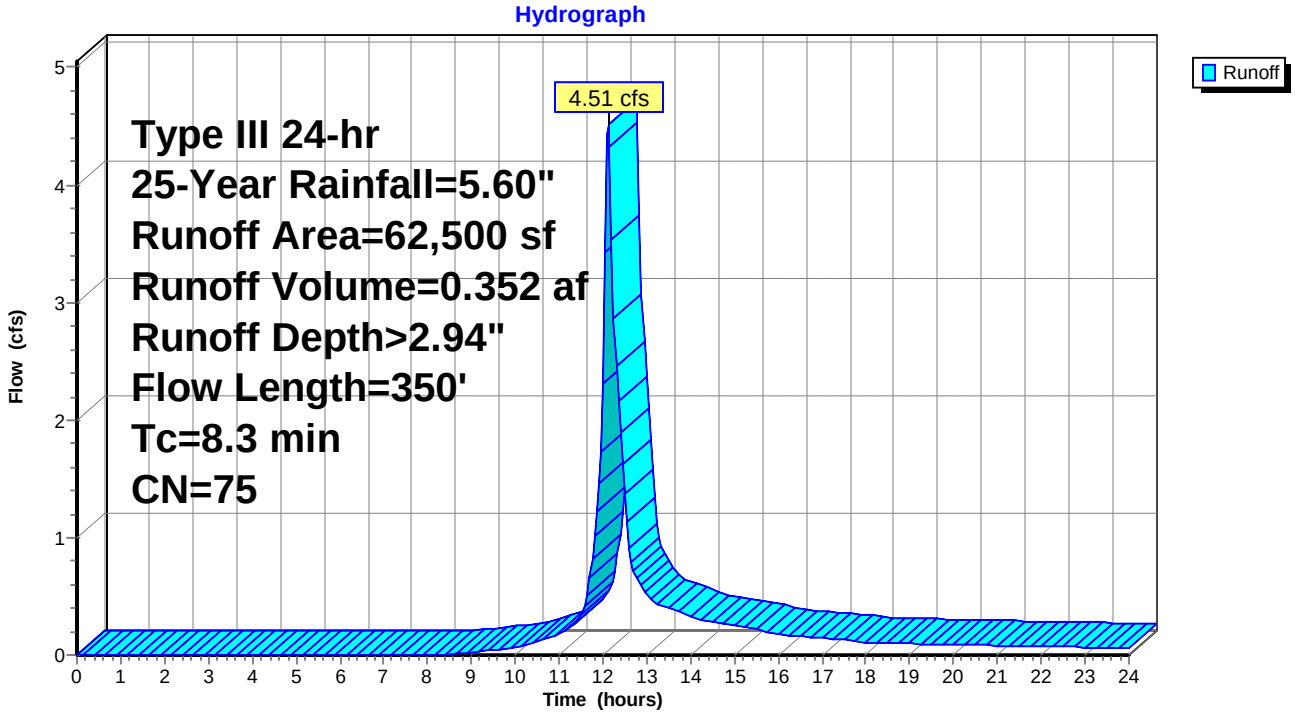
Runoff = 4.51 cfs @ 12.12 hrs, Volume= 0.352 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
60,704	74	Pasture/grassland/range, Good, HSG C
1,796	98	Impervious, HSG C
62,500	75	Weighted Average
60,704		97.13% Pervious Area
1,796		2.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0360	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
0.6	250	0.2050	7.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
8.3	350	Total			

Subcatchment EXDA6ND: EXDA-6

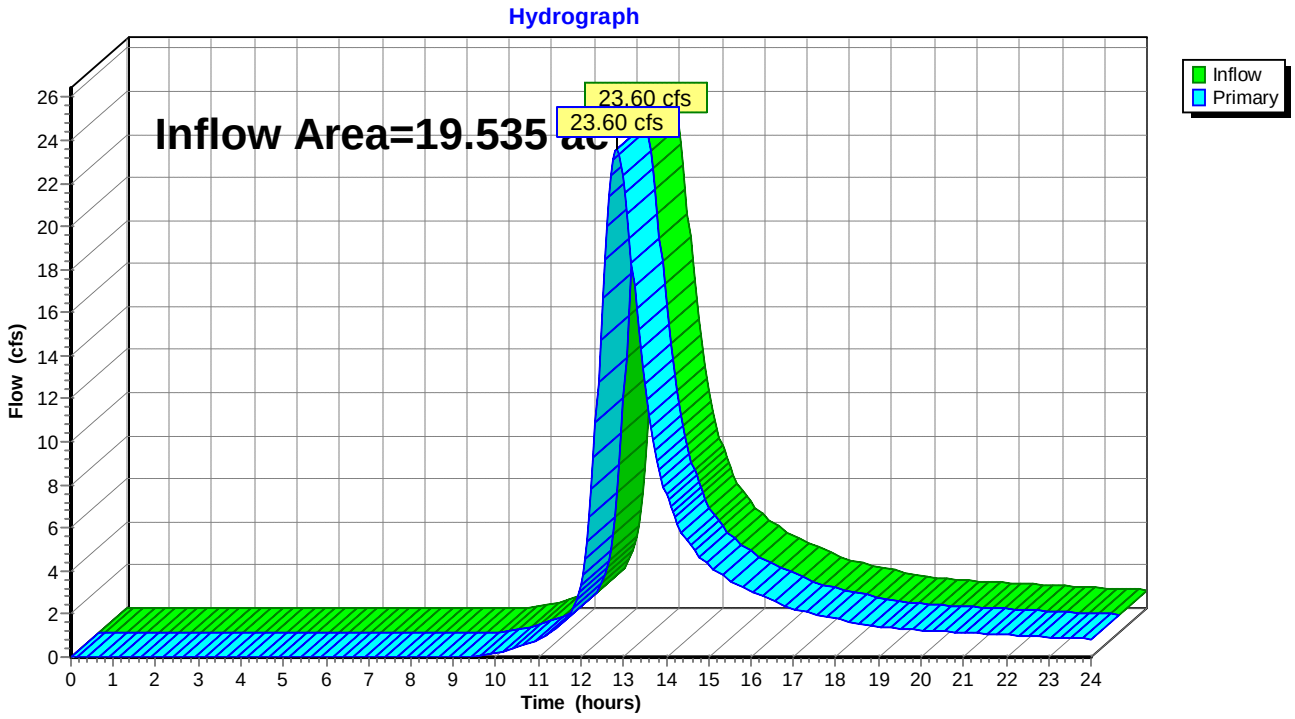


Summary for Link DP1: DP-1

Inflow Area = 19.535 ac, 5.77% Impervious, Inflow Depth > 2.63" for 25-Year event
Inflow = 23.60 cfs @ 12.84 hrs, Volume= 4.284 af
Primary = 23.60 cfs @ 12.84 hrs, Volume= 4.284 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DP-1

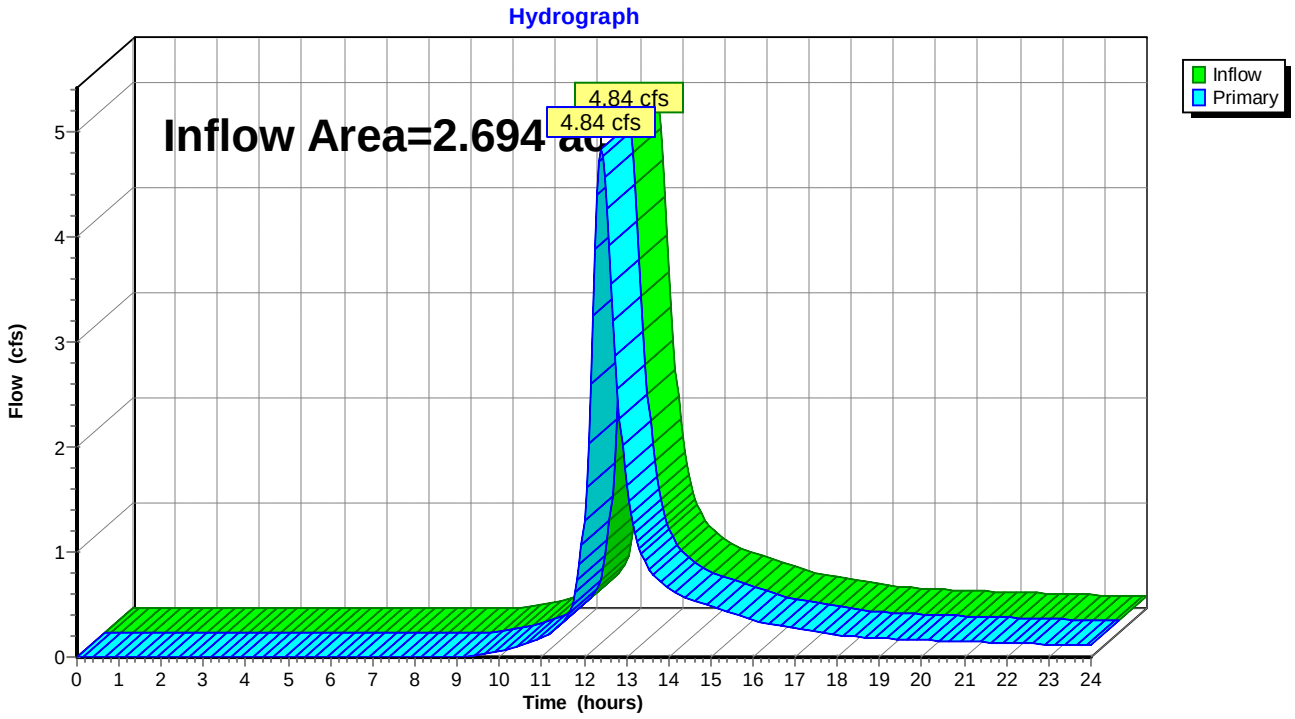


Summary for Link DP2A: DP-2A

Inflow Area = 2.694 ac, 0.00% Impervious, Inflow Depth > 2.65" for 25-Year event
Inflow = 4.84 cfs @ 12.41 hrs, Volume= 0.596 af
Primary = 4.84 cfs @ 12.41 hrs, Volume= 0.596 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2A: DP-2A

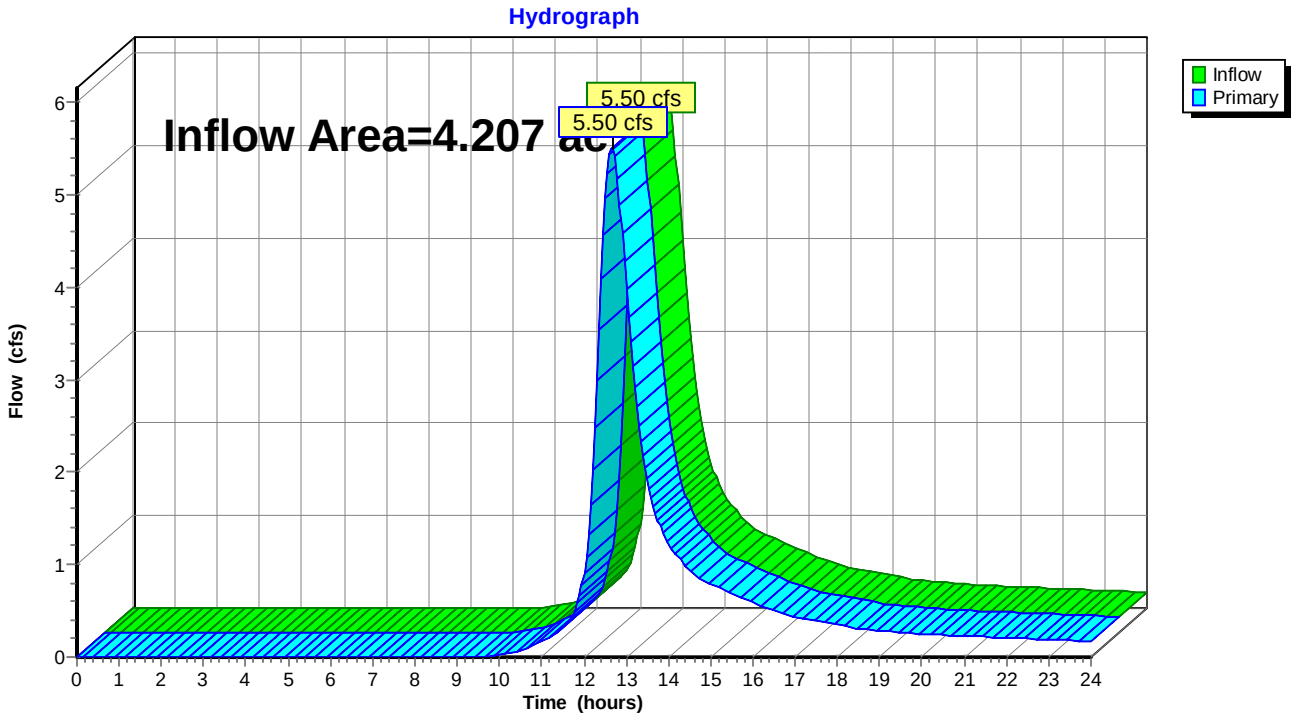


Summary for Link DP2B: DP-2B

Inflow Area = 4.207 ac, 0.00% Impervious, Inflow Depth > 2.46" for 25-Year event
Inflow = 5.50 cfs @ 12.66 hrs, Volume= 0.864 af
Primary = 5.50 cfs @ 12.66 hrs, Volume= 0.864 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2B: DP-2B

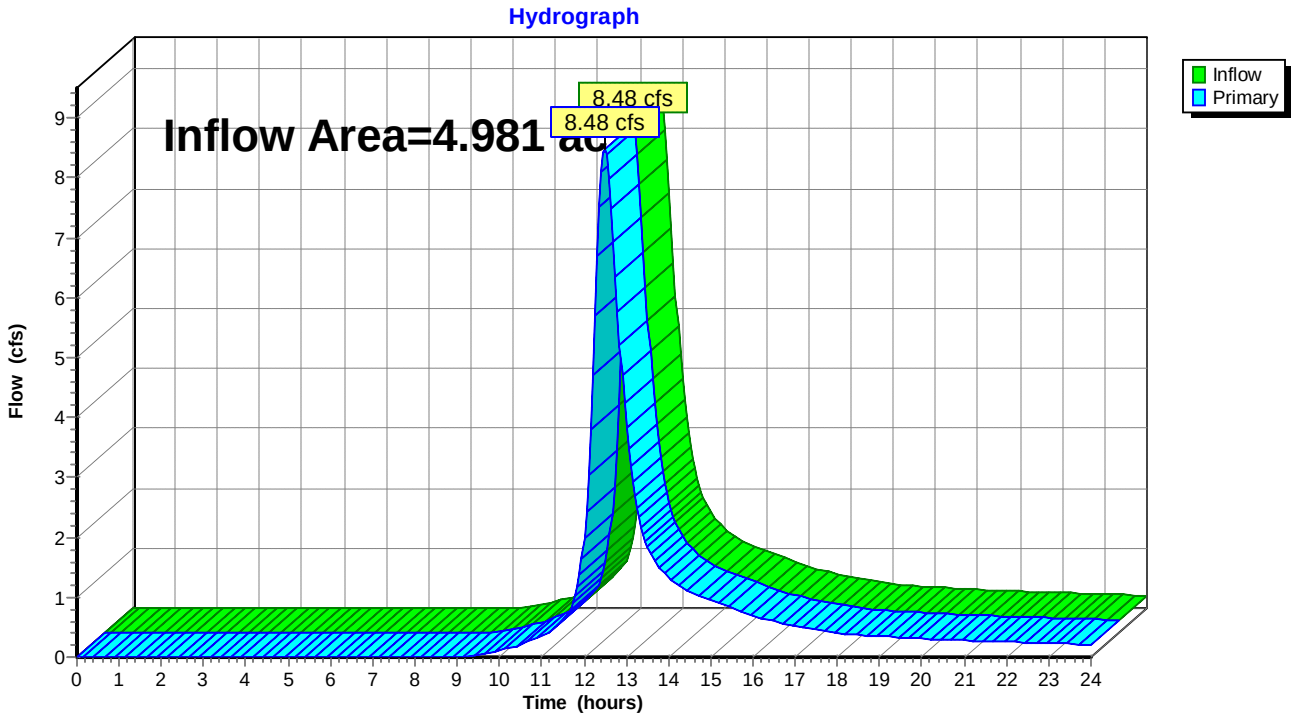


Summary for Link DP3: DP-3

Inflow Area = 4.981 ac, 7.60% Impervious, Inflow Depth > 2.74" for 25-Year event
Inflow = 8.48 cfs @ 12.49 hrs, Volume= 1.137 af
Primary = 8.48 cfs @ 12.49 hrs, Volume= 1.137 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: DP-3

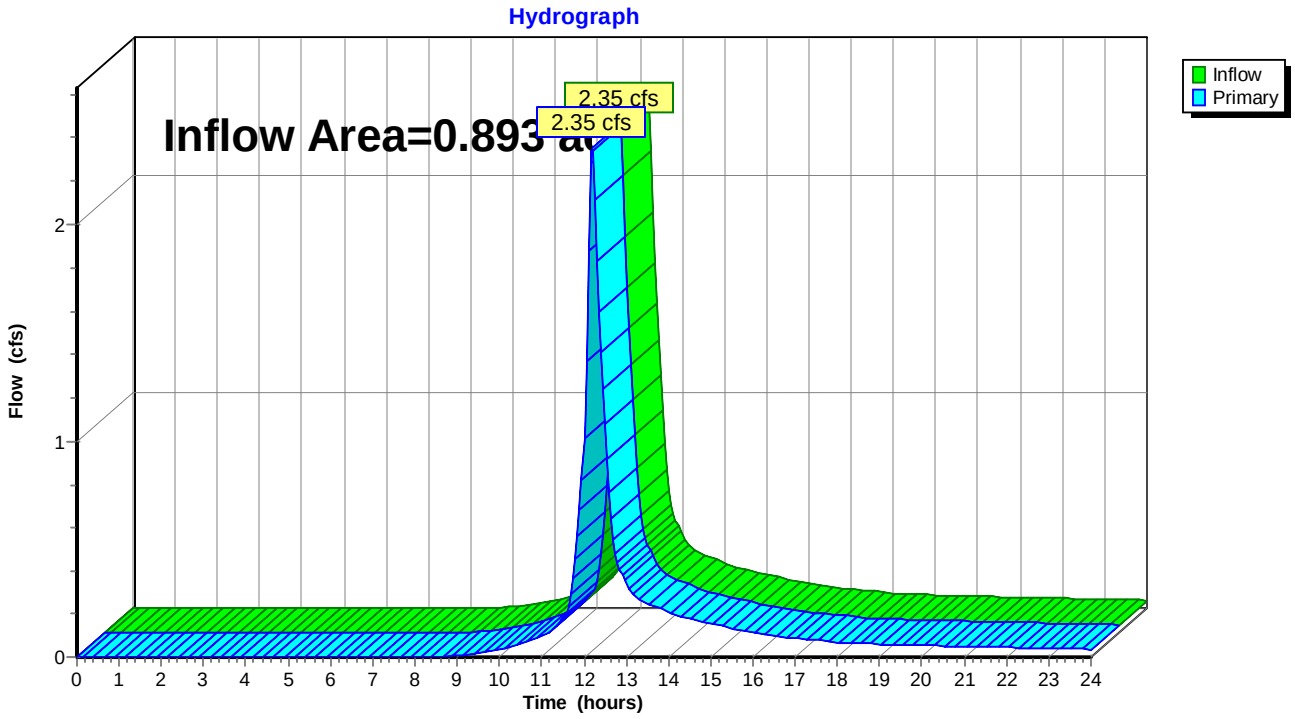


Summary for Link DP4: DP-4

Inflow Area = 0.893 ac, 5.13% Impervious, Inflow Depth > 2.84" for 25-Year event
Inflow = 2.35 cfs @ 12.19 hrs, Volume= 0.212 af
Primary = 2.35 cfs @ 12.19 hrs, Volume= 0.212 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP4: DP-4

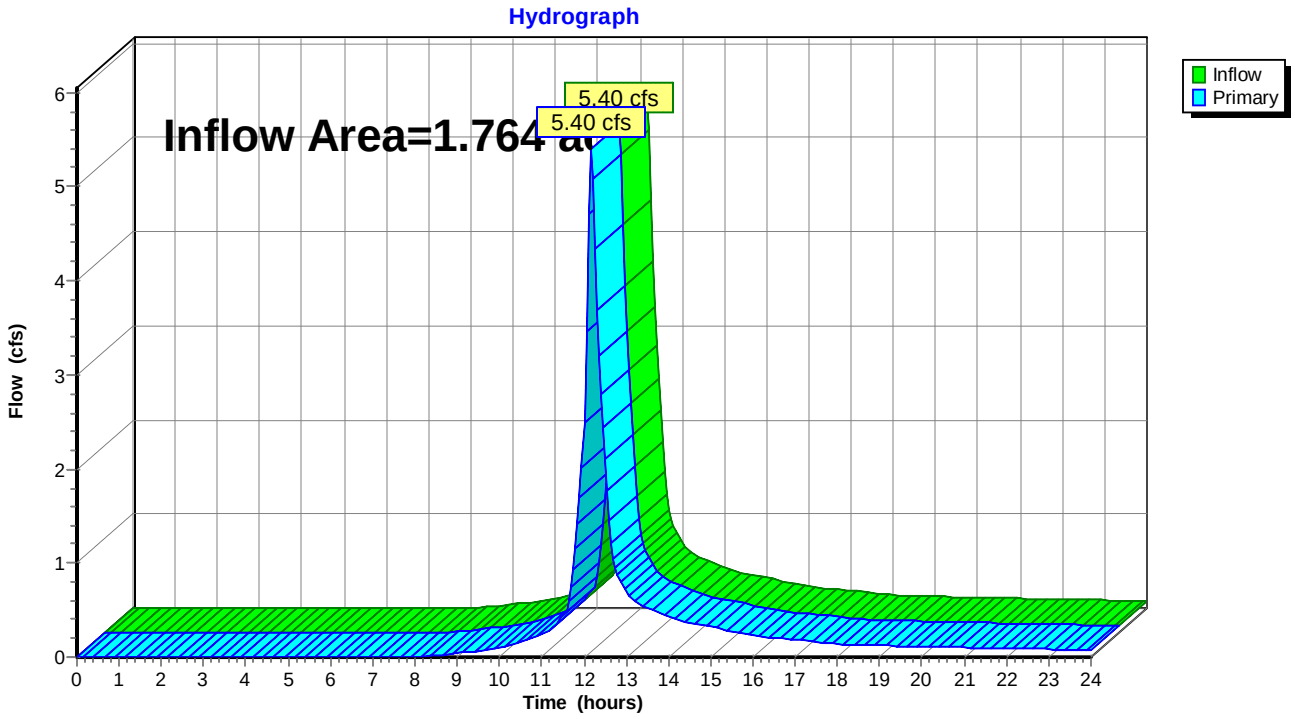


Summary for Link DP5: DP-5

Inflow Area = 1.764 ac, 11.76% Impervious, Inflow Depth > 3.13" for 25-Year event
Inflow = 5.40 cfs @ 12.16 hrs, Volume= 0.459 af
Primary = 5.40 cfs @ 12.16 hrs, Volume= 0.459 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP5: DP-5

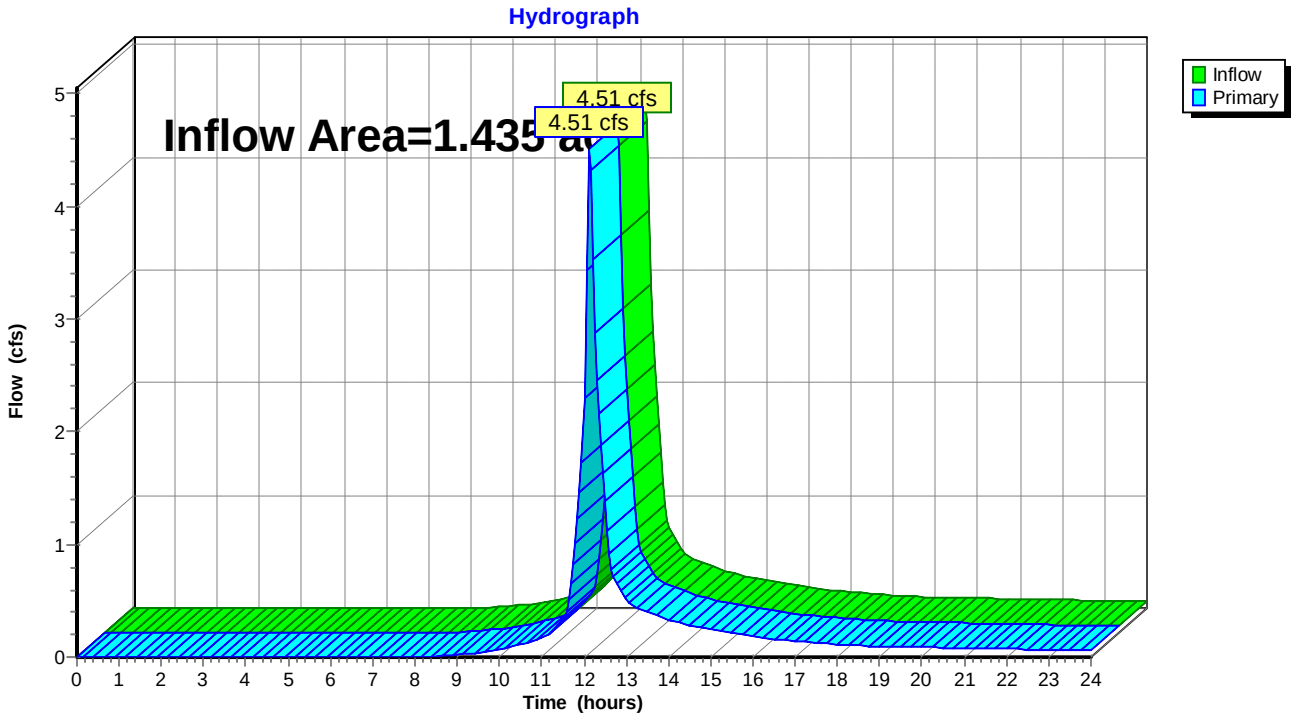


Summary for Link DP6: DP-6

Inflow Area = 1.435 ac, 2.87% Impervious, Inflow Depth > 2.94" for 25-Year event
Inflow = 4.51 cfs @ 12.12 hrs, Volume= 0.352 af
Primary = 4.51 cfs @ 12.12 hrs, Volume= 0.352 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP6: DP-6



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 EXDA1ND: EXDA-1
Runoff Area=850,940 sf 5.77% Impervious Runoff Depth>3.20"
Flow Length=2,225' Tc=61.0 min CN=72 Runoff=28.81 cfs 5.204 af

Subcatchment EXDA2AND: EXDA-2A
Runoff Area=117,366 sf 0.00% Impervious Runoff Depth>3.22"
Flow Length=450' Tc=28.5 min CN=72 Runoff=5.90 cfs 0.723 af

Subcatchment EXDA2BND: EXDA-2B
Runoff Area=183,271 sf 0.00% Impervious Runoff Depth>3.01"
Flow Length=1,050' Tc=46.7 min CN=70 Runoff=6.77 cfs 1.057 af

Subcatchment EXDA3ND: EXDA-3
Runoff Area=216,972 sf 7.60% Impervious Runoff Depth>3.32"
Flow Length=610' Tc=34.5 min CN=73 Runoff=10.30 cfs 1.376 af

Subcatchment EXDA4ND: EXDA-4
Runoff Area=38,901 sf 5.13% Impervious Runoff Depth>3.43"
Flow Length=400' Tc=13.0 min CN=74 Runoff=2.84 cfs 0.255 af

Subcatchment EXDA5ND: EXDA-5
Runoff Area=76,831 sf 11.76% Impervious Runoff Depth>3.74"
Flow Length=500' Tc=11.3 min CN=77 Runoff=6.45 cfs 0.549 af

Subcatchment EXDA6ND: EXDA-6
Runoff Area=62,500 sf 2.87% Impervious Runoff Depth>3.53"
Flow Length=350' Tc=8.3 min CN=75 Runoff=5.43 cfs 0.423 af

Link DP1: DP-1
Inflow=28.81 cfs 5.204 af
Primary=28.81 cfs 5.204 af

Link DP2A: DP-2A
Inflow=5.90 cfs 0.723 af
Primary=5.90 cfs 0.723 af

Link DP2B: DP-2B
Inflow=6.77 cfs 1.057 af
Primary=6.77 cfs 1.057 af

Link DP3: DP-3
Inflow=10.30 cfs 1.376 af
Primary=10.30 cfs 1.376 af

Link DP4: DP-4
Inflow=2.84 cfs 0.255 af
Primary=2.84 cfs 0.255 af

Link DP5: DP-5
Inflow=6.45 cfs 0.549 af
Primary=6.45 cfs 0.549 af

Link DP6: DP-6
Inflow=5.43 cfs 0.423 af
Primary=5.43 cfs 0.423 af

Total Runoff Area = 35.509 ac Runoff Volume = 9.586 af Average Runoff Depth = 3.24"
94.93% Pervious = 33.708 ac 5.07% Impervious = 1.801 ac

Summary for Subcatchment EXDA1ND: EXDA-1

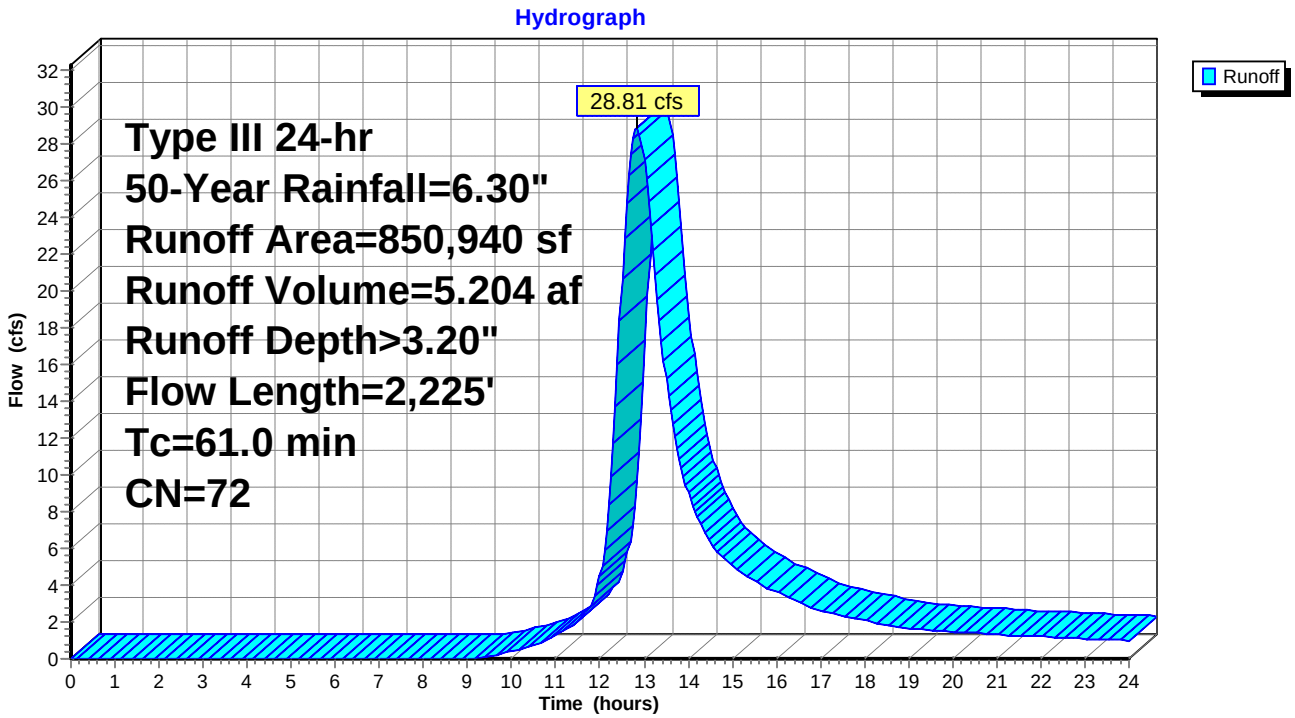
Runoff = 28.81 cfs @ 12.83 hrs, Volume= 5.204 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
635,511	70	Woods, Good, HSG C
148,147	74	Pasture/grassland/range, Good, HSG C
18,170	71	Meadow, non-grazed, HSG C
49,112	98	Impervious, HSG C
850,940	72	Weighted Average
801,828		94.23% Pervious Area
49,112		5.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
23.0	1,450	0.0440	1.05		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.0	525	0.0570	8.87	53.22	Channel Flow, Area= 6.0 sf Perim= 6.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides
61.0	2,225	Total			

Subcatchment EXDA1ND: EXDA-1



Summary for Subcatchment EXDA2AND: EXDA-2A

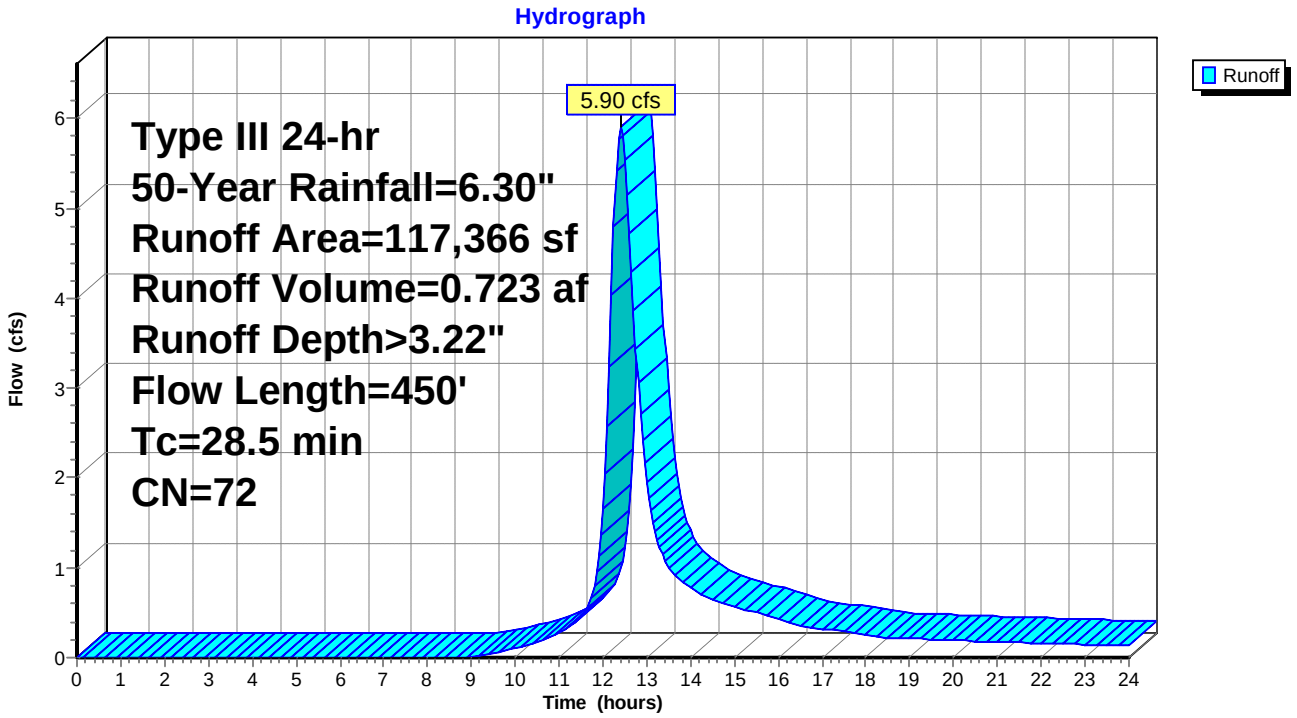
Runoff = 5.90 cfs @ 12.40 hrs, Volume= 0.723 af, Depth> 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
60,051	70	Woods, Good, HSG C
57,315	74	Pasture/grassland/range, Good, HSG C
117,366	72	Weighted Average
117,366		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.1	250	0.0700	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.4	200	0.2150	2.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
28.5	450	Total			

Subcatchment EXDA2AND: EXDA-2A



Summary for Subcatchment EXDA2BND: EXDA-2B

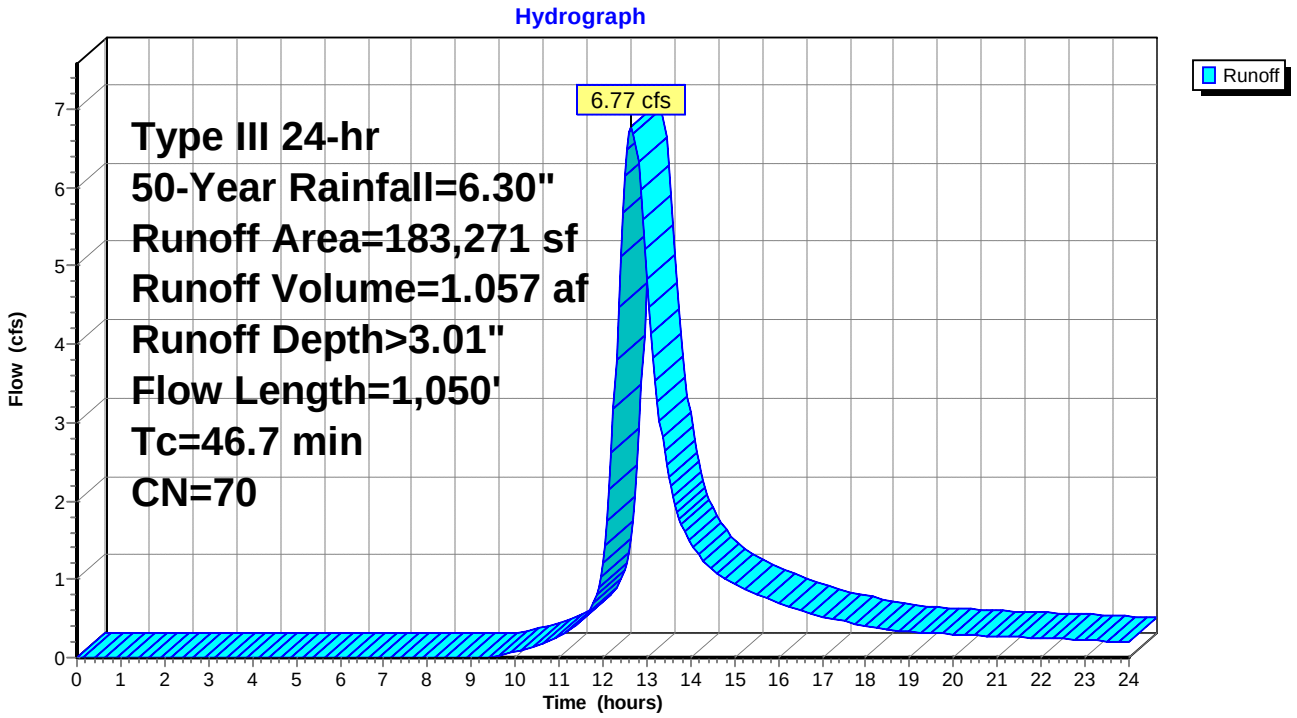
Runoff = 6.77 cfs @ 12.65 hrs, Volume= 1.057 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
179,894	70	Woods, Good, HSG C
3,377	74	Pasture/grassland/range, Good, HSG C
183,271	70	Weighted Average
183,271		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.1	250	0.0340	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
10.6	800	0.0637	1.26		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
46.7	1,050	Total			

Subcatchment EXDA2BND: EXDA-2B



Summary for Subcatchment EXDA3ND: EXDA-3

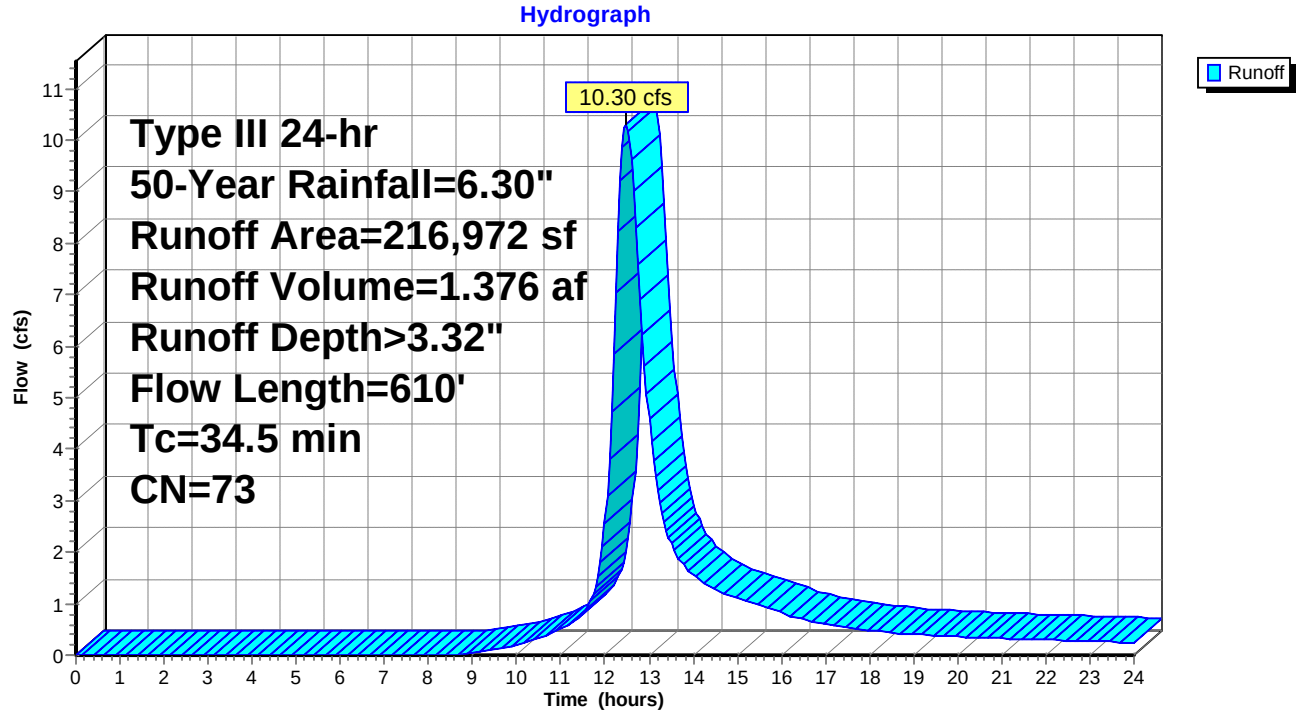
Runoff = 10.30 cfs @ 12.48 hrs, Volume= 1.376 af, Depth> 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
56,418	70	Woods, Good, HSG C
132,061	71	Meadow, non-grazed, HSG C
11,996	74	Pasture/grassland/range, Good, HSG C
16,497	98	Impervious, HSG C
216,972	73	Weighted Average
200,475		92.40% Pervious Area
16,497		7.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.5	250	0.0520	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	360	0.0889	1.49		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
34.5	610	Total			

Subcatchment EXDA3ND: EXDA-3



Summary for Subcatchment EXDA4ND: EXDA-4

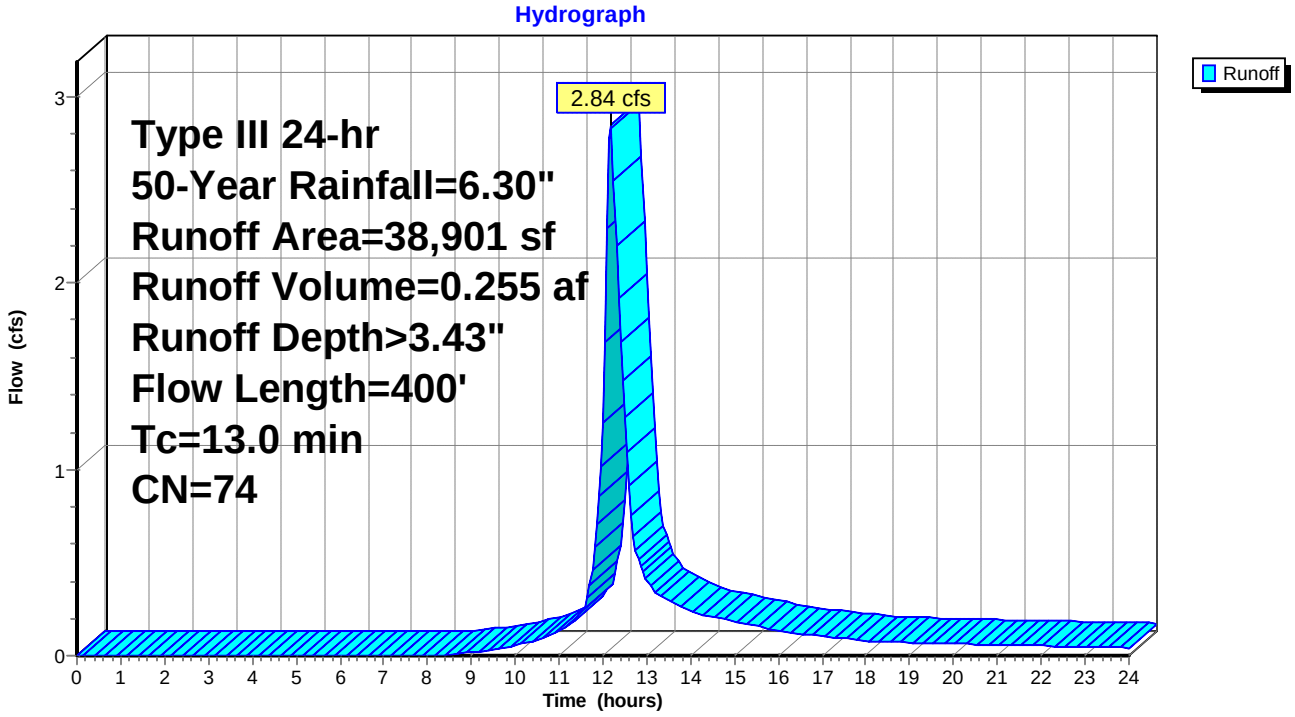
Runoff = 2.84 cfs @ 12.18 hrs, Volume= 0.255 af, Depth> 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

	Area (sf)	CN	Description
	21,726	74	Pasture/grassland/range, Good, HSG C
	15,178	71	Meadow, non-grazed, HSG C
*	1,997	98	Impervious
	38,901	74	Weighted Average
	36,904		94.87% Pervious Area
	1,997		5.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	200	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.2	200	0.1500	2.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.0	400	Total			

Subcatchment EXDA4ND: EXDA-4



Summary for Subcatchment EXDA5ND: EXDA-5

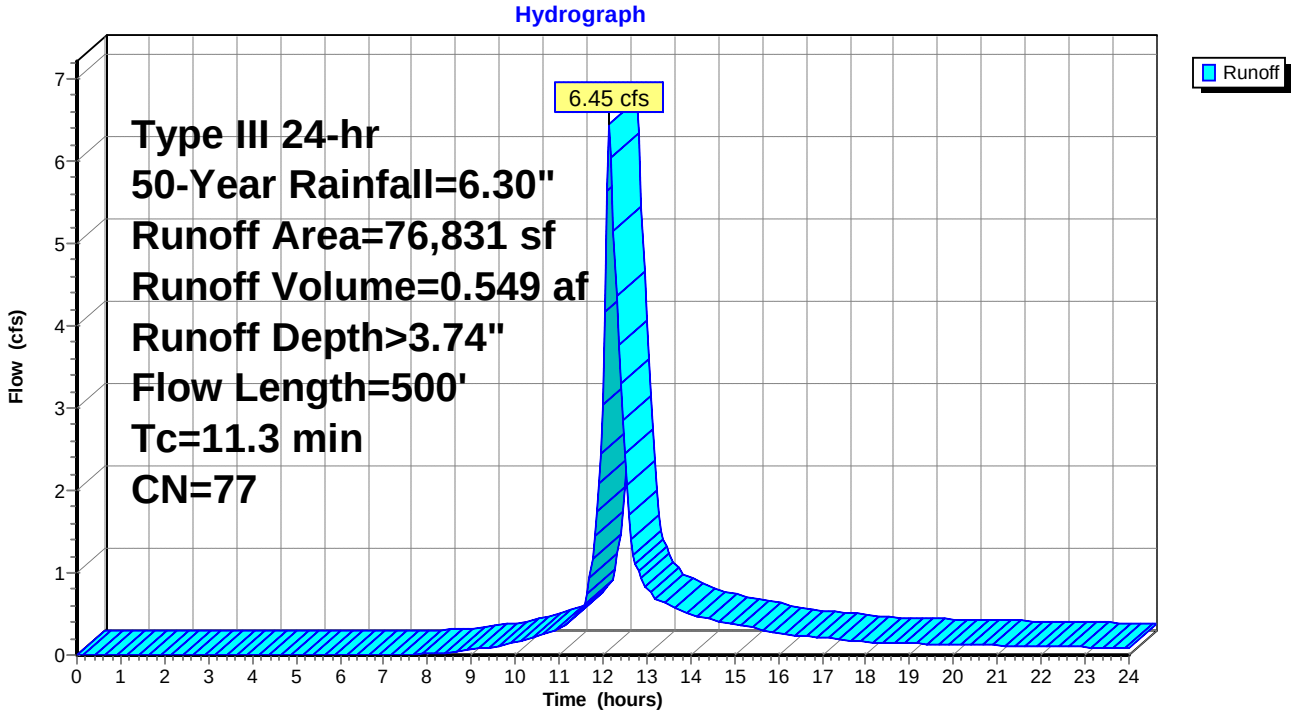
Runoff = 6.45 cfs @ 12.16 hrs, Volume= 0.549 af, Depth> 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
9,039	98	Impervious, HSG C
67,792	74	Pasture/grassland/range, Good, HSG C
76,831	77	Weighted Average
67,792		88.24% Pervious Area
9,039		11.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0400	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.0	350	0.1350	5.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.3	500	Total			

Subcatchment EXDA5ND: EXDA-5



Summary for Subcatchment EXDA6ND: EXDA-6

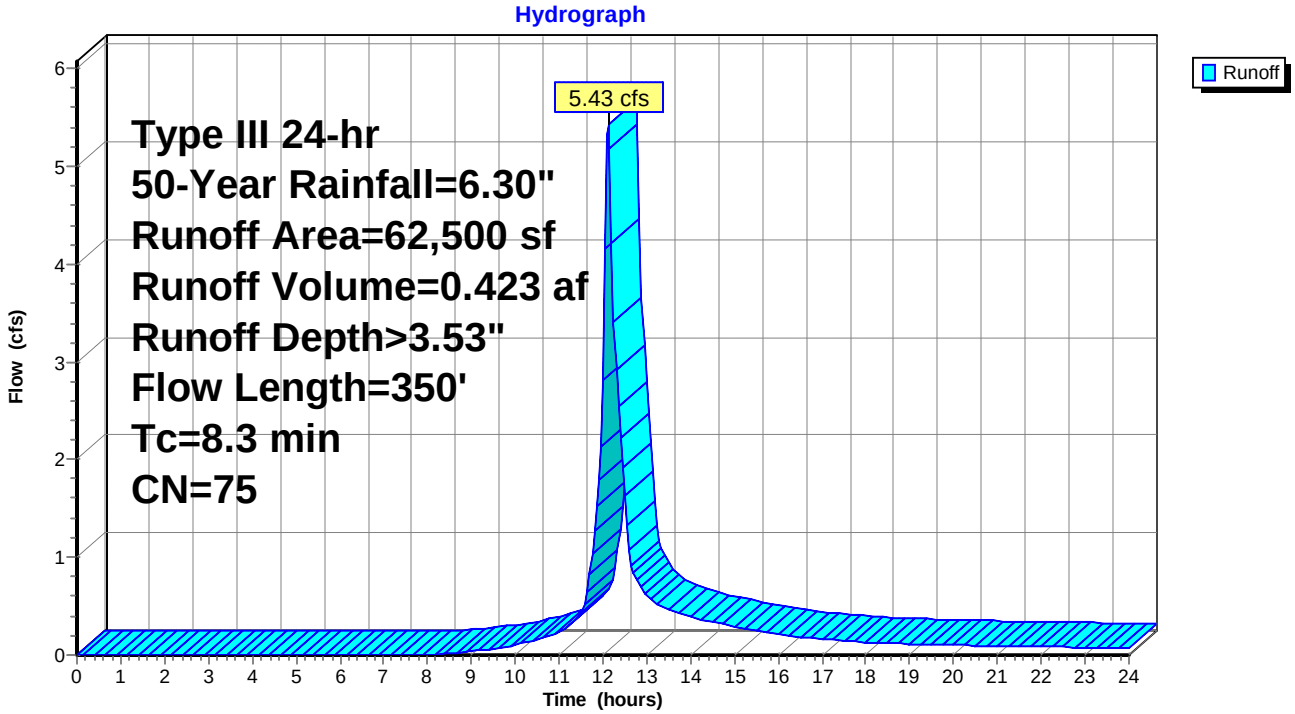
Runoff = 5.43 cfs @ 12.12 hrs, Volume= 0.423 af, Depth> 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
60,704	74	Pasture/grassland/range, Good, HSG C
1,796	98	Impervious, HSG C
62,500	75	Weighted Average
60,704		97.13% Pervious Area
1,796		2.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0360	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
0.6	250	0.2050	7.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
8.3	350	Total			

Subcatchment EXDA6ND: EXDA-6

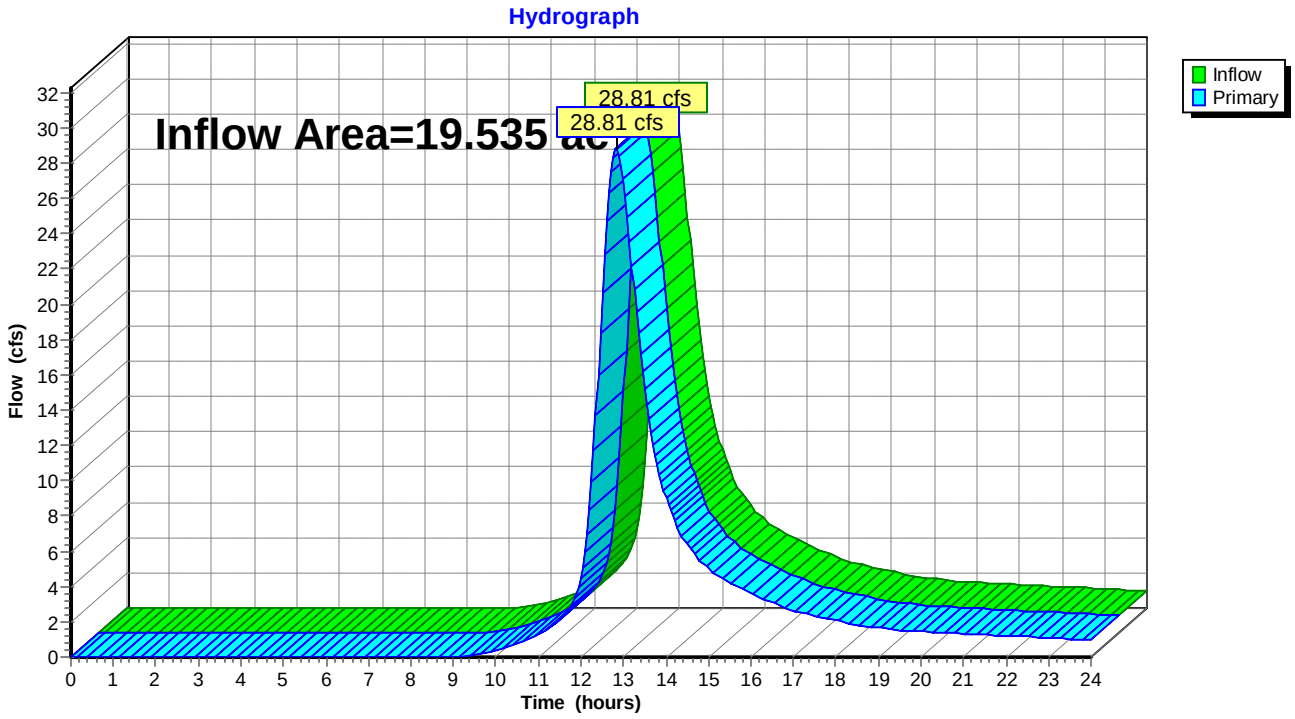


Summary for Link DP1: DP-1

Inflow Area = 19.535 ac, 5.77% Impervious, Inflow Depth > 3.20" for 50-Year event
Inflow = 28.81 cfs @ 12.83 hrs, Volume= 5.204 af
Primary = 28.81 cfs @ 12.83 hrs, Volume= 5.204 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DP-1

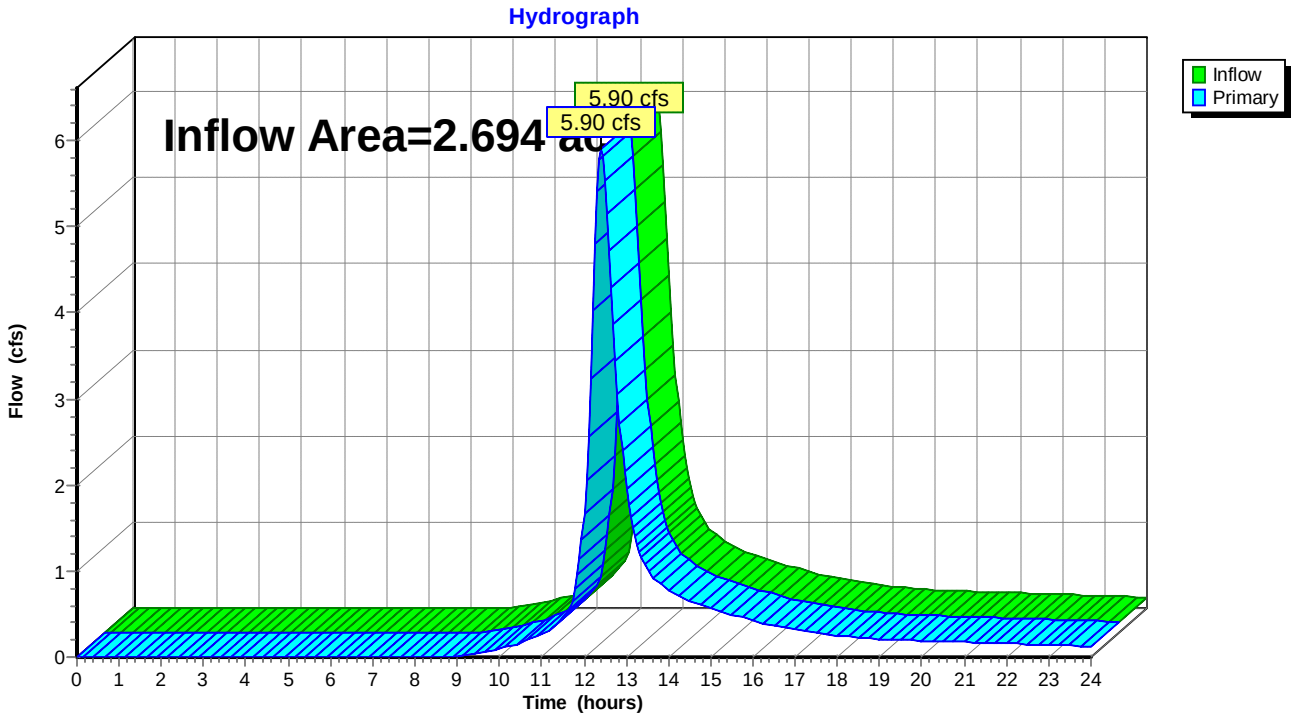


Summary for Link DP2A: DP-2A

Inflow Area = 2.694 ac, 0.00% Impervious, Inflow Depth > 3.22" for 50-Year event
Inflow = 5.90 cfs @ 12.40 hrs, Volume= 0.723 af
Primary = 5.90 cfs @ 12.40 hrs, Volume= 0.723 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2A: DP-2A

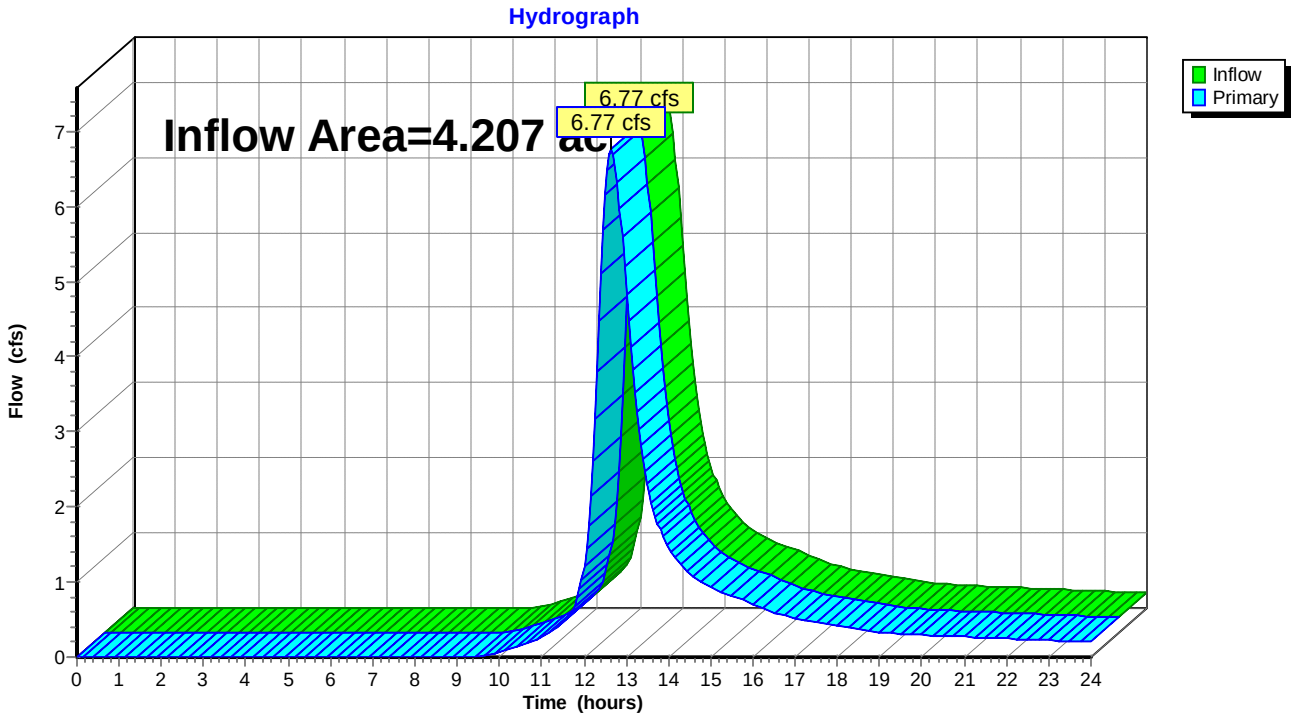


Summary for Link DP2B: DP-2B

Inflow Area = 4.207 ac, 0.00% Impervious, Inflow Depth > 3.01" for 50-Year event
Inflow = 6.77 cfs @ 12.65 hrs, Volume= 1.057 af
Primary = 6.77 cfs @ 12.65 hrs, Volume= 1.057 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2B: DP-2B

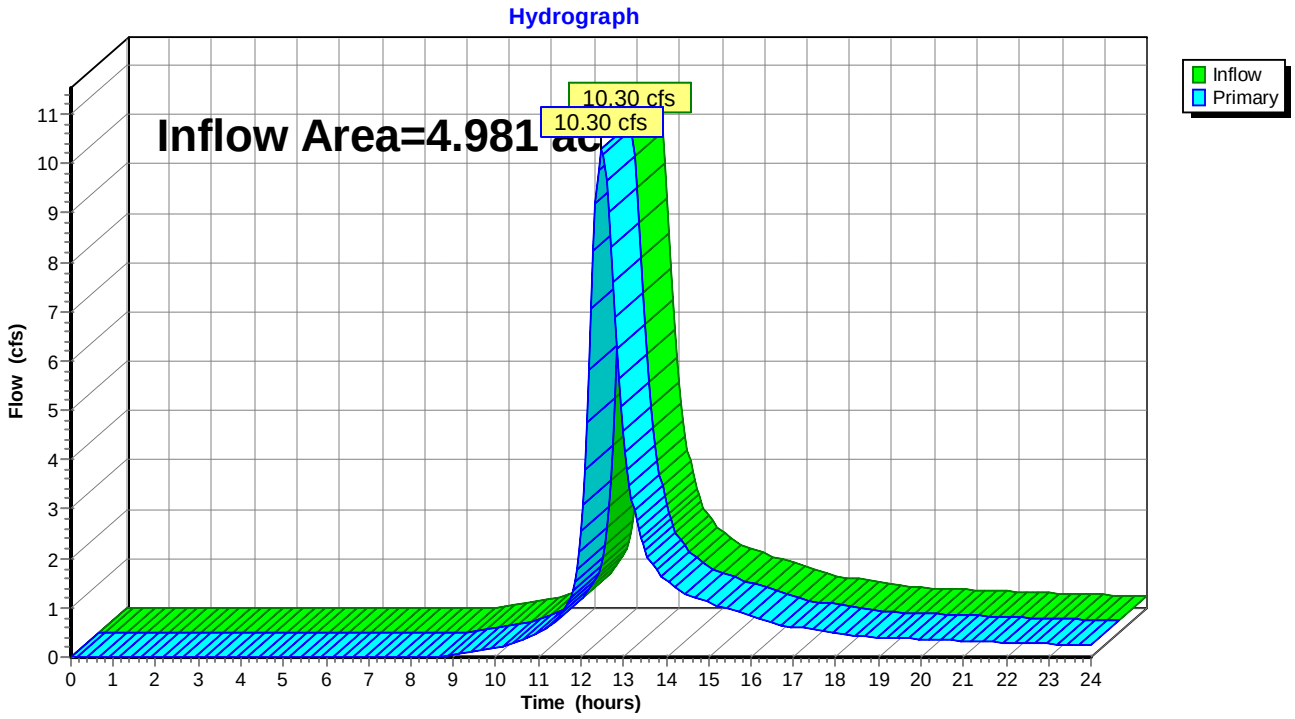


Summary for Link DP3: DP-3

Inflow Area = 4.981 ac, 7.60% Impervious, Inflow Depth > 3.32" for 50-Year event
Inflow = 10.30 cfs @ 12.48 hrs, Volume= 1.376 af
Primary = 10.30 cfs @ 12.48 hrs, Volume= 1.376 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: DP-3

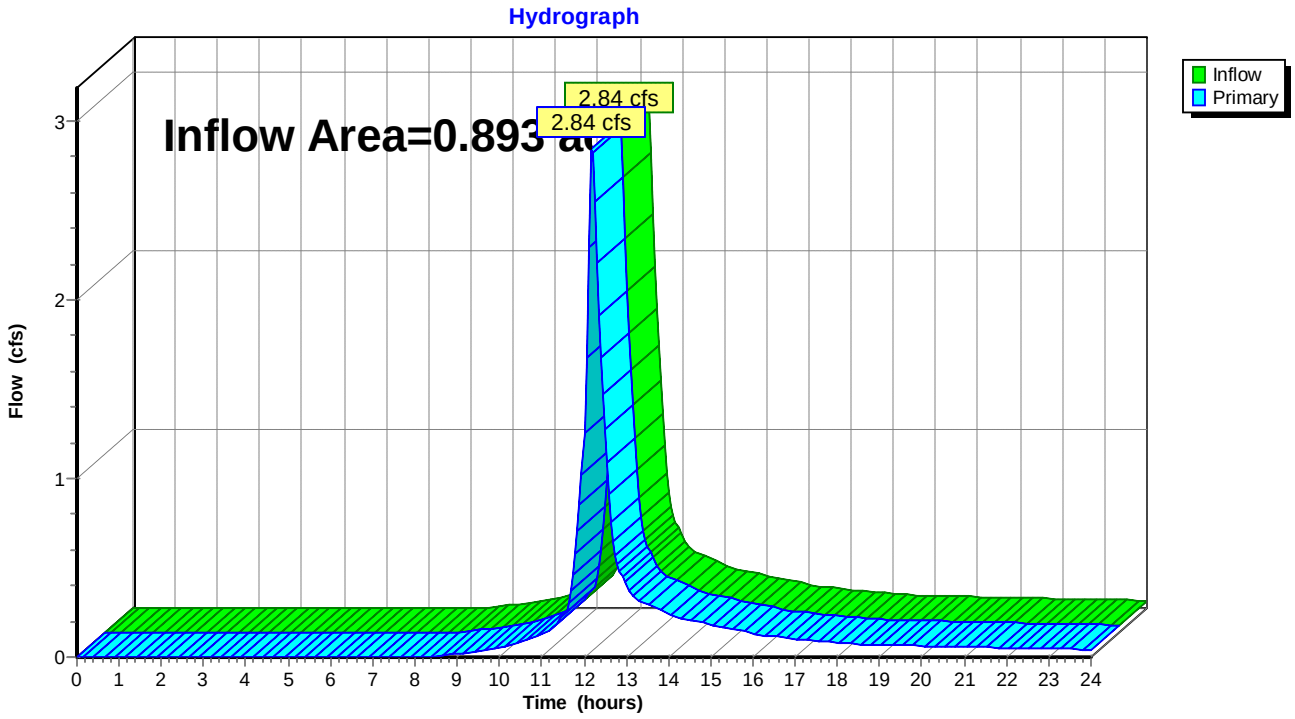


Summary for Link DP4: DP-4

Inflow Area = 0.893 ac, 5.13% Impervious, Inflow Depth > 3.43" for 50-Year event
Inflow = 2.84 cfs @ 12.18 hrs, Volume= 0.255 af
Primary = 2.84 cfs @ 12.18 hrs, Volume= 0.255 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP4: DP-4

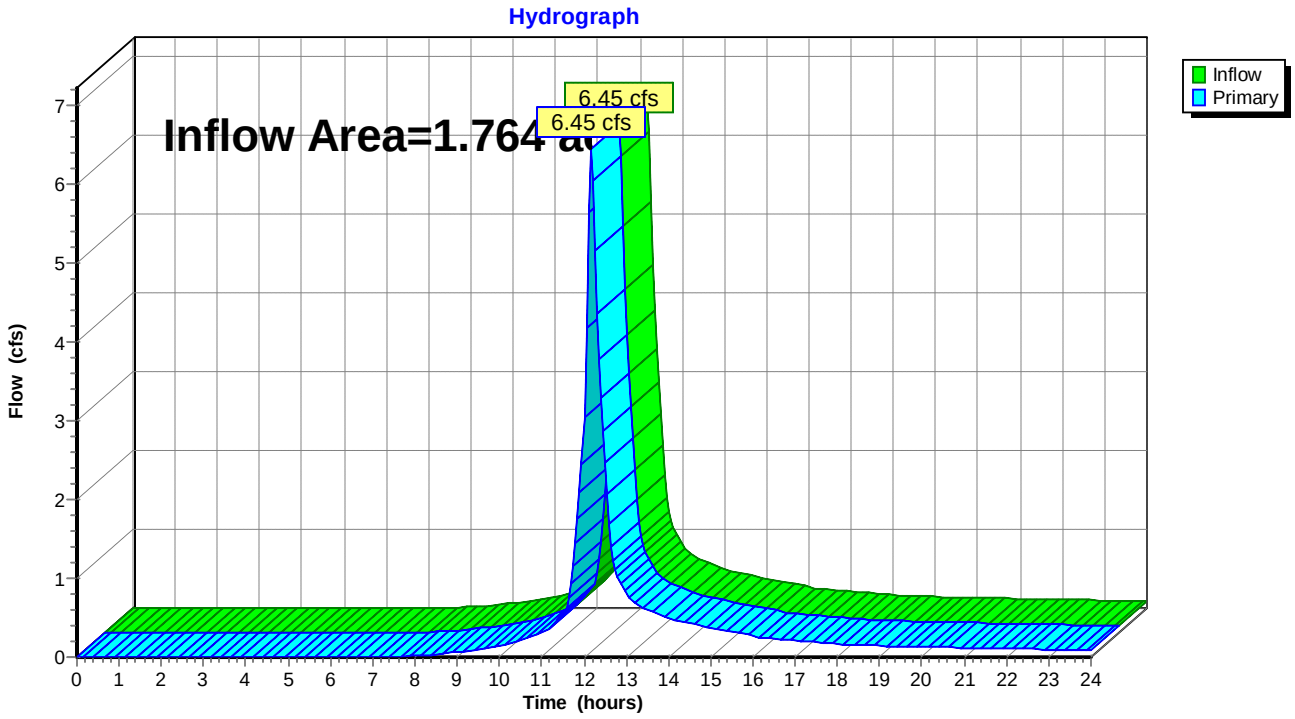


Summary for Link DP5: DP-5

Inflow Area = 1.764 ac, 11.76% Impervious, Inflow Depth > 3.74" for 50-Year event
Inflow = 6.45 cfs @ 12.16 hrs, Volume= 0.549 af
Primary = 6.45 cfs @ 12.16 hrs, Volume= 0.549 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP5: DP-5

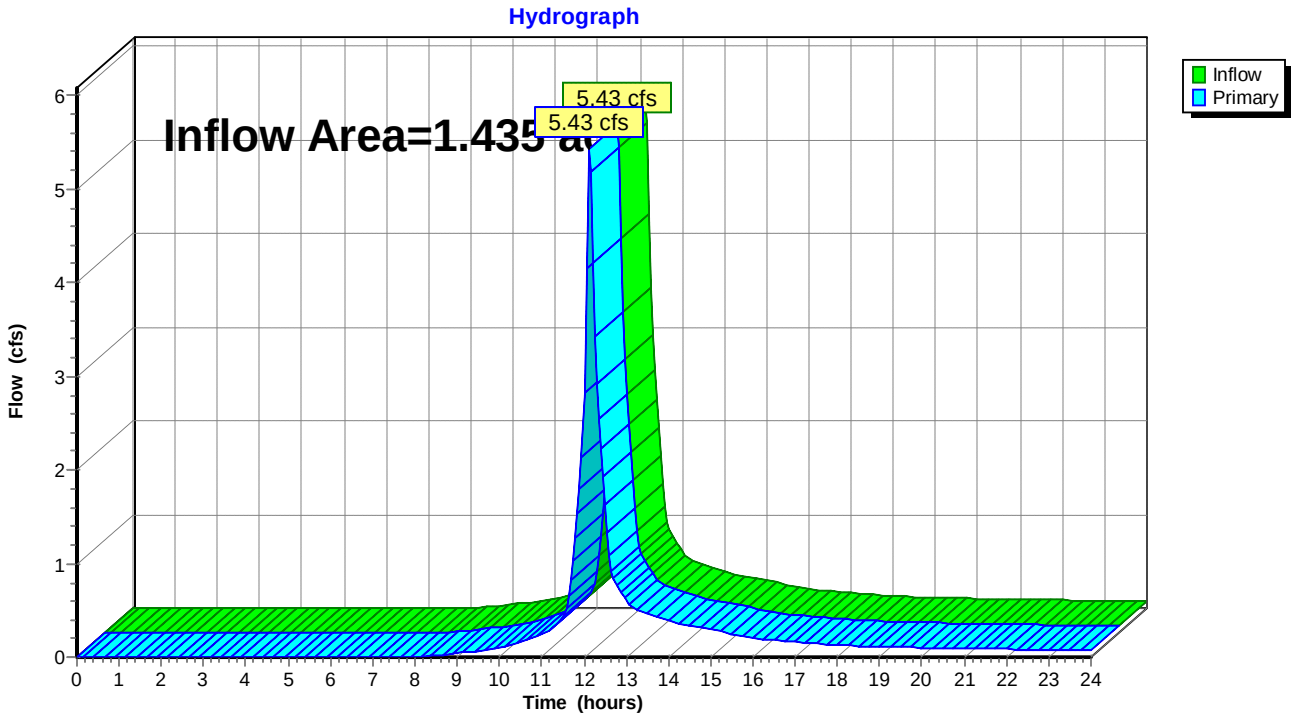


Summary for Link DP6: DP-6

Inflow Area = 1.435 ac, 2.87% Impervious, Inflow Depth > 3.53" for 50-Year event
Inflow = 5.43 cfs @ 12.12 hrs, Volume= 0.423 af
Primary = 5.43 cfs @ 12.12 hrs, Volume= 0.423 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP6: DP-6



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 EXDA1ND: EXDA-1 Runoff Area=850,940 sf 5.77% Impervious Runoff Depth>3.86"
Flow Length=2,225' Tc=61.0 min CN=72 Runoff=34.94 cfs 6.289 af

Subcatchment EXDA2AND: EXDA-2A Runoff Area=117,366 sf 0.00% Impervious Runoff Depth>3.89"
Flow Length=450' Tc=28.5 min CN=72 Runoff=7.15 cfs 0.874 af

Subcatchment EXDA2BND: EXDA-2B Runoff Area=183,271 sf 0.00% Impervious Runoff Depth>3.66"
Flow Length=1,050' Tc=46.7 min CN=70 Runoff=8.26 cfs 1.285 af

Subcatchment EXDA3ND: EXDA-3 Runoff Area=216,972 sf 7.60% Impervious Runoff Depth>3.99"
Flow Length=610' Tc=34.5 min CN=73 Runoff=12.42 cfs 1.658 af

Subcatchment EXDA4ND: EXDA-4 Runoff Area=38,901 sf 5.13% Impervious Runoff Depth>4.12"
Flow Length=400' Tc=13.0 min CN=74 Runoff=3.41 cfs 0.307 af

Subcatchment EXDA5ND: EXDA-5 Runoff Area=76,831 sf 11.76% Impervious Runoff Depth>4.45"
Flow Length=500' Tc=11.3 min CN=77 Runoff=7.66 cfs 0.654 af

Subcatchment EXDA6ND: EXDA-6 Runoff Area=62,500 sf 2.87% Impervious Runoff Depth>4.23"
Flow Length=350' Tc=8.3 min CN=75 Runoff=6.49 cfs 0.506 af

Link DP1: DP-1 Inflow=34.94 cfs 6.289 af
Primary=34.94 cfs 6.289 af

Link DP2A: DP-2A Inflow=7.15 cfs 0.874 af
Primary=7.15 cfs 0.874 af

Link DP2B: DP-2B Inflow=8.26 cfs 1.285 af
Primary=8.26 cfs 1.285 af

Link DP3: DP-3 Inflow=12.42 cfs 1.658 af
Primary=12.42 cfs 1.658 af

Link DP4: DP-4 Inflow=3.41 cfs 0.307 af
Primary=3.41 cfs 0.307 af

Link DP5: DP-5 Inflow=7.66 cfs 0.654 af
Primary=7.66 cfs 0.654 af

Link DP6: DP-6 Inflow=6.49 cfs 0.506 af
Primary=6.49 cfs 0.506 af

Total Runoff Area = 35.509 ac Runoff Volume = 11.572 af Average Runoff Depth = 3.91"
94.93% Pervious = 33.708 ac 5.07% Impervious = 1.801 ac

Summary for Subcatchment EXDA1ND: EXDA-1

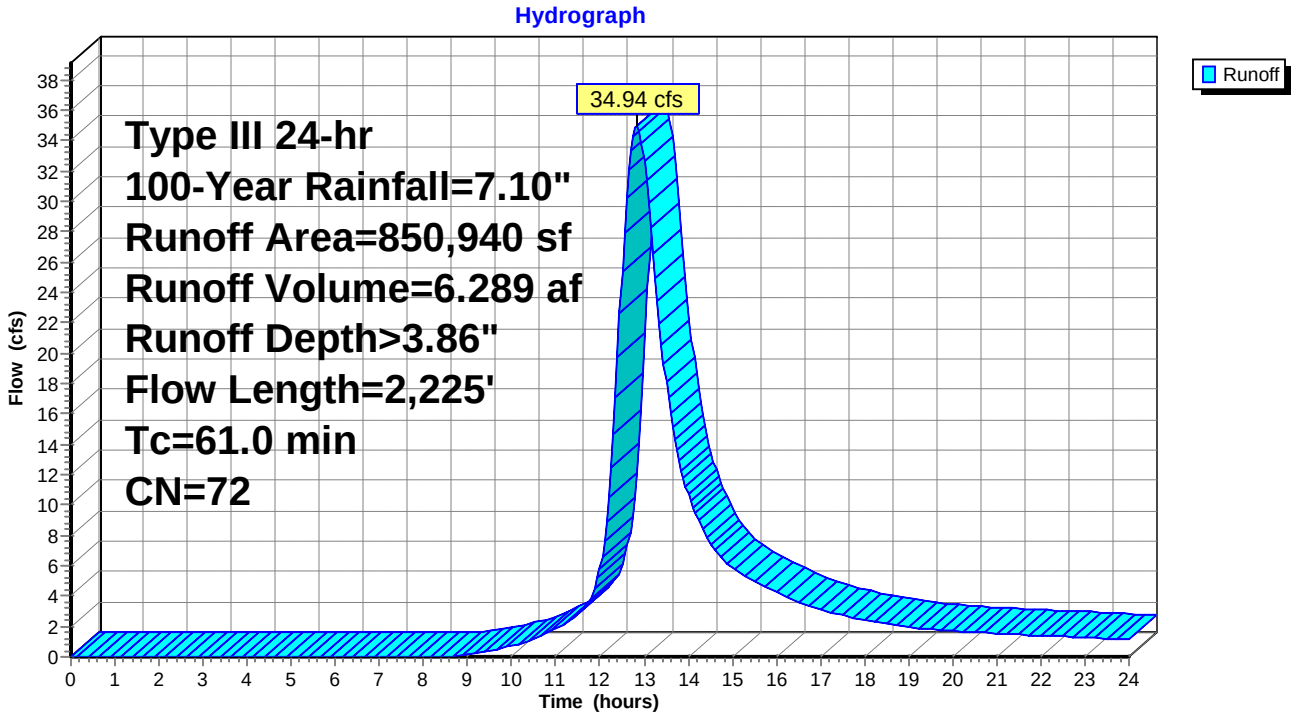
Runoff = 34.94 cfs @ 12.82 hrs, Volume= 6.289 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
635,511	70	Woods, Good, HSG C
148,147	74	Pasture/grassland/range, Good, HSG C
18,170	71	Meadow, non-grazed, HSG C
49,112	98	Impervious, HSG C
850,940	72	Weighted Average
801,828		94.23% Pervious Area
49,112		5.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
23.0	1,450	0.0440	1.05		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.0	525	0.0570	8.87	53.22	Channel Flow, Area= 6.0 sf Perim= 6.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides
61.0	2,225	Total			

Subcatchment EXDA1ND: EXDA-1



Summary for Subcatchment EXDA2AND: EXDA-2A

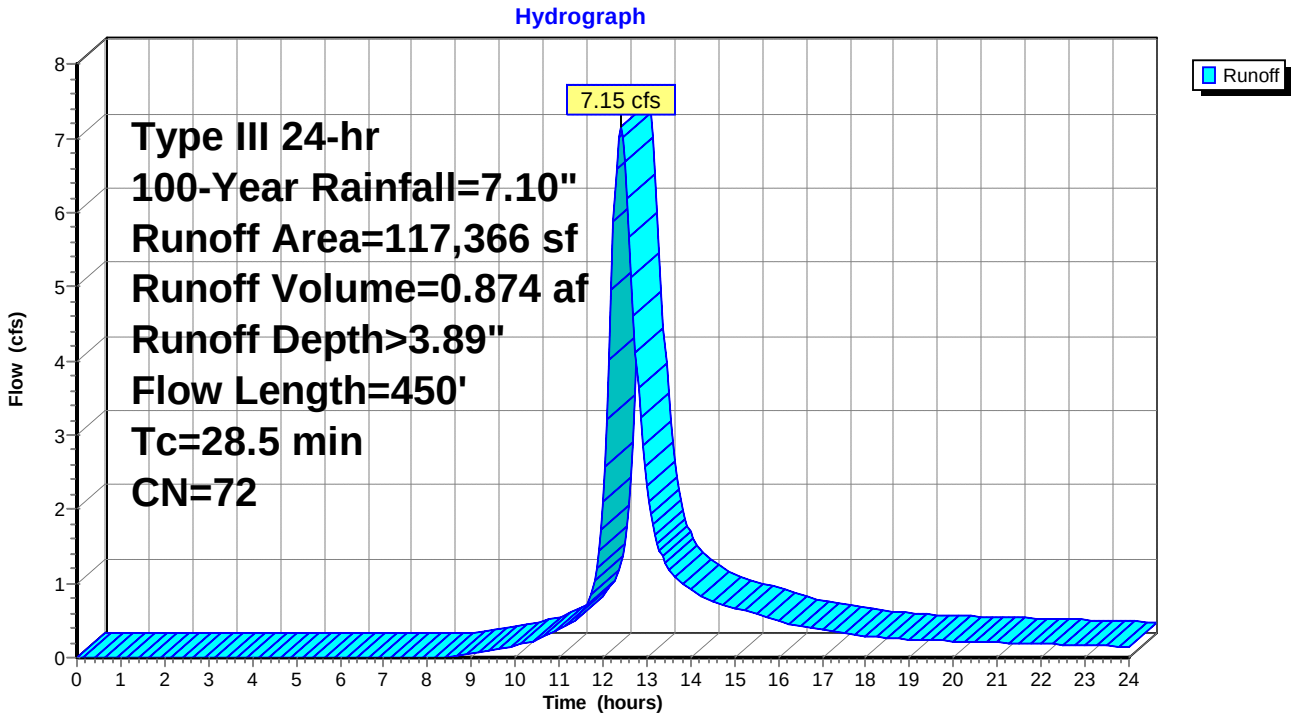
Runoff = 7.15 cfs @ 12.40 hrs, Volume= 0.874 af, Depth> 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
60,051	70	Woods, Good, HSG C
57,315	74	Pasture/grassland/range, Good, HSG C
117,366	72	Weighted Average
117,366		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.1	250	0.0700	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.4	200	0.2150	2.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
28.5	450	Total			

Subcatchment EXDA2AND: EXDA-2A



Summary for Subcatchment EXDA2BND: EXDA-2B

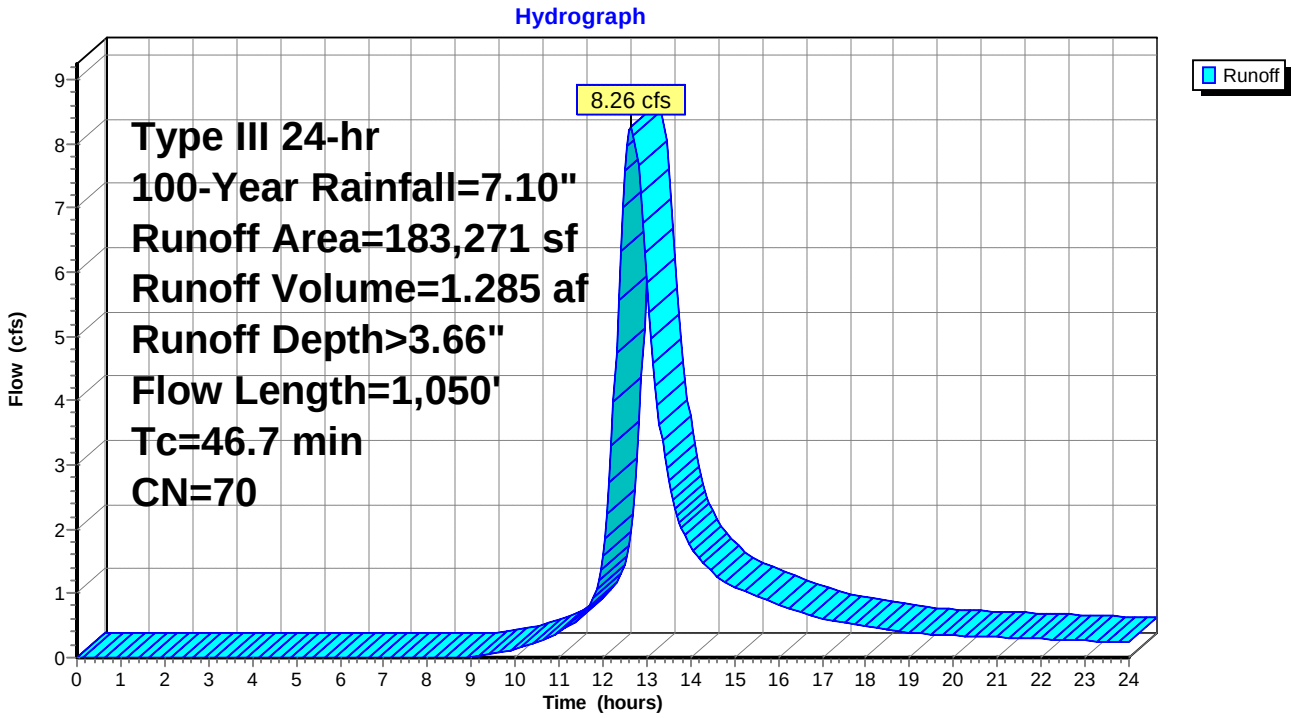
Runoff = 8.26 cfs @ 12.65 hrs, Volume= 1.285 af, Depth> 3.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
179,894	70	Woods, Good, HSG C
3,377	74	Pasture/grassland/range, Good, HSG C
183,271	70	Weighted Average
183,271		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.1	250	0.0340	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
10.6	800	0.0637	1.26		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
46.7	1,050	Total			

Subcatchment EXDA2BND: EXDA-2B



Summary for Subcatchment EXDA3ND: EXDA-3

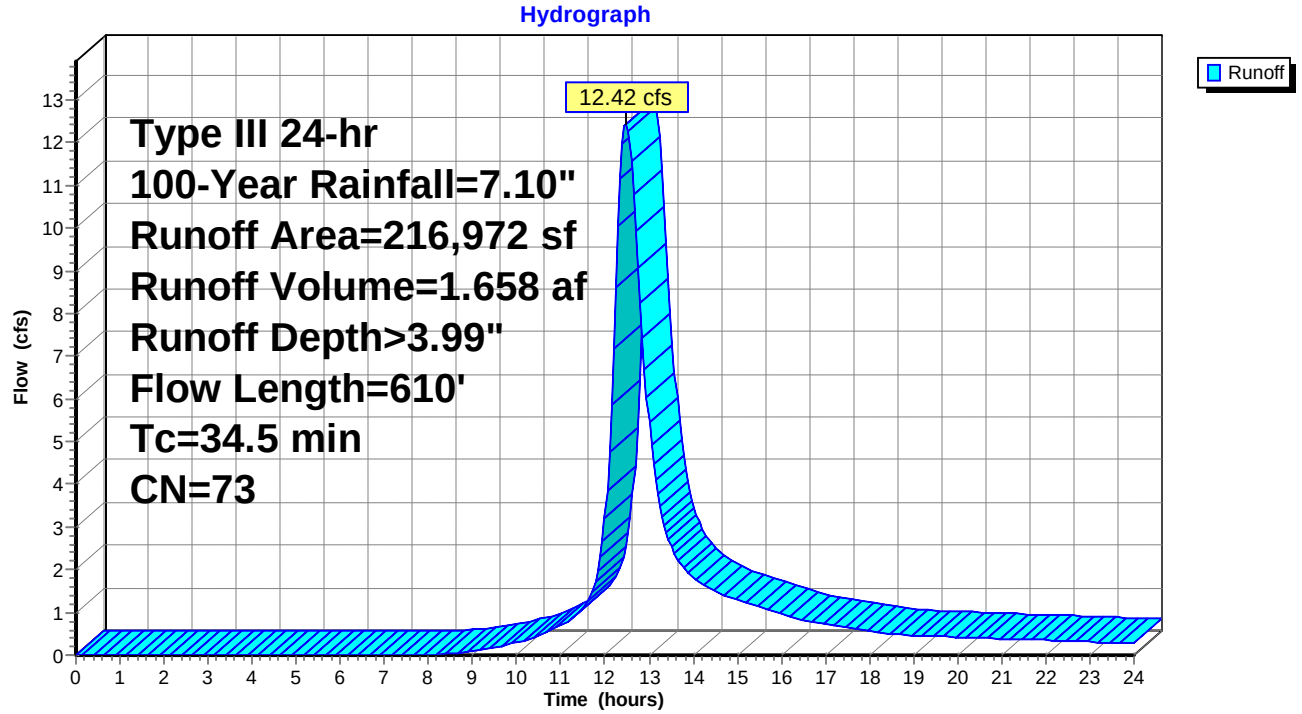
Runoff = 12.42 cfs @ 12.48 hrs, Volume= 1.658 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
56,418	70	Woods, Good, HSG C
132,061	71	Meadow, non-grazed, HSG C
11,996	74	Pasture/grassland/range, Good, HSG C
16,497	98	Impervious, HSG C
216,972	73	Weighted Average
200,475		92.40% Pervious Area
16,497		7.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.5	250	0.0520	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	360	0.0889	1.49		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
34.5	610	Total			

Subcatchment EXDA3ND: EXDA-3



Summary for Subcatchment EXDA4ND: EXDA-4

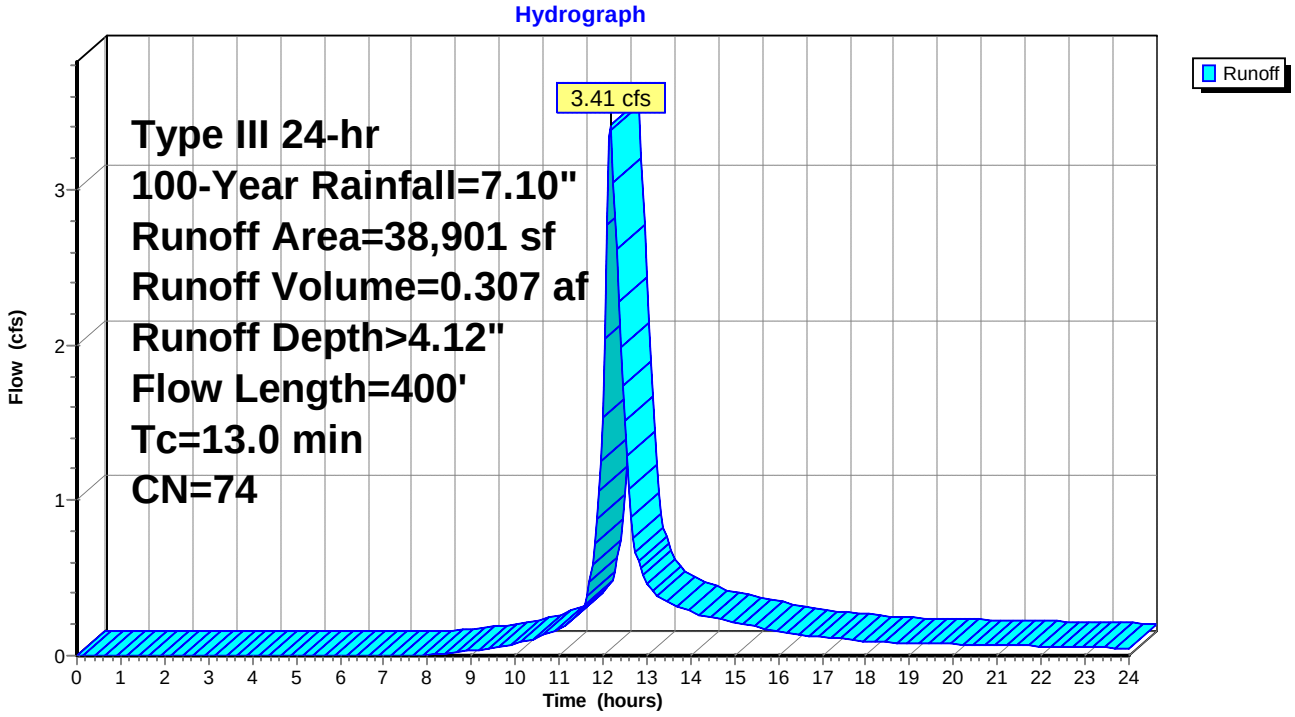
Runoff = 3.41 cfs @ 12.18 hrs, Volume= 0.307 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
	21,726	74	Pasture/grassland/range, Good, HSG C
	15,178	71	Meadow, non-grazed, HSG C
*	1,997	98	Impervious
	38,901	74	Weighted Average
	36,904		94.87% Pervious Area
	1,997		5.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	200	0.0500	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.2	200	0.1500	2.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.0	400	Total			

Subcatchment EXDA4ND: EXDA-4



Summary for Subcatchment EXDA5ND: EXDA-5

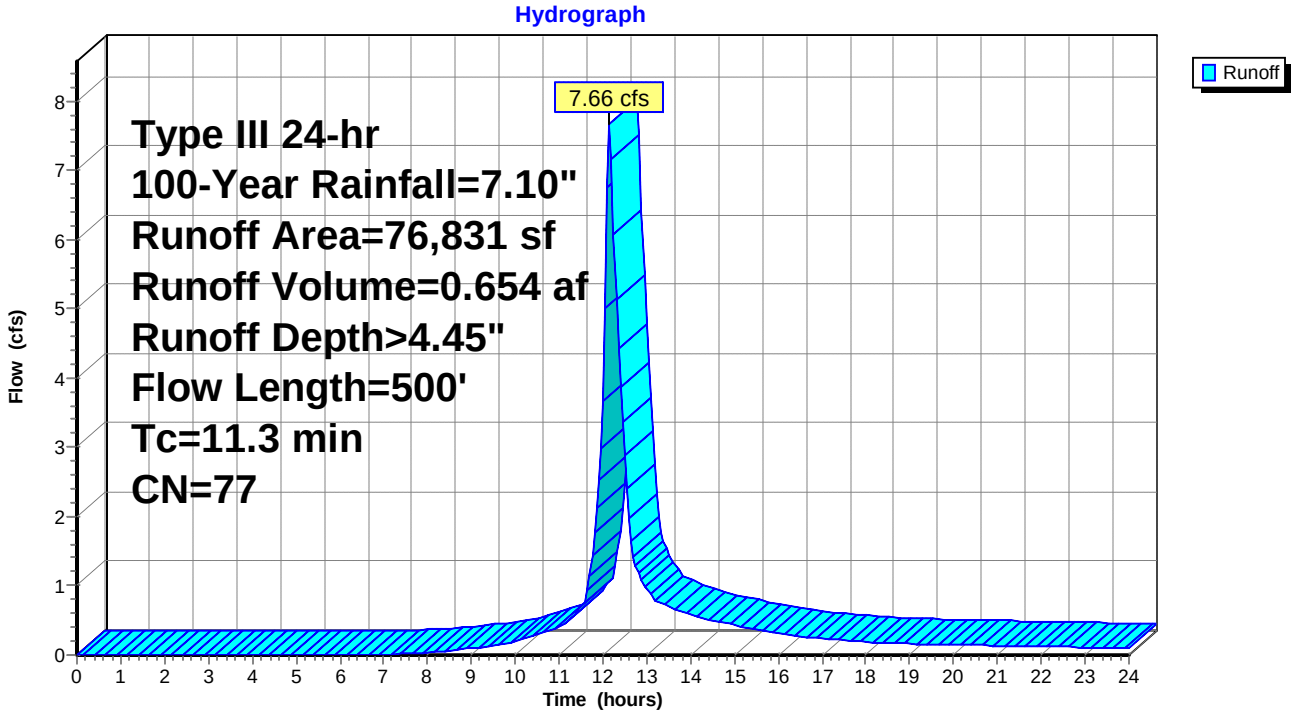
Runoff = 7.66 cfs @ 12.16 hrs, Volume= 0.654 af, Depth> 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
9,039	98	Impervious, HSG C
67,792	74	Pasture/grassland/range, Good, HSG C
76,831	77	Weighted Average
67,792		88.24% Pervious Area
9,039		11.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0400	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.0	350	0.1350	5.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.3	500	Total			

Subcatchment EXDA5ND: EXDA-5



Summary for Subcatchment EXDA6ND: EXDA-6

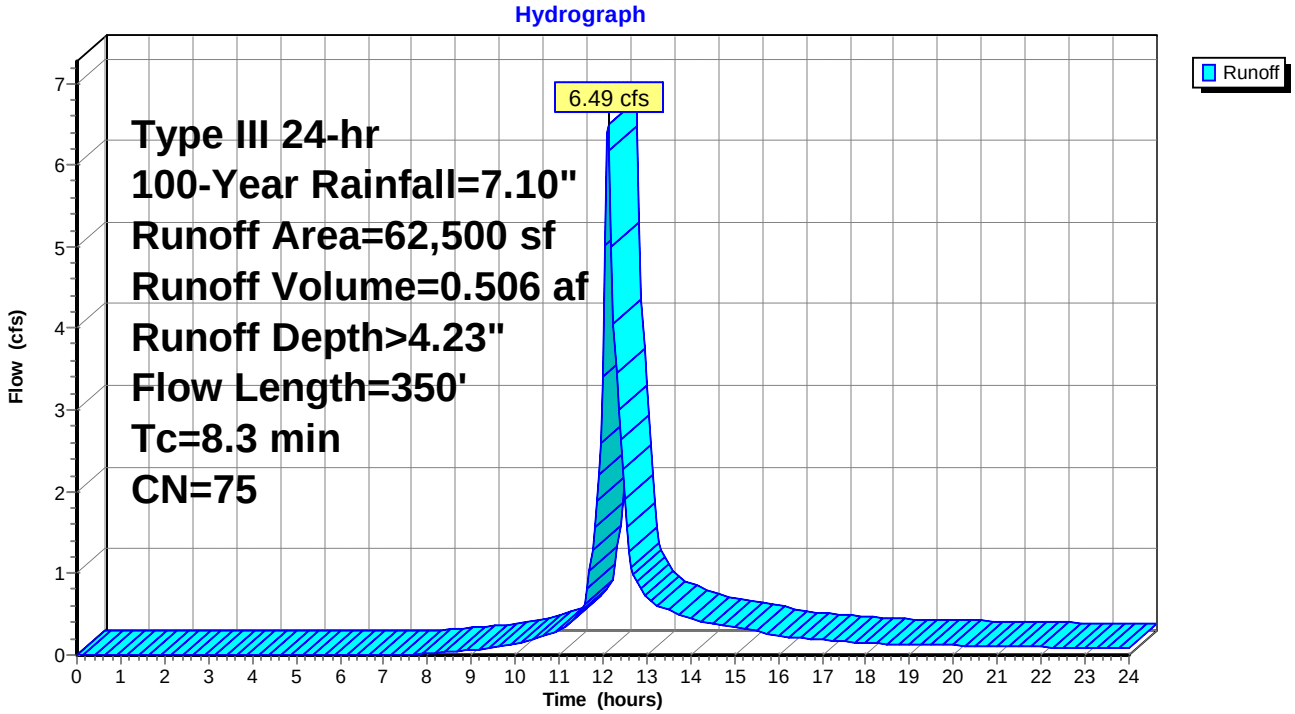
Runoff = 6.49 cfs @ 12.12 hrs, Volume= 0.506 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
60,704	74	Pasture/grassland/range, Good, HSG C
1,796	98	Impervious, HSG C
62,500	75	Weighted Average
60,704		97.13% Pervious Area
1,796		2.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0360	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
0.6	250	0.2050	7.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
8.3	350	Total			

Subcatchment EXDA6ND: EXDA-6

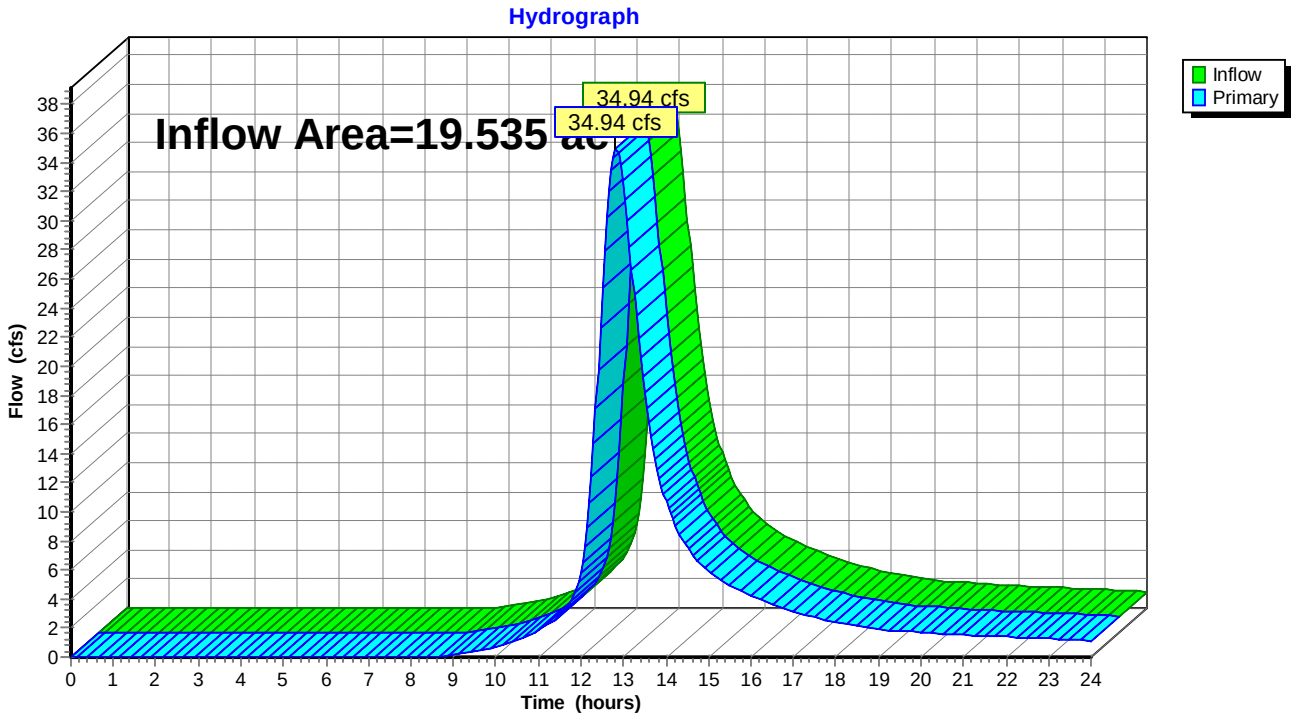


Summary for Link DP1: DP-1

Inflow Area = 19.535 ac, 5.77% Impervious, Inflow Depth > 3.86" for 100-Year event
Inflow = 34.94 cfs @ 12.82 hrs, Volume= 6.289 af
Primary = 34.94 cfs @ 12.82 hrs, Volume= 6.289 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DP-1

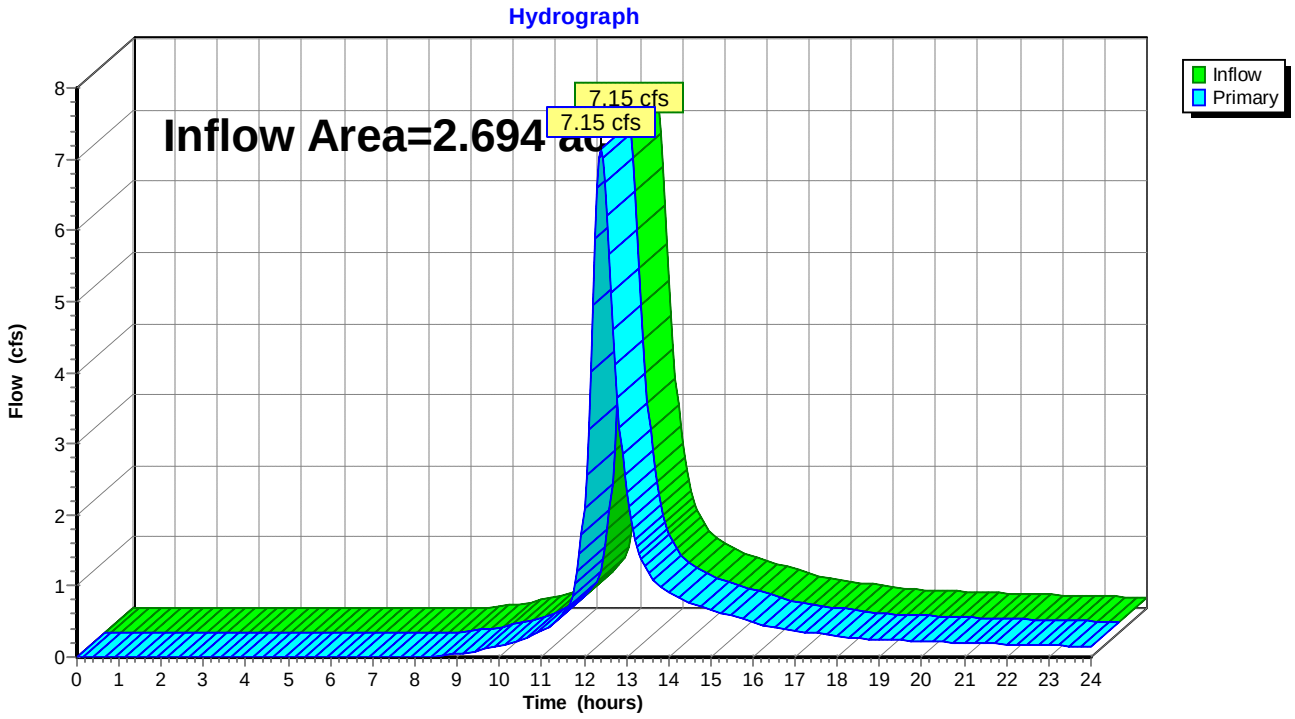


Summary for Link DP2A: DP-2A

Inflow Area = 2.694 ac, 0.00% Impervious, Inflow Depth > 3.89" for 100-Year event
Inflow = 7.15 cfs @ 12.40 hrs, Volume= 0.874 af
Primary = 7.15 cfs @ 12.40 hrs, Volume= 0.874 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2A: DP-2A

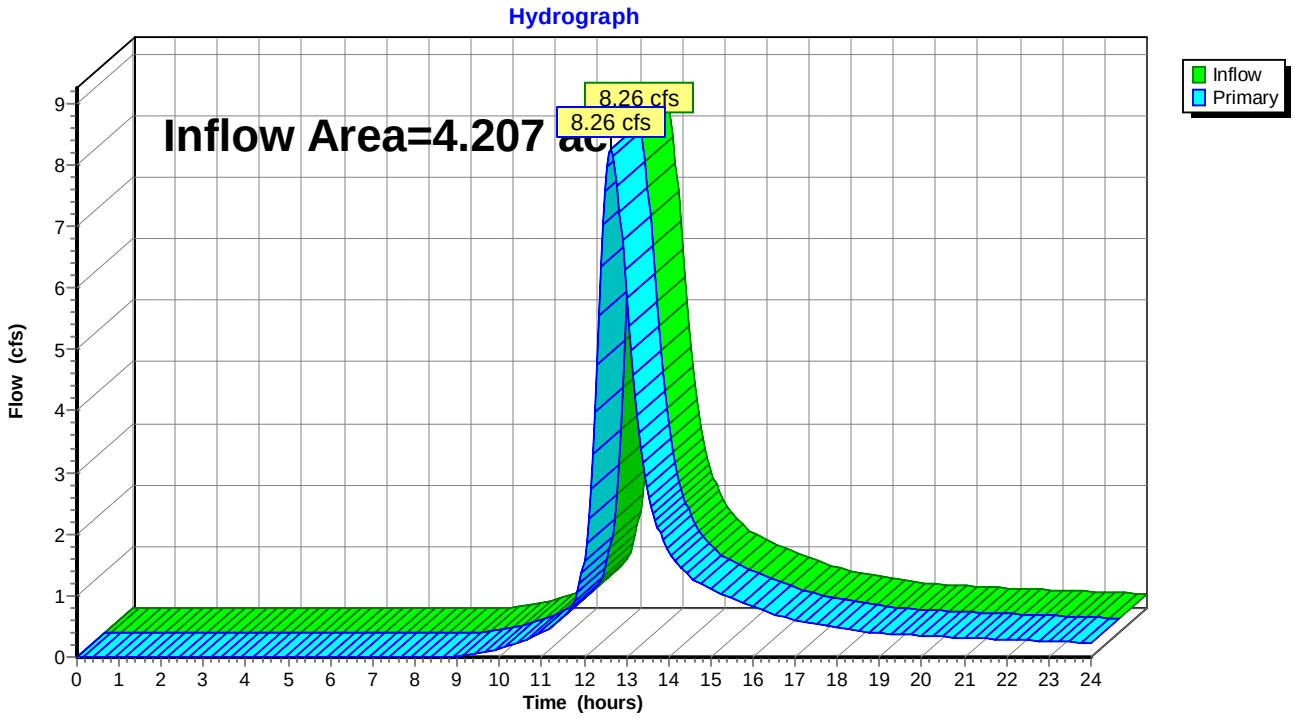


Summary for Link DP2B: DP-2B

Inflow Area = 4.207 ac, 0.00% Impervious, Inflow Depth > 3.66" for 100-Year event
Inflow = 8.26 cfs @ 12.65 hrs, Volume= 1.285 af
Primary = 8.26 cfs @ 12.65 hrs, Volume= 1.285 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2B: DP-2B

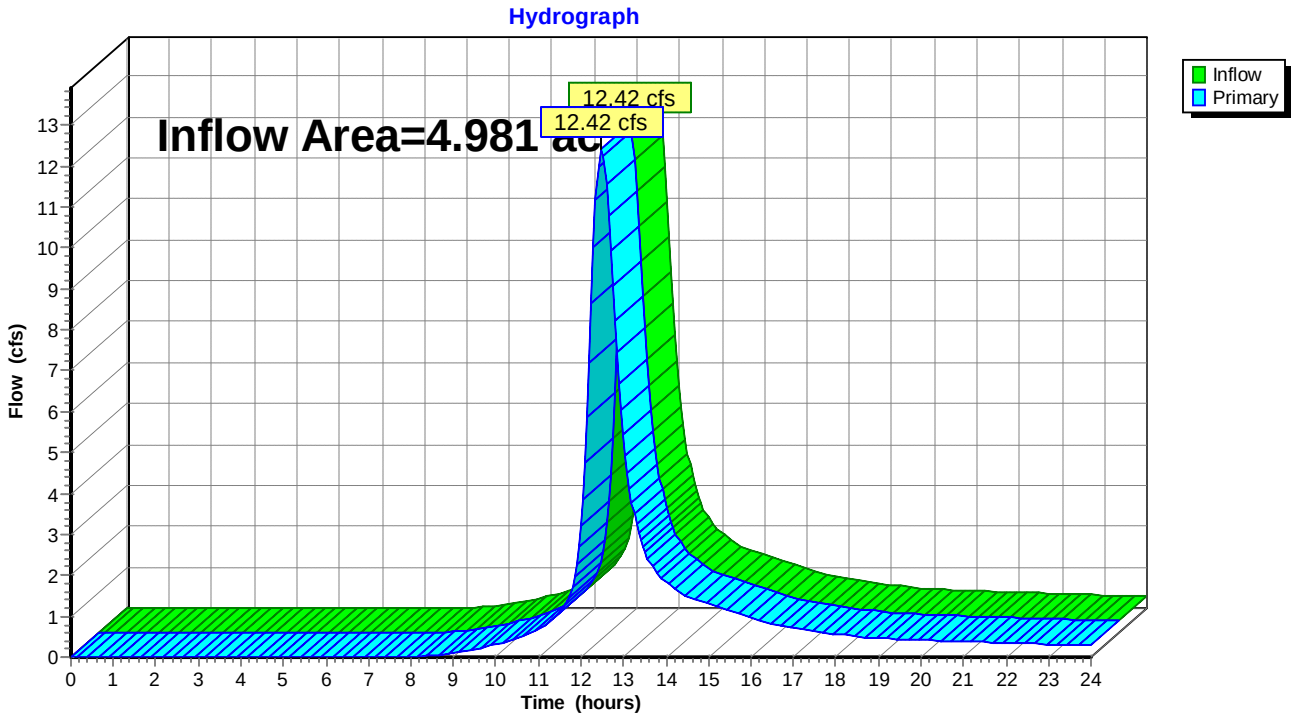


Summary for Link DP3: DP-3

Inflow Area = 4.981 ac, 7.60% Impervious, Inflow Depth > 3.99" for 100-Year event
Inflow = 12.42 cfs @ 12.48 hrs, Volume= 1.658 af
Primary = 12.42 cfs @ 12.48 hrs, Volume= 1.658 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: DP-3

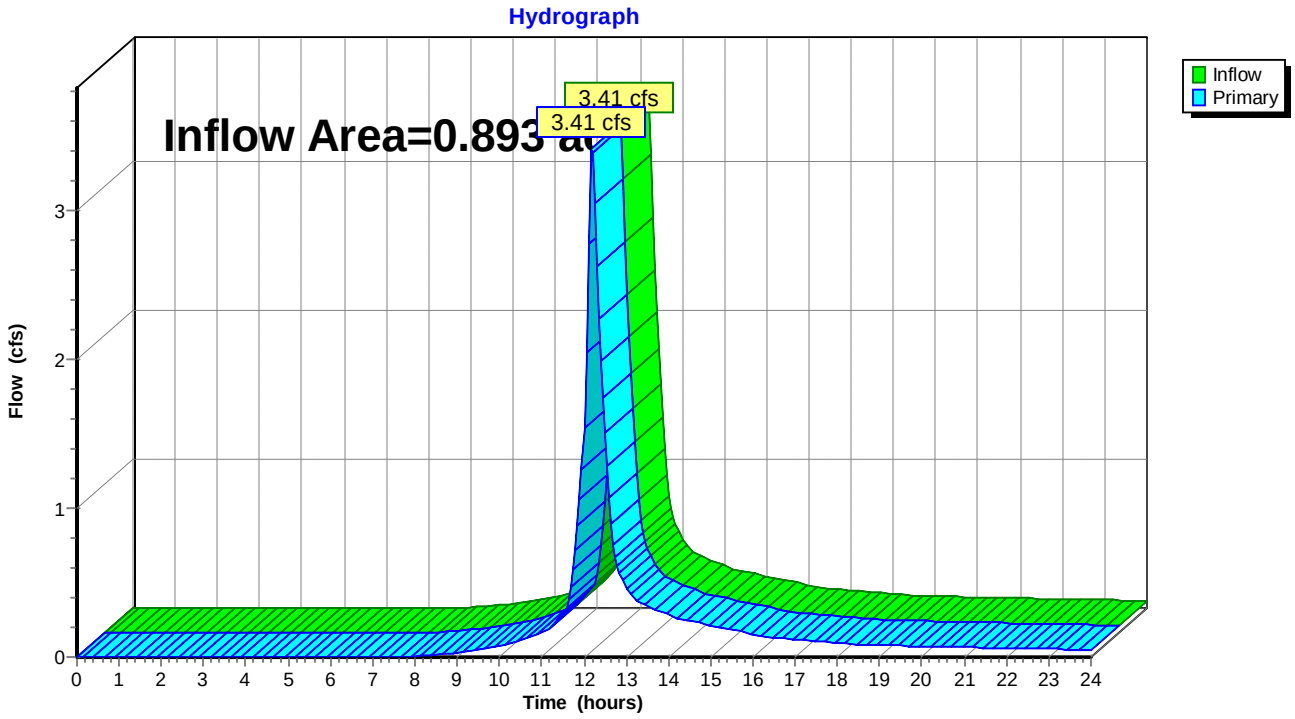


Summary for Link DP4: DP-4

Inflow Area = 0.893 ac, 5.13% Impervious, Inflow Depth > 4.12" for 100-Year event
Inflow = 3.41 cfs @ 12.18 hrs, Volume= 0.307 af
Primary = 3.41 cfs @ 12.18 hrs, Volume= 0.307 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP4: DP-4

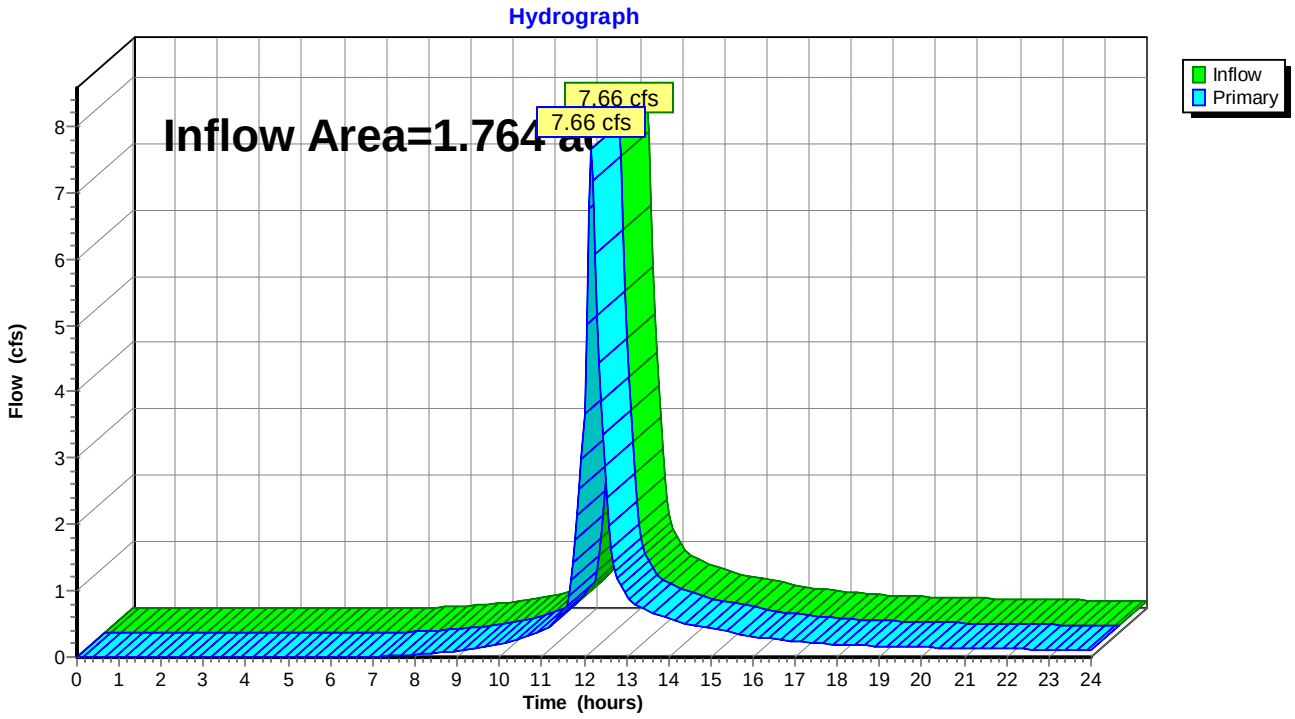


Summary for Link DP5: DP-5

Inflow Area = 1.764 ac, 11.76% Impervious, Inflow Depth > 4.45" for 100-Year event
Inflow = 7.66 cfs @ 12.16 hrs, Volume= 0.654 af
Primary = 7.66 cfs @ 12.16 hrs, Volume= 0.654 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP5: DP-5

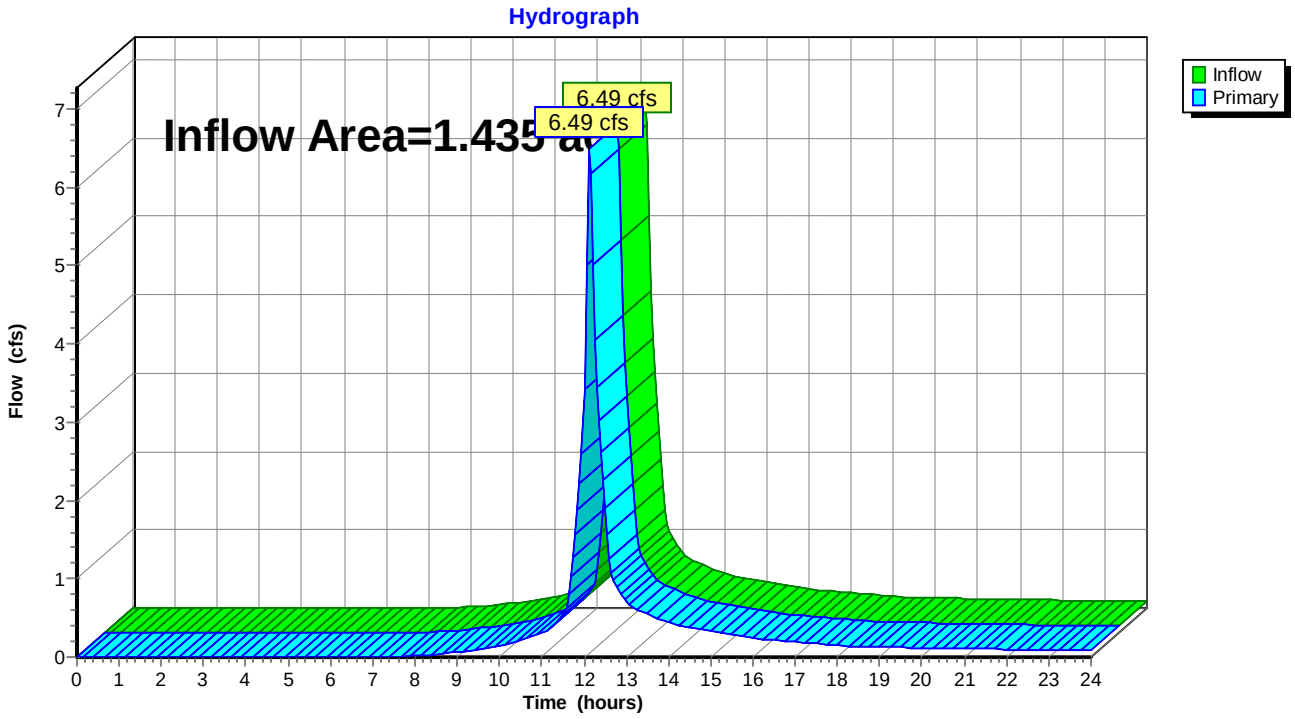


Summary for Link DP6: DP-6

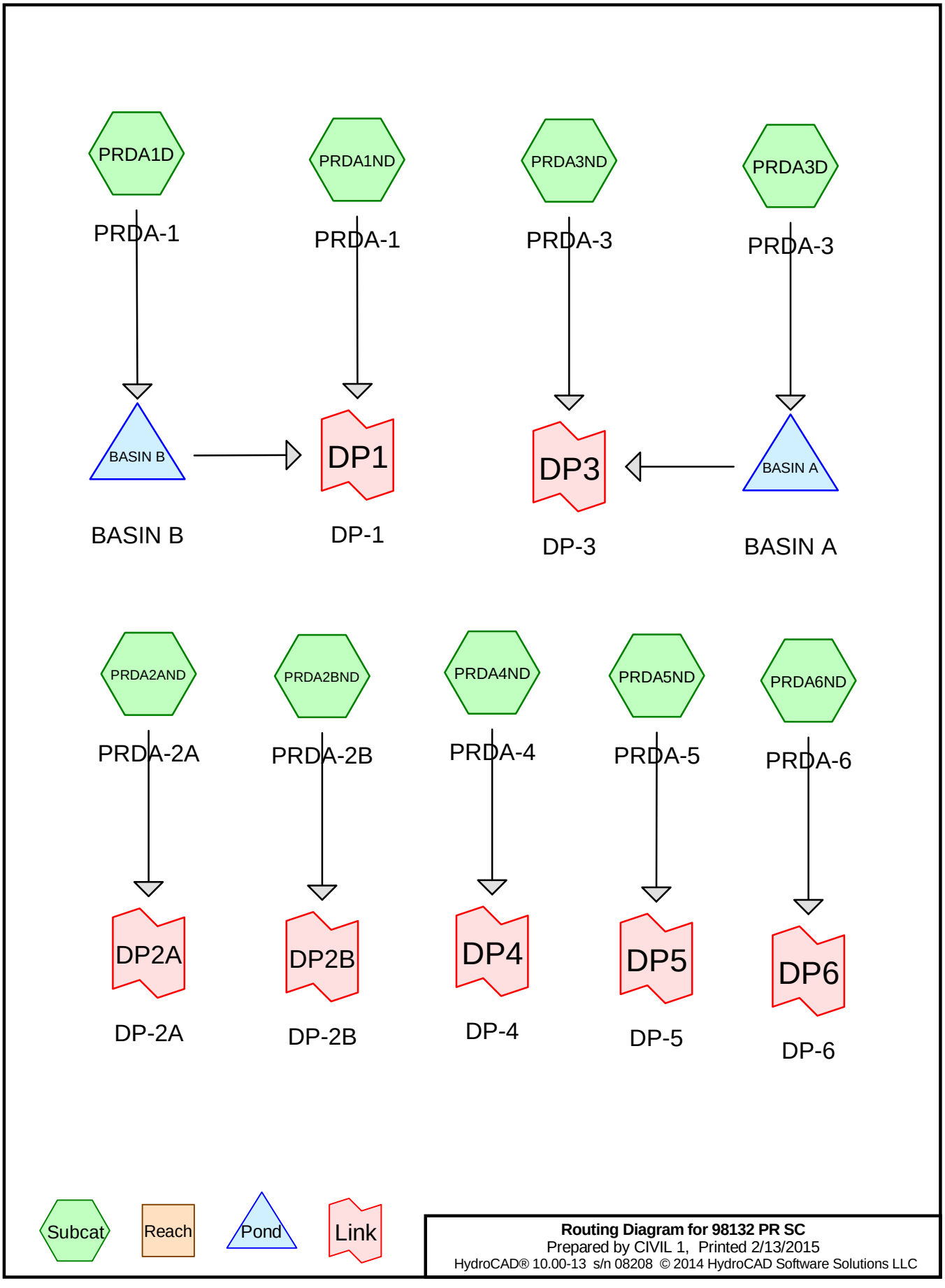
Inflow Area = 1.435 ac, 2.87% Impervious, Inflow Depth > 4.23" for 100-Year event
Inflow = 6.49 cfs @ 12.12 hrs, Volume= 0.506 af
Primary = 6.49 cfs @ 12.12 hrs, Volume= 0.506 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP6: DP-6



Attachment C – Proposed Conditions HydroCAD Routing



Routing Diagram for 98132 PR SC
Prepared by CIVIL 1, Printed 2/13/2015

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.638	75	Gravel, HSG C (PRDA1D, PRDA3D)
0.046	98	Impervious (PRDA4ND)
4.716	98	Impervious, HSG C (PRDA1D, PRDA1ND, PRDA3D, PRDA3ND, PRDA5ND, PRDA6ND)
13.568	74	Pasture/grassland/range, Good, HSG C (PRDA1D, PRDA1ND, PRDA2AND, PRDA2BND, PRDA3ND, PRDA4ND, PRDA5ND, PRDA6ND)
0.866	98	Roofs, HSG C (PRDA1D, PRDA3D)
1.380	98	Water Surface, HSG C (PRDA1D, PRDA3D)
5.932	70	Woods, Good, HSG C (PRDA1D, PRDA1ND, PRDA2AND, PRDA2BND)
35.146	78	TOTAL AREA

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
35.100	HSG C	PRDA1D, PRDA1ND, PRDA2AND, PRDA2BND, PRDA3D, PRDA3ND, PRDA4ND, PRDA5ND, PRDA6ND
0.000	HSG D	
0.046	Other	PRDA4ND
35.146		TOTAL AREA

Ground Covers (selected 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	8.638	0.000	0.000	8.638	Gravel	PRDA1D, PRDA3D
0.000	0.000	4.716	0.000	0.046	4.762	Impervious	PRDA1D, PRDA1ND, PRDA3D, PRDA3ND, PRDA4ND, PRDA5ND, PRDA6ND
0.000	0.000	13.568	0.000	0.000	13.568	Pasture/grassland/range, Good	PRDA1D, PRDA1ND, PRDA2AND, PRDA2BND, PRDA3ND, PRDA4ND, PRDA5ND, PRDA6ND
0.000	0.000	0.866	0.000	0.000	0.866	Roofs	PRDA1D, PRDA3D
0.000	0.000	1.380	0.000	0.000	1.380	Water Surface	PRDA1D, PRDA3D
0.000	0.000	5.932	0.000	0.000	5.932	Woods, Good	PRDA1D, PRDA1ND, PRDA2AND, PRDA2BND
0.000	0.000	35.100	0.000	0.046	35.146	TOTAL AREA	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	PRDA3D	0.00	0.00	1,200.0	0.0075	0.010	15.0	0.0	0.0
2	PRDA5ND	0.00	0.00	100.0	0.0100	0.010	15.0	0.0	0.0
3	BASIN A	820.00	786.00	250.0	0.1360	0.010	15.0	0.0	0.0
4	BASIN B	821.00	797.00	100.0	0.2400	0.010	18.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 PRDA1D: PRDA-1 — Runoff Area=360,934 sf 15.66% Impervious Runoff Depth>1.27"
Flow Length=850' Tc=42.4 min CN=77 Runoff=5.80 cfs 0.877 af

Subcatchment PRDA1ND: PRDA-1 — Runoff Area=430,511 sf 13.86% Impervious Runoff Depth>1.21"
Flow Length=1,775' Tc=42.9 min CN=76 Runoff=6.49 cfs 0.996 af

Subcatchment PRDA2AND: PRDA-2A — Runoff Area=103,805 sf 0.00% Impervious Runoff Depth>0.99"
Flow Length=400' Tc=24.1 min CN=72 Runoff=1.60 cfs 0.196 af

Subcatchment PRDA2BND: PRDA-2B — Runoff Area=85,134 sf 0.00% Impervious Runoff Depth>0.99"
Flow Length=300' Tc=17.4 min CN=72 Runoff=1.50 cfs 0.161 af

Subcatchment PRDA3D: PRDA-3 — Runoff Area=407,573 sf 36.10% Impervious Runoff Depth>1.69"
Flow Length=1,450' Tc=6.7 min CN=83 Runoff=17.85 cfs 1.318 af

Subcatchment PRDA3ND: PRDA-3 — Runoff Area=21,688 sf 76.07% Impervious Runoff Depth>2.44"
Flow Length=100' Slope=0.1100 '/' Tc=5.0 min CN=92 Runoff=1.40 cfs 0.101 af

Subcatchment PRDA4ND: PRDA-4 — Runoff Area=9,707 sf 20.57% Impervious Runoff Depth>1.41"
Flow Length=100' Slope=0.1100 '/' Tc=5.0 min CN=79 Runoff=0.37 cfs 0.026 af

Subcatchment PRDA5ND: PRDA-5 — Runoff Area=61,426 sf 22.51% Impervious Runoff Depth>1.41"
Flow Length=300' Tc=5.7 min CN=79 Runoff=2.28 cfs 0.166 af

Subcatchment PRDA6ND: PRDA-6 — Runoff Area=50,175 sf 19.16% Impervious Runoff Depth>1.41"
Flow Length=650' Tc=5.6 min CN=79 Runoff=1.87 cfs 0.135 af

Pond BASIN A: BASIN A — Peak Elev=820.95' Storage=30,992 cf Inflow=17.85 cfs 1.318 af
Outflow=1.32 cfs 1.008 af

Pond BASIN B: BASIN B — Peak Elev=822.40' Storage=15,365 cf Inflow=5.80 cfs 0.877 af
Outflow=1.82 cfs 0.798 af

Link DP1: DP-1 — Inflow=7.21 cfs 1.793 af
Primary=7.21 cfs 1.793 af

Link DP2A: DP-2A — Inflow=1.60 cfs 0.196 af
Primary=1.60 cfs 0.196 af

Link DP2B: DP-2B — Inflow=1.50 cfs 0.161 af
Primary=1.50 cfs 0.161 af

Link DP3: DP-3 — Inflow=1.99 cfs 1.109 af
Primary=1.99 cfs 1.109 af

Link DP4: DP-4 — Inflow=0.37 cfs 0.026 af
Primary=0.37 cfs 0.026 af

Link DP5: DP-5 Inflow=2.28 cfs 0.166 af
Primary=2.28 cfs 0.166 af

Link DP6: DP-6 Inflow=1.87 cfs 0.135 af
Primary=1.87 cfs 0.135 af

Total Runoff Area = 35.146 ac Runoff Volume = 3.976 af Average Runoff Depth = 1.36"
80.06% Pervious = 28.138 ac 19.94% Impervious = 7.008 ac

Summary for Subcatchment PRDA1D: PRDA-1

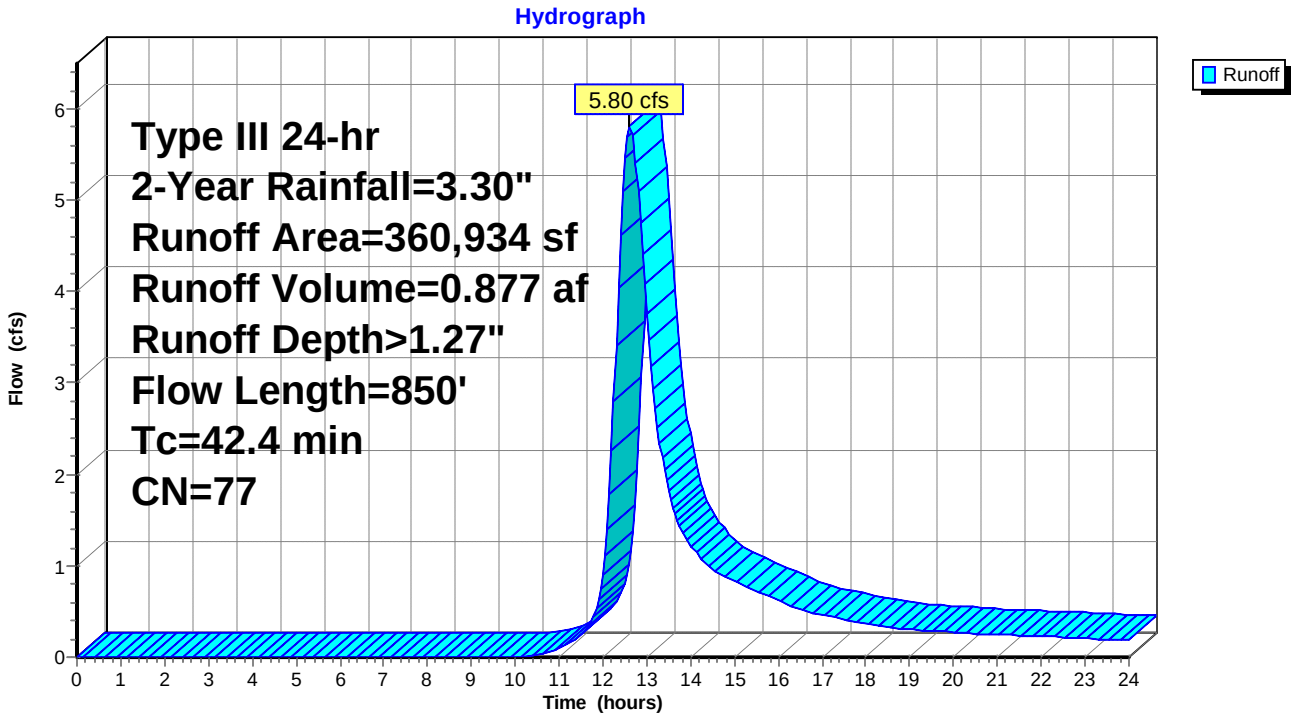
Runoff = 5.80 cfs @ 12.61 hrs, Volume= 0.877 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

	Area (sf)	CN	Description
	36,718	98	Impervious, HSG C
	1,151	98	Roofs, HSG C
	18,667	98	Water Surface, HSG C
	124,441	74	Pasture/grassland/range, Good, HSG C
*	115,820	75	Gravel, HSG C
	64,137	70	Woods, Good, HSG C
	360,934	77	Weighted Average
	304,398		84.34% Pervious Area
	56,536		15.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
5.4	600	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
42.4	850	Total			

Subcatchment PRDA1D: PRDA-1



Summary for Subcatchment PRDA1ND: PRDA-1

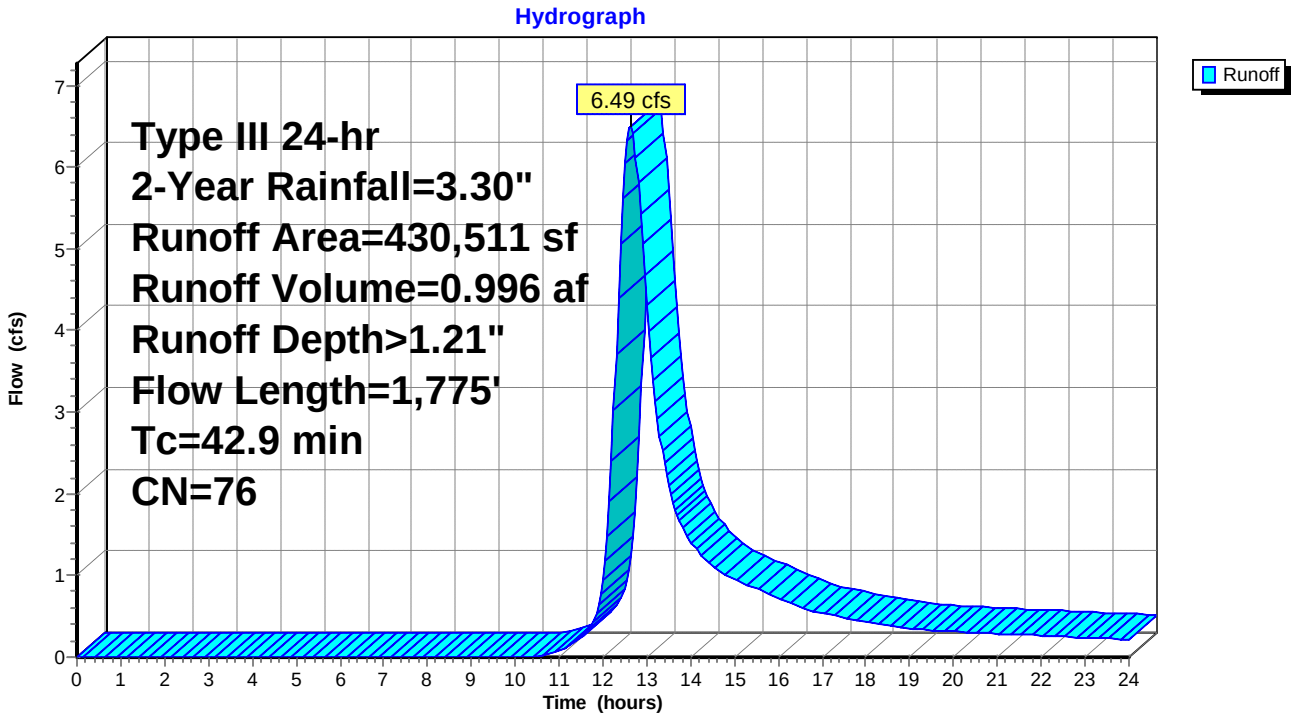
Runoff = 6.49 cfs @ 12.63 hrs, Volume= 0.996 af, Depth> 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
114,584	70	Woods, Good, HSG C
256,245	74	Pasture/grassland/range, Good, HSG C
59,682	98	Impervious, HSG C
430,511	76	Weighted Average
370,829		86.14% Pervious Area
59,682		13.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
4.9	1,000	0.0440	3.38		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.0	525	0.0570	8.87	53.22	Channel Flow, Area= 6.0 sf Perim= 6.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides
42.9	1,775	Total			

Subcatchment PRDA1ND: PRDA-1



Summary for Subcatchment PRDA2AND: PRDA-2A

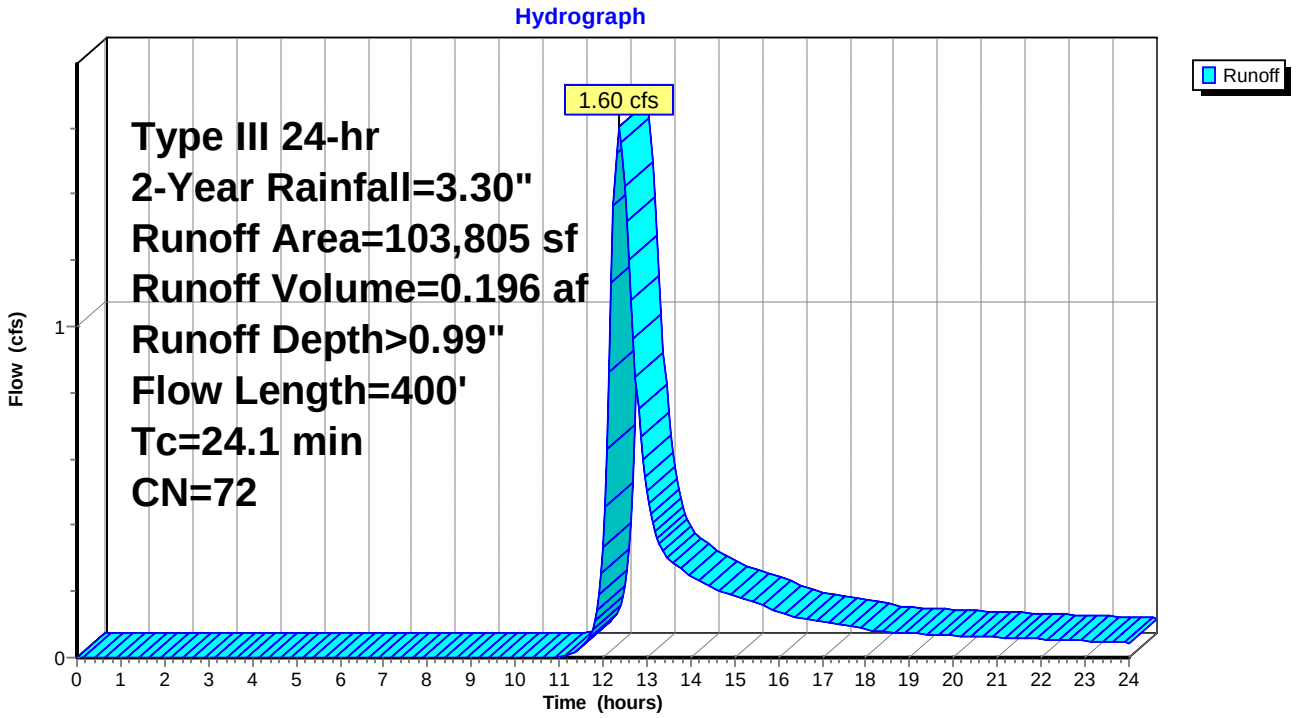
Runoff = 1.60 cfs @ 12.37 hrs, Volume= 0.196 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
46,490	70	Woods, Good, HSG C
57,315	74	Pasture/grassland/range, Good, HSG C
103,805	72	Weighted Average
103,805		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.1	250	0.1040	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	150	0.2400	2.45		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.1	400	Total			

Subcatchment PRDA2AND: PRDA-2A



Summary for Subcatchment PRDA2BND: PRDA-2B

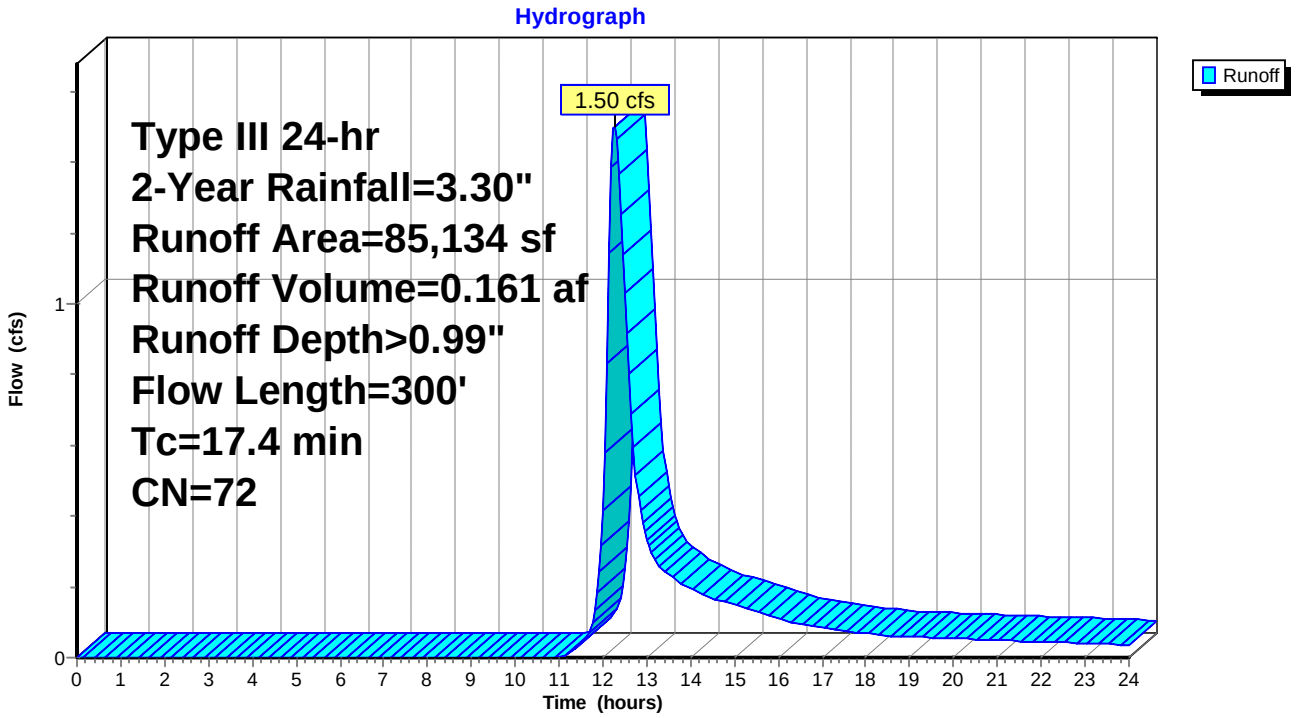
Runoff = 1.50 cfs @ 12.26 hrs, Volume= 0.161 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
33,200	70	Woods, Good, HSG C
51,934	74	Pasture/grassland/range, Good, HSG C
85,134	72	Weighted Average
85,134		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	200	0.1650	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	100	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.4	300	Total			

Subcatchment PRDA2BND: PRDA-2B



Summary for Subcatchment PRDA3D: PRDA-3

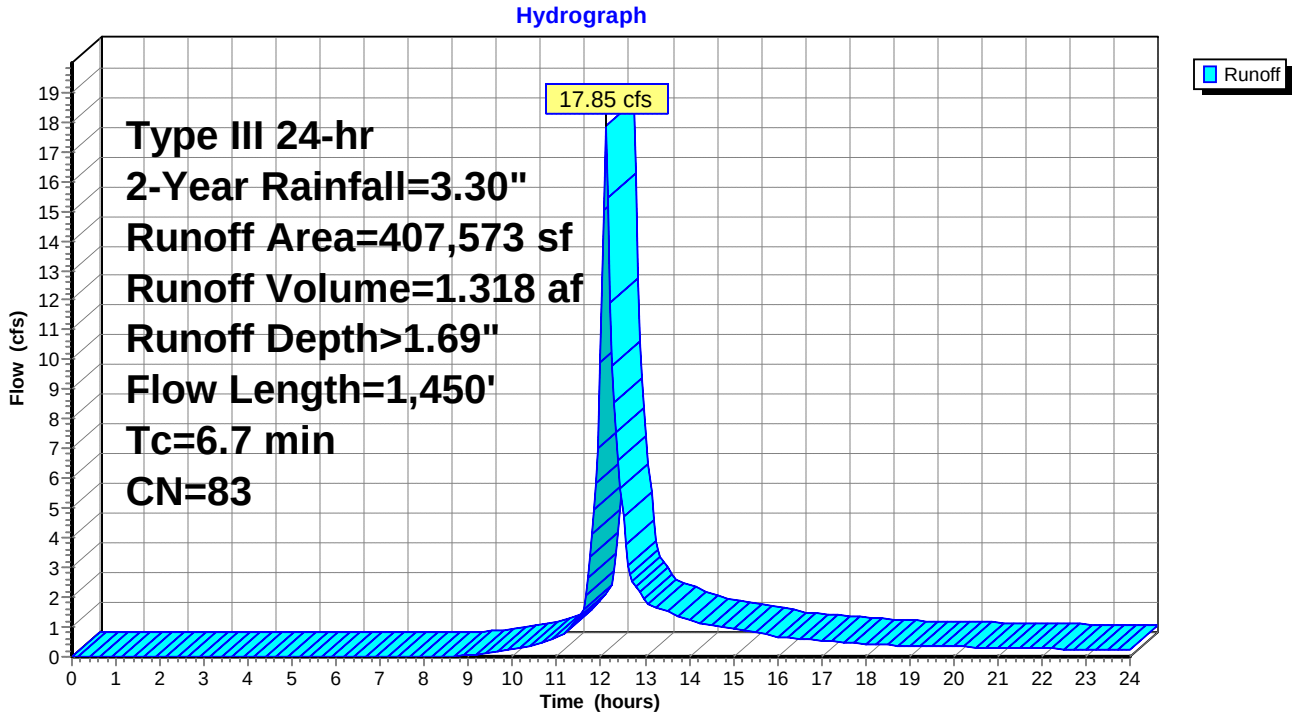
Runoff = 17.85 cfs @ 12.10 hrs, Volume= 1.318 af, Depth> 1.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

	Area (sf)	CN	Description
	69,087	98	Impervious, HSG C
	36,569	98	Roofs, HSG C
	41,458	98	Water Surface, HSG C
*	260,459	75	Gravel, HSG C
	407,573	83	Weighted Average
	260,459		63.90% Pervious Area
	147,114		36.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	250	0.0100	1.25		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.20"
3.4	1,200	0.0075	5.93	7.27	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
6.7	1,450	Total			

Subcatchment PRDA3D: PRDA-3



Summary for Subcatchment PRDA3ND: PRDA-3

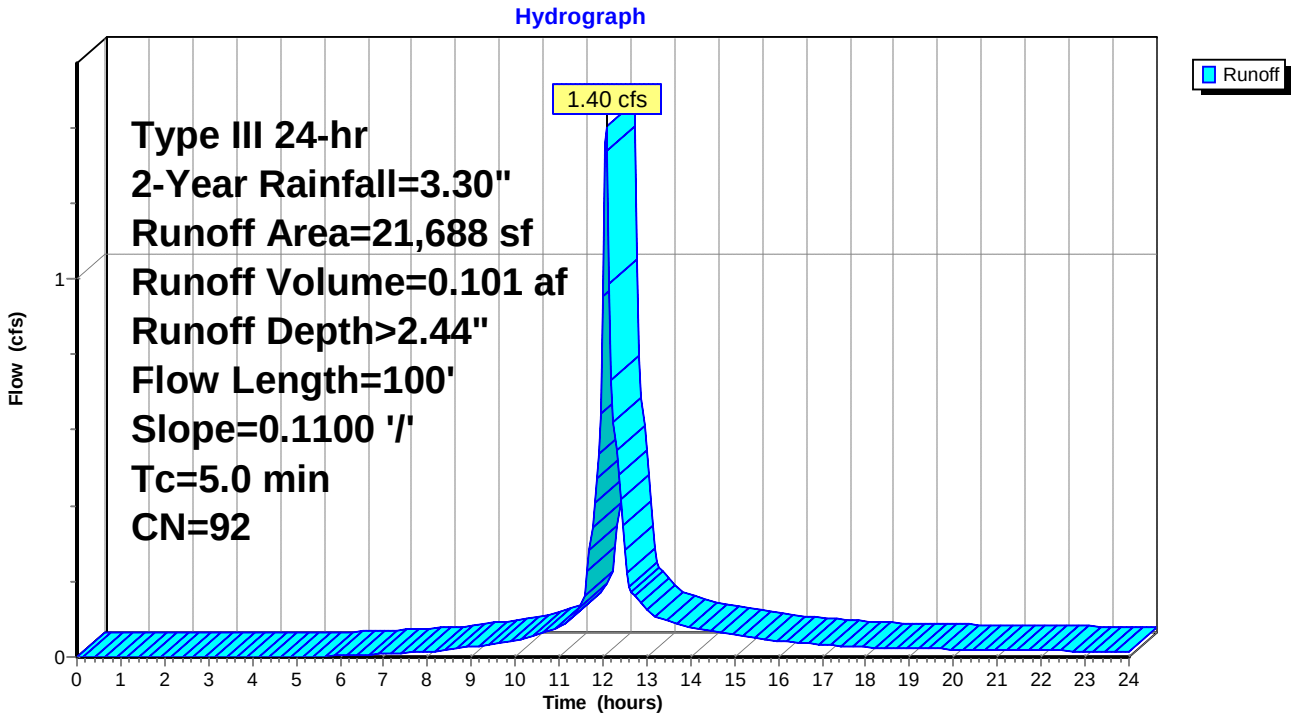
Runoff = 1.40 cfs @ 12.07 hrs, Volume= 0.101 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
5,191	74	Pasture/grassland/range, Good, HSG C
16,497	98	Impervious, HSG C
21,688	92	Weighted Average
5,191		23.93% Pervious Area
16,497		76.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"

Subcatchment PRDA3ND: PRDA-3



Summary for Subcatchment PRDA4ND: PRDA-4

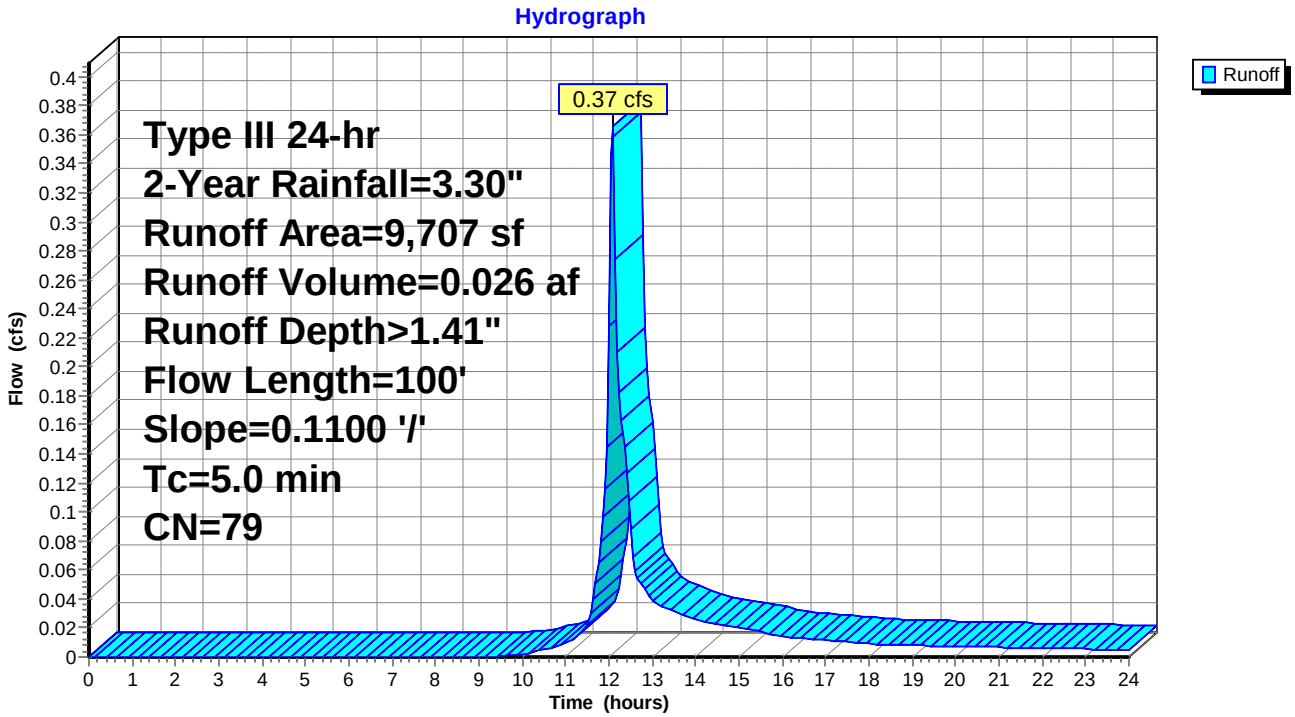
Runoff = 0.37 cfs @ 12.08 hrs, Volume= 0.026 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

	Area (sf)	CN	Description
	7,710	74	Pasture/grassland/range, Good, HSG C
*	1,997	98	Impervious
	9,707	79	Weighted Average
	7,710		79.43% Pervious Area
	1,997		20.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"

Subcatchment PRDA4ND: PRDA-4



Summary for Subcatchment PRDA5ND: PRDA-5

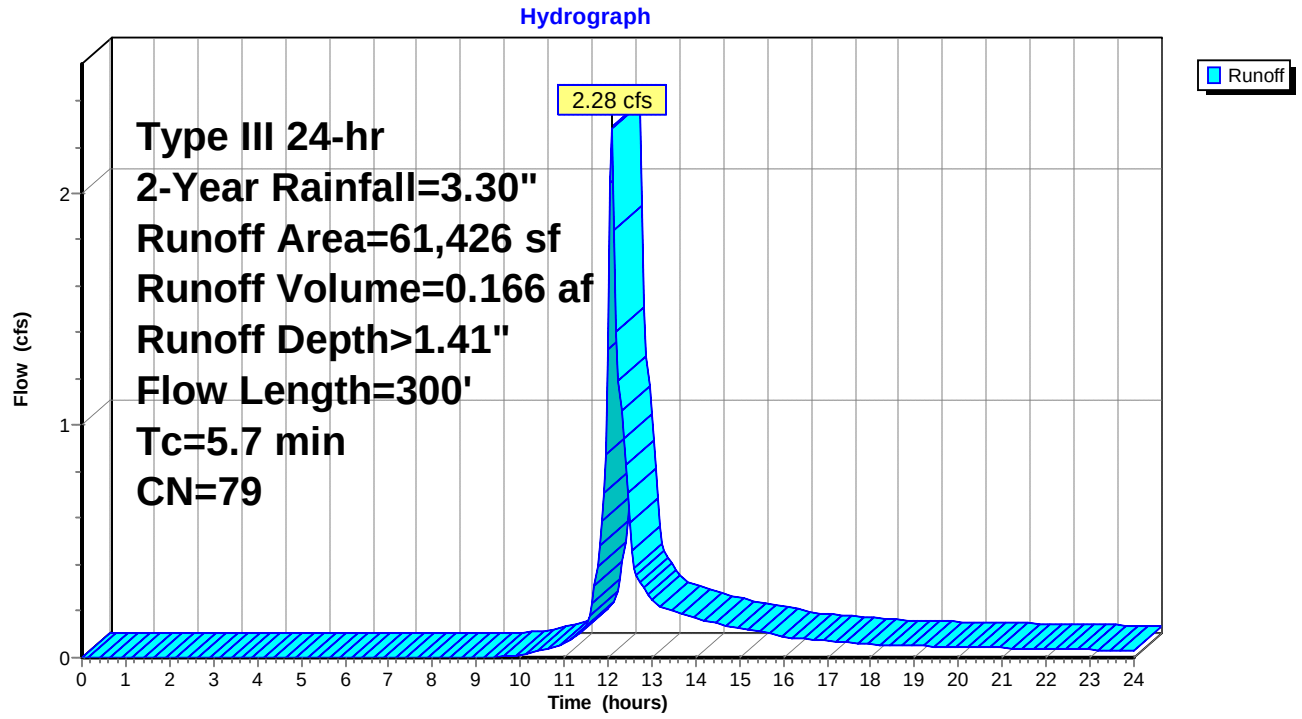
Runoff = 2.28 cfs @ 12.09 hrs, Volume= 0.166 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
13,824	98	Impervious, HSG C
47,602	74	Pasture/grassland/range, Good, HSG C
61,426	79	Weighted Average
47,602		77.49% Pervious Area
13,824		22.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	200	0.3333	0.60		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
0.2	100	0.0100	6.84	8.40	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
5.7	300	Total			

Subcatchment PRDA5ND: PRDA-5



Summary for Subcatchment PRDA6ND: PRDA-6

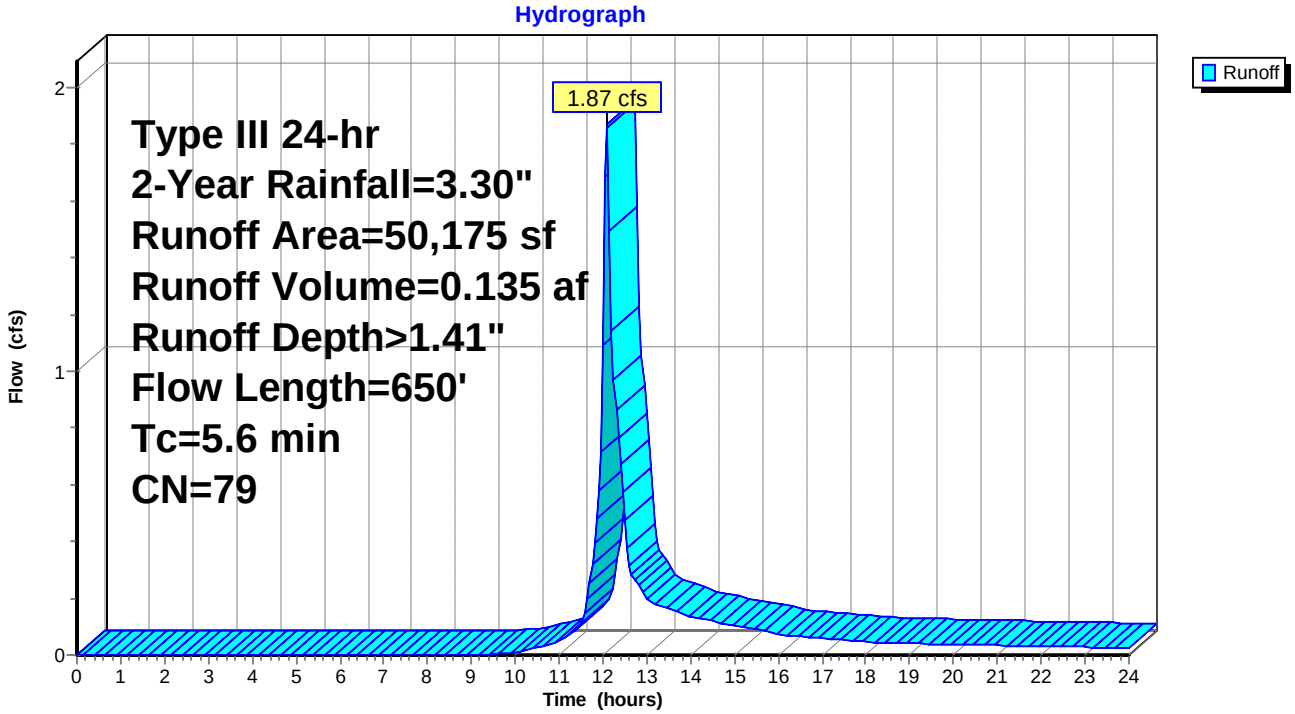
Runoff = 1.87 cfs @ 12.09 hrs, Volume= 0.135 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
40,563	74	Pasture/grassland/range, Good, HSG C
9,612	98	Impervious, HSG C
50,175	79	Weighted Average
40,563		80.84% Pervious Area
9,612		19.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	150	0.3333	0.57		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.2	500	0.2050	6.79		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
5.6	650	Total			

Subcatchment PRDA6ND: PRDA-6



Summary for Pond BASIN A: BASIN A

Inflow Area = 9.357 ac, 36.10% Impervious, Inflow Depth > 1.69" for 2-Year event
Inflow = 17.85 cfs @ 12.10 hrs, Volume= 1.318 af
Outflow = 1.32 cfs @ 13.84 hrs, Volume= 1.008 af, Atten= 93%, Lag= 104.4 min
Primary = 1.32 cfs @ 13.84 hrs, Volume= 1.008 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 820.95' @ 13.84 hrs Surf.Area= 34,112 sf Storage= 30,992 cf

Plug-Flow detention time= 284.2 min calculated for 1.006 af (76% of inflow)
Center-of-Mass det. time= 199.4 min (1,030.8 - 831.5)

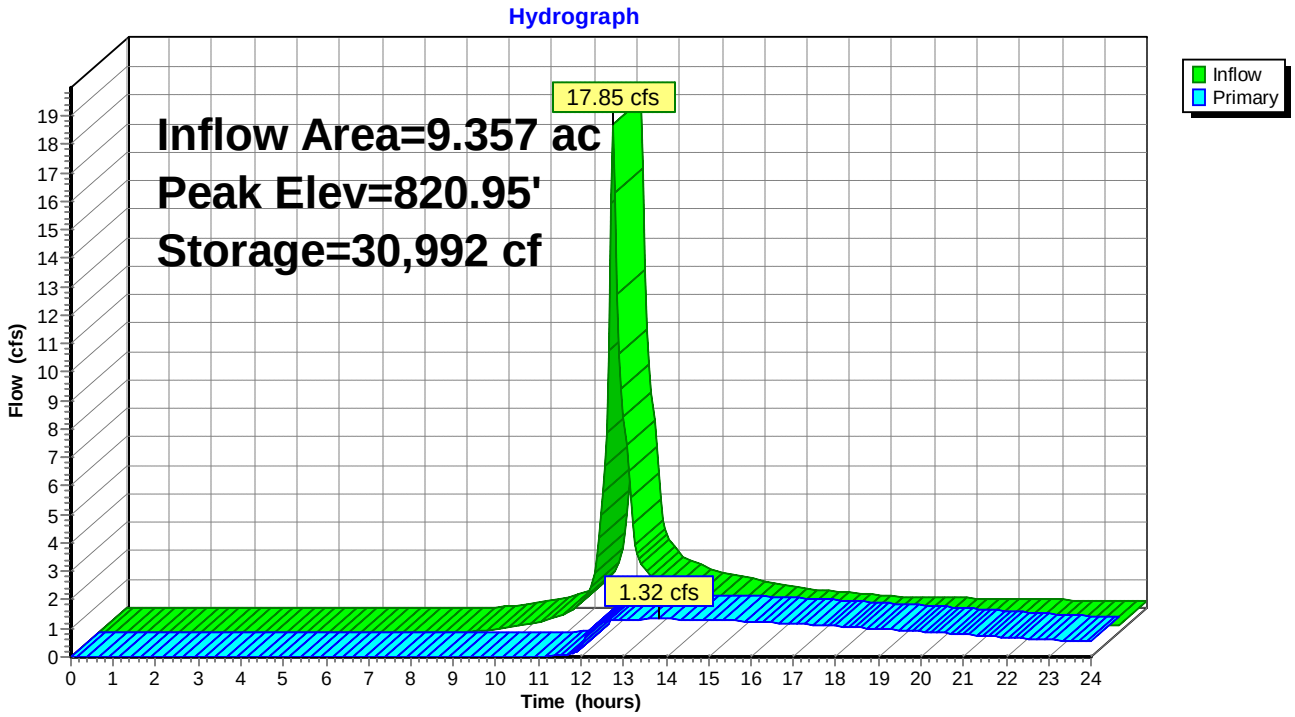
Volume	Invert	Avail.Storage	Storage Description
#1	820.00'	151,470 cf	Basin A (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
820.00	30,856	1,150.0	0	0	30,856
822.00	37,867	1,187.0	68,603	68,603	38,123
824.00	45,105	1,225.0	82,867	151,470	45,805

Device	Routing	Invert	Outlet Devices
#1	Primary	820.00'	15.0" Round Culvert L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 820.00' / 786.00' S= 0.1360 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	820.00'	8.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	822.00'	15.0" W x 12.0" H Vert. Orifice/Grate X 2.00 C= 0.600

Primary OutFlow Max=1.32 cfs @ 13.84 hrs HW=820.95' (Free Discharge)
└1=Culvert (Passes 1.32 cfs of 3.34 cfs potential flow)
  ├2=Orifice/Grate (Orifice Controls 1.32 cfs @ 3.79 fps)
  └3=Orifice/Grate (Controls 0.00 cfs)

Pond BASIN A: BASIN A



Summary for Pond BASIN B: BASIN B

Inflow Area = 8.286 ac, 15.66% Impervious, Inflow Depth > 1.27" for 2-Year event
Inflow = 5.80 cfs @ 12.61 hrs, Volume= 0.877 af
Outflow = 1.82 cfs @ 13.50 hrs, Volume= 0.798 af, Atten= 69%, Lag= 53.2 min
Primary = 1.82 cfs @ 13.50 hrs, Volume= 0.798 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 822.40' @ 13.50 hrs Surf.Area= 12,535 sf Storage= 15,365 cf

Plug-Flow detention time= 166.5 min calculated for 0.798 af (91% of inflow)
Center-of-Mass det. time= 123.8 min (1,002.1 - 878.3)

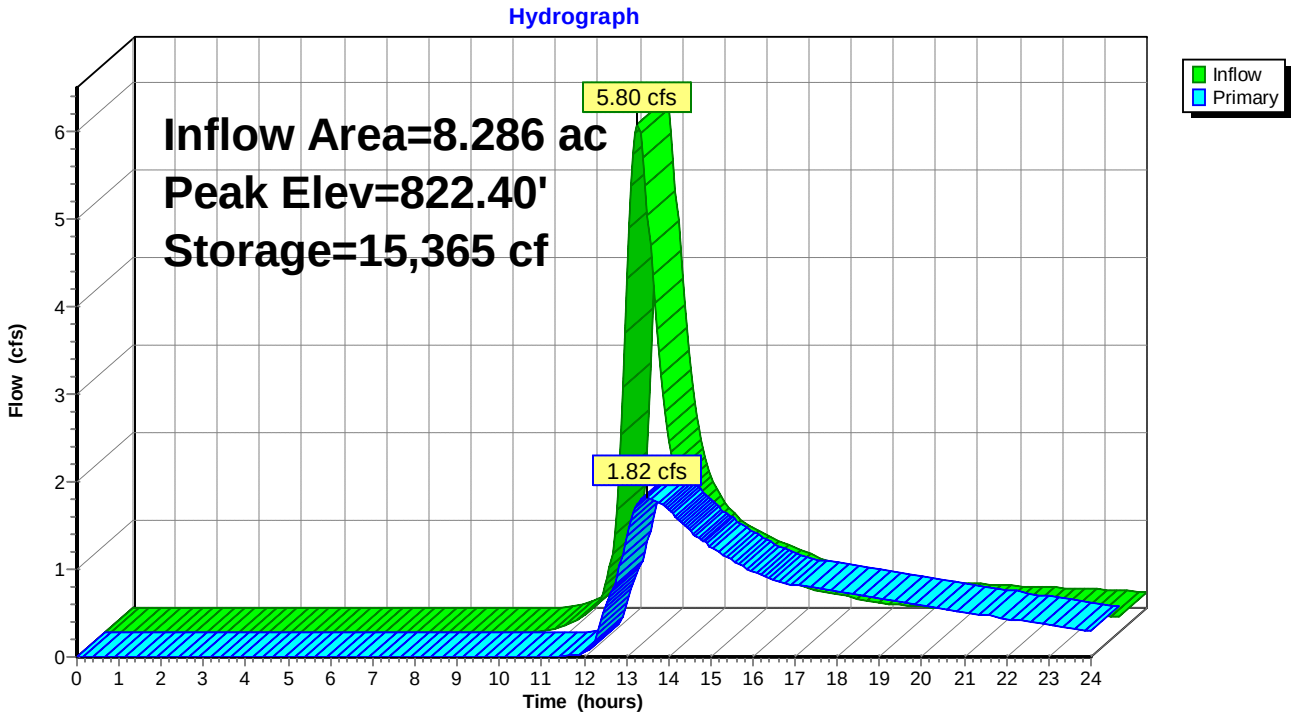
Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	122,878 cf	**Basin B (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
821.00	9,468	729.0	0	0	9,468
822.00	11,682	748.0	10,556	10,556	11,820
824.00	16,283	786.0	27,838	38,394	16,706
826.00	21,113	824.1	37,292	75,685	21,846
828.00	26,170	850.0	47,193	122,878	25,681

Device	Routing	Invert	Outlet Devices
#1	Primary	821.00'	**18.0" Round Culvert** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 821.00' / 797.00' S= 0.2400 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	821.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	822.00'	**12.0" W x 30.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	825.00'	**24.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.82 cfs @ 13.50 hrs HW=822.40' (Free Discharge)
└1=**Culvert** (Passes 1.82 cfs of 6.90 cfs potential flow)
  └2=**Orifice/Grate** (Orifice Controls 1.01 cfs @ 5.16 fps)
  └3=**Orifice/Grate** (Orifice Controls 0.80 cfs @ 2.02 fps)
└4=**Orifice/Grate** (Controls 0.00 cfs)

Pond BASIN B: BASIN B

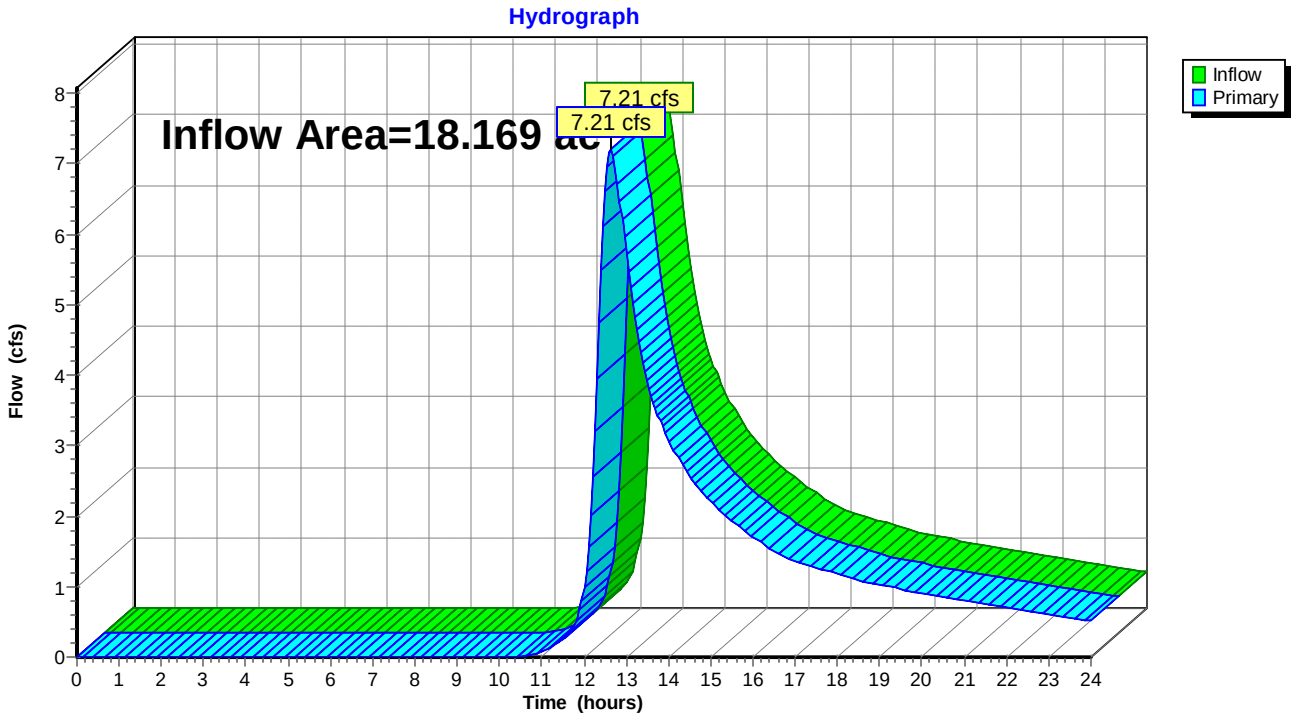


Summary for Link DP1: DP-1

Inflow Area = 18.169 ac, 14.68% Impervious, Inflow Depth > 1.18" for 2-Year event
Inflow = 7.21 cfs @ 12.65 hrs, Volume= 1.793 af
Primary = 7.21 cfs @ 12.65 hrs, Volume= 1.793 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DP-1

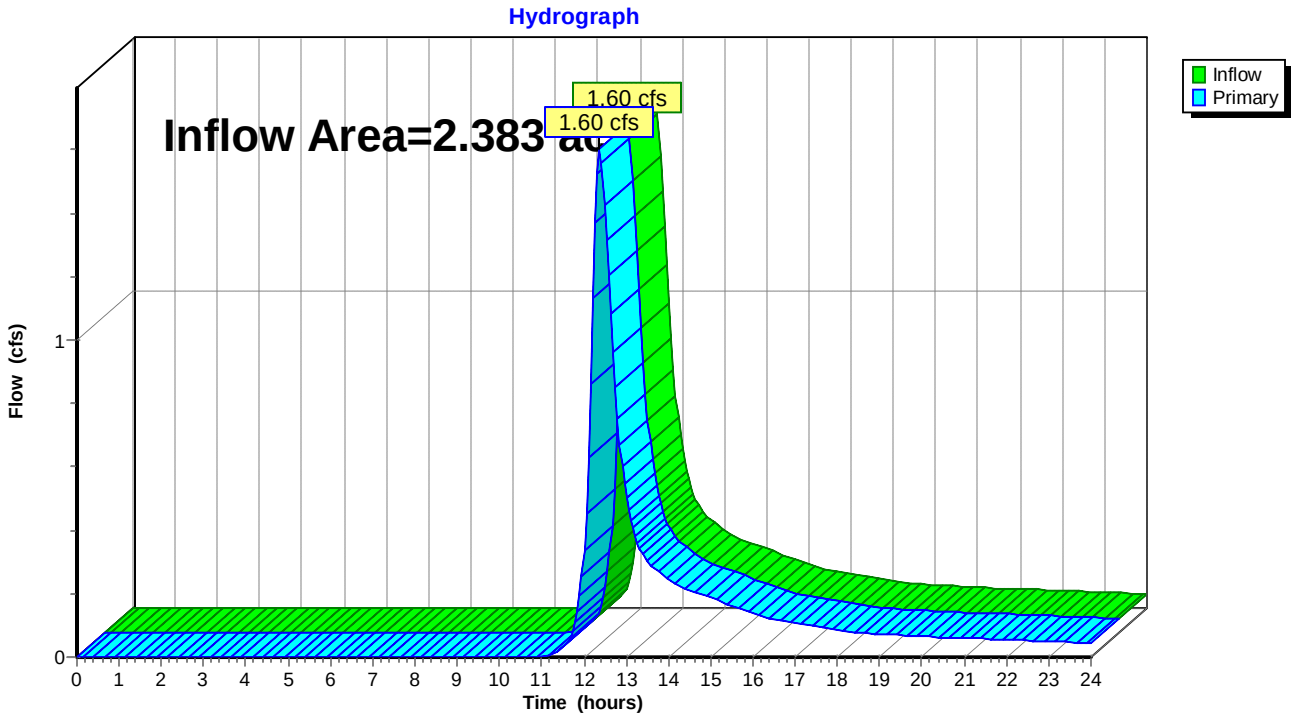


Summary for Link DP2A: DP-2A

Inflow Area = 2.383 ac, 0.00% Impervious, Inflow Depth > 0.99" for 2-Year event
Inflow = 1.60 cfs @ 12.37 hrs, Volume= 0.196 af
Primary = 1.60 cfs @ 12.37 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2A: DP-2A

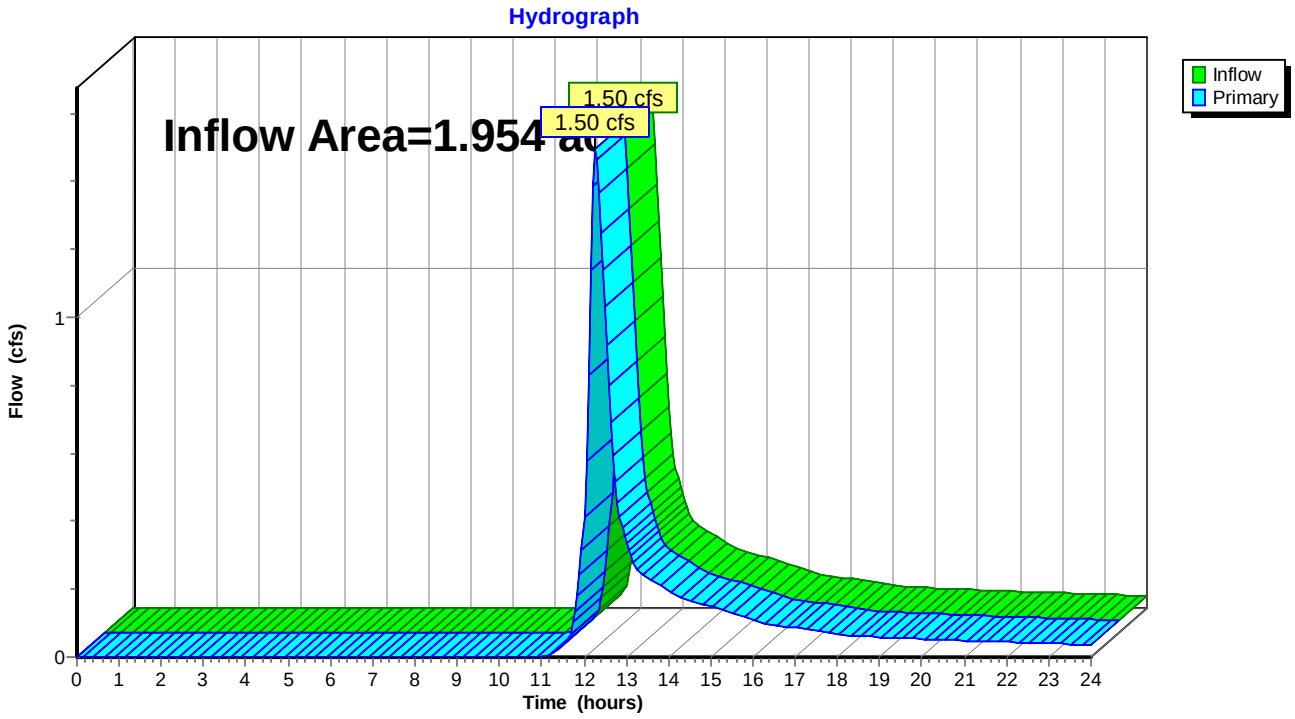


Summary for Link DP2B: DP-2B

Inflow Area = 1.954 ac, 0.00% Impervious, Inflow Depth > 0.99" for 2-Year event
Inflow = 1.50 cfs @ 12.26 hrs, Volume= 0.161 af
Primary = 1.50 cfs @ 12.26 hrs, Volume= 0.161 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2B: DP-2B

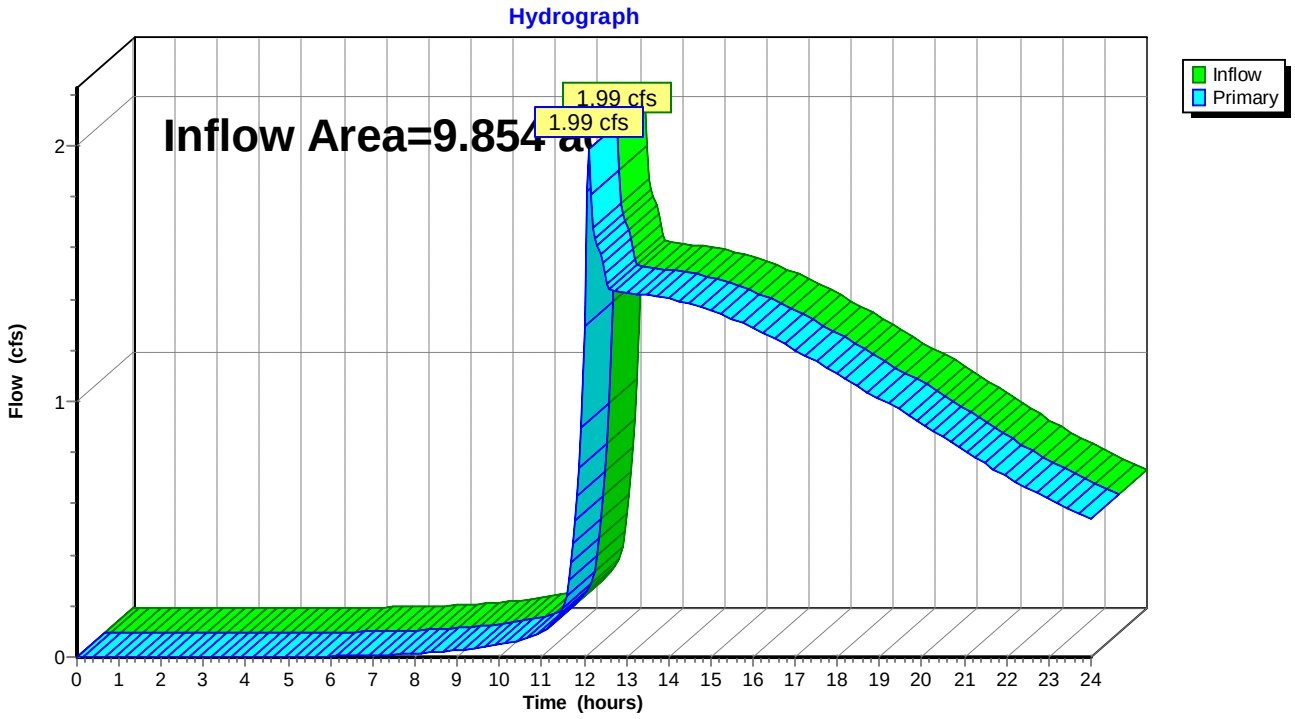


Summary for Link DP3: DP-3

Inflow Area = 9.854 ac, 38.11% Impervious, Inflow Depth > 1.35" for 2-Year event
Inflow = 1.99 cfs @ 12.10 hrs, Volume= 1.109 af
Primary = 1.99 cfs @ 12.10 hrs, Volume= 1.109 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: DP-3

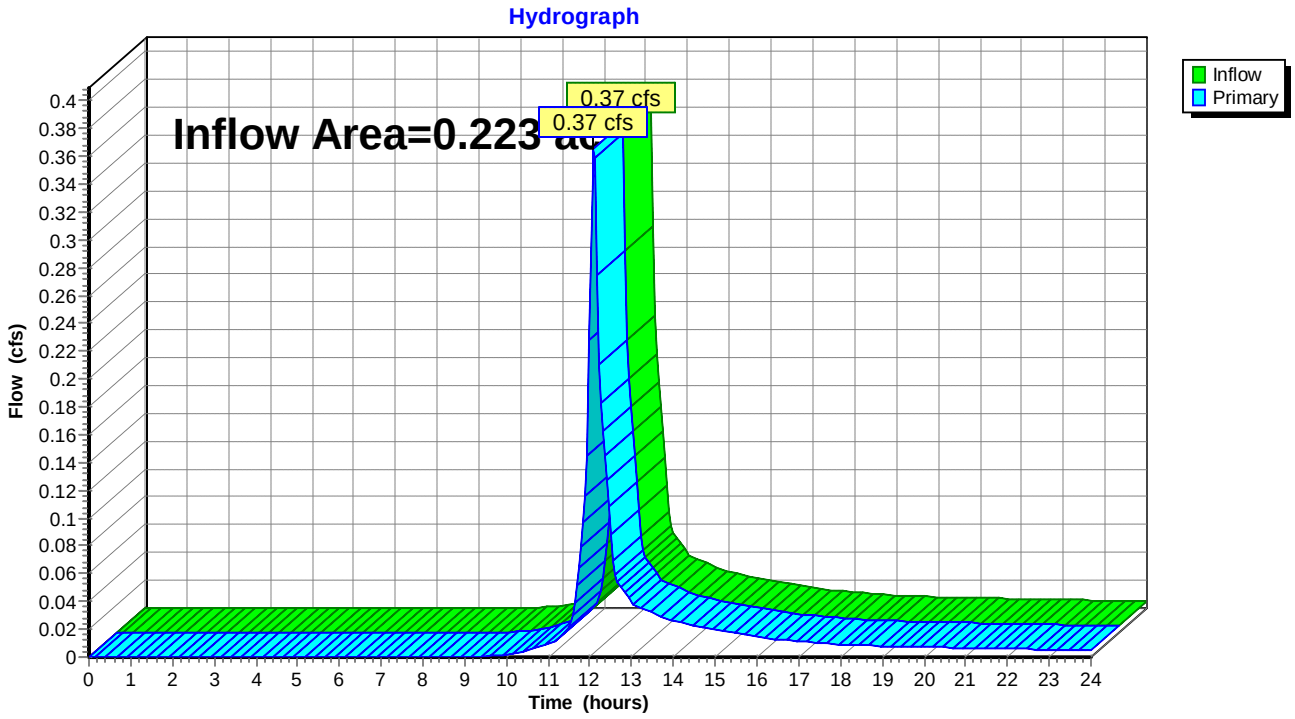


Summary for Link DP4: DP-4

Inflow Area = 0.223 ac, 20.57% Impervious, Inflow Depth > 1.41" for 2-Year event
Inflow = 0.37 cfs @ 12.08 hrs, Volume= 0.026 af
Primary = 0.37 cfs @ 12.08 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP4: DP-4

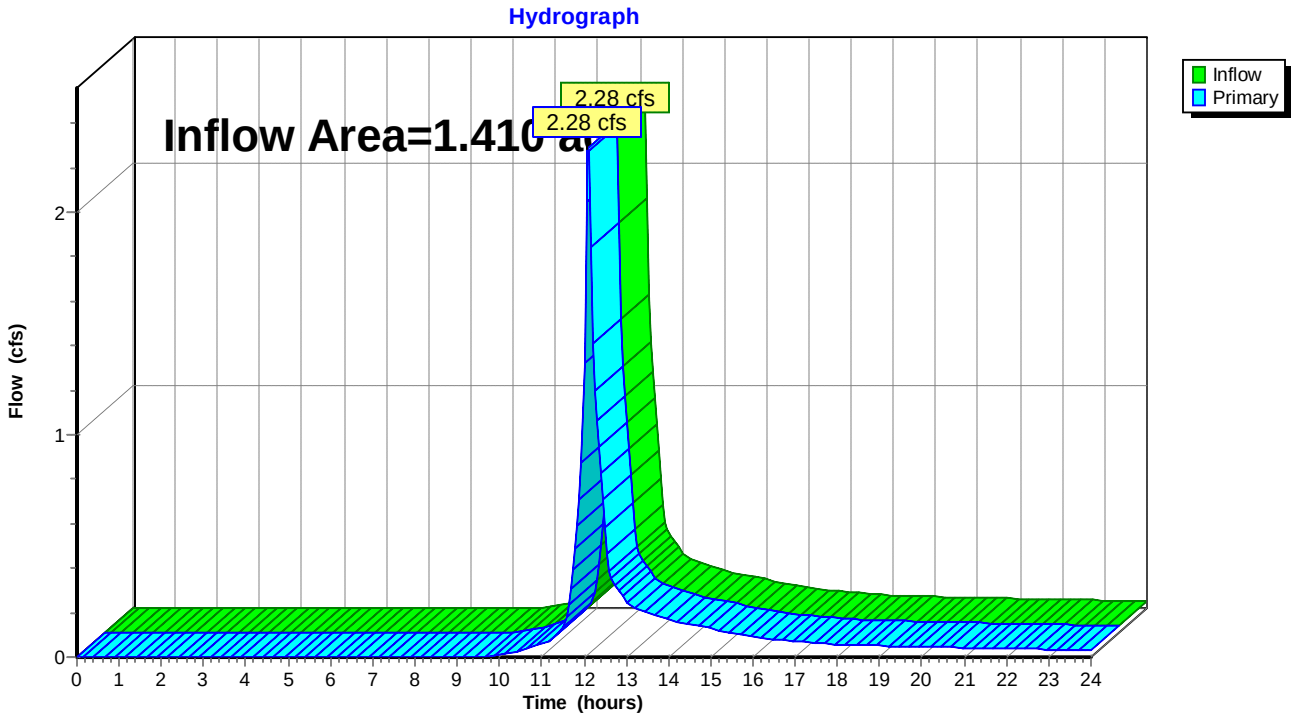


Summary for Link DP5: DP-5

Inflow Area = 1.410 ac, 22.51% Impervious, Inflow Depth > 1.41" for 2-Year event
Inflow = 2.28 cfs @ 12.09 hrs, Volume= 0.166 af
Primary = 2.28 cfs @ 12.09 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP5: DP-5

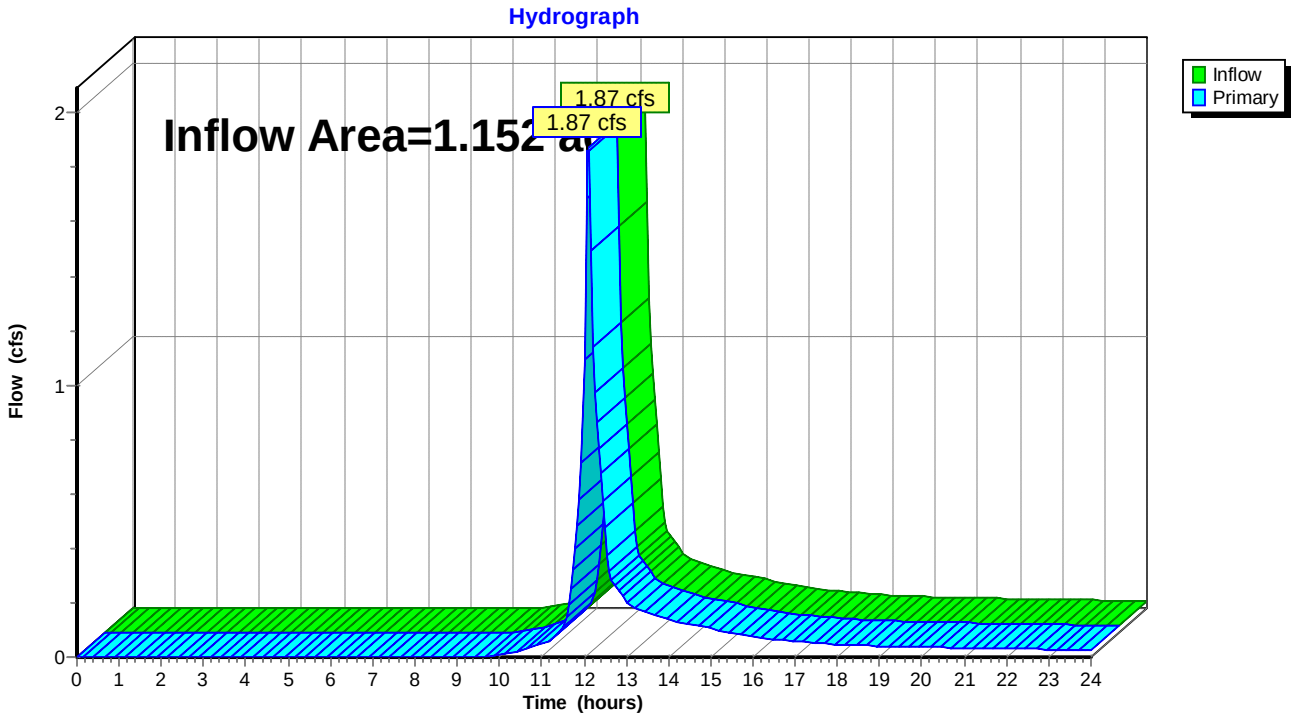


Summary for Link DP6: DP-6

Inflow Area = 1.152 ac, 19.16% Impervious, Inflow Depth > 1.41" for 2-Year event
Inflow = 1.87 cfs @ 12.09 hrs, Volume= 0.135 af
Primary = 1.87 cfs @ 12.09 hrs, Volume= 0.135 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP6: DP-6



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 PRDA1D: PRDA-1
Runoff Area=360,934 sf 15.66% Impervious Runoff Depth>2.60"
Flow Length=850' Tc=42.4 min CN=77 Runoff=12.15 cfs 1.795 af

Subcatchment PRDA1ND: PRDA-1
Runoff Area=430,511 sf 13.86% Impervious Runoff Depth>2.51"
Flow Length=1,775' Tc=42.9 min CN=76 Runoff=13.89 cfs 2.069 af

Subcatchment PRDA2AND: PRDA-2A
Runoff Area=103,805 sf 0.00% Impervious Runoff Depth>2.19"
Flow Length=400' Tc=24.1 min CN=72 Runoff=3.77 cfs 0.434 af

Subcatchment PRDA2BND: PRDA-2B
Runoff Area=85,134 sf 0.00% Impervious Runoff Depth>2.19"
Flow Length=300' Tc=17.4 min CN=72 Runoff=3.53 cfs 0.357 af

Subcatchment PRDA3D: PRDA-3
Runoff Area=407,573 sf 36.10% Impervious Runoff Depth>3.17"
Flow Length=1,450' Tc=6.7 min CN=83 Runoff=33.34 cfs 2.473 af

Subcatchment PRDA3ND: PRDA-3
Runoff Area=21,688 sf 76.07% Impervious Runoff Depth>4.09"
Flow Length=100' Slope=0.1100 '/' Tc=5.0 min CN=92 Runoff=2.28 cfs 0.170 af

Subcatchment PRDA4ND: PRDA-4
Runoff Area=9,707 sf 20.57% Impervious Runoff Depth>2.80"
Flow Length=100' Slope=0.1100 '/' Tc=5.0 min CN=79 Runoff=0.73 cfs 0.052 af

Subcatchment PRDA5ND: PRDA-5
Runoff Area=61,426 sf 22.51% Impervious Runoff Depth>2.80"
Flow Length=300' Tc=5.7 min CN=79 Runoff=4.57 cfs 0.329 af

Subcatchment PRDA6ND: PRDA-6
Runoff Area=50,175 sf 19.16% Impervious Runoff Depth>2.80"
Flow Length=650' Tc=5.6 min CN=79 Runoff=3.74 cfs 0.269 af

Pond BASIN A: BASIN A
Peak Elev=821.84' Storage=62,557 cf Inflow=33.34 cfs 2.473 af
Outflow=2.06 cfs 1.804 af

Pond BASIN B: BASIN B
Peak Elev=823.28' Storage=27,284 cf Inflow=12.15 cfs 1.795 af
Outflow=5.99 cfs 1.661 af

Link DP1: DP-1
Inflow=17.41 cfs 3.730 af
Primary=17.41 cfs 3.730 af

Link DP2A: DP-2A
Inflow=3.77 cfs 0.434 af
Primary=3.77 cfs 0.434 af

Link DP2B: DP-2B
Inflow=3.53 cfs 0.357 af
Primary=3.53 cfs 0.357 af

Link DP3: DP-3
Inflow=3.59 cfs 1.974 af
Primary=3.59 cfs 1.974 af

Link DP4: DP-4
Inflow=0.73 cfs 0.052 af
Primary=0.73 cfs 0.052 af

Link DP5: DP-5 Inflow=4.57 cfs 0.329 af
Primary=4.57 cfs 0.329 af

Link DP6: DP-6 Inflow=3.74 cfs 0.269 af
Primary=3.74 cfs 0.269 af

Total Runoff Area = 35.146 ac Runoff Volume = 7.946 af Average Runoff Depth = 2.71"
80.06% Pervious = 28.138 ac 19.94% Impervious = 7.008 ac

Summary for Subcatchment PRDA1D: PRDA-1

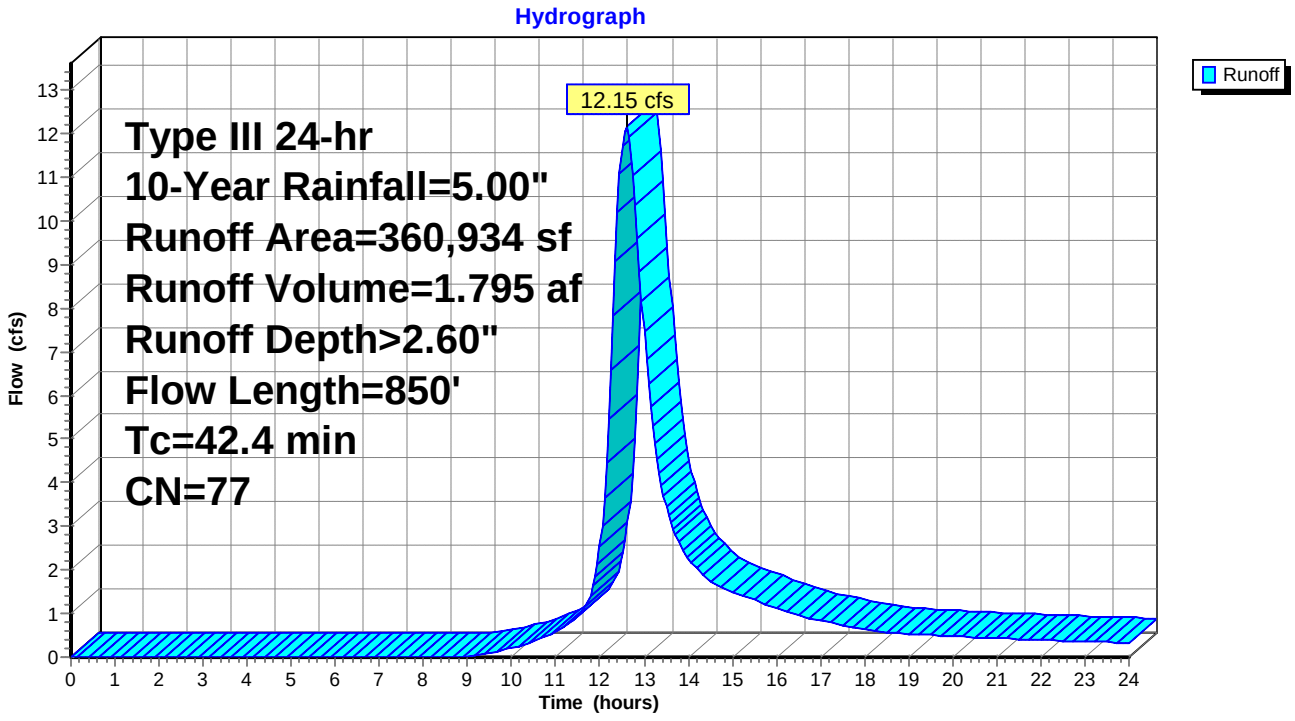
Runoff = 12.15 cfs @ 12.59 hrs, Volume= 1.795 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

	Area (sf)	CN	Description
	36,718	98	Impervious, HSG C
	1,151	98	Roofs, HSG C
	18,667	98	Water Surface, HSG C
	124,441	74	Pasture/grassland/range, Good, HSG C
*	115,820	75	Gravel, HSG C
	64,137	70	Woods, Good, HSG C
	360,934	77	Weighted Average
	304,398		84.34% Pervious Area
	56,536		15.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
5.4	600	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
42.4	850	Total			

Subcatchment PRDA1D: PRDA-1



Summary for Subcatchment PRDA1ND: PRDA-1

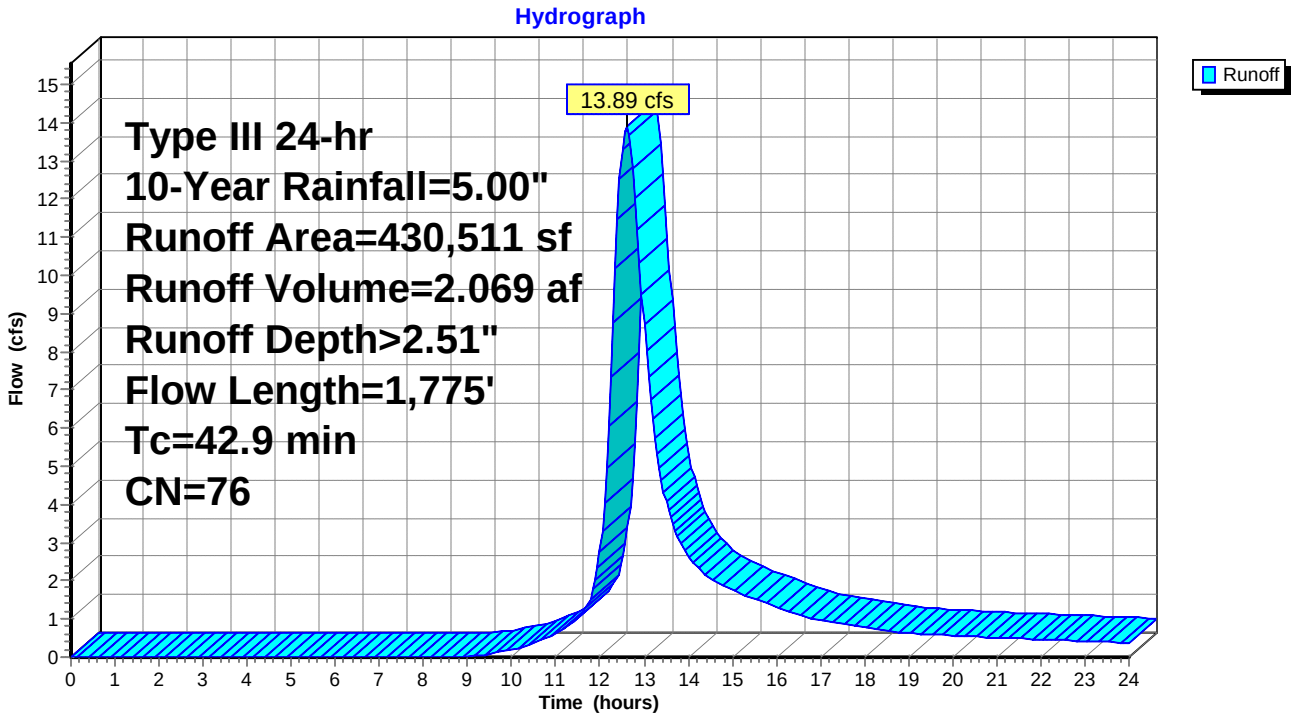
Runoff = 13.89 cfs @ 12.60 hrs, Volume= 2.069 af, Depth> 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
114,584	70	Woods, Good, HSG C
256,245	74	Pasture/grassland/range, Good, HSG C
59,682	98	Impervious, HSG C
430,511	76	Weighted Average
370,829		86.14% Pervious Area
59,682		13.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
4.9	1,000	0.0440	3.38		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.0	525	0.0570	8.87	53.22	Channel Flow, Area= 6.0 sf Perim= 6.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides
42.9	1,775	Total			

Subcatchment PRDA1ND: PRDA-1



Summary for Subcatchment PRDA2AND: PRDA-2A

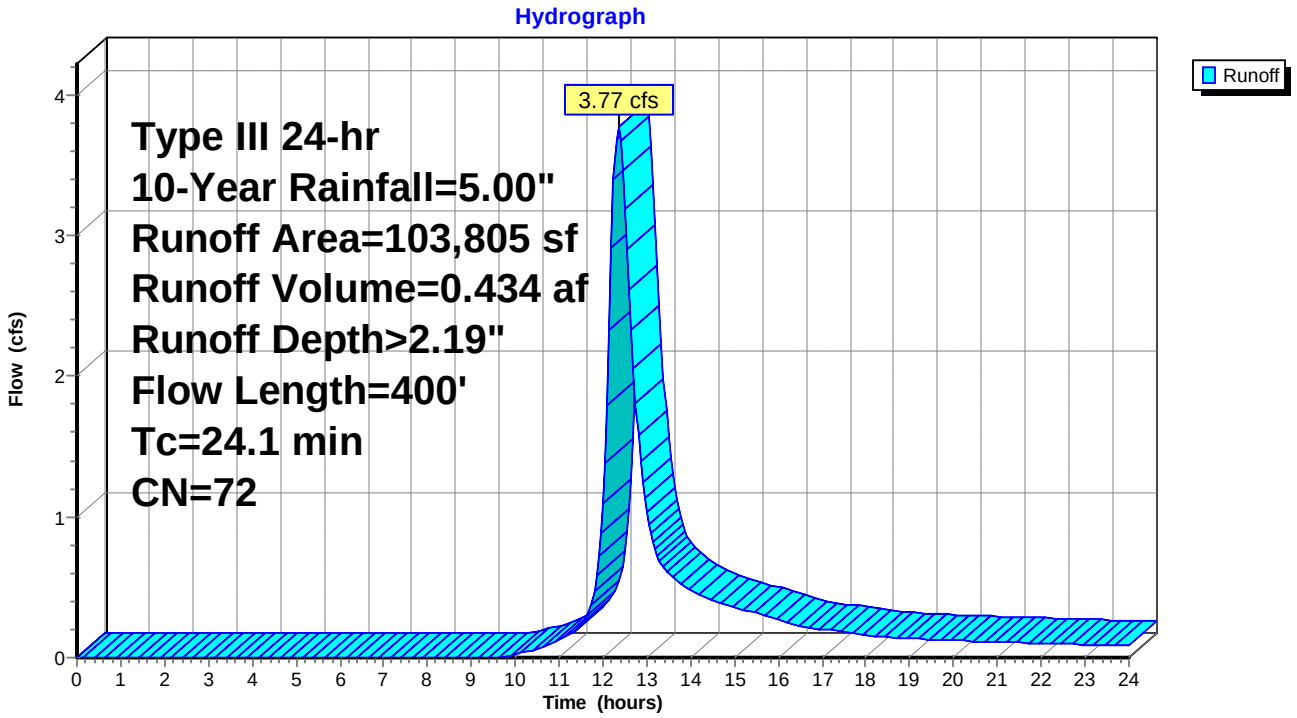
Runoff = 3.77 cfs @ 12.35 hrs, Volume= 0.434 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
46,490	70	Woods, Good, HSG C
57,315	74	Pasture/grassland/range, Good, HSG C
103,805	72	Weighted Average
103,805		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.1	250	0.1040	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	150	0.2400	2.45		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.1	400	Total			

Subcatchment PRDA2AND: PRDA-2A



Summary for Subcatchment PRDA2BND: PRDA-2B

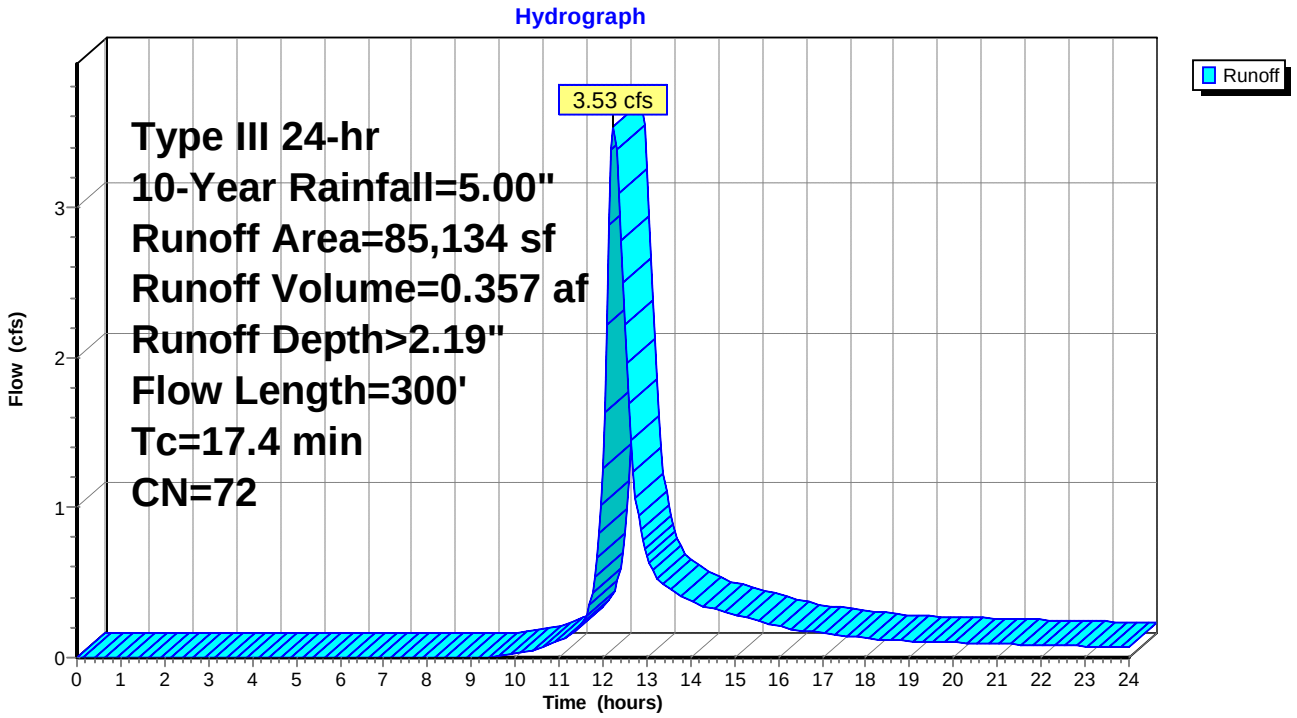
Runoff = 3.53 cfs @ 12.25 hrs, Volume= 0.357 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
33,200	70	Woods, Good, HSG C
51,934	74	Pasture/grassland/range, Good, HSG C
85,134	72	Weighted Average
85,134		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	200	0.1650	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	100	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.4	300	Total			

Subcatchment PRDA2BND: PRDA-2B



Summary for Subcatchment PRDA3D: PRDA-3

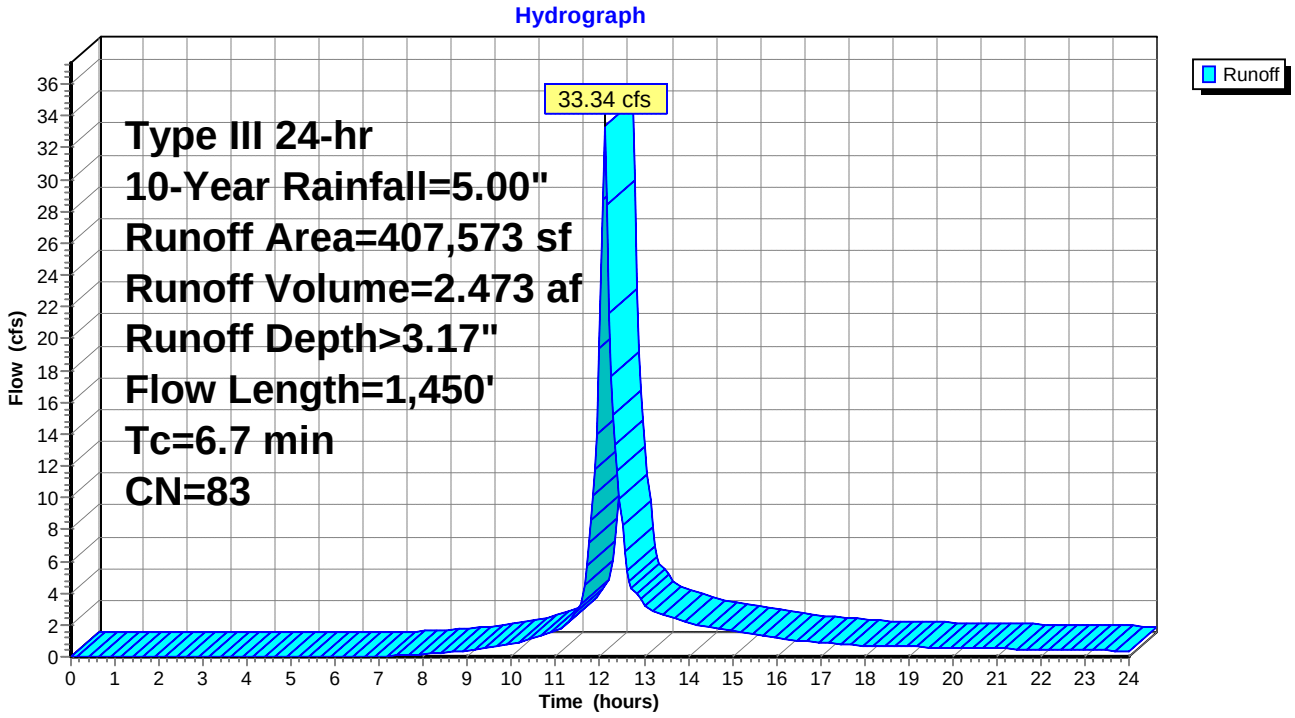
Runoff = 33.34 cfs @ 12.10 hrs, Volume= 2.473 af, Depth> 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

	Area (sf)	CN	Description
	69,087	98	Impervious, HSG C
	36,569	98	Roofs, HSG C
	41,458	98	Water Surface, HSG C
*	260,459	75	Gravel, HSG C
	407,573	83	Weighted Average
	260,459		63.90% Pervious Area
	147,114		36.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	250	0.0100	1.25		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.20"
3.4	1,200	0.0075	5.93	7.27	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
6.7	1,450	Total			

Subcatchment PRDA3D: PRDA-3



Summary for Subcatchment PRDA3ND: PRDA-3

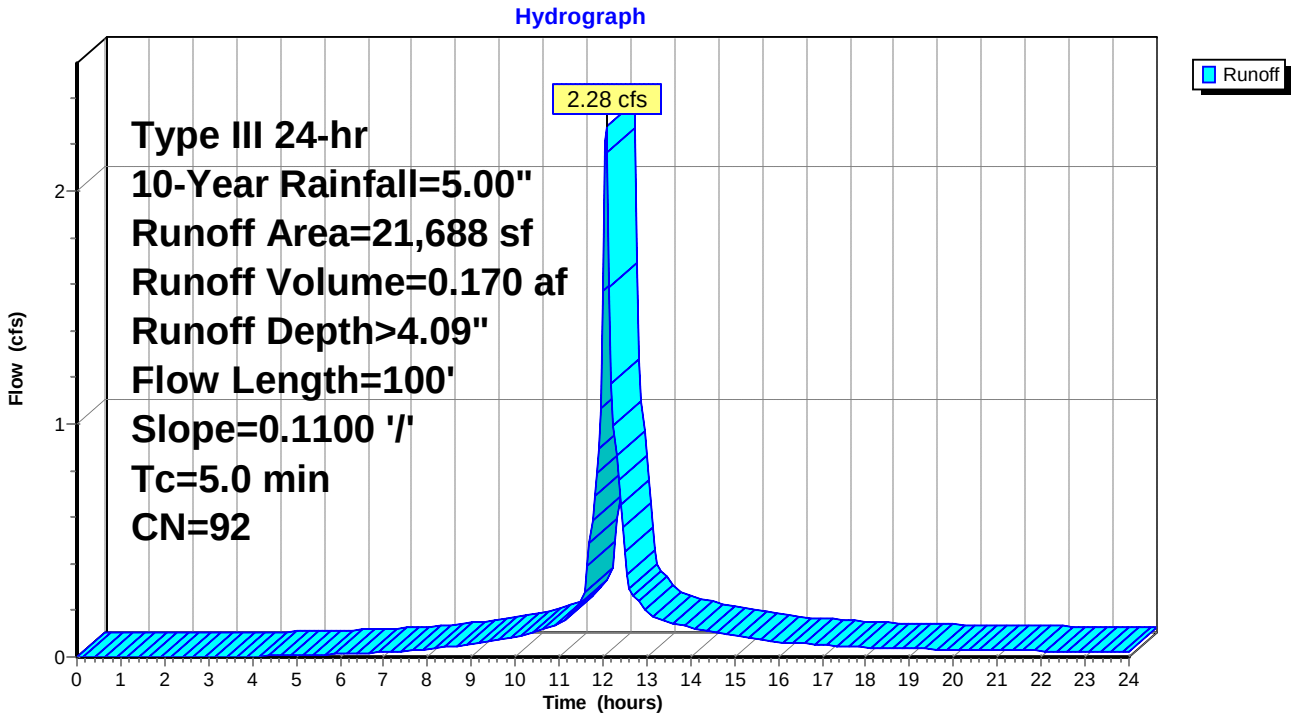
Runoff = 2.28 cfs @ 12.07 hrs, Volume= 0.170 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
5,191	74	Pasture/grassland/range, Good, HSG C
16,497	98	Impervious, HSG C
21,688	92	Weighted Average
5,191		23.93% Pervious Area
16,497		76.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"

Subcatchment PRDA3ND: PRDA-3



Summary for Subcatchment PRDA4ND: PRDA-4

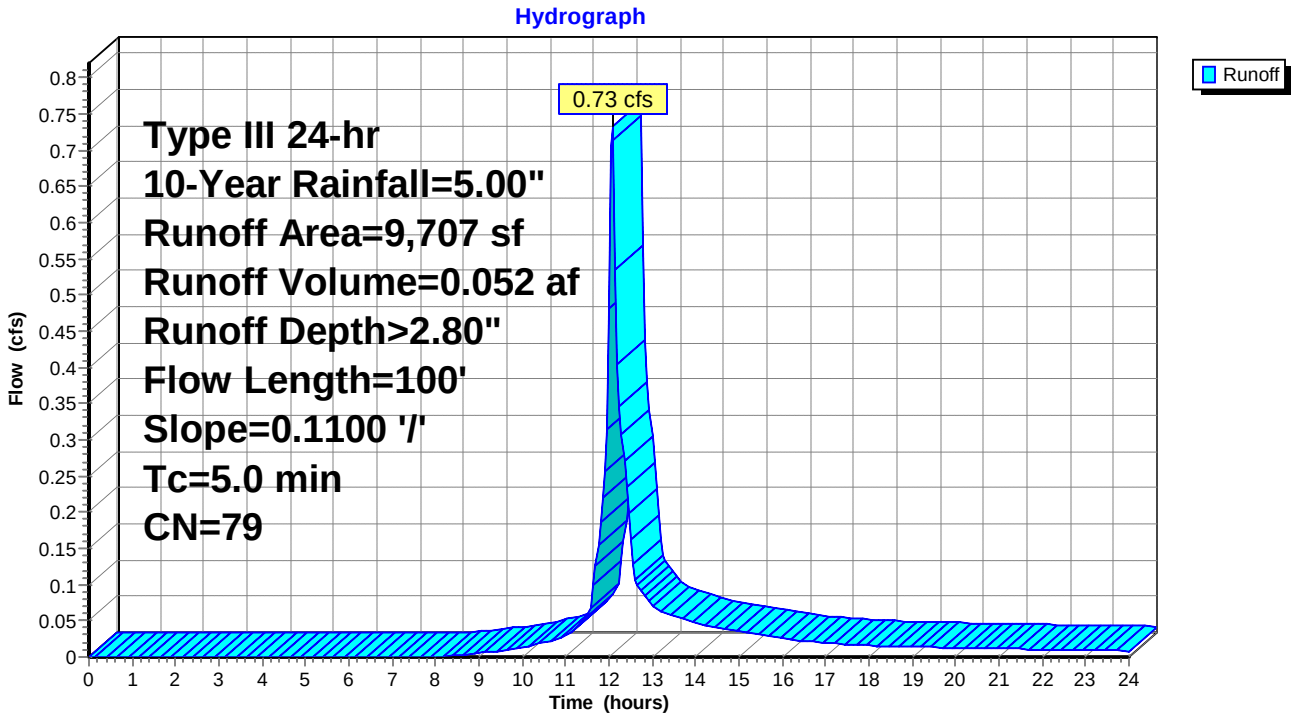
Runoff = 0.73 cfs @ 12.08 hrs, Volume= 0.052 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

	Area (sf)	CN	Description
	7,710	74	Pasture/grassland/range, Good, HSG C
*	1,997	98	Impervious
	9,707	79	Weighted Average
	7,710		79.43% Pervious Area
	1,997		20.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"

Subcatchment PRDA4ND: PRDA-4



Summary for Subcatchment PRDA5ND: PRDA-5

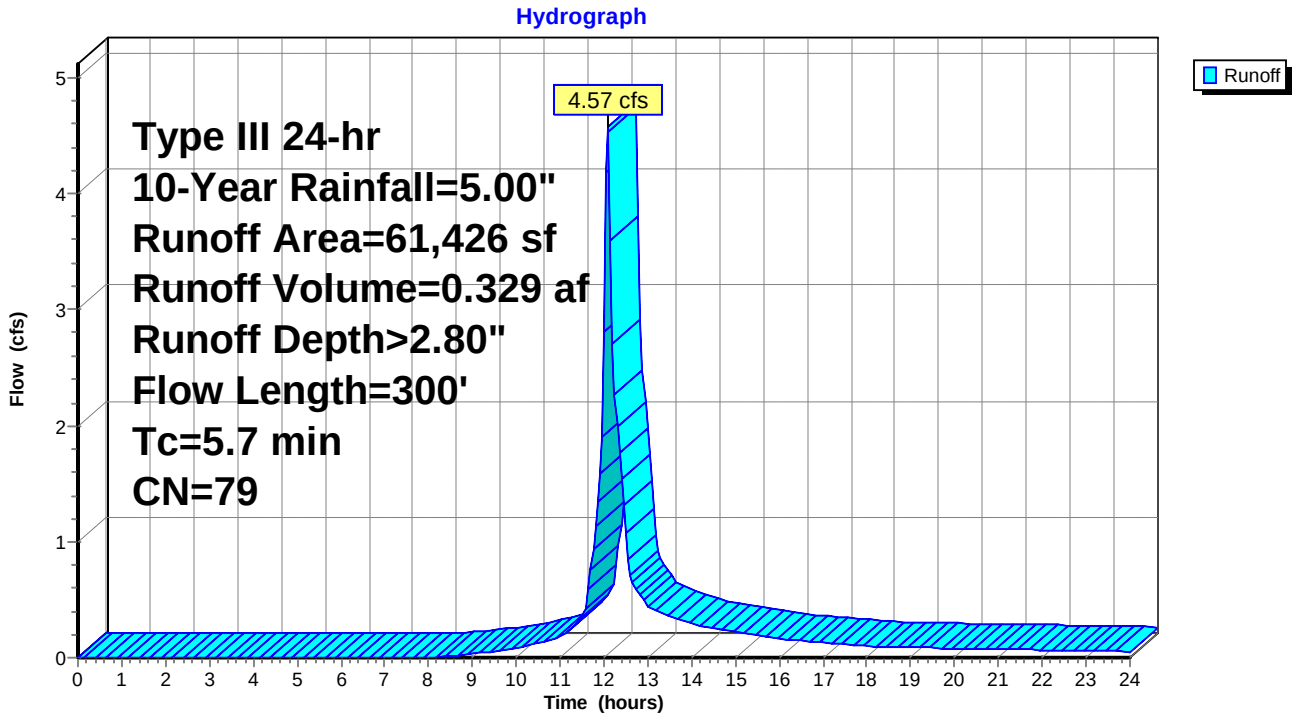
Runoff = 4.57 cfs @ 12.09 hrs, Volume= 0.329 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
13,824	98	Impervious, HSG C
47,602	74	Pasture/grassland/range, Good, HSG C
61,426	79	Weighted Average
47,602		77.49% Pervious Area
13,824		22.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	200	0.3333	0.60		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
0.2	100	0.0100	6.84	8.40	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
5.7	300	Total			

Subcatchment PRDA5ND: PRDA-5



Summary for Subcatchment PRDA6ND: PRDA-6

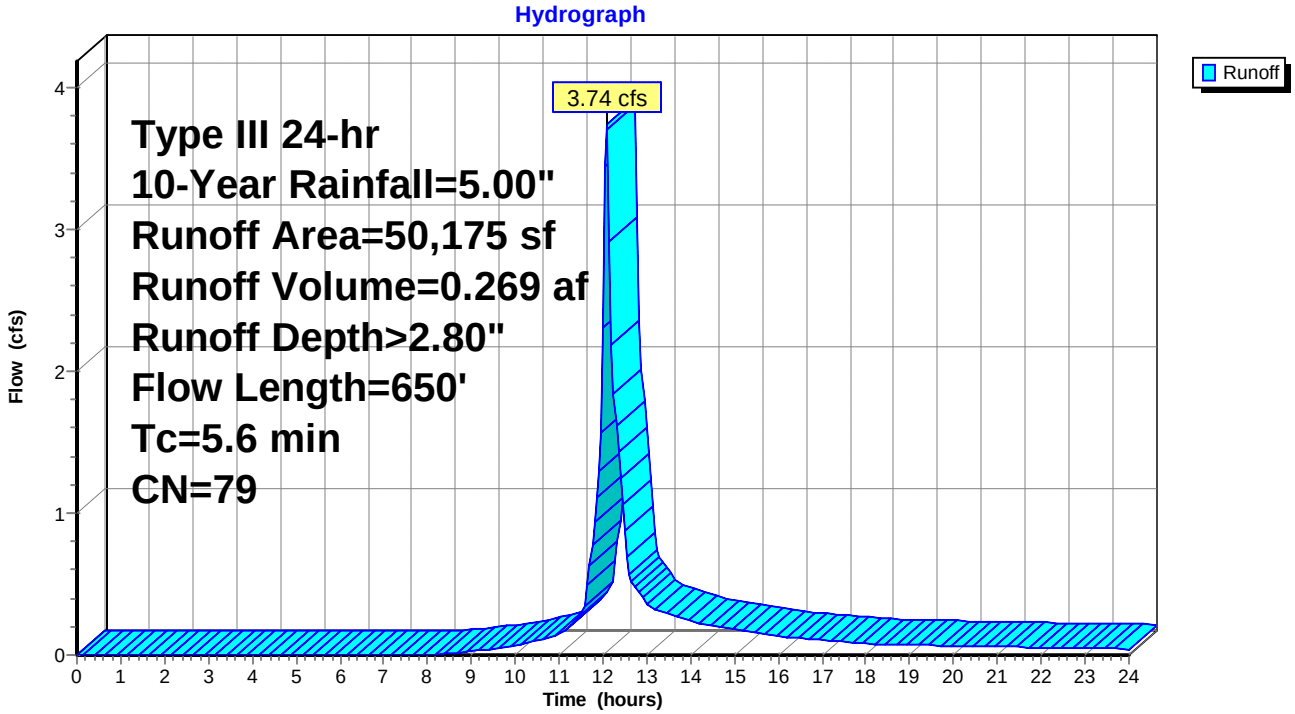
Runoff = 3.74 cfs @ 12.09 hrs, Volume= 0.269 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
40,563	74	Pasture/grassland/range, Good, HSG C
9,612	98	Impervious, HSG C
50,175	79	Weighted Average
40,563		80.84% Pervious Area
9,612		19.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	150	0.3333	0.57		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.2	500	0.2050	6.79		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
5.6	650	Total			

Subcatchment PRDA6ND: PRDA-6



Summary for Pond BASIN A: BASIN A

Inflow Area = 9.357 ac, 36.10% Impervious, Inflow Depth > 3.17" for 10-Year event
Inflow = 33.34 cfs @ 12.10 hrs, Volume= 2.473 af
Outflow = 2.06 cfs @ 14.05 hrs, Volume= 1.804 af, Atten= 94%, Lag= 117.3 min
Primary = 2.06 cfs @ 14.05 hrs, Volume= 1.804 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 821.84' @ 14.05 hrs Surf.Area= 37,276 sf Storage= 62,557 cf

Plug-Flow detention time= 321.2 min calculated for 1.800 af (73% of inflow)
Center-of-Mass det. time= 232.4 min (1,045.9 - 813.5)

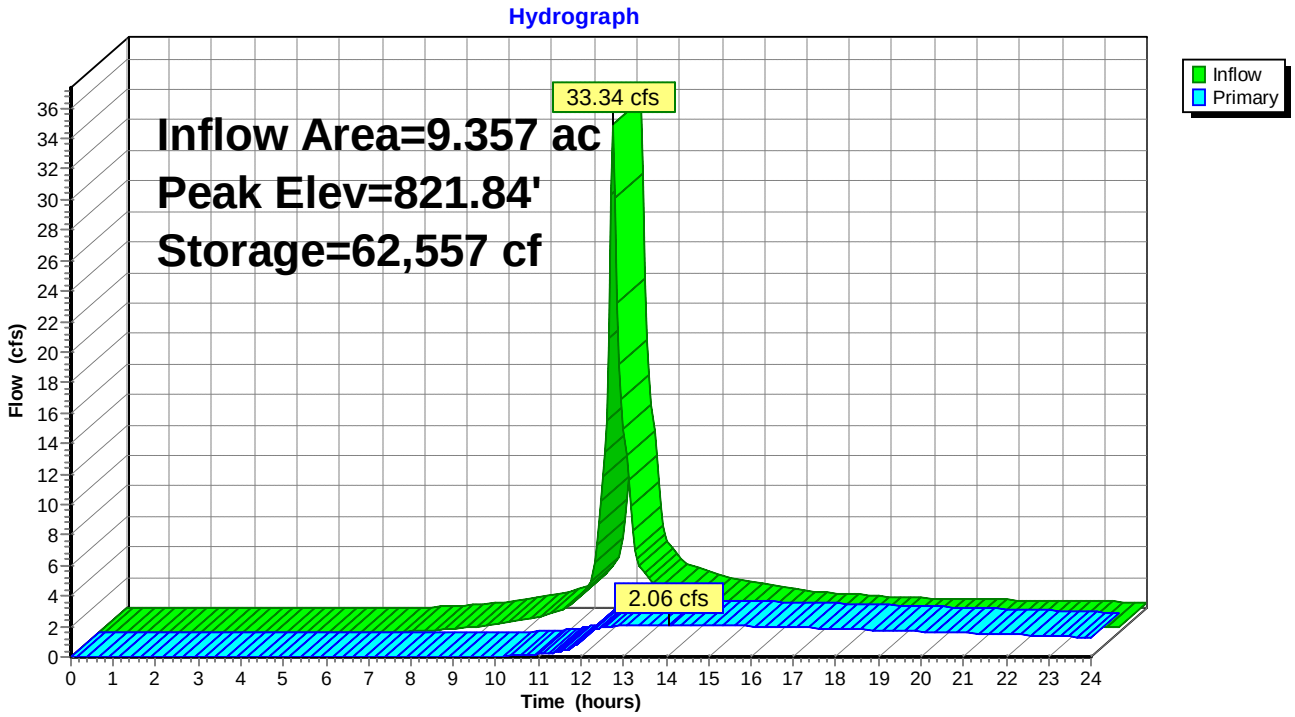
Volume	Invert	Avail.Storage	Storage Description
#1	820.00'	151,470 cf	Basin A (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
820.00	30,856	1,150.0	0	0	30,856
822.00	37,867	1,187.0	68,603	68,603	38,123
824.00	45,105	1,225.0	82,867	151,470	45,805

Device	Routing	Invert	Outlet Devices
#1	Primary	820.00'	15.0" Round Culvert L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 820.00' / 786.00' S= 0.1360 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	820.00'	8.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	822.00'	15.0" W x 12.0" H Vert. Orifice/Grate X 2.00 C= 0.600

Primary OutFlow Max=2.06 cfs @ 14.05 hrs HW=821.84' (Free Discharge)
└1=Culvert (Passes 2.06 cfs of 6.51 cfs potential flow)
  ├2=Orifice/Grate (Orifice Controls 2.06 cfs @ 5.91 fps)
  └3=Orifice/Grate (Controls 0.00 cfs)

Pond BASIN A: BASIN A



Summary for Pond BASIN B: BASIN B

Inflow Area = 8.286 ac, 15.66% Impervious, Inflow Depth > 2.60" for 10-Year event
Inflow = 12.15 cfs @ 12.59 hrs, Volume= 1.795 af
Outflow = 5.99 cfs @ 13.13 hrs, Volume= 1.661 af, Atten= 51%, Lag= 32.1 min
Primary = 5.99 cfs @ 13.13 hrs, Volume= 1.661 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 823.28' @ 13.13 hrs Surf.Area= 14,536 sf Storage= 27,284 cf

Plug-Flow detention time= 121.4 min calculated for 1.661 af (93% of inflow)
Center-of-Mass det. time= 84.9 min (943.0 - 858.0)

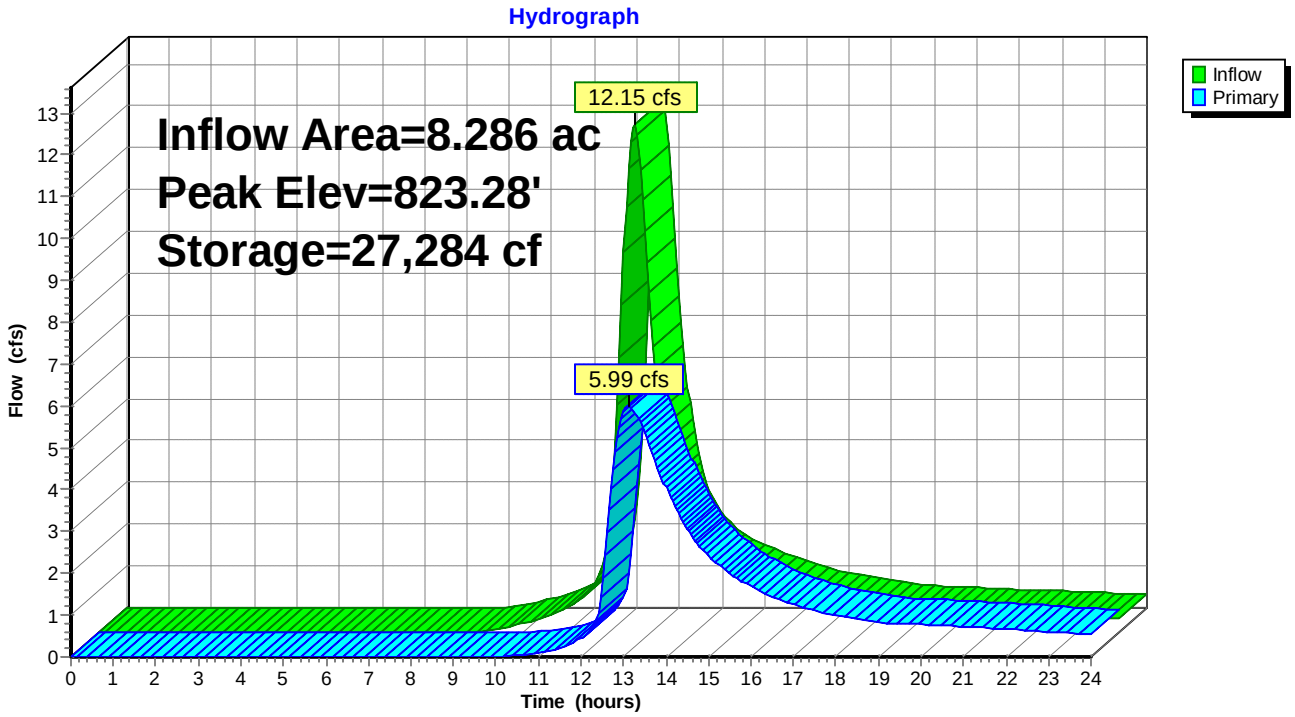
Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	122,878 cf	Basin B (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
821.00	9,468	729.0	0	0	9,468
822.00	11,682	748.0	10,556	10,556	11,820
824.00	16,283	786.0	27,838	38,394	16,706
826.00	21,113	824.1	37,292	75,685	21,846
828.00	26,170	850.0	47,193	122,878	25,681

Device	Routing	Invert	Outlet Devices
#1	Primary	821.00'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 821.00' / 797.00' S= 0.2400 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	821.00'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	822.00'	12.0" W x 30.0" H Vert. Orifice/Grate C= 0.600
#4	Primary	825.00'	24.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=5.98 cfs @ 13.13 hrs HW=823.28' (Free Discharge)
- 1=Culvert (Passes 5.98 cfs of 10.52 cfs potential flow)
  - 2=Orifice/Grate (Orifice Controls 1.35 cfs @ 6.86 fps)
  - 3=Orifice/Grate (Orifice Controls 4.64 cfs @ 3.63 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)

Pond BASIN B: BASIN B

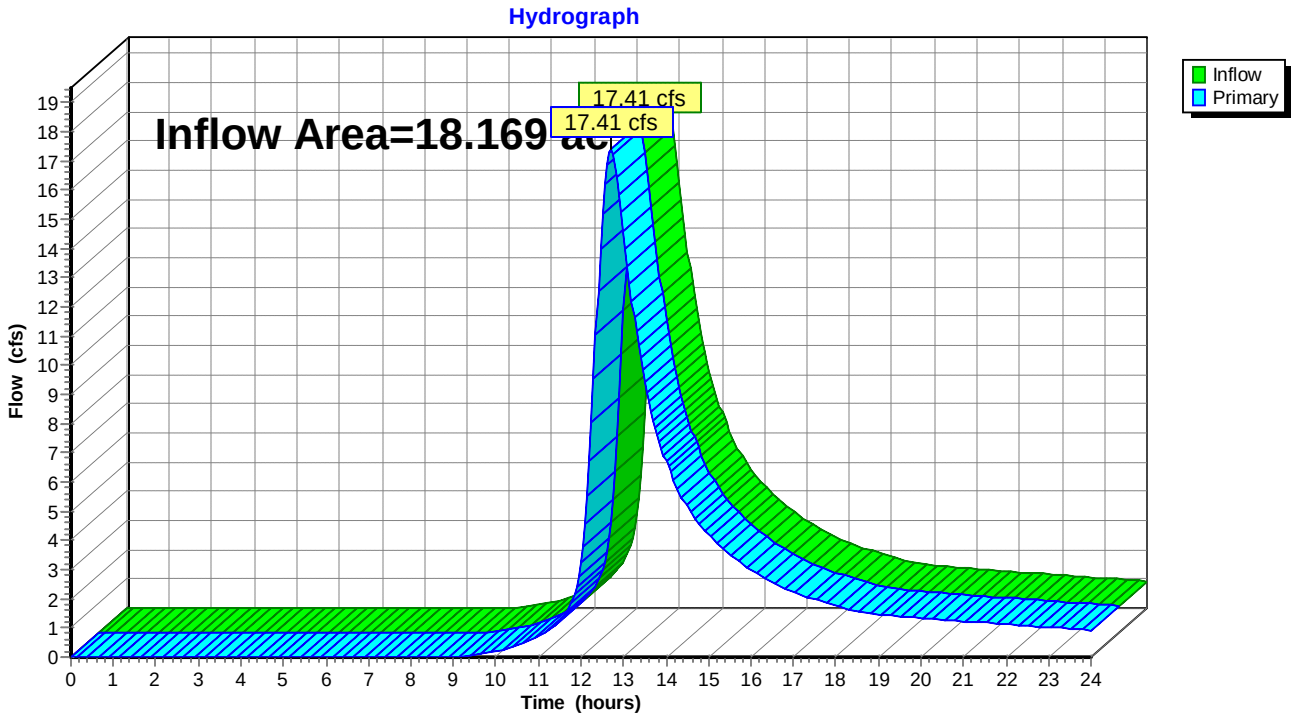


Summary for Link DP1: DP-1

Inflow Area = 18.169 ac, 14.68% Impervious, Inflow Depth > 2.46" for 10-Year event
Inflow = 17.41 cfs @ 12.70 hrs, Volume= 3.730 af
Primary = 17.41 cfs @ 12.70 hrs, Volume= 3.730 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DP-1

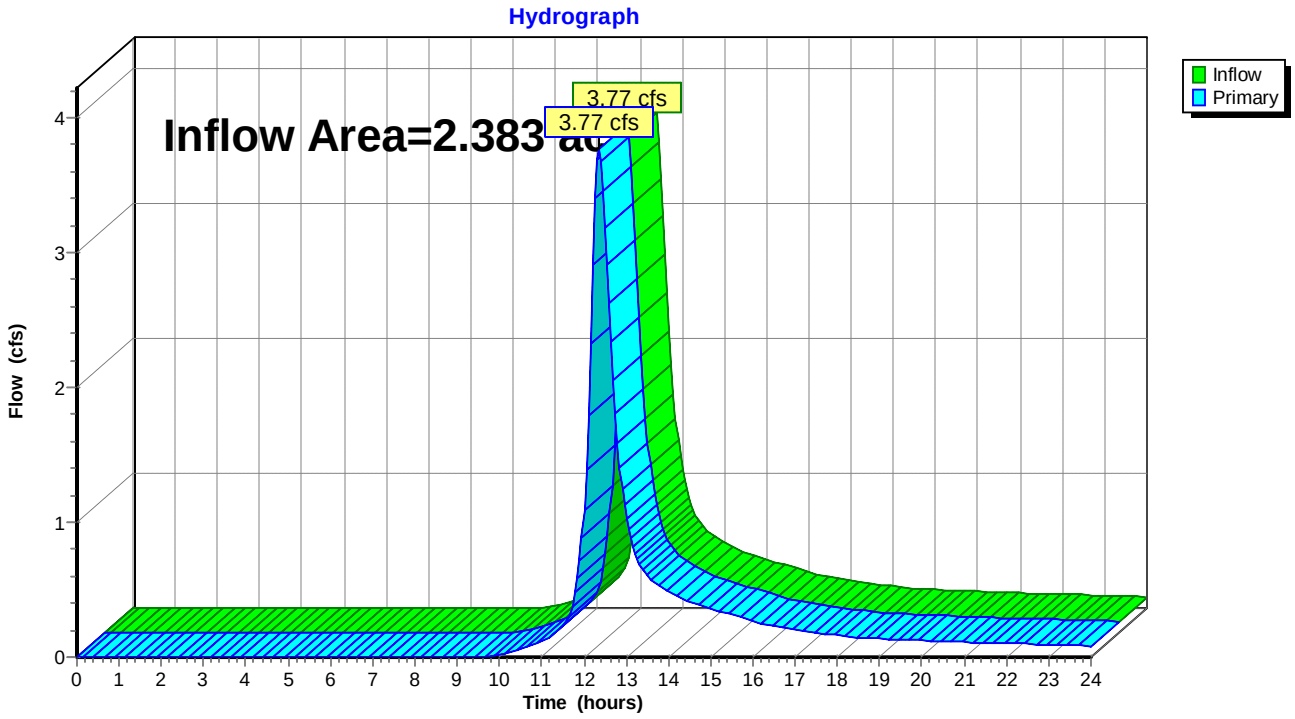


Summary for Link DP2A: DP-2A

Inflow Area = 2.383 ac, 0.00% Impervious, Inflow Depth > 2.19" for 10-Year event
Inflow = 3.77 cfs @ 12.35 hrs, Volume= 0.434 af
Primary = 3.77 cfs @ 12.35 hrs, Volume= 0.434 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2A: DP-2A

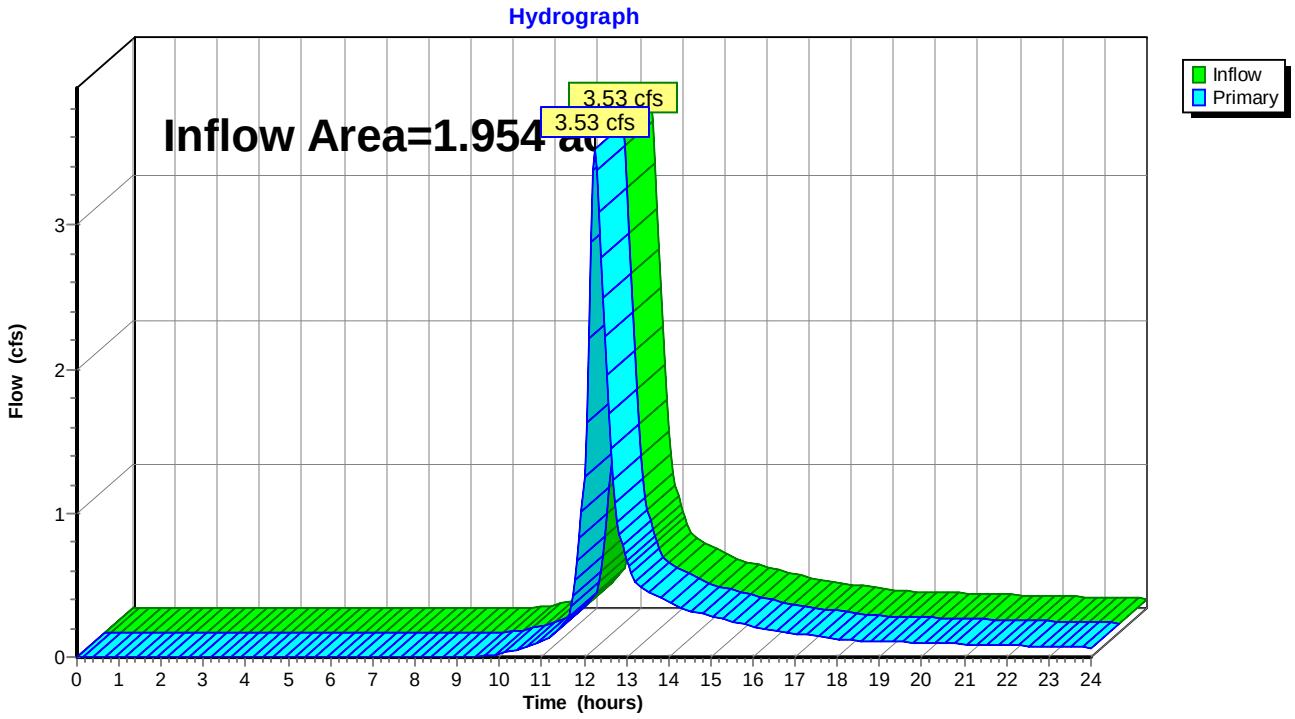


Summary for Link DP2B: DP-2B

Inflow Area = 1.954 ac, 0.00% Impervious, Inflow Depth > 2.19" for 10-Year event
Inflow = 3.53 cfs @ 12.25 hrs, Volume= 0.357 af
Primary = 3.53 cfs @ 12.25 hrs, Volume= 0.357 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2B: DP-2B

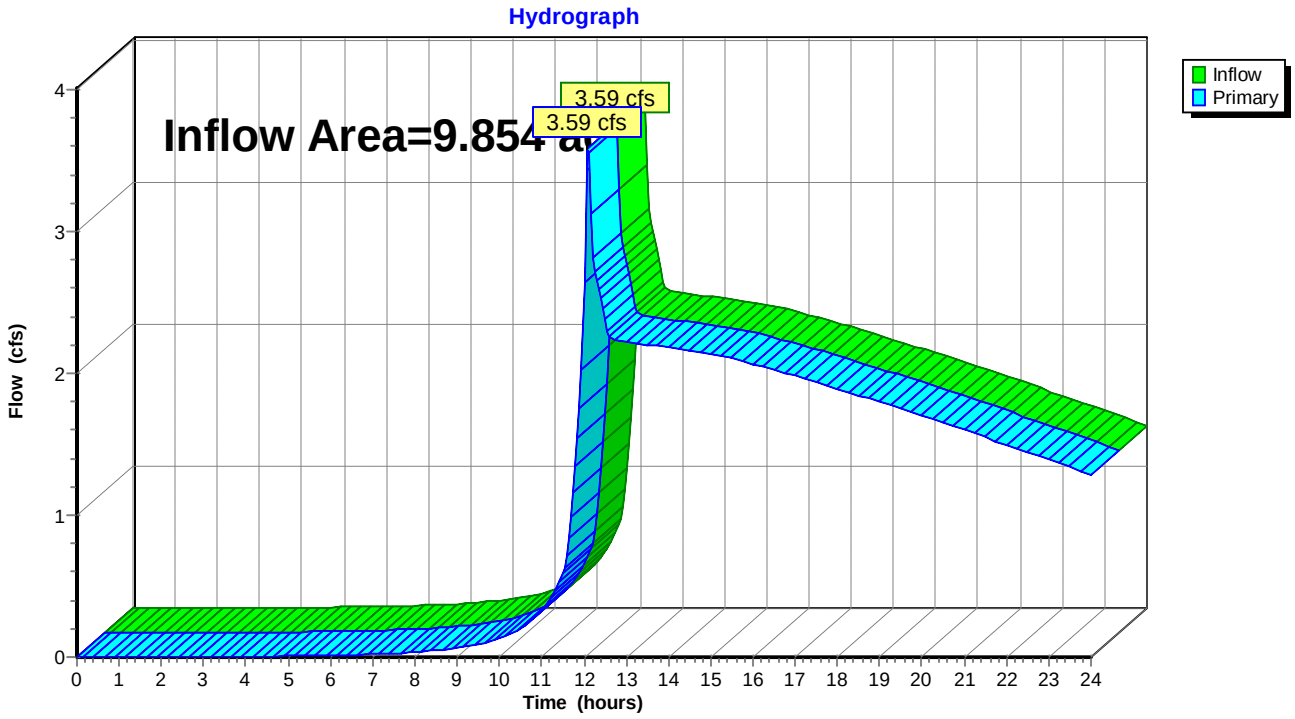


Summary for Link DP3: DP-3

Inflow Area = 9.854 ac, 38.11% Impervious, Inflow Depth > 2.40" for 10-Year event
Inflow = 3.59 cfs @ 12.09 hrs, Volume= 1.974 af
Primary = 3.59 cfs @ 12.09 hrs, Volume= 1.974 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: DP-3

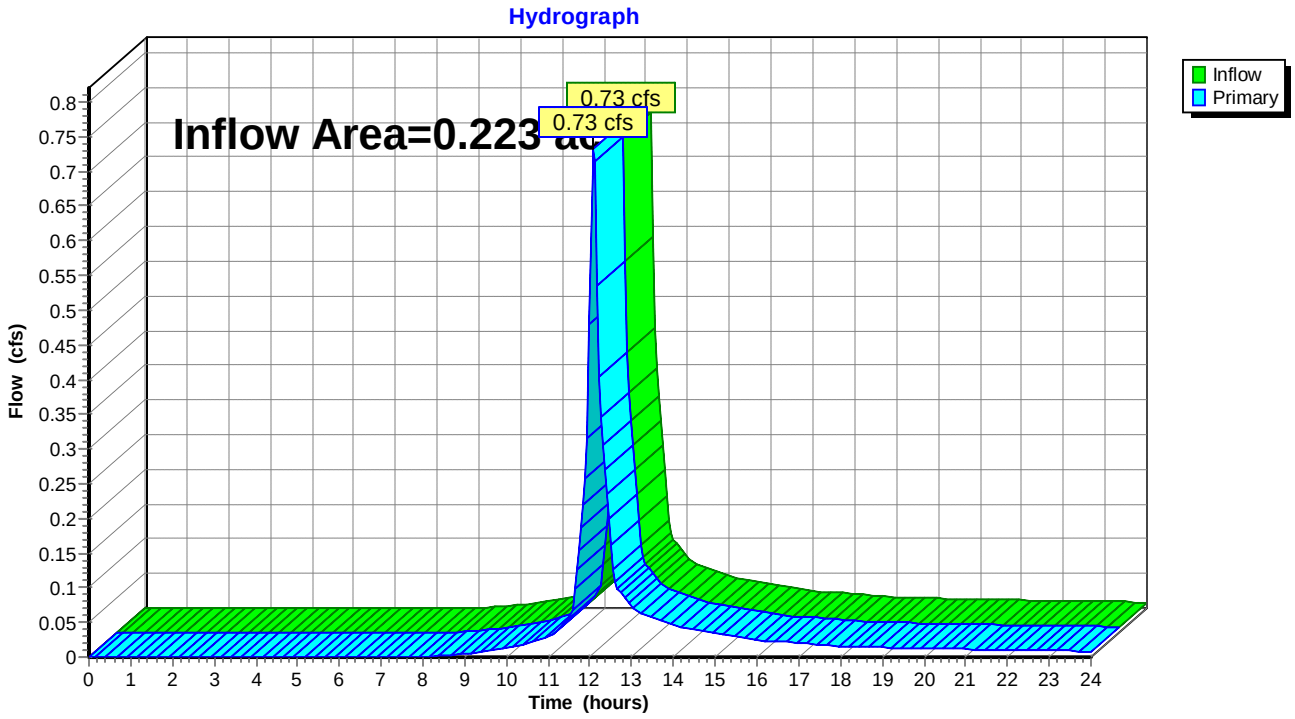


Summary for Link DP4: DP-4

Inflow Area = 0.223 ac, 20.57% Impervious, Inflow Depth > 2.80" for 10-Year event
Inflow = 0.73 cfs @ 12.08 hrs, Volume= 0.052 af
Primary = 0.73 cfs @ 12.08 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP4: DP-4

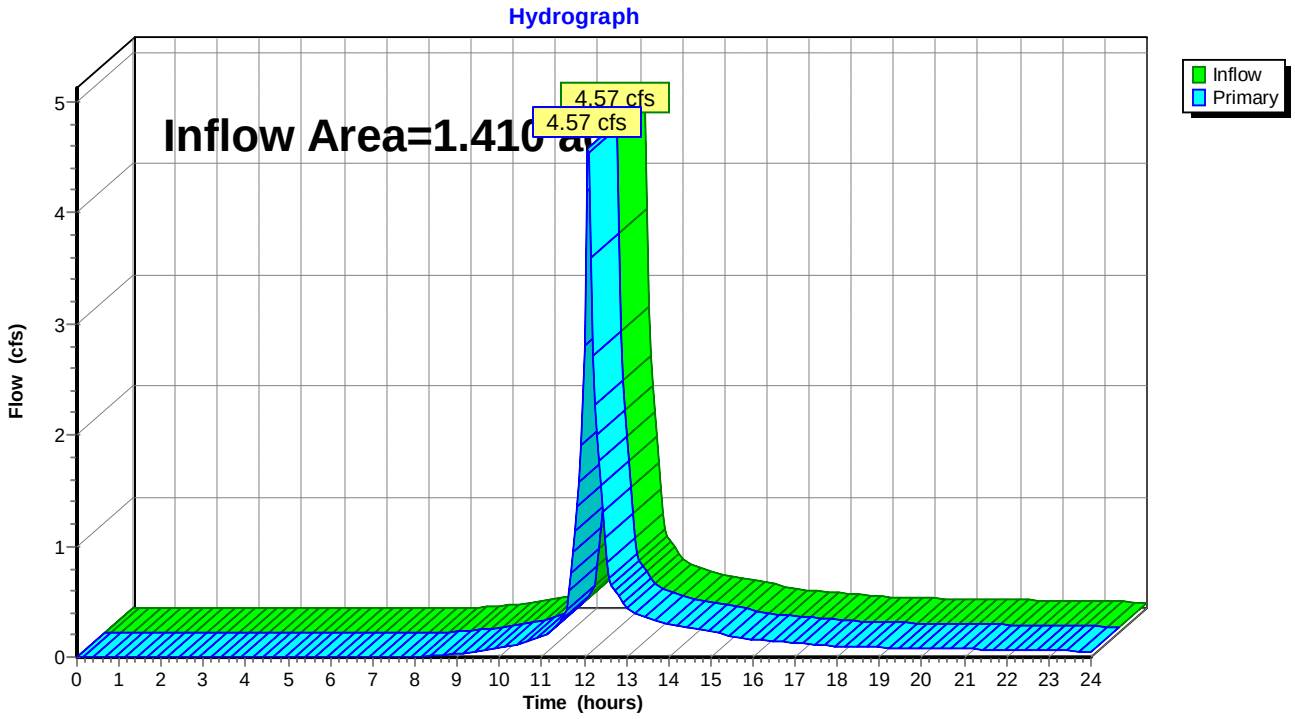


Summary for Link DP5: DP-5

Inflow Area = 1.410 ac, 22.51% Impervious, Inflow Depth > 2.80" for 10-Year event
Inflow = 4.57 cfs @ 12.09 hrs, Volume= 0.329 af
Primary = 4.57 cfs @ 12.09 hrs, Volume= 0.329 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP5: DP-5

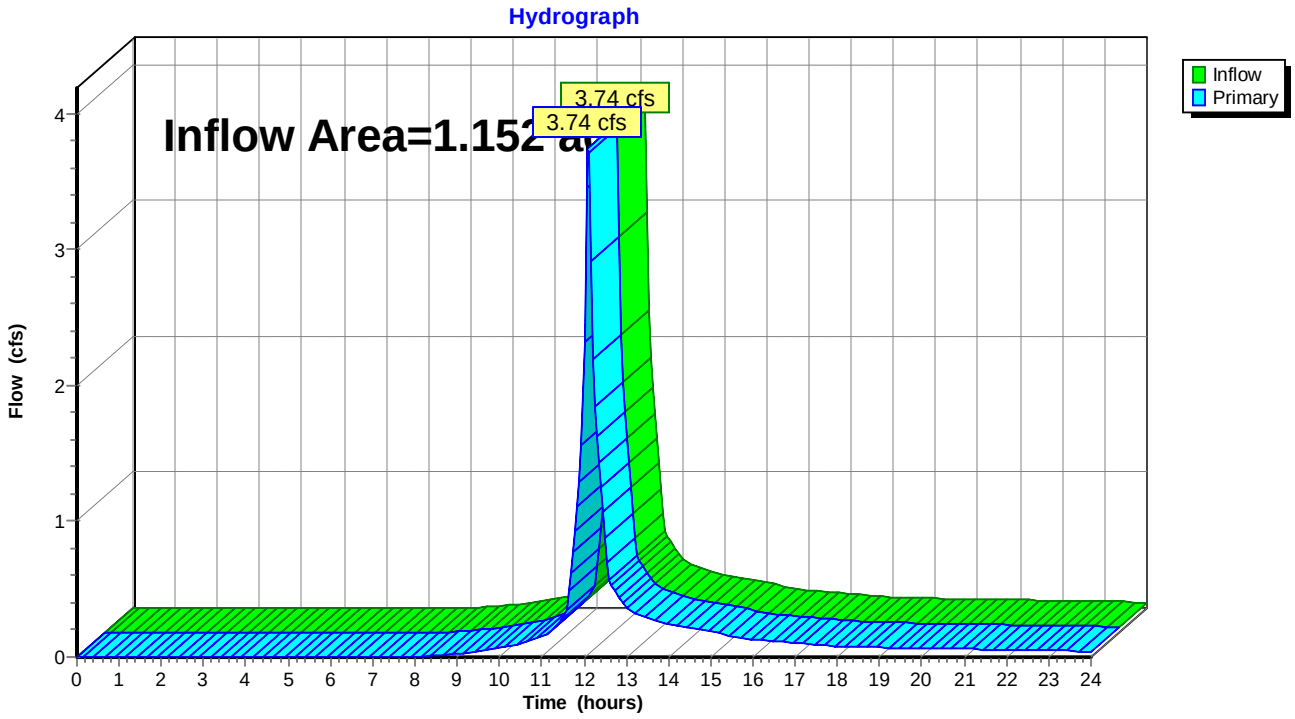


Summary for Link DP6: DP-6

Inflow Area = 1.152 ac, 19.16% Impervious, Inflow Depth > 2.80" for 10-Year event
Inflow = 3.74 cfs @ 12.09 hrs, Volume= 0.269 af
Primary = 3.74 cfs @ 12.09 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP6: DP-6



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 PRDA1D: PRDA-1
Runoff Area=360,934 sf 15.66% Impervious Runoff Depth>3.11"
Flow Length=850' Tc=42.4 min CN=77 Runoff=14.53 cfs 2.144 af

Subcatchment PRDA1ND: PRDA-1
Runoff Area=430,511 sf 13.86% Impervious Runoff Depth>3.01"
Flow Length=1,775' Tc=42.9 min CN=76 Runoff=16.68 cfs 2.479 af

Subcatchment PRDA2AND: PRDA-2A
Runoff Area=103,805 sf 0.00% Impervious Runoff Depth>2.66"
Flow Length=400' Tc=24.1 min CN=72 Runoff=4.61 cfs 0.527 af

Subcatchment PRDA2BND: PRDA-2B
Runoff Area=85,134 sf 0.00% Impervious Runoff Depth>2.66"
Flow Length=300' Tc=17.4 min CN=72 Runoff=4.32 cfs 0.433 af

Subcatchment PRDA3D: PRDA-3
Runoff Area=407,573 sf 36.10% Impervious Runoff Depth>3.72"
Flow Length=1,450' Tc=6.7 min CN=83 Runoff=38.92 cfs 2.899 af

Subcatchment PRDA3ND: PRDA-3
Runoff Area=21,688 sf 76.07% Impervious Runoff Depth>4.67"
Flow Length=100' Slope=0.1100 '/' Tc=5.0 min CN=92 Runoff=2.59 cfs 0.194 af

Subcatchment PRDA4ND: PRDA-4
Runoff Area=9,707 sf 20.57% Impervious Runoff Depth>3.32"
Flow Length=100' Slope=0.1100 '/' Tc=5.0 min CN=79 Runoff=0.87 cfs 0.062 af

Subcatchment PRDA5ND: PRDA-5
Runoff Area=61,426 sf 22.51% Impervious Runoff Depth>3.32"
Flow Length=300' Tc=5.7 min CN=79 Runoff=5.41 cfs 0.390 af

Subcatchment PRDA6ND: PRDA-6
Runoff Area=50,175 sf 19.16% Impervious Runoff Depth>3.32"
Flow Length=650' Tc=5.6 min CN=79 Runoff=4.43 cfs 0.319 af

Pond BASIN A: BASIN A
Peak Elev=822.13' Storage=73,424 cf Inflow=38.92 cfs 2.899 af
Outflow=2.61 cfs 2.077 af

Pond BASIN B: BASIN B
Peak Elev=823.56' Storage=31,421 cf Inflow=14.53 cfs 2.144 af
Outflow=7.67 cfs 1.990 af

Link DP1: DP-1
Inflow=21.65 cfs 4.470 af
Primary=21.65 cfs 4.470 af

Link DP2A: DP-2A
Inflow=4.61 cfs 0.527 af
Primary=4.61 cfs 0.527 af

Link DP2B: DP-2B
Inflow=4.32 cfs 0.433 af
Primary=4.32 cfs 0.433 af

Link DP3: DP-3
Inflow=4.07 cfs 2.271 af
Primary=4.07 cfs 2.271 af

Link DP4: DP-4
Inflow=0.87 cfs 0.062 af
Primary=0.87 cfs 0.062 af

Link DP5: DP-5

Inflow=5.41 cfs 0.390 af
Primary=5.41 cfs 0.390 af

Link DP6: DP-6

Inflow=4.43 cfs 0.319 af
Primary=4.43 cfs 0.319 af

Total Runoff Area = 35.146 ac Runoff Volume = 9.448 af Average Runoff Depth = 3.23"
80.06% Pervious = 28.138 ac 19.94% Impervious = 7.008 ac

Summary for Subcatchment PRDA1D: PRDA-1

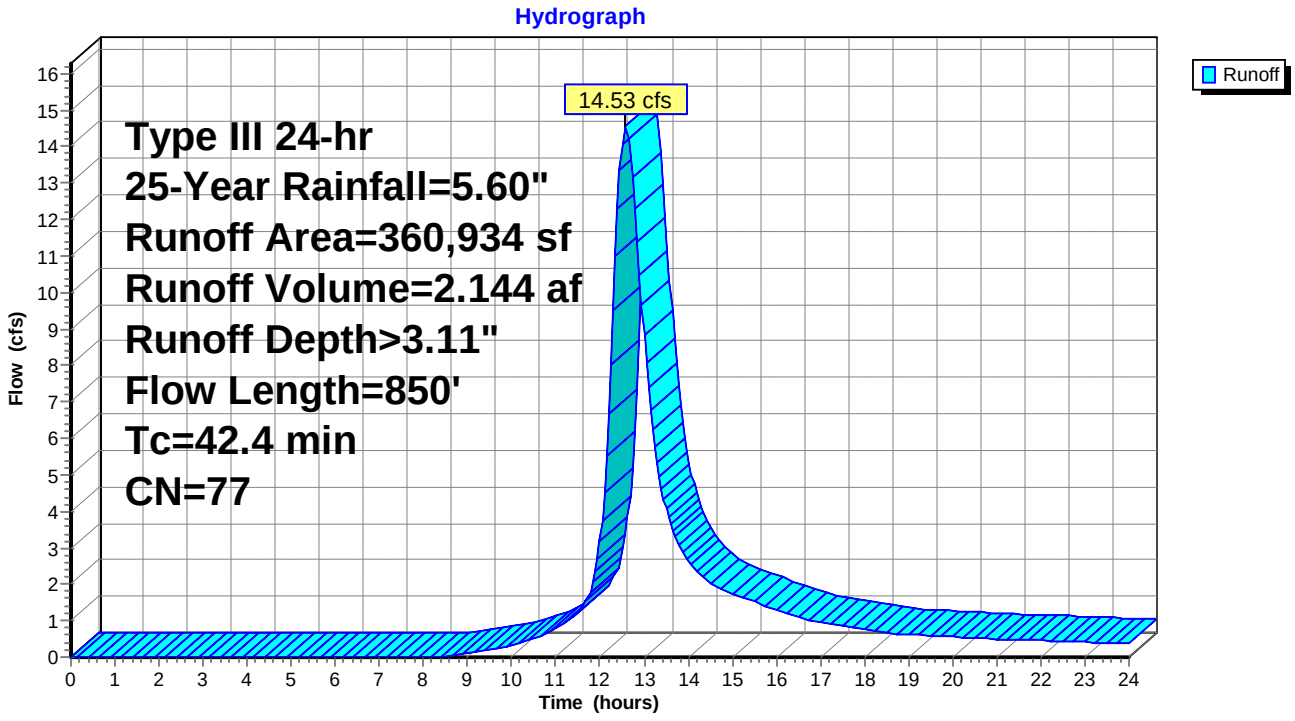
Runoff = 14.53 cfs @ 12.59 hrs, Volume= 2.144 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
	36,718	98	Impervious, HSG C
	1,151	98	Roofs, HSG C
	18,667	98	Water Surface, HSG C
	124,441	74	Pasture/grassland/range, Good, HSG C
*	115,820	75	Gravel, HSG C
	64,137	70	Woods, Good, HSG C
	360,934	77	Weighted Average
	304,398		84.34% Pervious Area
	56,536		15.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
5.4	600	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
42.4	850	Total			

Subcatchment PRDA1D: PRDA-1



Summary for Subcatchment PRDA1ND: PRDA-1

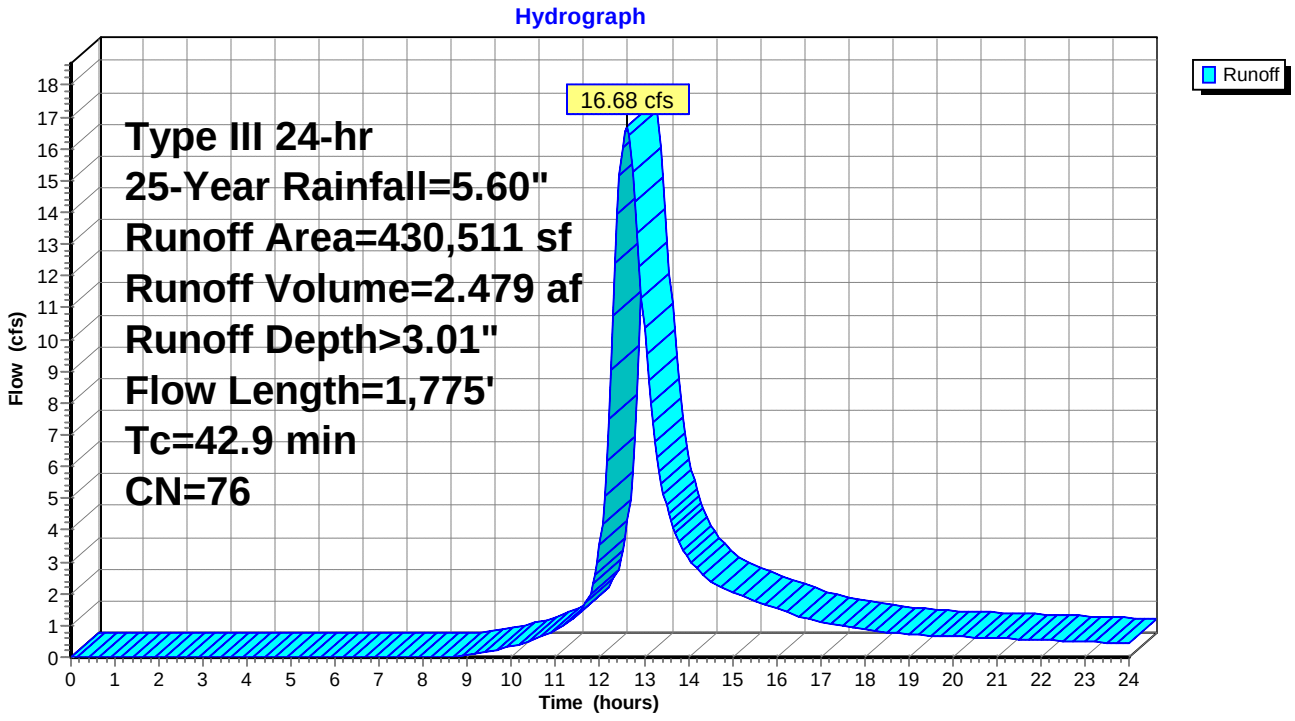
Runoff = 16.68 cfs @ 12.60 hrs, Volume= 2.479 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
114,584	70	Woods, Good, HSG C
256,245	74	Pasture/grassland/range, Good, HSG C
59,682	98	Impervious, HSG C
430,511	76	Weighted Average
370,829		86.14% Pervious Area
59,682		13.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
4.9	1,000	0.0440	3.38		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.0	525	0.0570	8.87	53.22	Channel Flow, Area= 6.0 sf Perim= 6.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides
42.9	1,775	Total			

Subcatchment PRDA1ND: PRDA-1



Summary for Subcatchment PRDA2AND: PRDA-2A

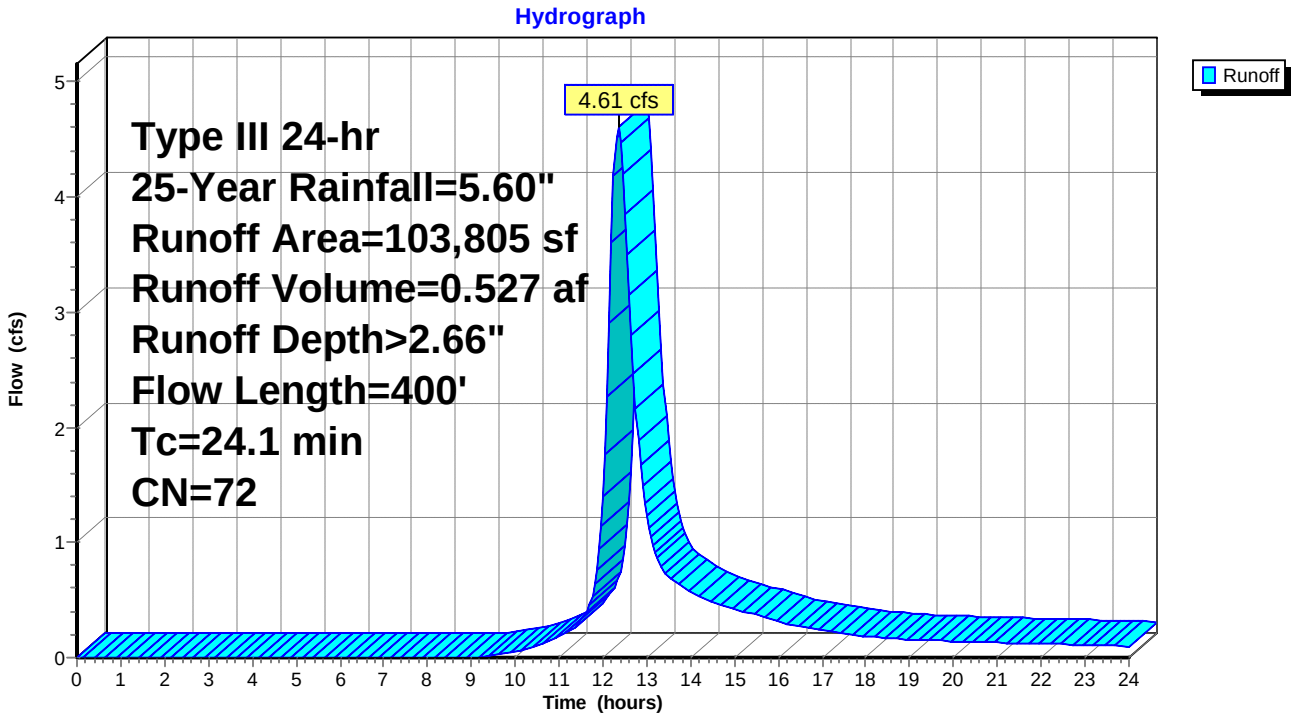
Runoff = 4.61 cfs @ 12.34 hrs, Volume= 0.527 af, Depth> 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
46,490	70	Woods, Good, HSG C
57,315	74	Pasture/grassland/range, Good, HSG C
103,805	72	Weighted Average
103,805		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.1	250	0.1040	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	150	0.2400	2.45		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.1	400	Total			

Subcatchment PRDA2AND: PRDA-2A



Summary for Subcatchment PRDA2BND: PRDA-2B

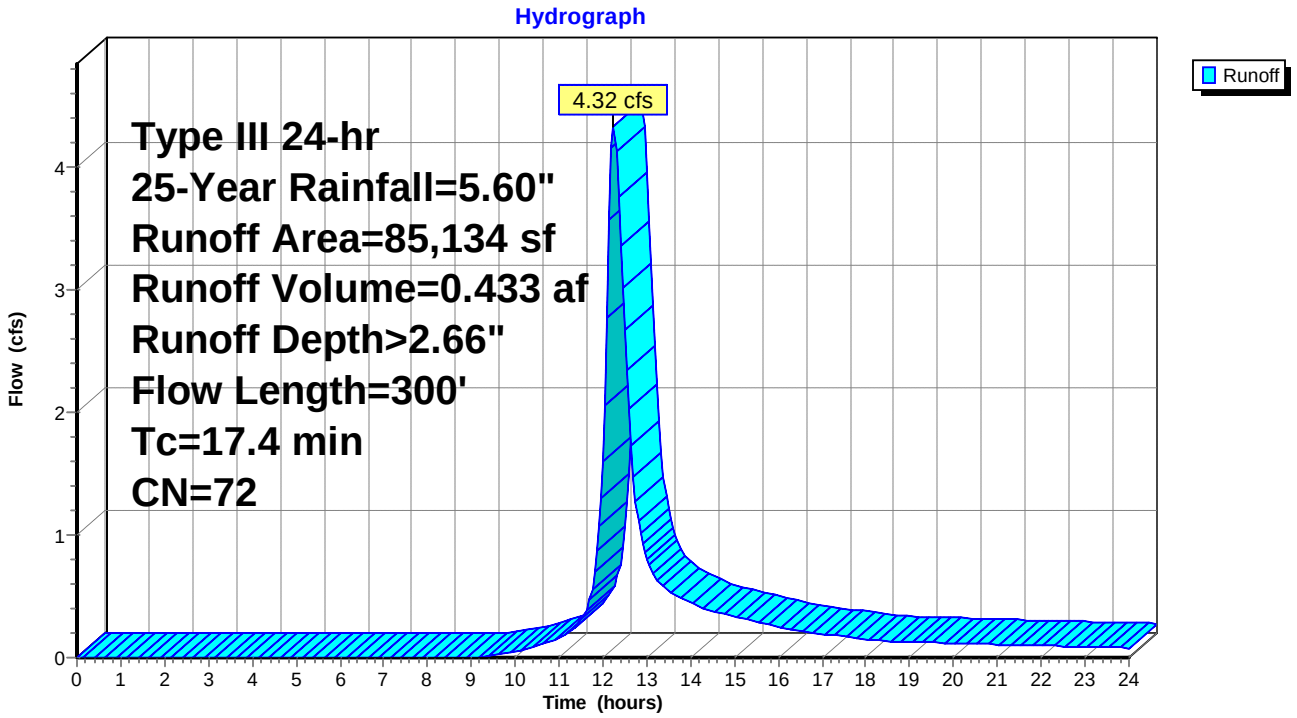
Runoff = 4.32 cfs @ 12.25 hrs, Volume= 0.433 af, Depth> 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
33,200	70	Woods, Good, HSG C
51,934	74	Pasture/grassland/range, Good, HSG C
85,134	72	Weighted Average
85,134		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	200	0.1650	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	100	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.4	300	Total			

Subcatchment PRDA2BND: PRDA-2B



Summary for Subcatchment PRDA3D: PRDA-3

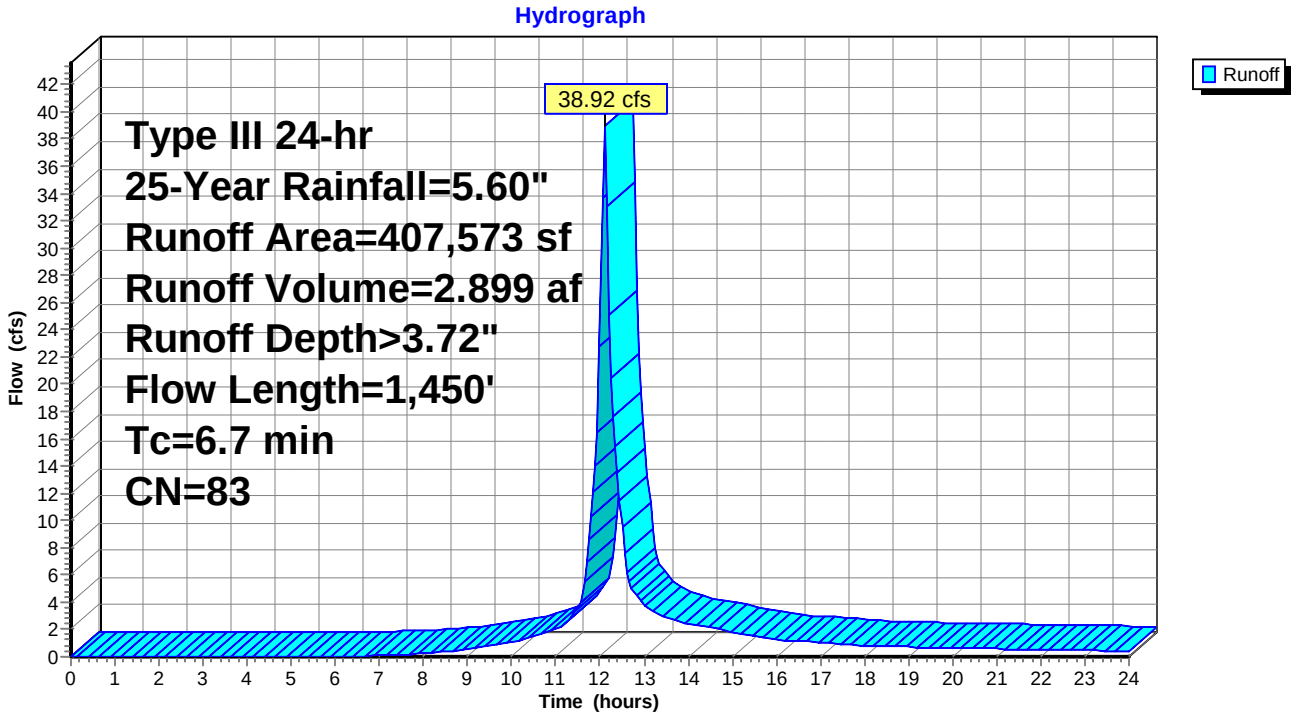
Runoff = 38.92 cfs @ 12.10 hrs, Volume= 2.899 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
	69,087	98	Impervious, HSG C
	36,569	98	Roofs, HSG C
	41,458	98	Water Surface, HSG C
*	260,459	75	Gravel, HSG C
	407,573	83	Weighted Average
	260,459		63.90% Pervious Area
	147,114		36.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	250	0.0100	1.25		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.20"
3.4	1,200	0.0075	5.93	7.27	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
6.7	1,450	Total			

Subcatchment PRDA3D: PRDA-3



Summary for Subcatchment PRDA3ND: PRDA-3

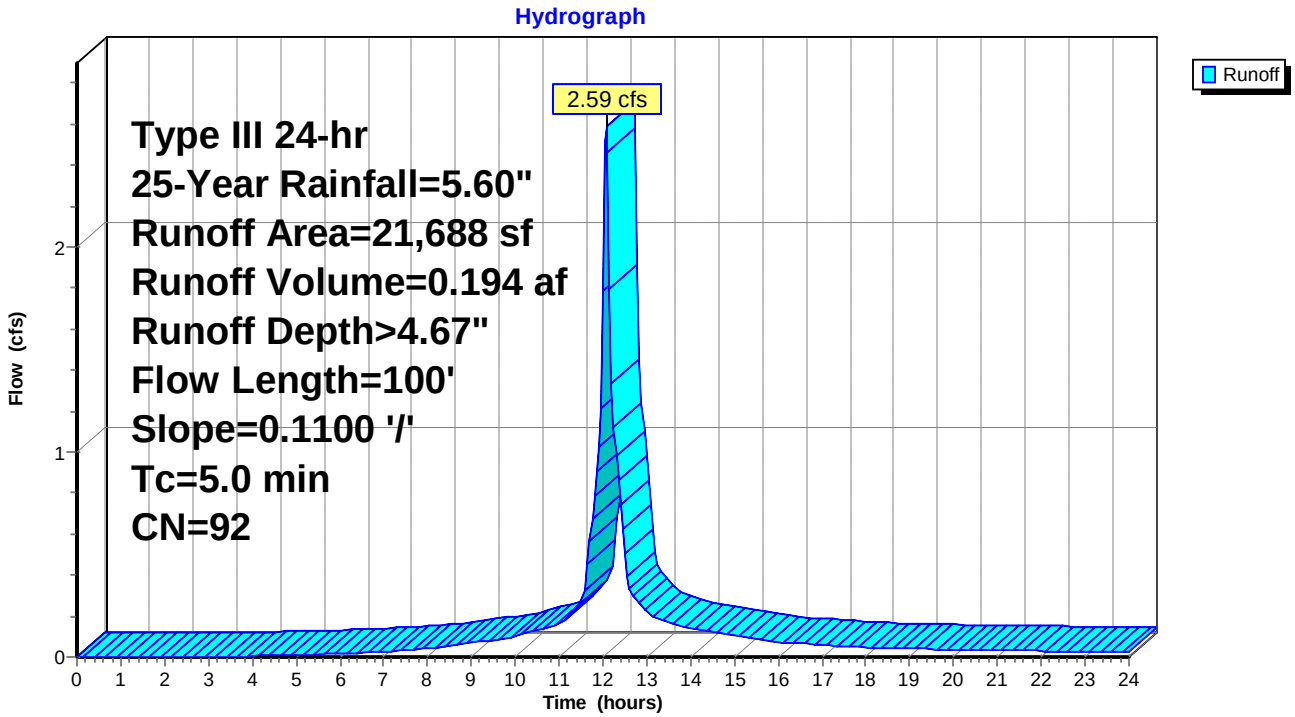
Runoff = 2.59 cfs @ 12.07 hrs, Volume= 0.194 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
5,191	74	Pasture/grassland/range, Good, HSG C
16,497	98	Impervious, HSG C
21,688	92	Weighted Average
5,191		23.93% Pervious Area
16,497		76.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"

Subcatchment PRDA3ND: PRDA-3



Summary for Subcatchment PRDA4ND: PRDA-4

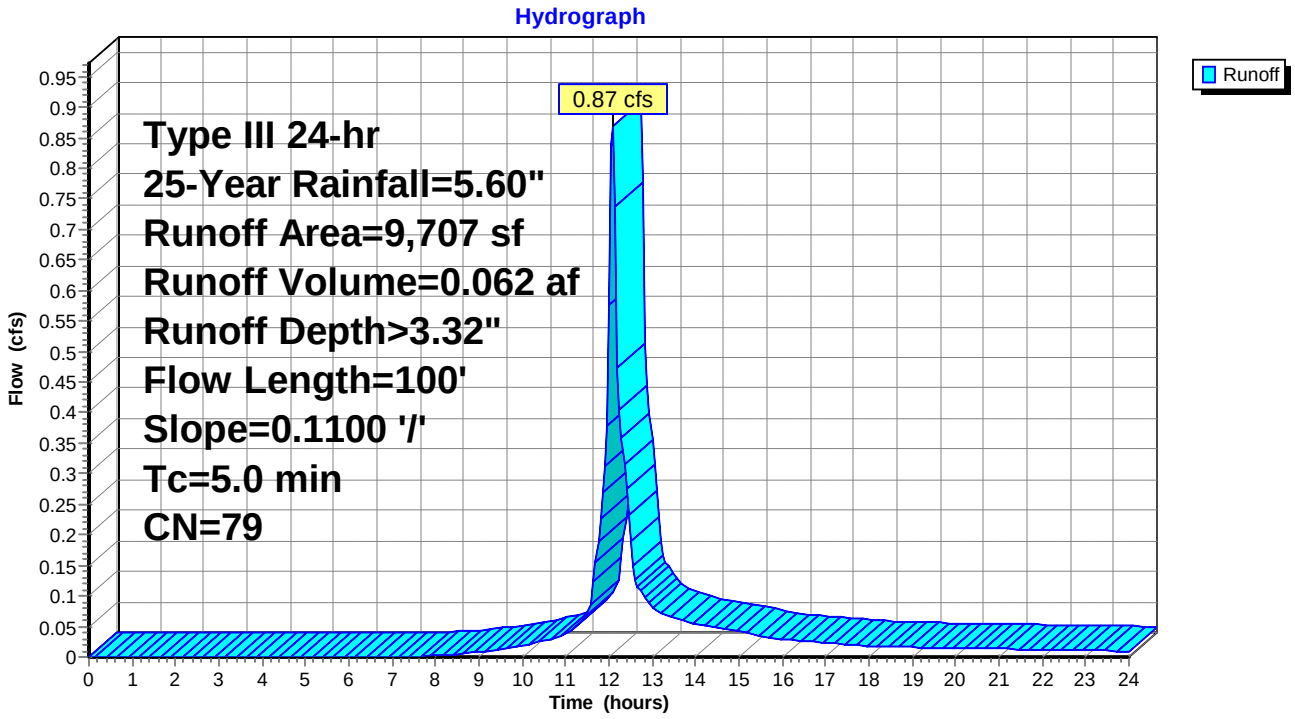
Runoff = 0.87 cfs @ 12.08 hrs, Volume= 0.062 af, Depth> 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

	Area (sf)	CN	Description
	7,710	74	Pasture/grassland/range, Good, HSG C
*	1,997	98	Impervious
	9,707	79	Weighted Average
	7,710		79.43% Pervious Area
	1,997		20.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"

Subcatchment PRDA4ND: PRDA-4



Summary for Subcatchment PRDA5ND: PRDA-5

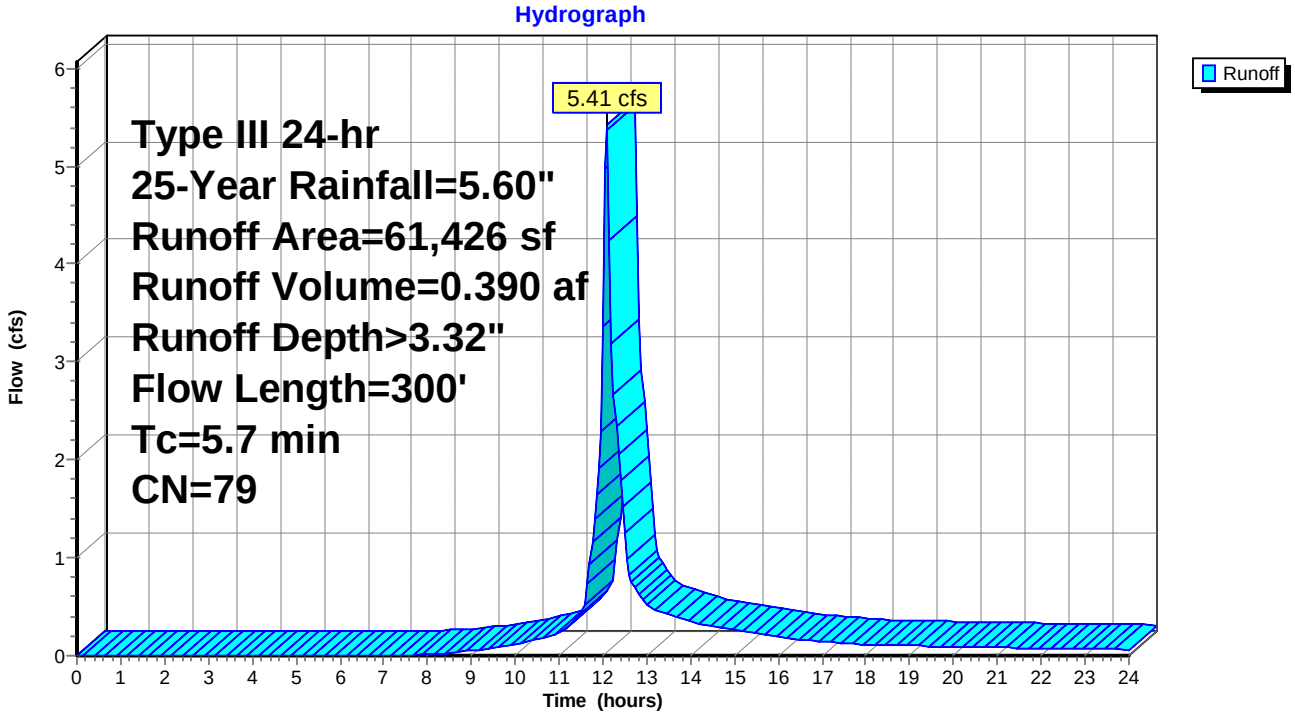
Runoff = 5.41 cfs @ 12.09 hrs, Volume= 0.390 af, Depth> 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
13,824	98	Impervious, HSG C
47,602	74	Pasture/grassland/range, Good, HSG C
61,426	79	Weighted Average
47,602		77.49% Pervious Area
13,824		22.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	200	0.3333	0.60		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
0.2	100	0.0100	6.84	8.40	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
5.7	300	Total			

Subcatchment PRDA5ND: PRDA-5



Summary for Subcatchment PRDA6ND: PRDA-6

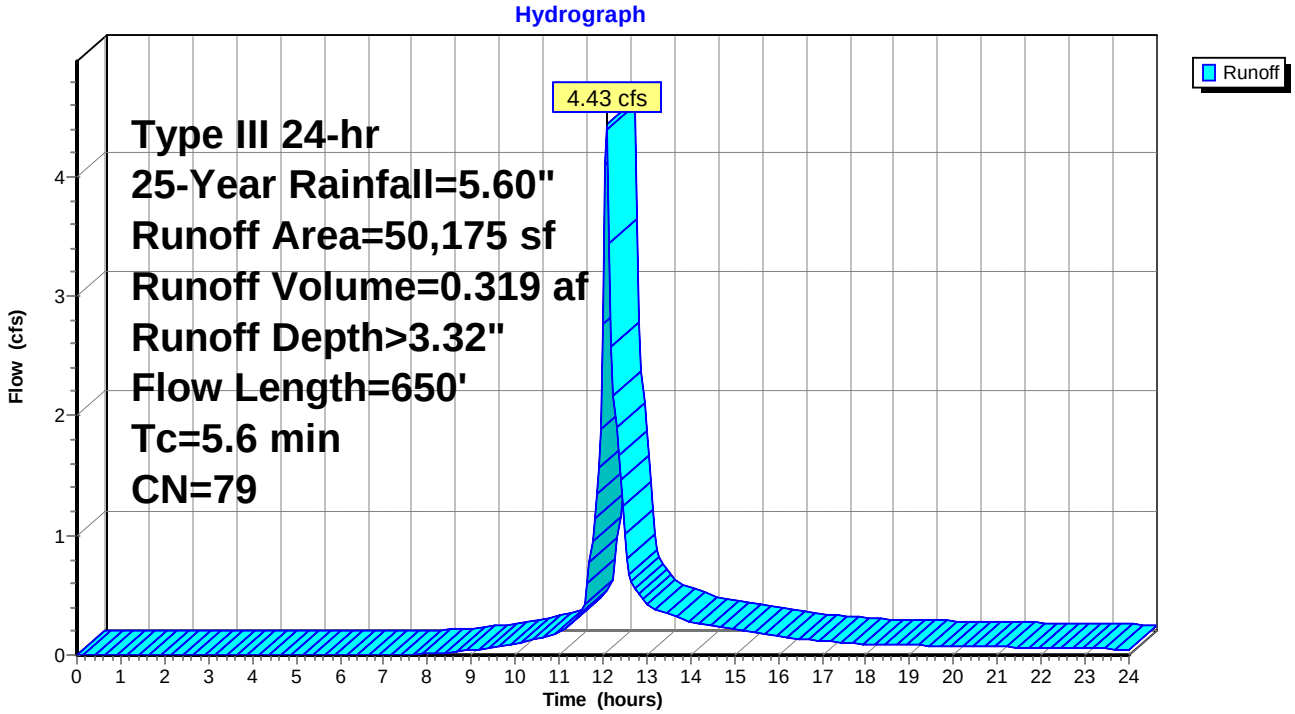
Runoff = 4.43 cfs @ 12.09 hrs, Volume= 0.319 af, Depth> 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.60"

Area (sf)	CN	Description
40,563	74	Pasture/grassland/range, Good, HSG C
9,612	98	Impervious, HSG C
50,175	79	Weighted Average
40,563		80.84% Pervious Area
9,612		19.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	150	0.3333	0.57		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.2	500	0.2050	6.79		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
5.6	650	Total			

Subcatchment PRDA6ND: PRDA-6



Summary for Pond BASIN A: BASIN A

Inflow Area = 9.357 ac, 36.10% Impervious, Inflow Depth > 3.72" for 25-Year event
Inflow = 38.92 cfs @ 12.10 hrs, Volume= 2.899 af
Outflow = 2.61 cfs @ 13.82 hrs, Volume= 2.077 af, Atten= 93%, Lag= 103.4 min
Primary = 2.61 cfs @ 13.82 hrs, Volume= 2.077 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 822.13' @ 13.82 hrs Surf.Area= 38,306 sf Storage= 73,424 cf

Plug-Flow detention time= 321.4 min calculated for 2.077 af (72% of inflow)
Center-of-Mass det. time= 230.6 min (1,039.6 - 809.0)

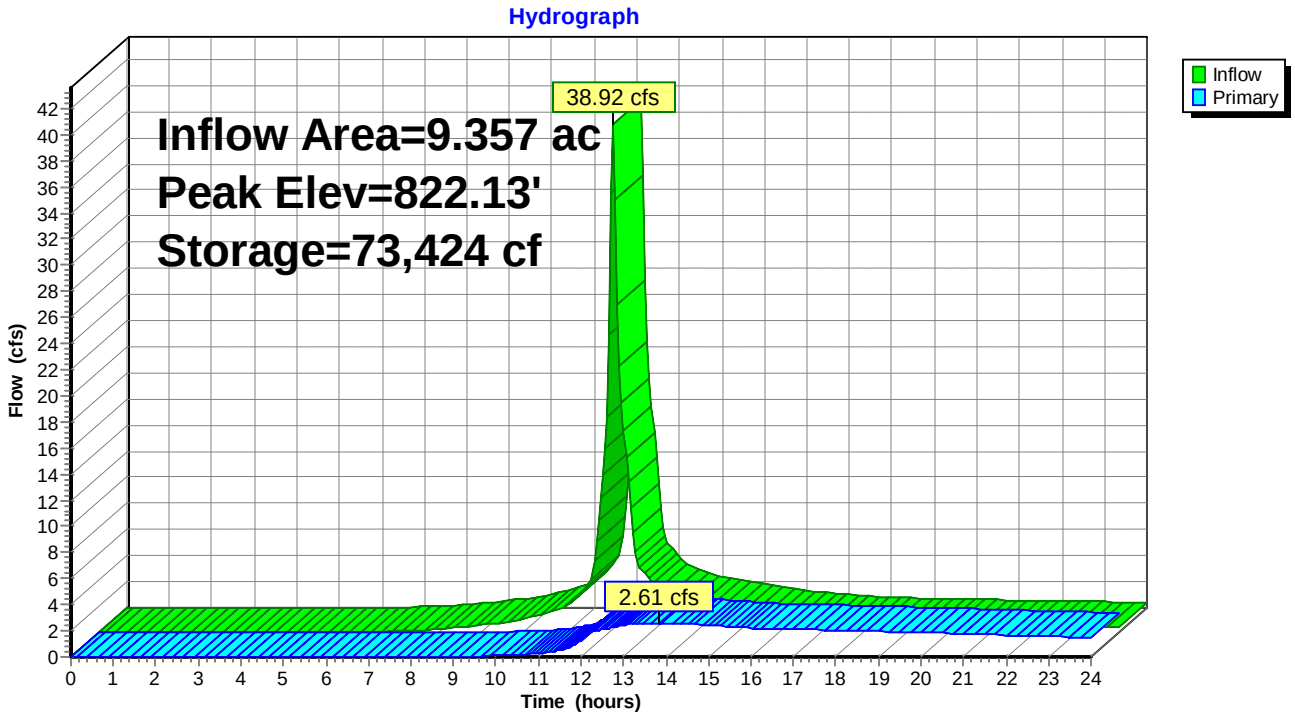
Volume	Invert	Avail.Storage	Storage Description
#1	820.00'	151,470 cf	Basin A (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
820.00	30,856	1,150.0	0	0	30,856
822.00	37,867	1,187.0	68,603	68,603	38,123
824.00	45,105	1,225.0	82,867	151,470	45,805

Device	Routing	Invert	Outlet Devices
#1	Primary	820.00'	15.0" Round Culvert L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 820.00' / 786.00' S= 0.1360 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	820.00'	8.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	822.00'	15.0" W x 12.0" H Vert. Orifice/Grate X 2.00 C= 0.600

Primary OutFlow Max=2.61 cfs @ 13.82 hrs HW=822.13' (Free Discharge)
└1=Culvert (Passes 2.61 cfs of 7.24 cfs potential flow)
  ├2=Orifice/Grate (Orifice Controls 2.25 cfs @ 6.45 fps)
  └3=Orifice/Grate (Orifice Controls 0.36 cfs @ 1.14 fps)

Pond BASIN A: BASIN A



Summary for Pond BASIN B: BASIN B

Inflow Area = 8.286 ac, 15.66% Impervious, Inflow Depth > 3.11" for 25-Year event
Inflow = 14.53 cfs @ 12.59 hrs, Volume= 2.144 af
Outflow = 7.67 cfs @ 13.08 hrs, Volume= 1.990 af, Atten= 47%, Lag= 29.6 min
Primary = 7.67 cfs @ 13.08 hrs, Volume= 1.990 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 823.56' @ 13.08 hrs Surf.Area= 15,198 sf Storage= 31,421 cf

Plug-Flow detention time= 112.0 min calculated for 1.990 af (93% of inflow)
Center-of-Mass det. time= 76.6 min (929.7 - 853.1)

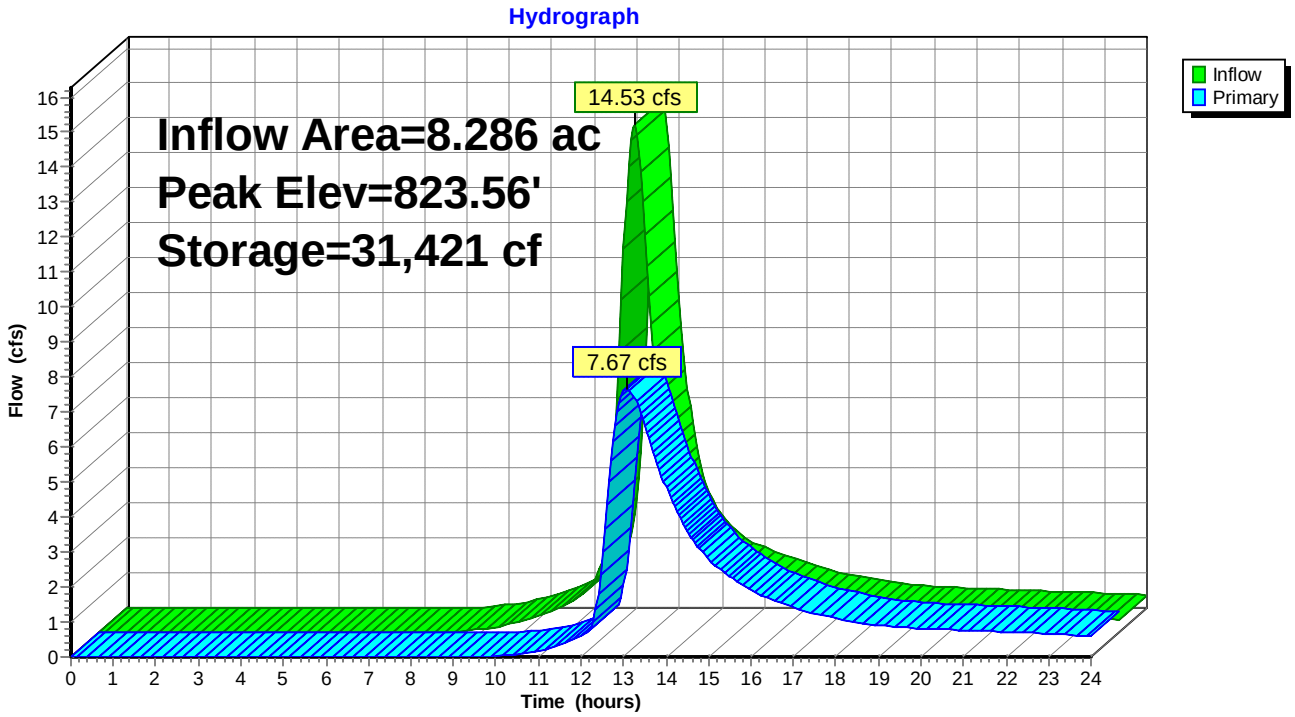
Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	122,878 cf	**Basin B (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
821.00	9,468	729.0	0	0	9,468
822.00	11,682	748.0	10,556	10,556	11,820
824.00	16,283	786.0	27,838	38,394	16,706
826.00	21,113	824.1	37,292	75,685	21,846
828.00	26,170	850.0	47,193	122,878	25,681

Device	Routing	Invert	Outlet Devices
#1	Primary	821.00'	**18.0" Round Culvert** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 821.00' / 797.00' S= 0.2400 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	821.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	822.00'	**12.0" W x 30.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	825.00'	**24.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=7.67 cfs @ 13.08 hrs HW=823.56' (Free Discharge)
└1=**Culvert** (Passes 7.67 cfs of 11.43 cfs potential flow)
  └2=**Orifice/Grate** (Orifice Controls 1.44 cfs @ 7.31 fps)
  └3=**Orifice/Grate** (Orifice Controls 6.23 cfs @ 4.00 fps)
└4=**Orifice/Grate** (Controls 0.00 cfs)

Pond BASIN B: BASIN B

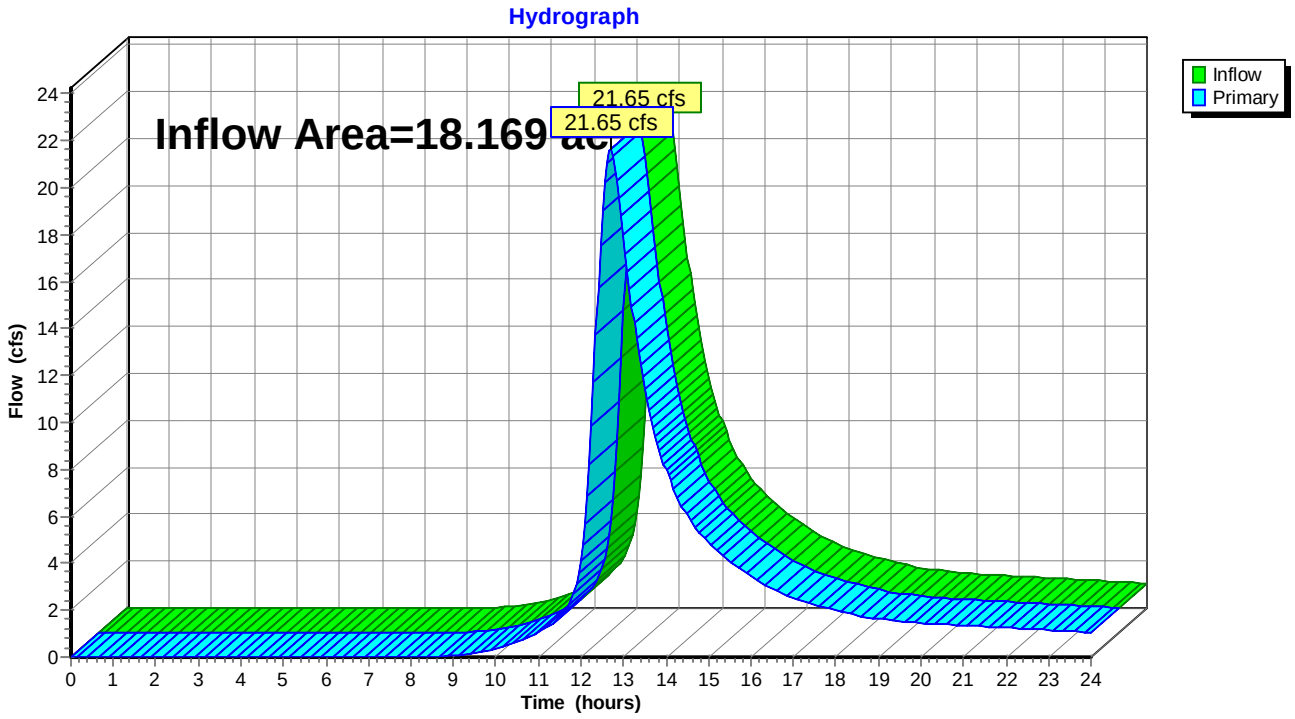


Summary for Link DP1: DP-1

Inflow Area = 18.169 ac, 14.68% Impervious, Inflow Depth > 2.95" for 25-Year event
Inflow = 21.65 cfs @ 12.69 hrs, Volume= 4.470 af
Primary = 21.65 cfs @ 12.69 hrs, Volume= 4.470 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DP-1

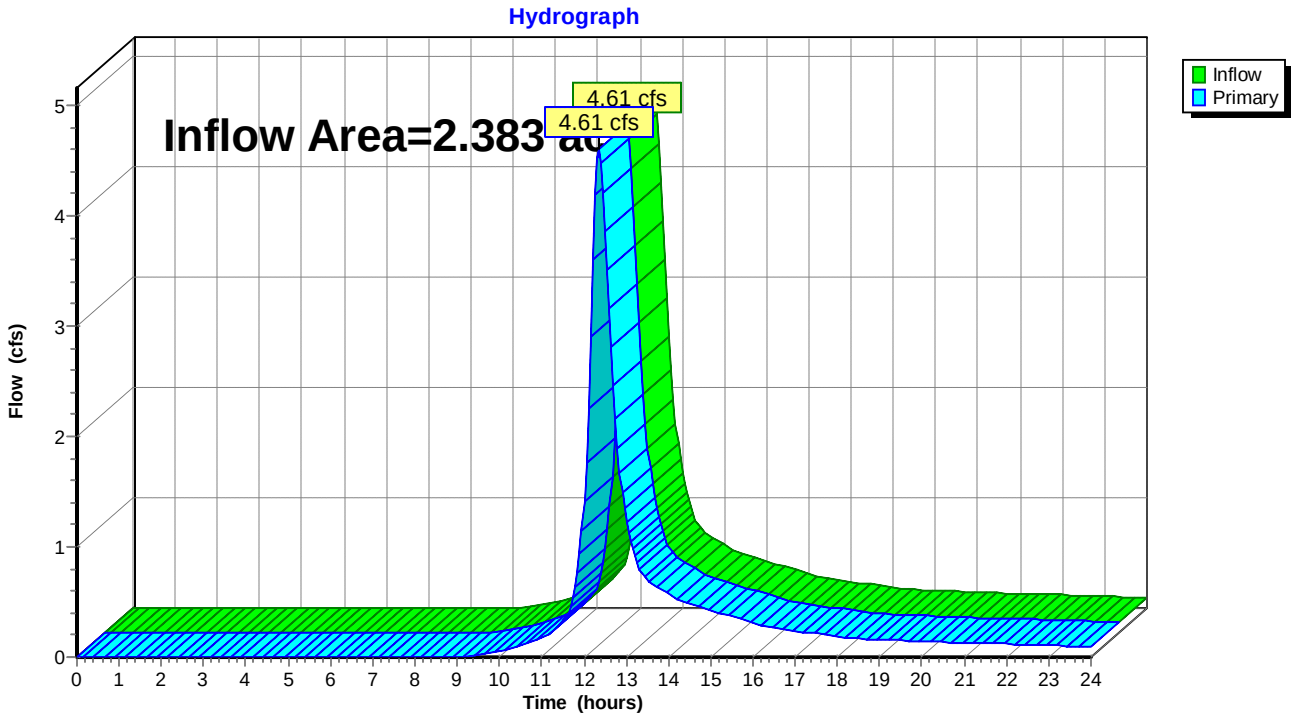


Summary for Link DP2A: DP-2A

Inflow Area = 2.383 ac, 0.00% Impervious, Inflow Depth > 2.66" for 25-Year event
Inflow = 4.61 cfs @ 12.34 hrs, Volume= 0.527 af
Primary = 4.61 cfs @ 12.34 hrs, Volume= 0.527 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2A: DP-2A

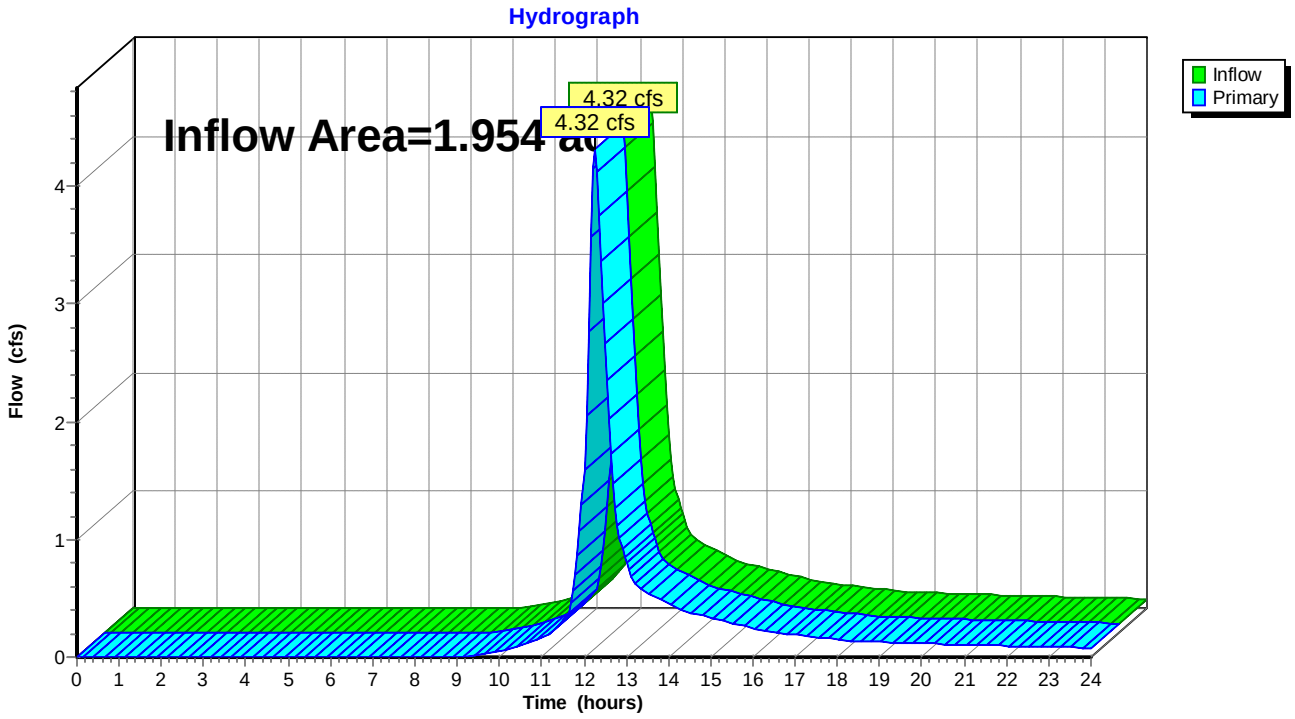


Summary for Link DP2B: DP-2B

Inflow Area = 1.954 ac, 0.00% Impervious, Inflow Depth > 2.66" for 25-Year event
Inflow = 4.32 cfs @ 12.25 hrs, Volume= 0.433 af
Primary = 4.32 cfs @ 12.25 hrs, Volume= 0.433 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2B: DP-2B

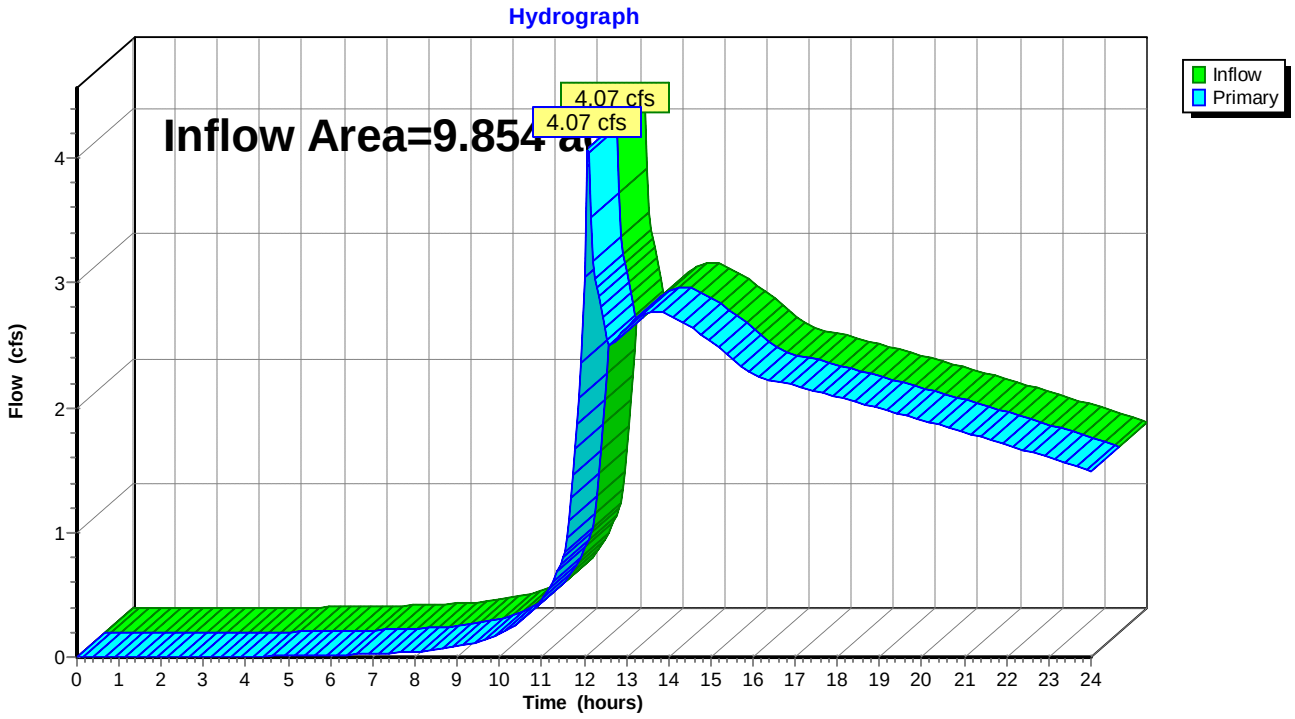


Summary for Link DP3: DP-3

Inflow Area = 9.854 ac, 38.11% Impervious, Inflow Depth > 2.77" for 25-Year event
Inflow = 4.07 cfs @ 12.08 hrs, Volume= 2.271 af
Primary = 4.07 cfs @ 12.08 hrs, Volume= 2.271 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: DP-3

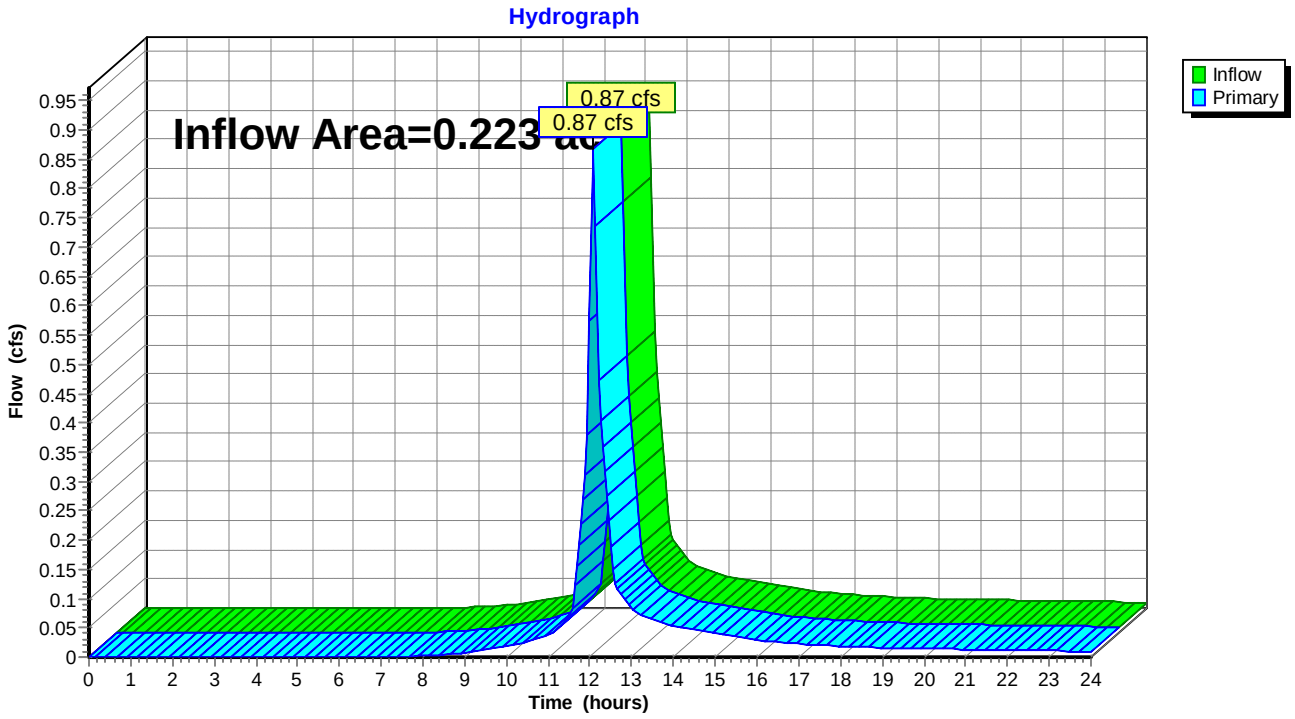


Summary for Link DP4: DP-4

Inflow Area = 0.223 ac, 20.57% Impervious, Inflow Depth > 3.32" for 25-Year event
Inflow = 0.87 cfs @ 12.08 hrs, Volume= 0.062 af
Primary = 0.87 cfs @ 12.08 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP4: DP-4

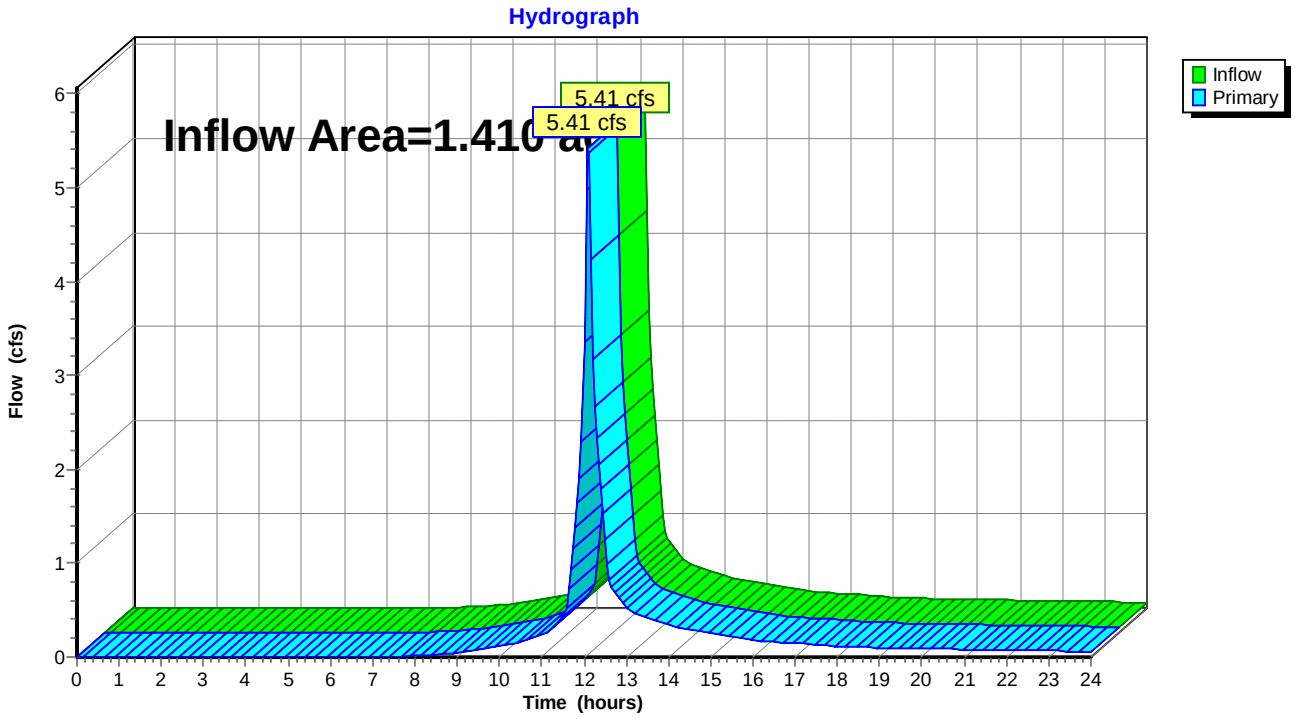


Summary for Link DP5: DP-5

Inflow Area = 1.410 ac, 22.51% Impervious, Inflow Depth > 3.32" for 25-Year event
Inflow = 5.41 cfs @ 12.09 hrs, Volume= 0.390 af
Primary = 5.41 cfs @ 12.09 hrs, Volume= 0.390 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP5: DP-5

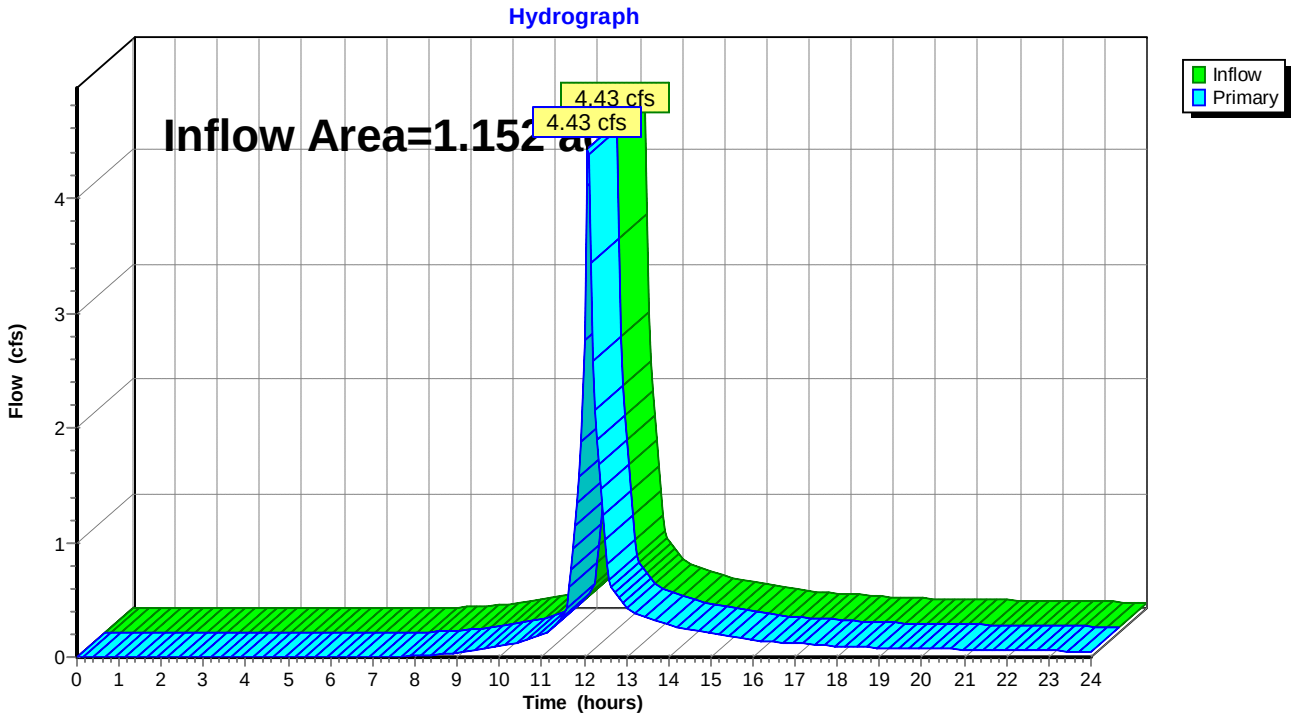


Summary for Link DP6: DP-6

Inflow Area = 1.152 ac, 19.16% Impervious, Inflow Depth > 3.32" for 25-Year event
Inflow = 4.43 cfs @ 12.09 hrs, Volume= 0.319 af
Primary = 4.43 cfs @ 12.09 hrs, Volume= 0.319 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP6: DP-6



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 PRDA1D: PRDA-1 — Runoff Area=360,934 sf 15.66% Impervious Runoff Depth>3.71"
Flow Length=850' Tc=42.4 min CN=77 Runoff=17.36 cfs 2.562 af

Subcatchment PRDA1ND: PRDA-1 — Runoff Area=430,511 sf 13.86% Impervious Runoff Depth>3.61"
Flow Length=1,775' Tc=42.9 min CN=76 Runoff=20.01 cfs 2.972 af

Subcatchment PRDA2AND: PRDA-2A — Runoff Area=103,805 sf 0.00% Impervious Runoff Depth>3.22"
Flow Length=400' Tc=24.1 min CN=72 Runoff=5.61 cfs 0.640 af

Subcatchment PRDA2BND: PRDA-2B — Runoff Area=85,134 sf 0.00% Impervious Runoff Depth>3.23"
Flow Length=300' Tc=17.4 min CN=72 Runoff=5.26 cfs 0.526 af

Subcatchment PRDA3D: PRDA-3 — Runoff Area=407,573 sf 36.10% Impervious Runoff Depth>4.37"
Flow Length=1,450' Tc=6.7 min CN=83 Runoff=45.46 cfs 3.405 af

Subcatchment PRDA3ND: PRDA-3 — Runoff Area=21,688 sf 76.07% Impervious Runoff Depth>5.36"
Flow Length=100' Slope=0.1100 '/' Tc=5.0 min CN=92 Runoff=2.94 cfs 0.222 af

Subcatchment PRDA4ND: PRDA-4 — Runoff Area=9,707 sf 20.57% Impervious Runoff Depth>3.95"
Flow Length=100' Slope=0.1100 '/' Tc=5.0 min CN=79 Runoff=1.03 cfs 0.073 af

Subcatchment PRDA5ND: PRDA-5 — Runoff Area=61,426 sf 22.51% Impervious Runoff Depth>3.95"
Flow Length=300' Tc=5.7 min CN=79 Runoff=6.41 cfs 0.464 af

Subcatchment PRDA6ND: PRDA-6 — Runoff Area=50,175 sf 19.16% Impervious Runoff Depth>3.95"
Flow Length=650' Tc=5.6 min CN=79 Runoff=5.25 cfs 0.379 af

Pond BASIN A: BASIN A — Peak Elev=822.36' Storage=82,538 cf Inflow=45.46 cfs 3.405 af
Outflow=4.14 cfs 2.494 af

Pond BASIN B: BASIN B — Peak Elev=823.86' Storage=36,215 cf Inflow=17.36 cfs 2.562 af
Outflow=9.70 cfs 2.386 af

Link DP1: DP-1 — Inflow=26.75 cfs 5.359 af
Primary=26.75 cfs 5.359 af

Link DP2A: DP-2A — Inflow=5.61 cfs 0.640 af
Primary=5.61 cfs 0.640 af

Link DP2B: DP-2B — Inflow=5.26 cfs 0.526 af
Primary=5.26 cfs 0.526 af

Link DP3: DP-3 — Inflow=4.62 cfs 2.716 af
Primary=4.62 cfs 2.716 af

Link DP4: DP-4 — Inflow=1.03 cfs 0.073 af
Primary=1.03 cfs 0.073 af

Link DP5: DP-5

Inflow=6.41 cfs 0.464 af
Primary=6.41 cfs 0.464 af

Link DP6: DP-6

Inflow=5.25 cfs 0.379 af
Primary=5.25 cfs 0.379 af

Total Runoff Area = 35.146 ac Runoff Volume = 11.244 af Average Runoff Depth = 3.84"
80.06% Pervious = 28.138 ac 19.94% Impervious = 7.008 ac

Summary for Subcatchment PRDA1D: PRDA-1

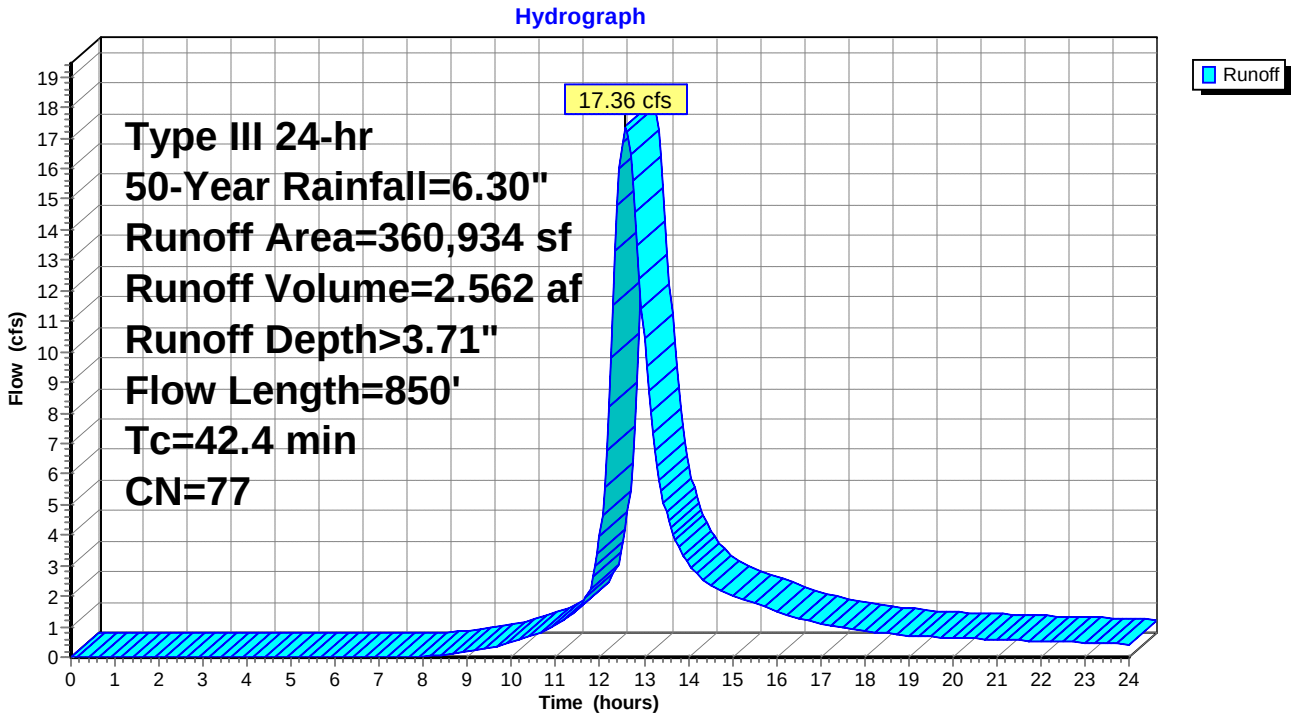
Runoff = 17.36 cfs @ 12.58 hrs, Volume= 2.562 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

	Area (sf)	CN	Description
	36,718	98	Impervious, HSG C
	1,151	98	Roofs, HSG C
	18,667	98	Water Surface, HSG C
	124,441	74	Pasture/grassland/range, Good, HSG C
*	115,820	75	Gravel, HSG C
	64,137	70	Woods, Good, HSG C
	360,934	77	Weighted Average
	304,398		84.34% Pervious Area
	56,536		15.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
5.4	600	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
42.4	850	Total			

Subcatchment PRDA1D: PRDA-1



Summary for Subcatchment PRDA1ND: PRDA-1

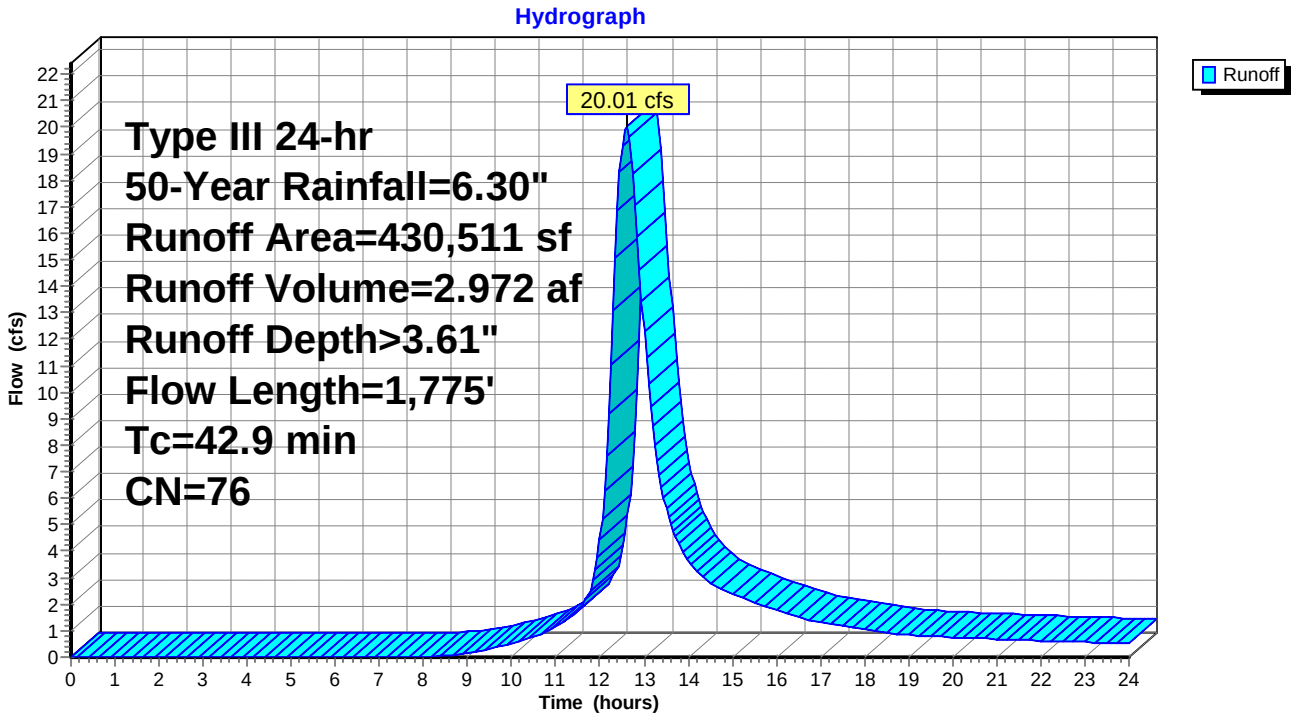
Runoff = 20.01 cfs @ 12.59 hrs, Volume= 2.972 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
114,584	70	Woods, Good, HSG C
256,245	74	Pasture/grassland/range, Good, HSG C
59,682	98	Impervious, HSG C
430,511	76	Weighted Average
370,829		86.14% Pervious Area
59,682		13.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
4.9	1,000	0.0440	3.38		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.0	525	0.0570	8.87	53.22	Channel Flow, Area= 6.0 sf Perim= 6.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides
42.9	1,775	Total			

Subcatchment PRDA1ND: PRDA-1



Summary for Subcatchment PRDA2AND: PRDA-2A

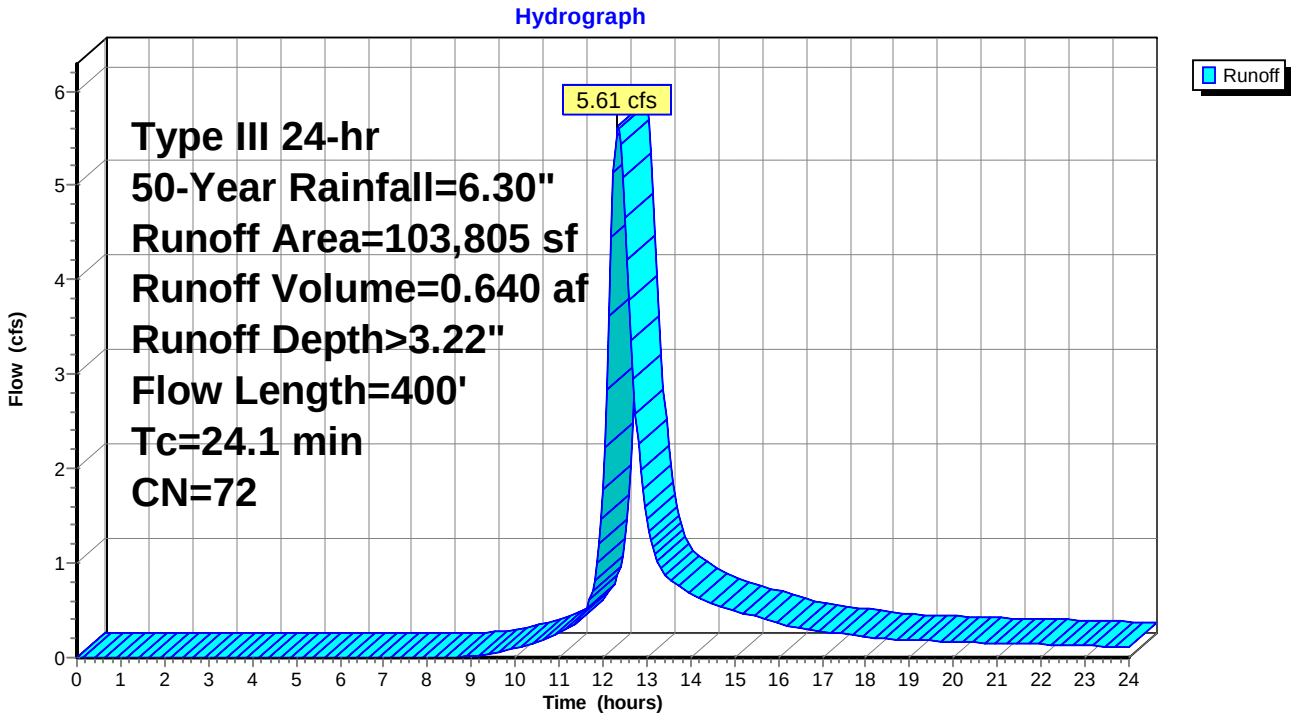
Runoff = 5.61 cfs @ 12.34 hrs, Volume= 0.640 af, Depth> 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
46,490	70	Woods, Good, HSG C
57,315	74	Pasture/grassland/range, Good, HSG C
103,805	72	Weighted Average
103,805		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.1	250	0.1040	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	150	0.2400	2.45		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.1	400	Total			

Subcatchment PRDA2AND: PRDA-2A



Summary for Subcatchment PRDA2BND: PRDA-2B

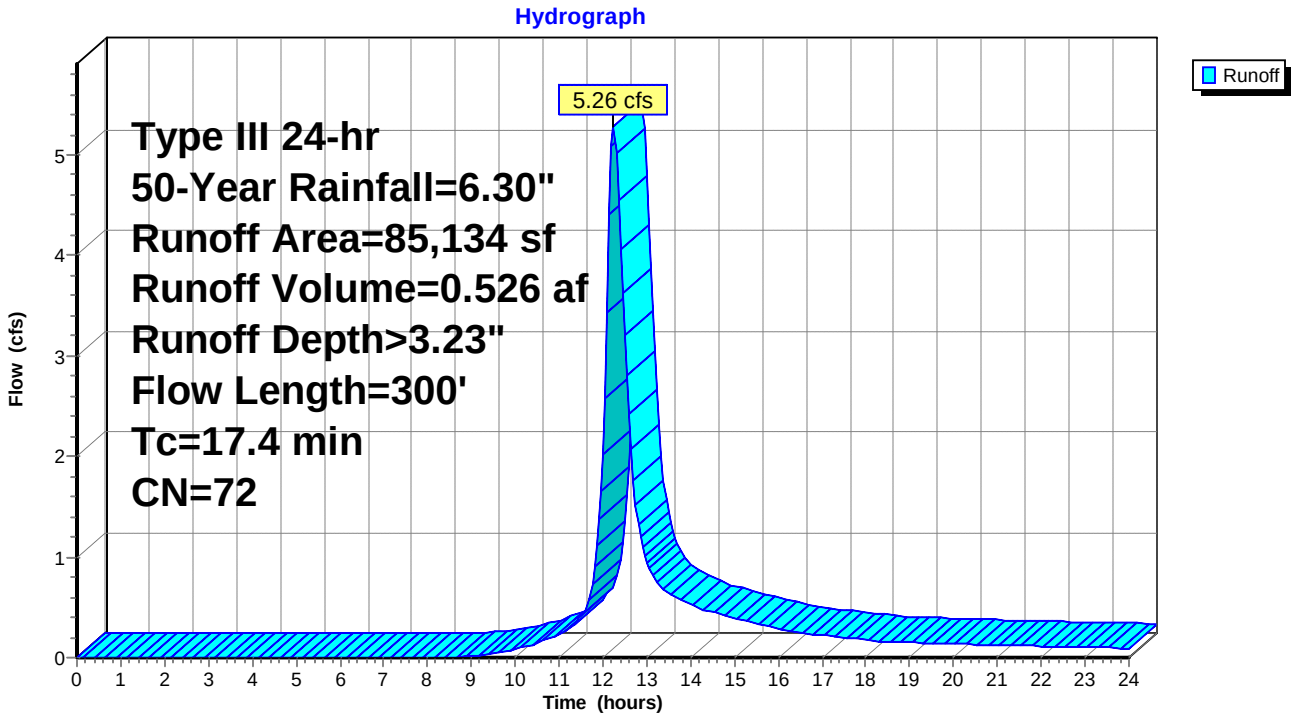
Runoff = 5.26 cfs @ 12.25 hrs, Volume= 0.526 af, Depth> 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
33,200	70	Woods, Good, HSG C
51,934	74	Pasture/grassland/range, Good, HSG C
85,134	72	Weighted Average
85,134		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	200	0.1650	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	100	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.4	300	Total			

Subcatchment PRDA2BND: PRDA-2B



Summary for Subcatchment PRDA3D: PRDA-3

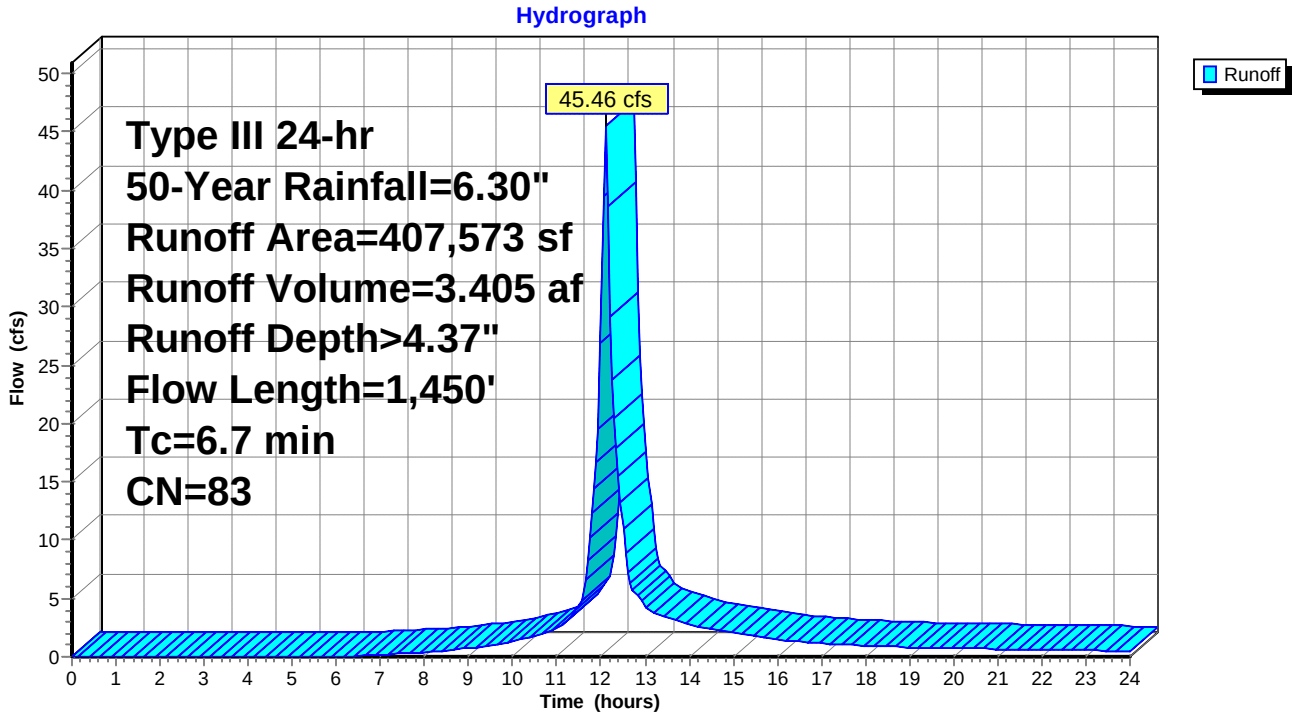
Runoff = 45.46 cfs @ 12.10 hrs, Volume= 3.405 af, Depth> 4.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

	Area (sf)	CN	Description
	69,087	98	Impervious, HSG C
	36,569	98	Roofs, HSG C
	41,458	98	Water Surface, HSG C
*	260,459	75	Gravel, HSG C
	407,573	83	Weighted Average
	260,459		63.90% Pervious Area
	147,114		36.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	250	0.0100	1.25		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.20"
3.4	1,200	0.0075	5.93	7.27	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
6.7	1,450	Total			

Subcatchment PRDA3D: PRDA-3



Summary for Subcatchment PRDA3ND: PRDA-3

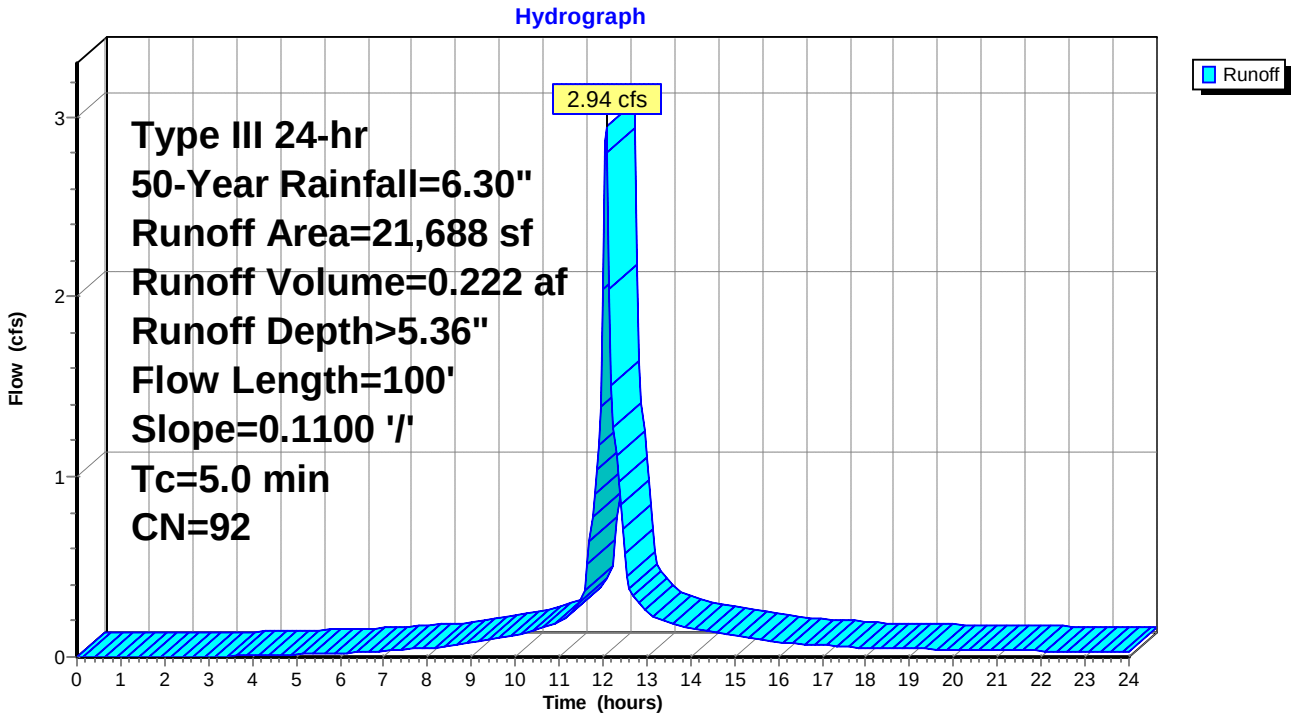
Runoff = 2.94 cfs @ 12.07 hrs, Volume= 0.222 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
5,191	74	Pasture/grassland/range, Good, HSG C
16,497	98	Impervious, HSG C
21,688	92	Weighted Average
5,191		23.93% Pervious Area
16,497		76.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"

Subcatchment PRDA3ND: PRDA-3



Summary for Subcatchment PRDA4ND: PRDA-4

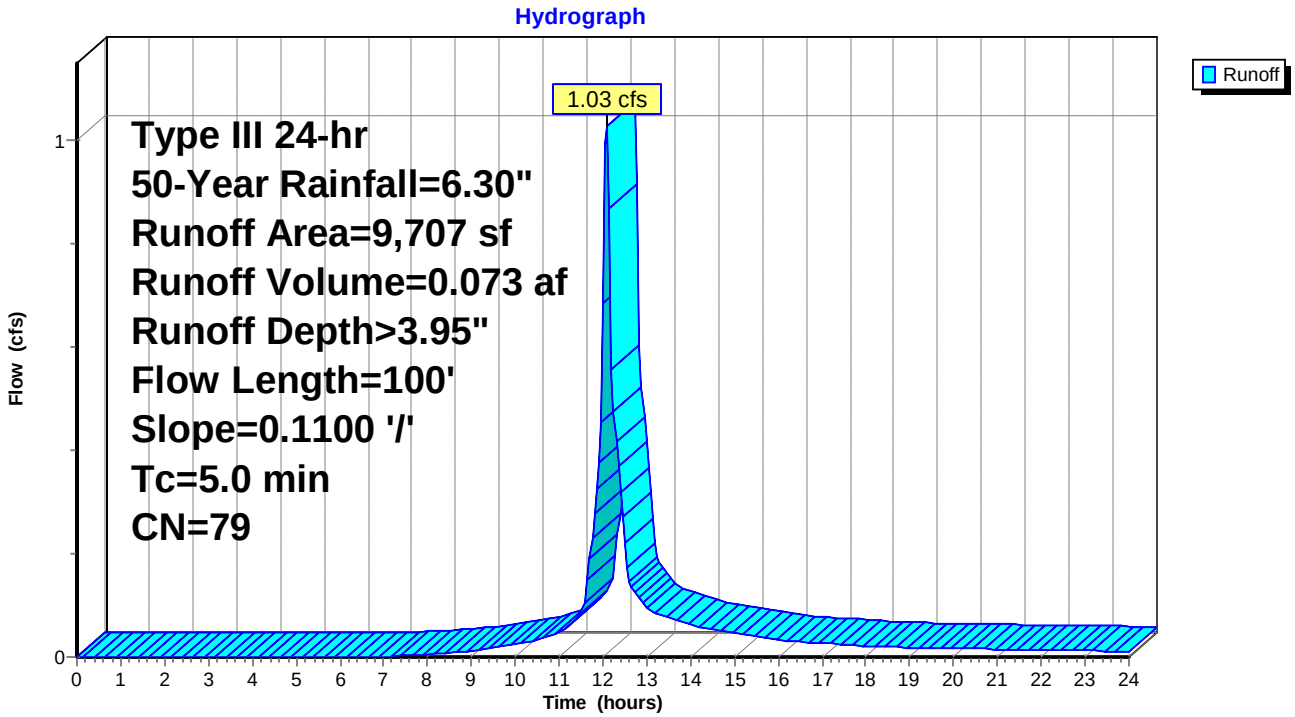
Runoff = 1.03 cfs @ 12.08 hrs, Volume= 0.073 af, Depth> 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

	Area (sf)	CN	Description
	7,710	74	Pasture/grassland/range, Good, HSG C
*	1,997	98	Impervious
	9,707	79	Weighted Average
	7,710		79.43% Pervious Area
	1,997		20.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"

Subcatchment PRDA4ND: PRDA-4



Summary for Subcatchment PRDA5ND: PRDA-5

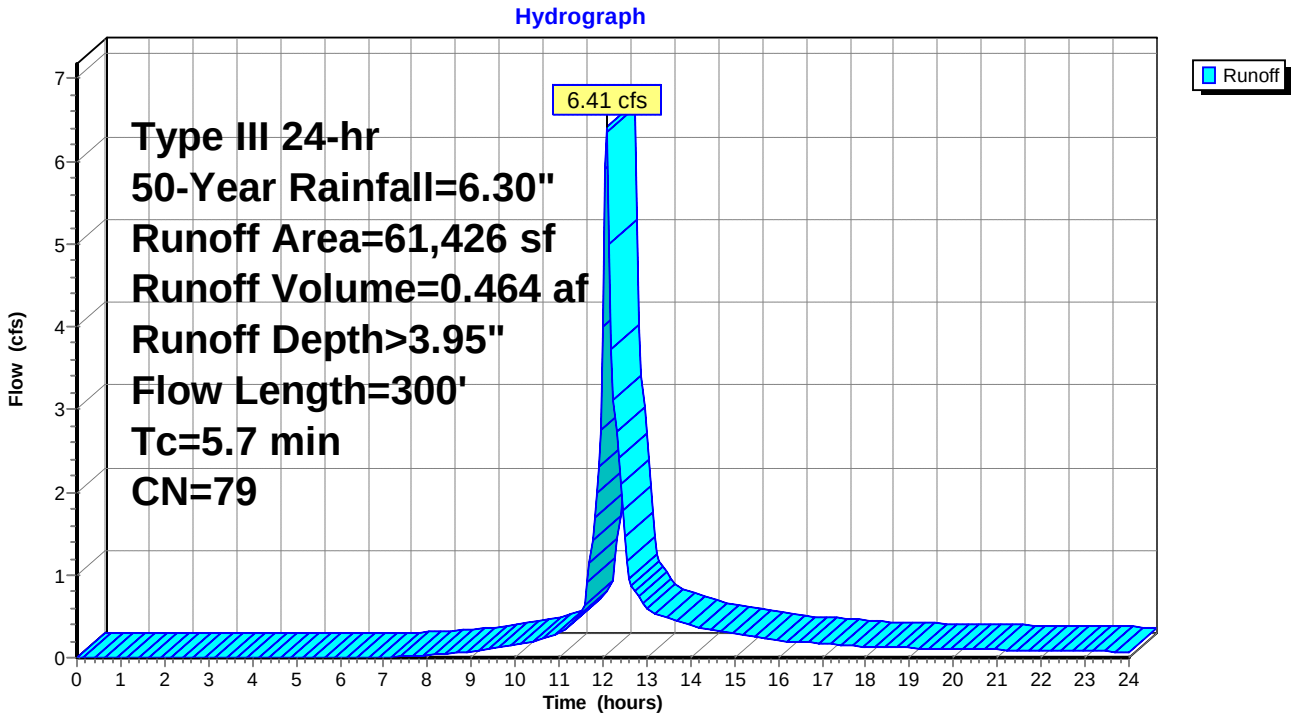
Runoff = 6.41 cfs @ 12.09 hrs, Volume= 0.464 af, Depth> 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
13,824	98	Impervious, HSG C
47,602	74	Pasture/grassland/range, Good, HSG C
61,426	79	Weighted Average
47,602		77.49% Pervious Area
13,824		22.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	200	0.3333	0.60		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
0.2	100	0.0100	6.84	8.40	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
5.7	300	Total			

Subcatchment PRDA5ND: PRDA-5



Summary for Subcatchment PRDA6ND: PRDA-6

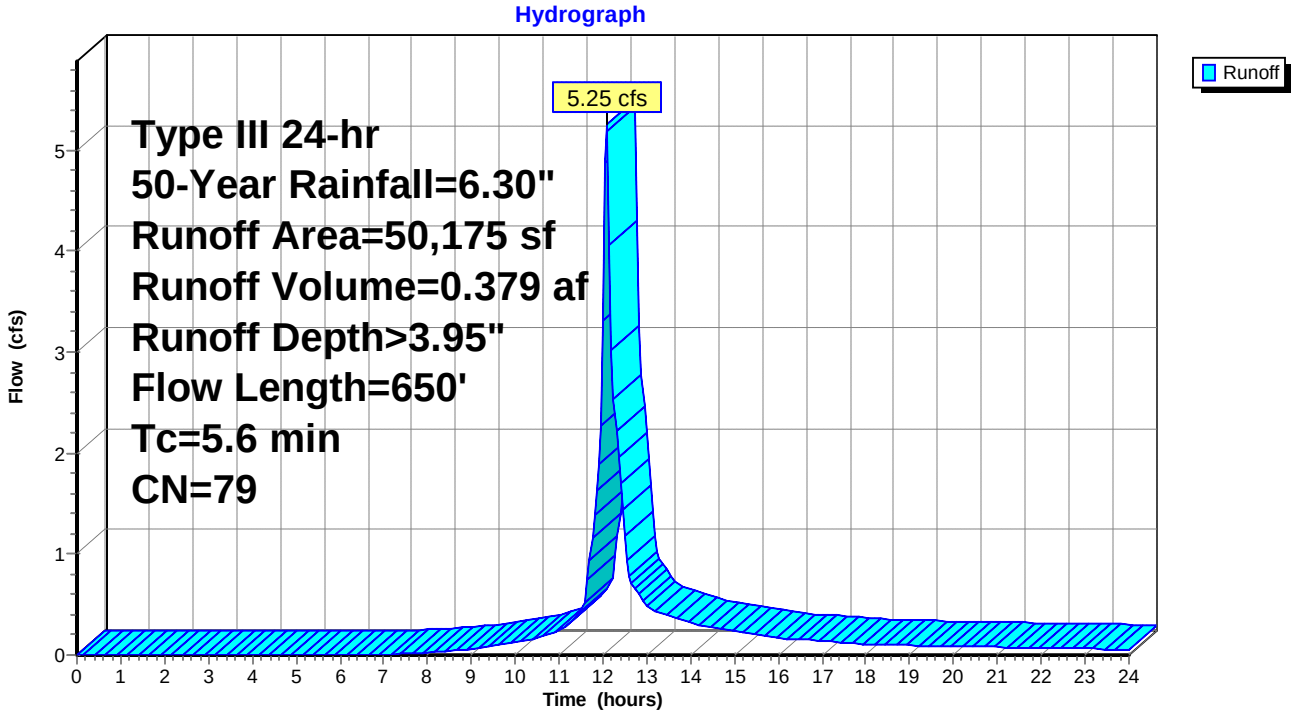
Runoff = 5.25 cfs @ 12.09 hrs, Volume= 0.379 af, Depth> 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=6.30"

Area (sf)	CN	Description
40,563	74	Pasture/grassland/range, Good, HSG C
9,612	98	Impervious, HSG C
50,175	79	Weighted Average
40,563		80.84% Pervious Area
9,612		19.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	150	0.3333	0.57		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.2	500	0.2050	6.79		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
5.6	650	Total			

Subcatchment PRDA6ND: PRDA-6



Summary for Pond BASIN A: BASIN A

Inflow Area = 9.357 ac, 36.10% Impervious, Inflow Depth > 4.37" for 50-Year event
Inflow = 45.46 cfs @ 12.10 hrs, Volume= 3.405 af
Outflow = 4.14 cfs @ 13.06 hrs, Volume= 2.494 af, Atten= 91%, Lag= 57.5 min
Primary = 4.14 cfs @ 13.06 hrs, Volume= 2.494 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 822.36' @ 13.06 hrs Surf.Area= 39,130 sf Storage= 82,538 cf

Plug-Flow detention time= 294.7 min calculated for 2.494 af (73% of inflow)
Center-of-Mass det. time= 206.9 min (1,011.4 - 804.4)

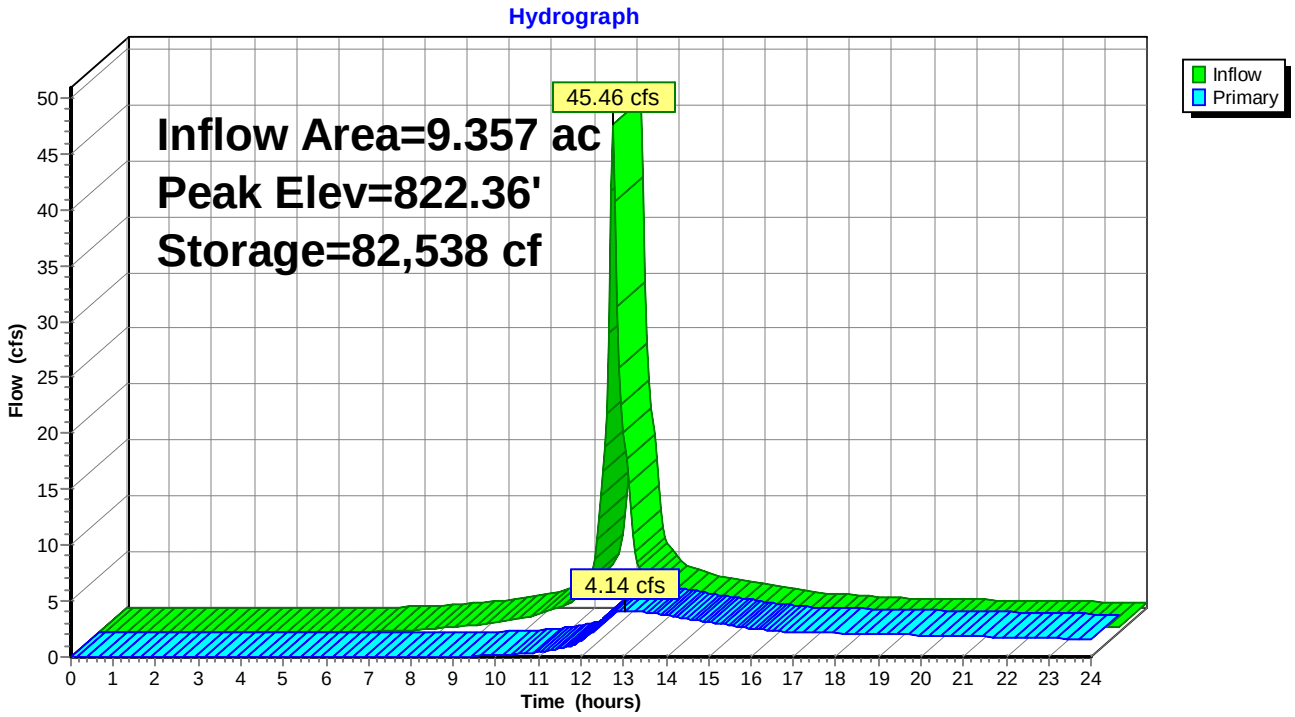
Volume	Invert	Avail.Storage	Storage Description
#1	820.00'	151,470 cf	Basin A (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
820.00	30,856	1,150.0	0	0	30,856
822.00	37,867	1,187.0	68,603	68,603	38,123
824.00	45,105	1,225.0	82,867	151,470	45,805

Device	Routing	Invert	Outlet Devices
#1	Primary	820.00'	15.0" Round Culvert L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 820.00' / 786.00' S= 0.1360 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	820.00'	8.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	822.00'	15.0" W x 12.0" H Vert. Orifice/Grate X 2.00 C= 0.600

Primary OutFlow Max=4.14 cfs @ 13.06 hrs HW=822.36' (Free Discharge)
└1=Culvert (Passes 4.14 cfs of 7.79 cfs potential flow)
  ├2=Orifice/Grate (Orifice Controls 2.39 cfs @ 6.86 fps)
  └3=Orifice/Grate (Orifice Controls 1.75 cfs @ 1.93 fps)

Pond BASIN A: BASIN A



Summary for Pond BASIN B: BASIN B

Inflow Area = 8.286 ac, 15.66% Impervious, Inflow Depth > 3.71" for 50-Year event
Inflow = 17.36 cfs @ 12.58 hrs, Volume= 2.562 af
Outflow = 9.70 cfs @ 13.04 hrs, Volume= 2.386 af, Atten= 44%, Lag= 27.5 min
Primary = 9.70 cfs @ 13.04 hrs, Volume= 2.386 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 823.86' @ 13.04 hrs Surf.Area= 15,948 sf Storage= 36,215 cf

Plug-Flow detention time= 103.5 min calculated for 2.386 af (93% of inflow)
Center-of-Mass det. time= 69.3 min (917.4 - 848.1)

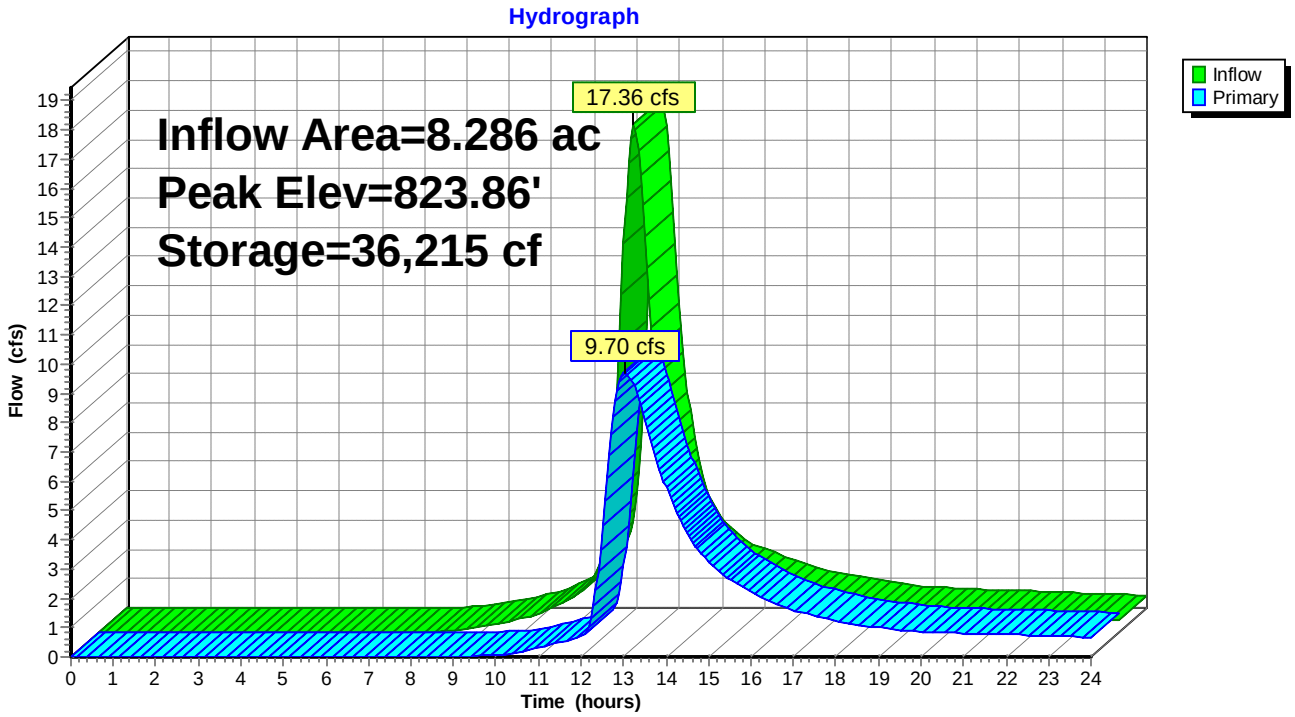
Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	122,878 cf	Basin B (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
821.00	9,468	729.0	0	0	9,468
822.00	11,682	748.0	10,556	10,556	11,820
824.00	16,283	786.0	27,838	38,394	16,706
826.00	21,113	824.1	37,292	75,685	21,846
828.00	26,170	850.0	47,193	122,878	25,681

Device	Routing	Invert	Outlet Devices
#1	Primary	821.00'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 821.00' / 797.00' S= 0.2400 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	821.00'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	822.00'	12.0" W x 30.0" H Vert. Orifice/Grate C= 0.600
#4	Primary	825.00'	24.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=9.70 cfs @ 13.04 hrs HW=823.86' (Free Discharge)
- 1=Culvert (Passes 9.70 cfs of 12.37 cfs potential flow)
  - 2=Orifice/Grate (Orifice Controls 1.53 cfs @ 7.79 fps)
  - 3=Orifice/Grate (Orifice Controls 8.17 cfs @ 4.38 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)

Pond BASIN B: BASIN B

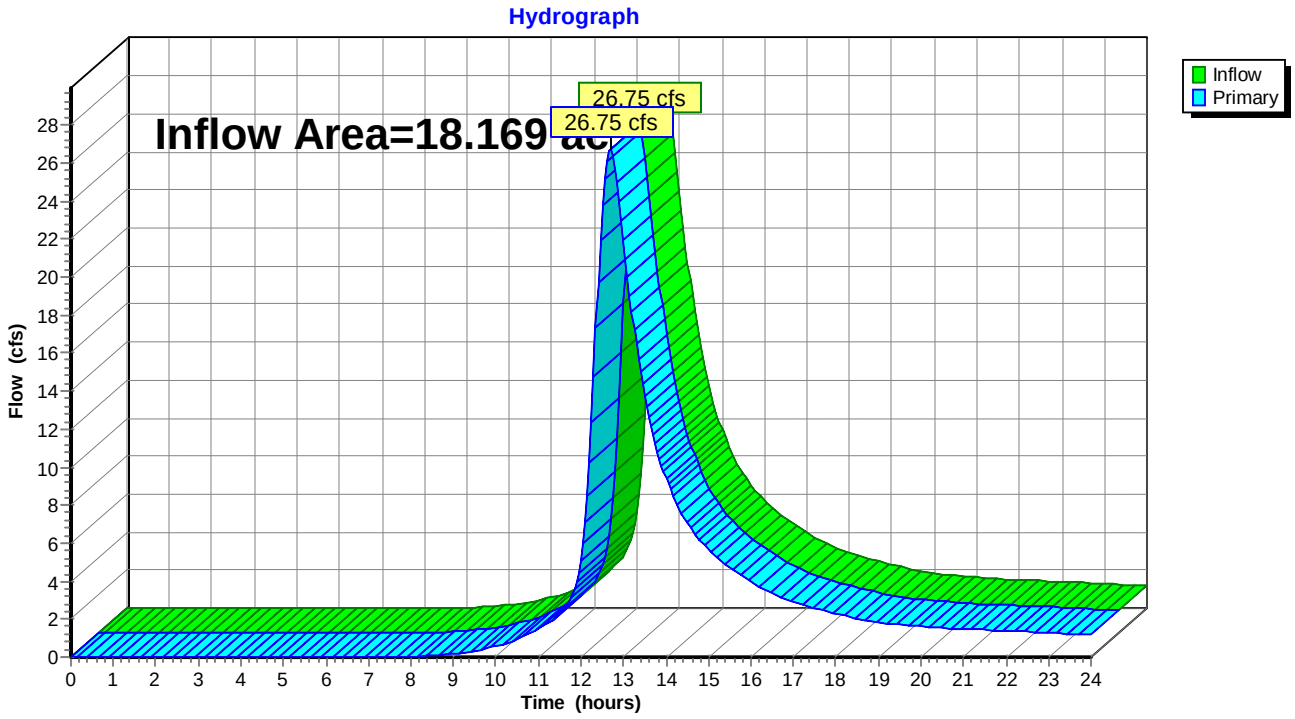


Summary for Link DP1: DP-1

Inflow Area = 18.169 ac, 14.68% Impervious, Inflow Depth > 3.54" for 50-Year event
Inflow = 26.75 cfs @ 12.69 hrs, Volume= 5.359 af
Primary = 26.75 cfs @ 12.69 hrs, Volume= 5.359 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DP-1

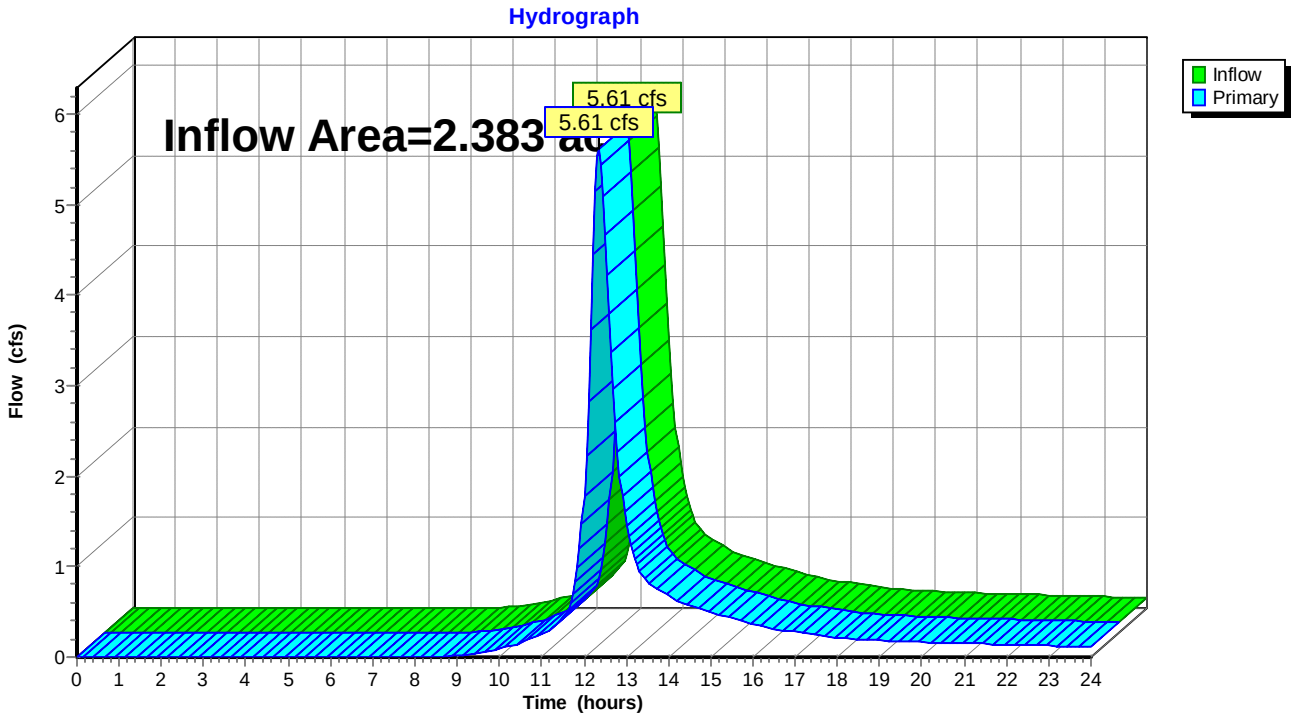


Summary for Link DP2A: DP-2A

Inflow Area = 2.383 ac, 0.00% Impervious, Inflow Depth > 3.22" for 50-Year event
Inflow = 5.61 cfs @ 12.34 hrs, Volume= 0.640 af
Primary = 5.61 cfs @ 12.34 hrs, Volume= 0.640 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2A: DP-2A

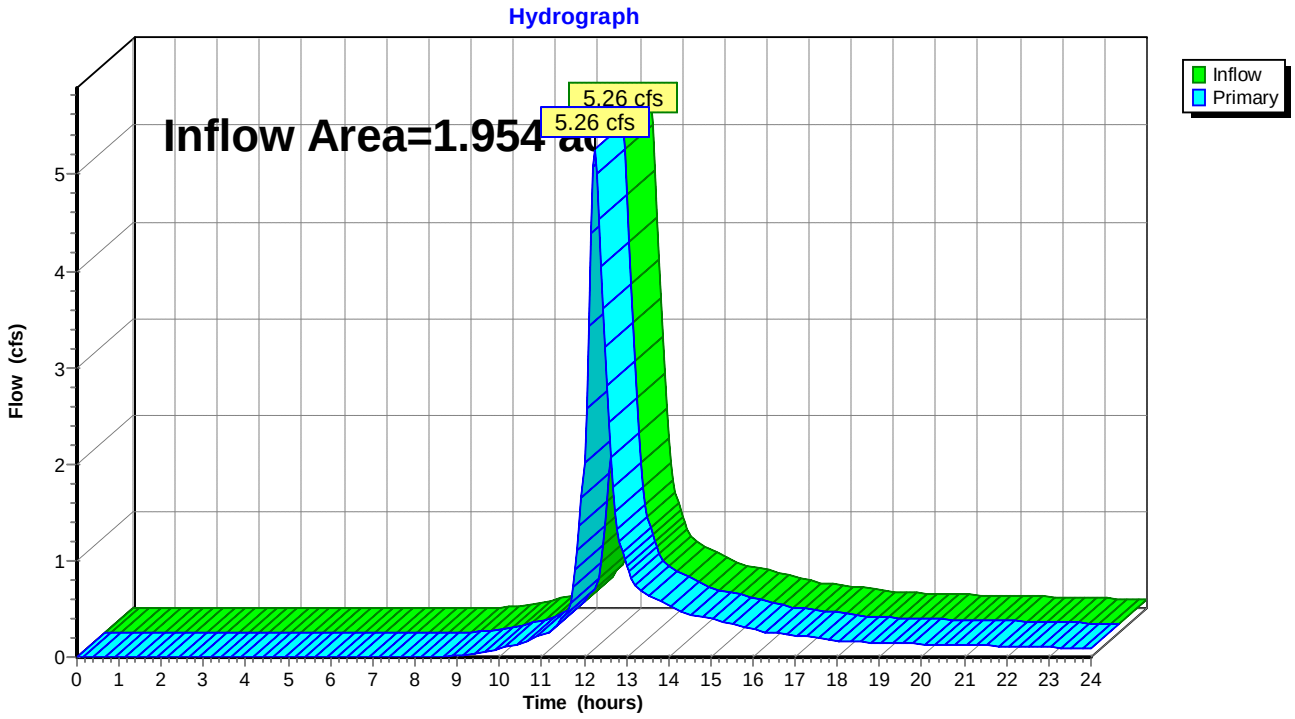


Summary for Link DP2B: DP-2B

Inflow Area = 1.954 ac, 0.00% Impervious, Inflow Depth > 3.23" for 50-Year event
Inflow = 5.26 cfs @ 12.25 hrs, Volume= 0.526 af
Primary = 5.26 cfs @ 12.25 hrs, Volume= 0.526 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2B: DP-2B

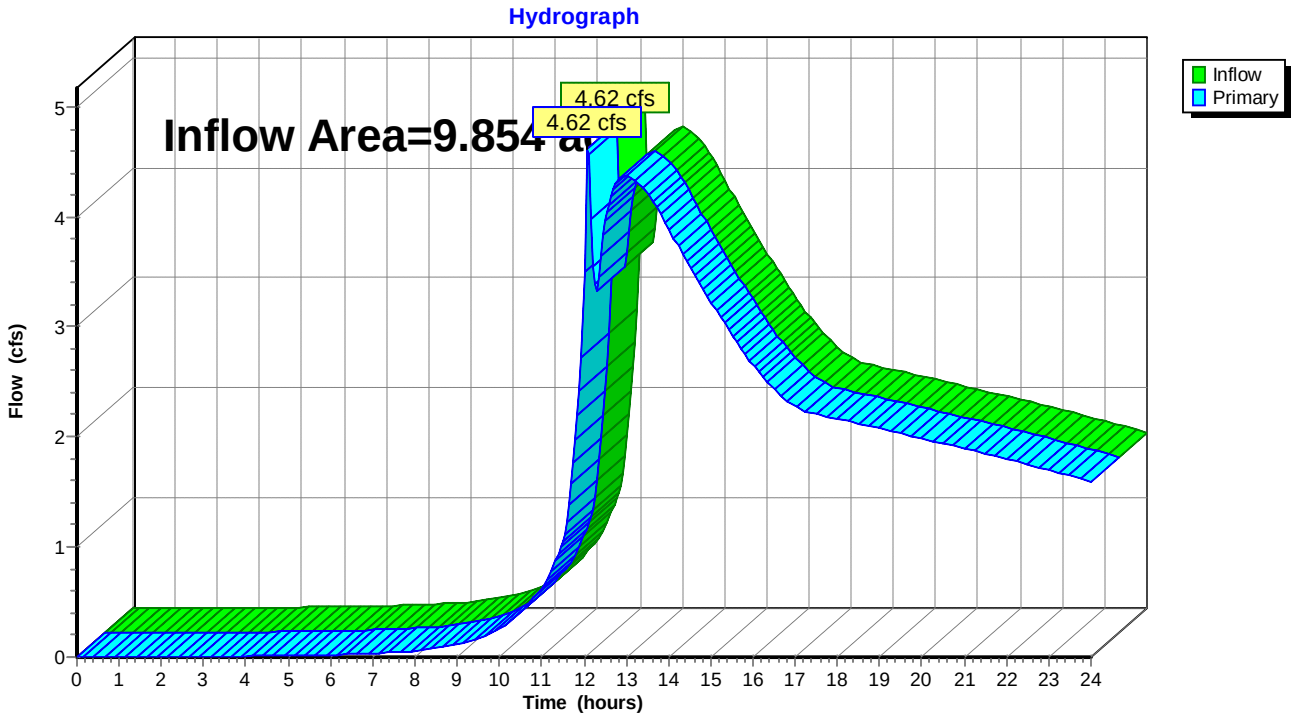


Summary for Link DP3: DP-3

Inflow Area = 9.854 ac, 38.11% Impervious, Inflow Depth > 3.31" for 50-Year event
Inflow = 4.62 cfs @ 12.08 hrs, Volume= 2.716 af
Primary = 4.62 cfs @ 12.08 hrs, Volume= 2.716 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: DP-3

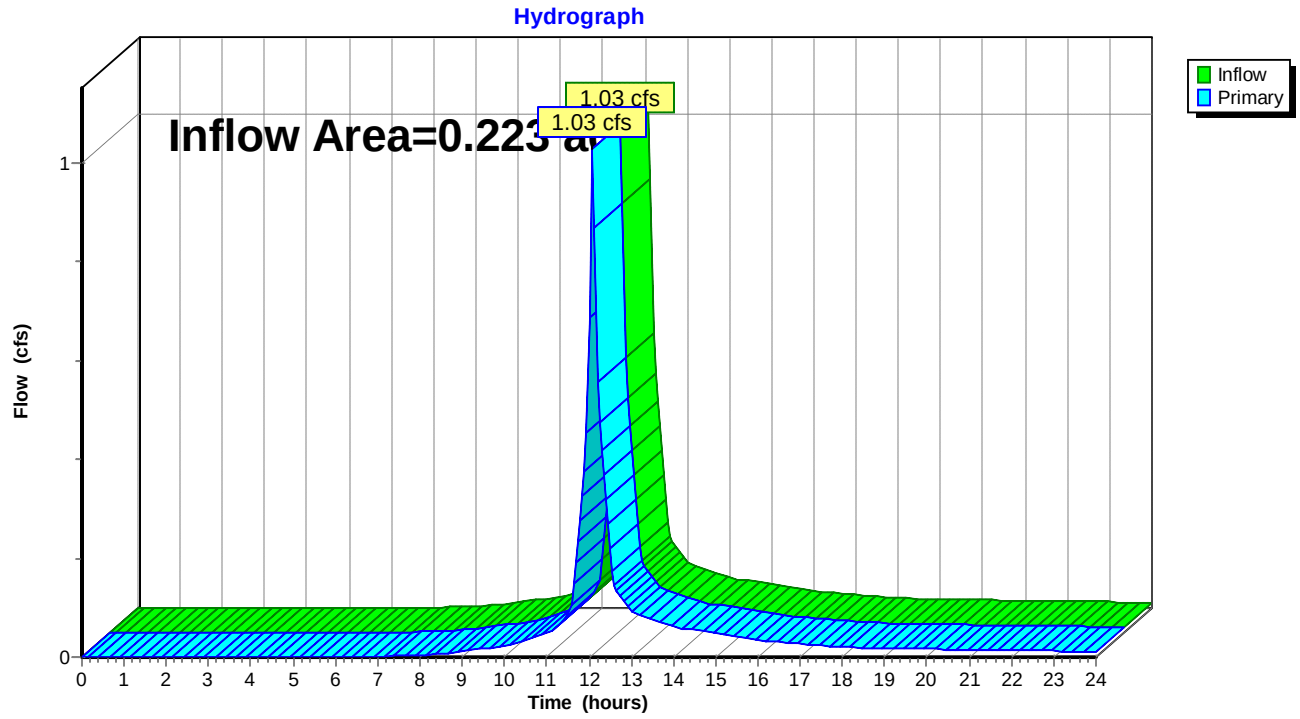


Summary for Link DP4: DP-4

Inflow Area = 0.223 ac, 20.57% Impervious, Inflow Depth > 3.95" for 50-Year event
Inflow = 1.03 cfs @ 12.08 hrs, Volume= 0.073 af
Primary = 1.03 cfs @ 12.08 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP4: DP-4

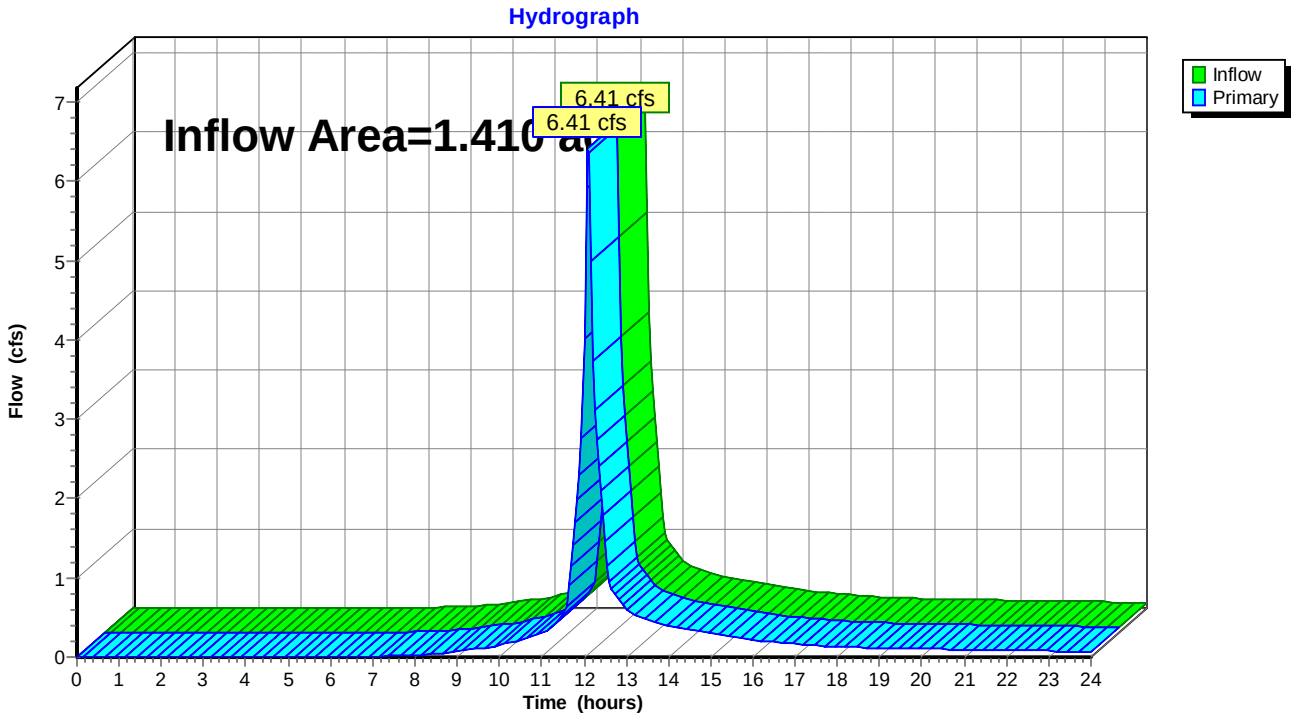


Summary for Link DP5: DP-5

Inflow Area = 1.410 ac, 22.51% Impervious, Inflow Depth > 3.95" for 50-Year event
Inflow = 6.41 cfs @ 12.09 hrs, Volume= 0.464 af
Primary = 6.41 cfs @ 12.09 hrs, Volume= 0.464 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP5: DP-5

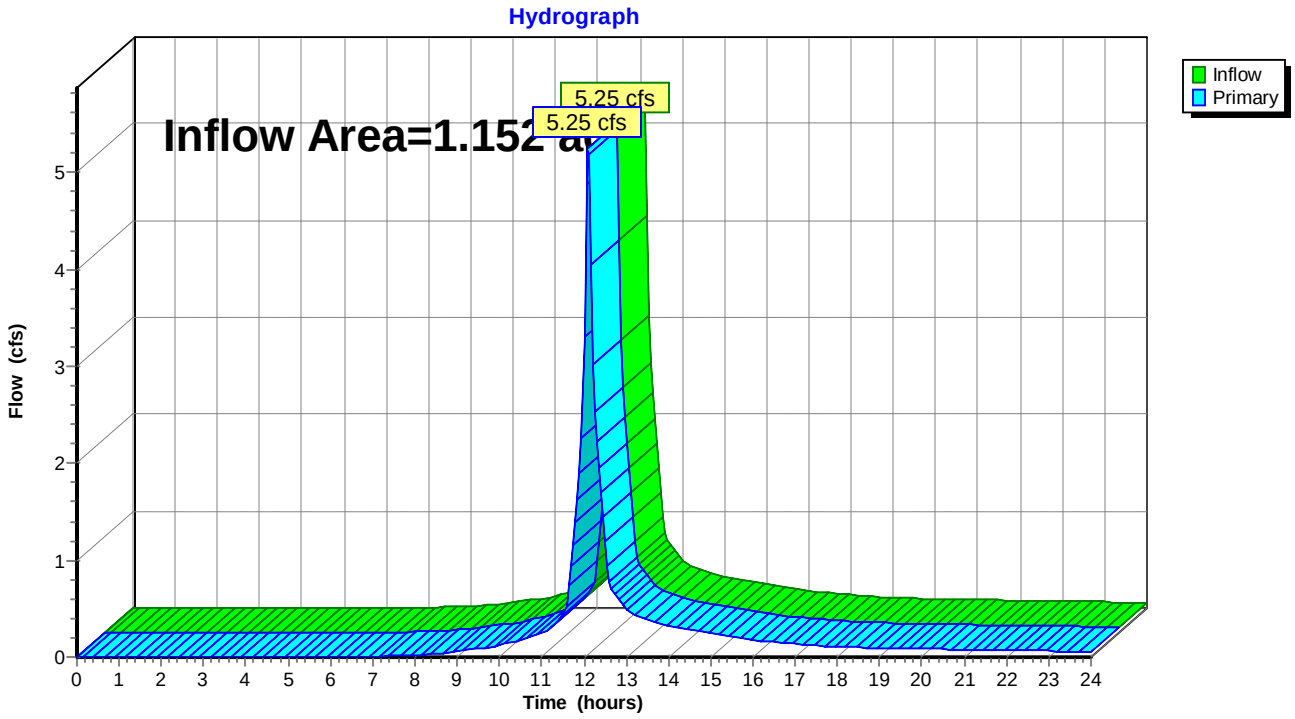


Summary for Link DP6: DP-6

Inflow Area = 1.152 ac, 19.16% Impervious, Inflow Depth > 3.95" for 50-Year event
Inflow = 5.25 cfs @ 12.09 hrs, Volume= 0.379 af
Primary = 5.25 cfs @ 12.09 hrs, Volume= 0.379 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP6: DP-6



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 PRDA1D: PRDA-1
Runoff Area=360,934 sf 15.66% Impervious Runoff Depth>4.42"
Flow Length=850' Tc=42.4 min CN=77 Runoff=20.64 cfs 3.052 af

Subcatchment PRDA1ND: PRDA-1
Runoff Area=430,511 sf 13.86% Impervious Runoff Depth>4.31"
Flow Length=1,775' Tc=42.9 min CN=76 Runoff=23.87 cfs 3.550 af

Subcatchment PRDA2AND: PRDA-2A
Runoff Area=103,805 sf 0.00% Impervious Runoff Depth>3.90"
Flow Length=400' Tc=24.1 min CN=72 Runoff=6.80 cfs 0.774 af

Subcatchment PRDA2BND: PRDA-2B
Runoff Area=85,134 sf 0.00% Impervious Runoff Depth>3.90"
Flow Length=300' Tc=17.4 min CN=72 Runoff=6.37 cfs 0.635 af

Subcatchment PRDA3D: PRDA-3
Runoff Area=407,573 sf 36.10% Impervious Runoff Depth>5.12"
Flow Length=1,450' Tc=6.7 min CN=83 Runoff=52.94 cfs 3.990 af

Subcatchment PRDA3ND: PRDA-3
Runoff Area=21,688 sf 76.07% Impervious Runoff Depth>6.15"
Flow Length=100' Slope=0.1100 '/' Tc=5.0 min CN=92 Runoff=3.35 cfs 0.255 af

Subcatchment PRDA4ND: PRDA-4
Runoff Area=9,707 sf 20.57% Impervious Runoff Depth>4.67"
Flow Length=100' Slope=0.1100 '/' Tc=5.0 min CN=79 Runoff=1.22 cfs 0.087 af

Subcatchment PRDA5ND: PRDA-5
Runoff Area=61,426 sf 22.51% Impervious Runoff Depth>4.67"
Flow Length=300' Tc=5.7 min CN=79 Runoff=7.56 cfs 0.549 af

Subcatchment PRDA6ND: PRDA-6
Runoff Area=50,175 sf 19.16% Impervious Runoff Depth>4.67"
Flow Length=650' Tc=5.6 min CN=79 Runoff=6.18 cfs 0.449 af

Pond BASIN A: BASIN A
Peak Elev=822.63' Storage=92,964 cf Inflow=52.94 cfs 3.990 af
Outflow=6.51 cfs 3.005 af

Pond BASIN B: BASIN B
Peak Elev=824.20' Storage=41,639 cf Inflow=20.64 cfs 3.052 af
Outflow=12.07 cfs 2.853 af

Link DP1: DP-1
Inflow=32.70 cfs 6.403 af
Primary=32.70 cfs 6.403 af

Link DP2A: DP-2A
Inflow=6.80 cfs 0.774 af
Primary=6.80 cfs 0.774 af

Link DP2B: DP-2B
Inflow=6.37 cfs 0.635 af
Primary=6.37 cfs 0.635 af

Link DP3: DP-3
Inflow=6.89 cfs 3.260 af
Primary=6.89 cfs 3.260 af

Link DP4: DP-4
Inflow=1.22 cfs 0.087 af
Primary=1.22 cfs 0.087 af

Link DP5: DP-5

Inflow=7.56 cfs 0.549 af
Primary=7.56 cfs 0.549 af

Link DP6: DP-6

Inflow=6.18 cfs 0.449 af
Primary=6.18 cfs 0.449 af

Total Runoff Area = 35.146 ac Runoff Volume = 13.341 af Average Runoff Depth = 4.56"
80.06% Pervious = 28.138 ac 19.94% Impervious = 7.008 ac

Summary for Subcatchment PRDA1D: PRDA-1

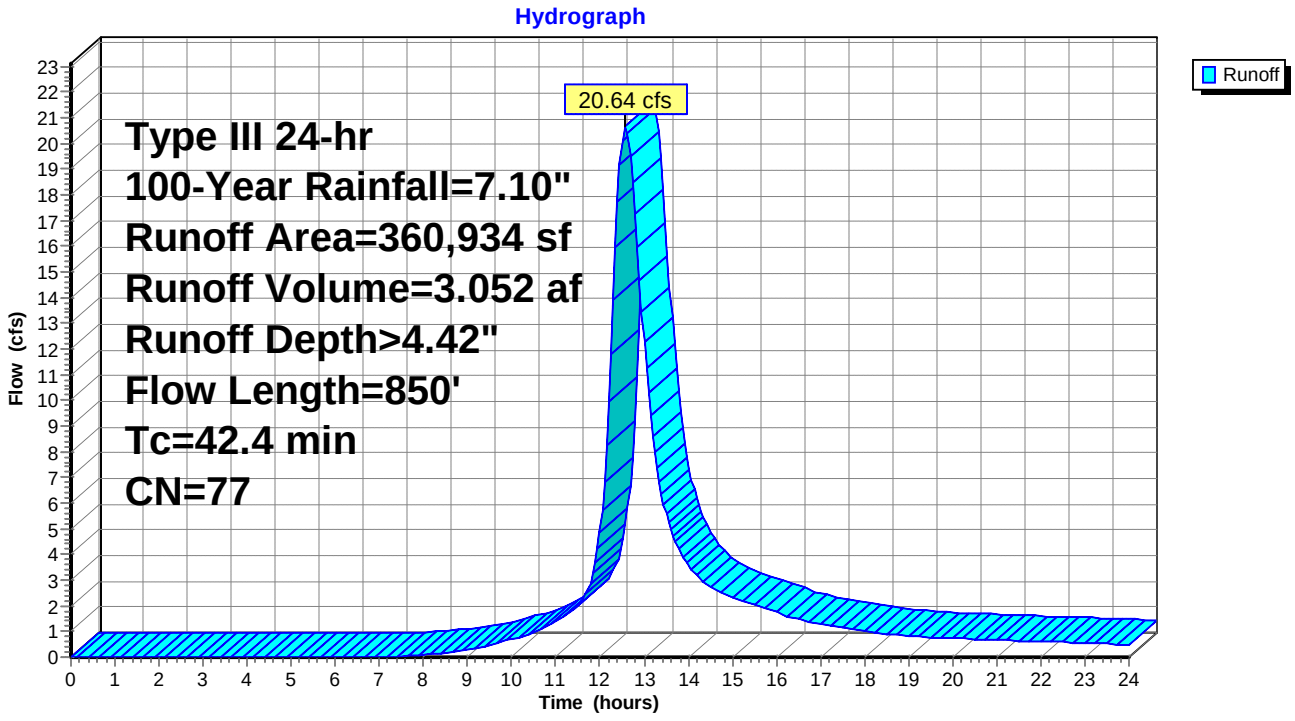
Runoff = 20.64 cfs @ 12.58 hrs, Volume= 3.052 af, Depth> 4.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
	36,718	98	Impervious, HSG C
	1,151	98	Roofs, HSG C
	18,667	98	Water Surface, HSG C
	124,441	74	Pasture/grassland/range, Good, HSG C
*	115,820	75	Gravel, HSG C
	64,137	70	Woods, Good, HSG C
	360,934	77	Weighted Average
	304,398		84.34% Pervious Area
	56,536		15.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
5.4	600	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
42.4	850	Total			

Subcatchment PRDA1D: PRDA-1



Summary for Subcatchment PRDA1ND: PRDA-1

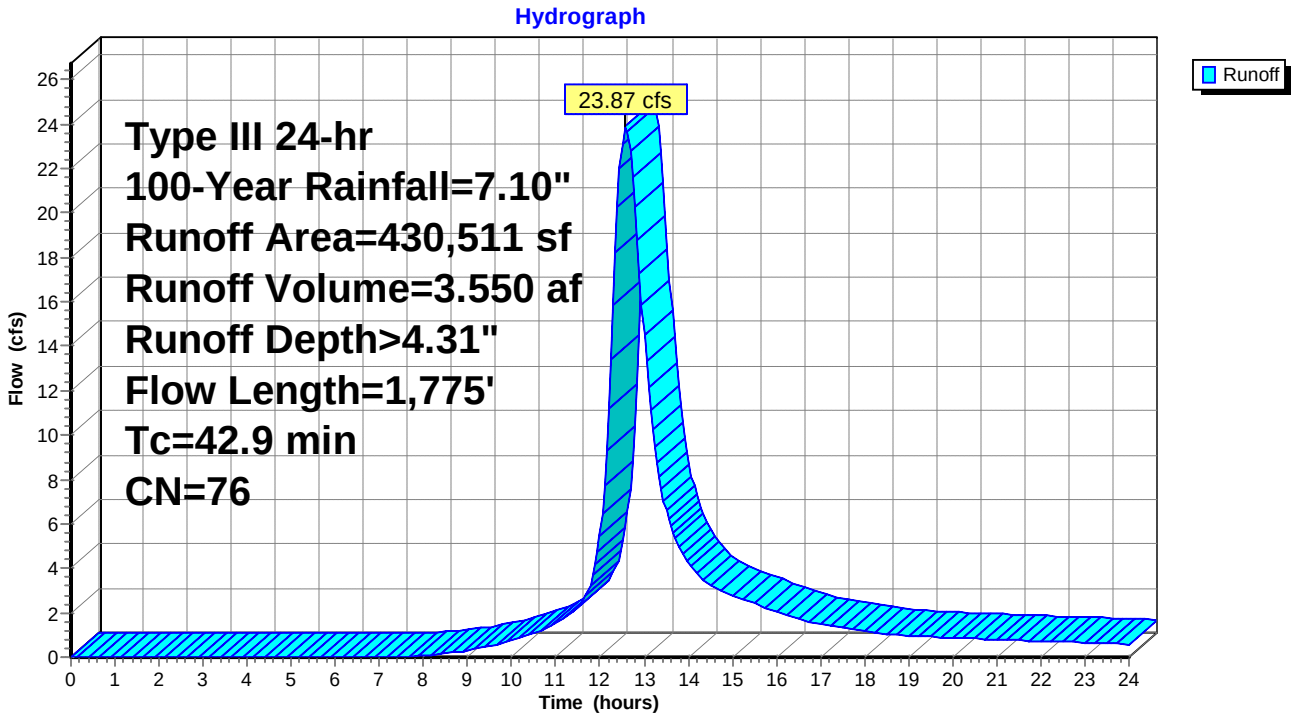
Runoff = 23.87 cfs @ 12.59 hrs, Volume= 3.550 af, Depth> 4.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
114,584	70	Woods, Good, HSG C
256,245	74	Pasture/grassland/range, Good, HSG C
59,682	98	Impervious, HSG C
430,511	76	Weighted Average
370,829		86.14% Pervious Area
59,682		13.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	250	0.0320	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
4.9	1,000	0.0440	3.38		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.0	525	0.0570	8.87	53.22	Channel Flow, Area= 6.0 sf Perim= 6.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides
42.9	1,775	Total			

Subcatchment PRDA1ND: PRDA-1



Summary for Subcatchment PRDA2AND: PRDA-2A

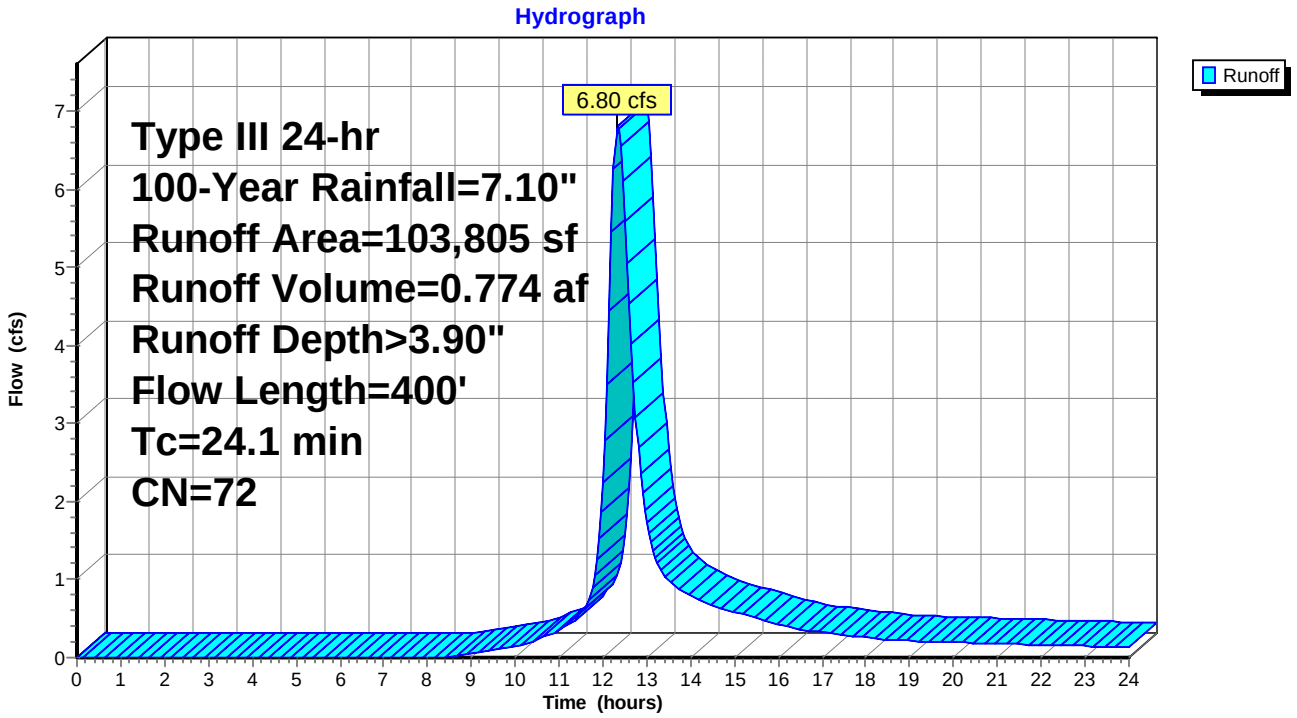
Runoff = 6.80 cfs @ 12.34 hrs, Volume= 0.774 af, Depth> 3.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
46,490	70	Woods, Good, HSG C
57,315	74	Pasture/grassland/range, Good, HSG C
103,805	72	Weighted Average
103,805		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.1	250	0.1040	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	150	0.2400	2.45		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.1	400	Total			

Subcatchment PRDA2AND: PRDA-2A



Summary for Subcatchment PRDA2BND: PRDA-2B

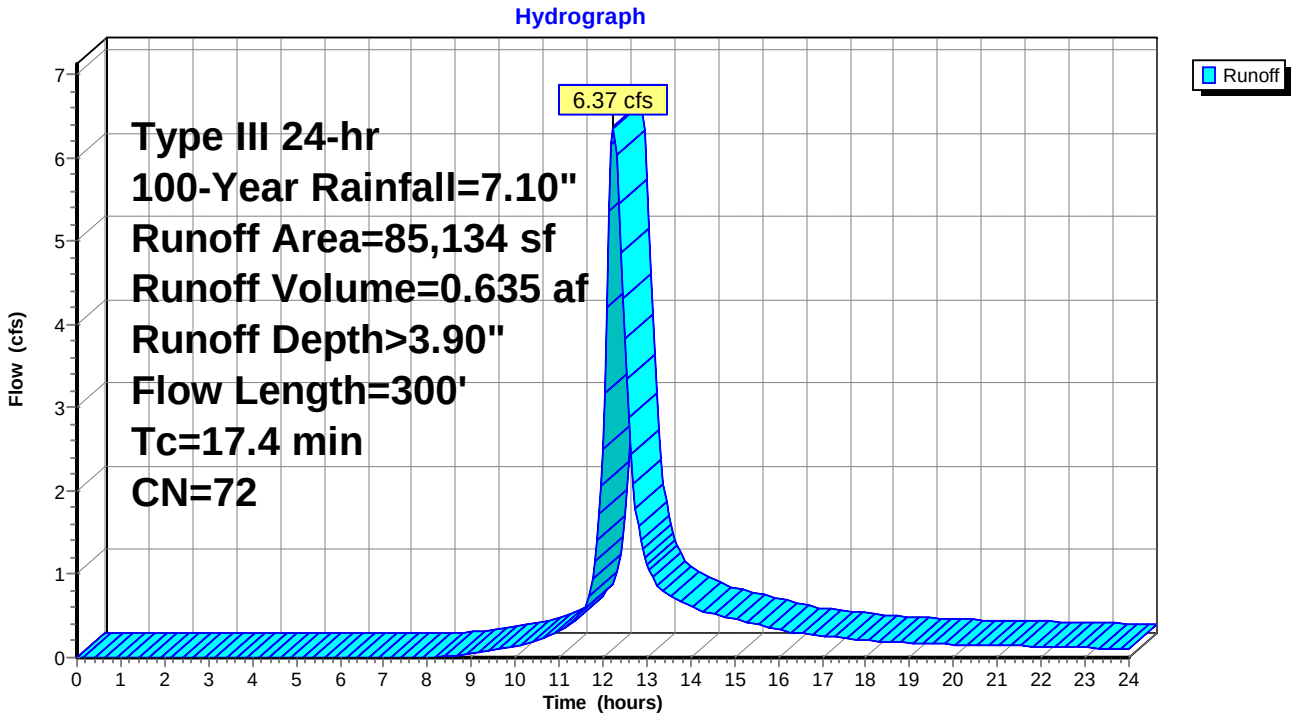
Runoff = 6.37 cfs @ 12.24 hrs, Volume= 0.635 af, Depth> 3.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
33,200	70	Woods, Good, HSG C
51,934	74	Pasture/grassland/range, Good, HSG C
85,134	72	Weighted Average
85,134		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	200	0.1650	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	100	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.4	300	Total			

Subcatchment PRDA2BND: PRDA-2B



Summary for Subcatchment PRDA3D: PRDA-3

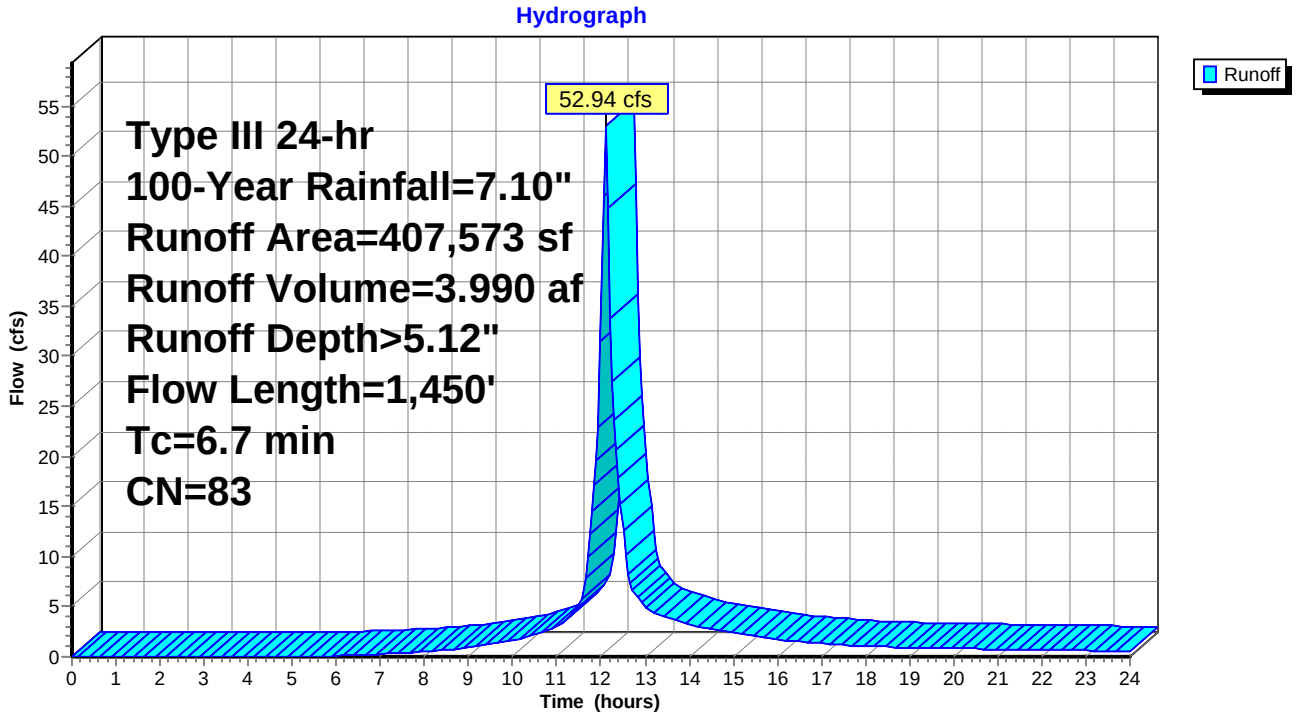
Runoff = 52.94 cfs @ 12.10 hrs, Volume= 3.990 af, Depth> 5.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
	69,087	98	Impervious, HSG C
	36,569	98	Roofs, HSG C
	41,458	98	Water Surface, HSG C
*	260,459	75	Gravel, HSG C
	407,573	83	Weighted Average
	260,459		63.90% Pervious Area
	147,114		36.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	250	0.0100	1.25		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.20"
3.4	1,200	0.0075	5.93	7.27	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
6.7	1,450	Total			

Subcatchment PRDA3D: PRDA-3



Summary for Subcatchment PRDA3ND: PRDA-3

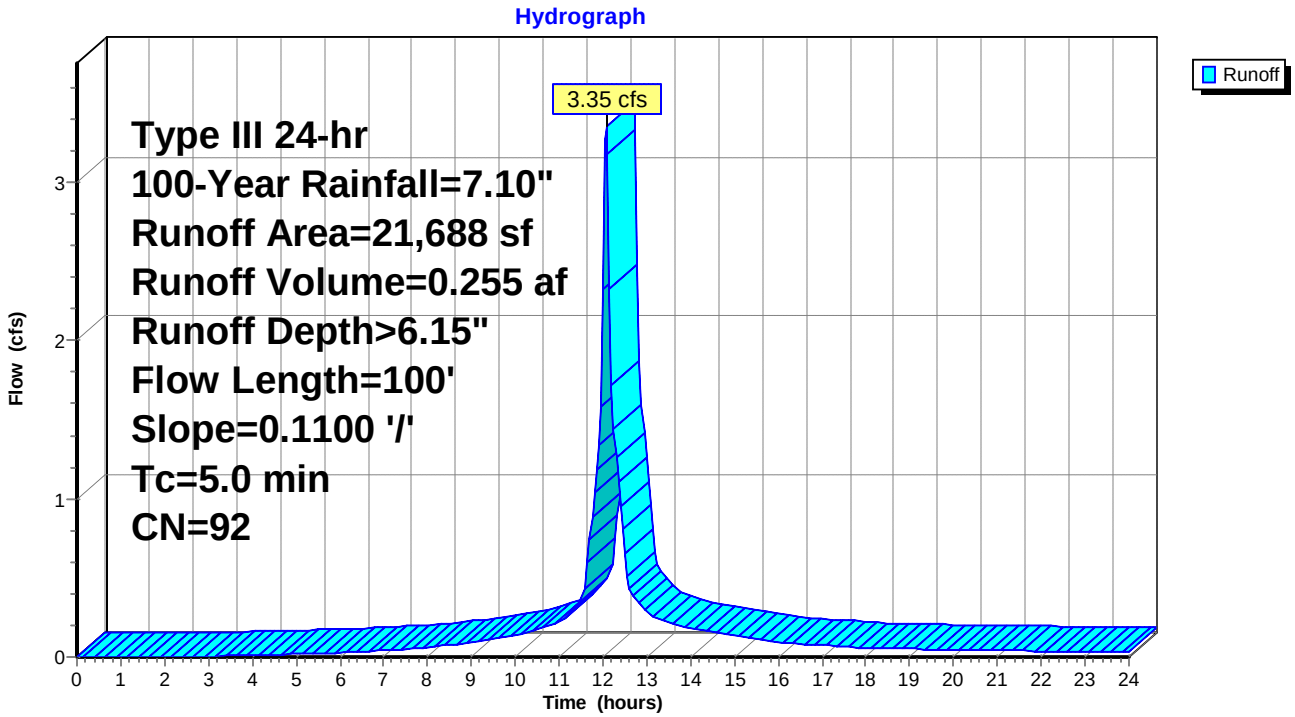
Runoff = 3.35 cfs @ 12.07 hrs, Volume= 0.255 af, Depth> 6.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
5,191	74	Pasture/grassland/range, Good, HSG C
16,497	98	Impervious, HSG C
21,688	92	Weighted Average
5,191		23.93% Pervious Area
16,497		76.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"

Subcatchment PRDA3ND: PRDA-3



Summary for Subcatchment PRDA4ND: PRDA-4

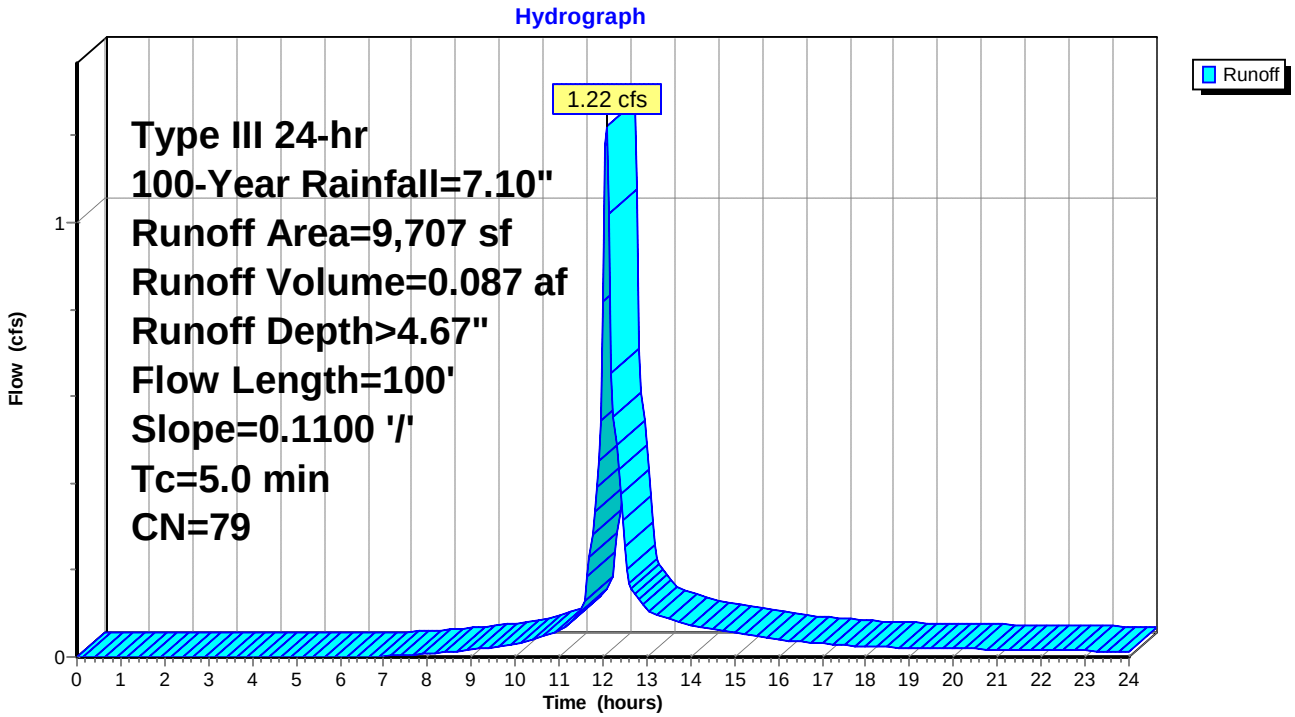
Runoff = 1.22 cfs @ 12.07 hrs, Volume= 0.087 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
	7,710	74	Pasture/grassland/range, Good, HSG C
*	1,997	98	Impervious
	9,707	79	Weighted Average
	7,710		79.43% Pervious Area
	1,997		20.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"

Subcatchment PRDA4ND: PRDA-4



Summary for Subcatchment PRDA5ND: PRDA-5

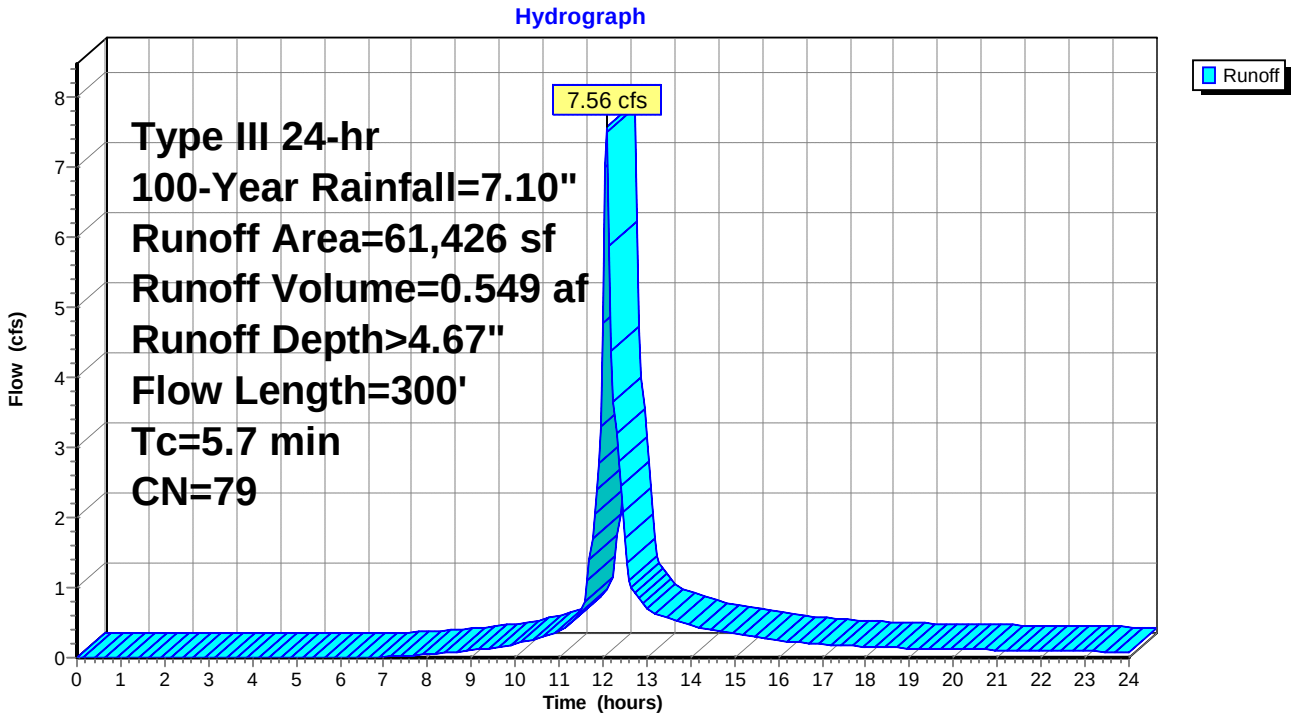
Runoff = 7.56 cfs @ 12.09 hrs, Volume= 0.549 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
13,824	98	Impervious, HSG C
47,602	74	Pasture/grassland/range, Good, HSG C
61,426	79	Weighted Average
47,602		77.49% Pervious Area
13,824		22.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	200	0.3333	0.60		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
0.2	100	0.0100	6.84	8.40	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
5.7	300	Total			

Subcatchment PRDA5ND: PRDA-5



Summary for Subcatchment PRDA6ND: PRDA-6

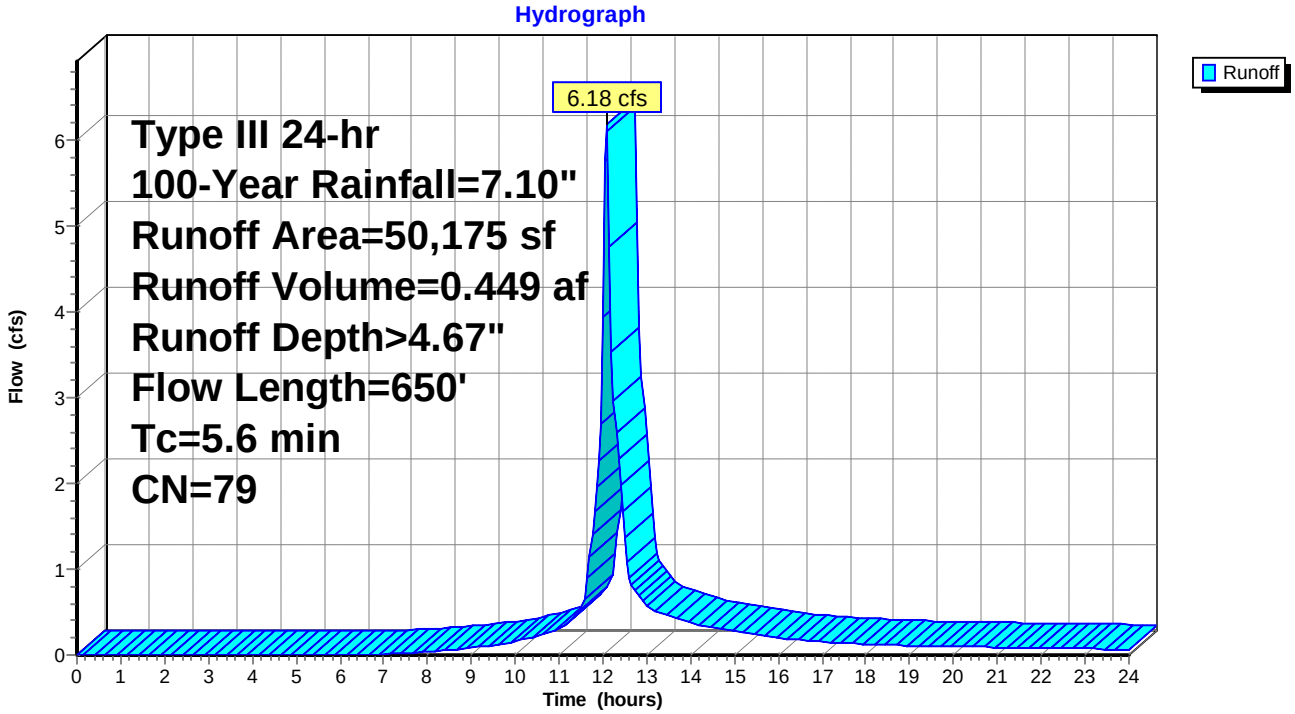
Runoff = 6.18 cfs @ 12.09 hrs, Volume= 0.449 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
40,563	74	Pasture/grassland/range, Good, HSG C
9,612	98	Impervious, HSG C
50,175	79	Weighted Average
40,563		80.84% Pervious Area
9,612		19.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	150	0.3333	0.57		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
1.2	500	0.2050	6.79		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
5.6	650	Total			

Subcatchment PRDA6ND: PRDA-6



Summary for Pond BASIN A: BASIN A

Inflow Area = 9.357 ac, 36.10% Impervious, Inflow Depth > 5.12" for 100-Year event
Inflow = 52.94 cfs @ 12.10 hrs, Volume= 3.990 af
Outflow = 6.51 cfs @ 12.74 hrs, Volume= 3.005 af, Atten= 88%, Lag= 38.6 min
Primary = 6.51 cfs @ 12.74 hrs, Volume= 3.005 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 822.63' @ 12.74 hrs Surf.Area= 40,062 sf Storage= 92,964 cf

Plug-Flow detention time= 265.9 min calculated for 2.999 af (75% of inflow)
Center-of-Mass det. time= 182.4 min (982.4 - 800.0)

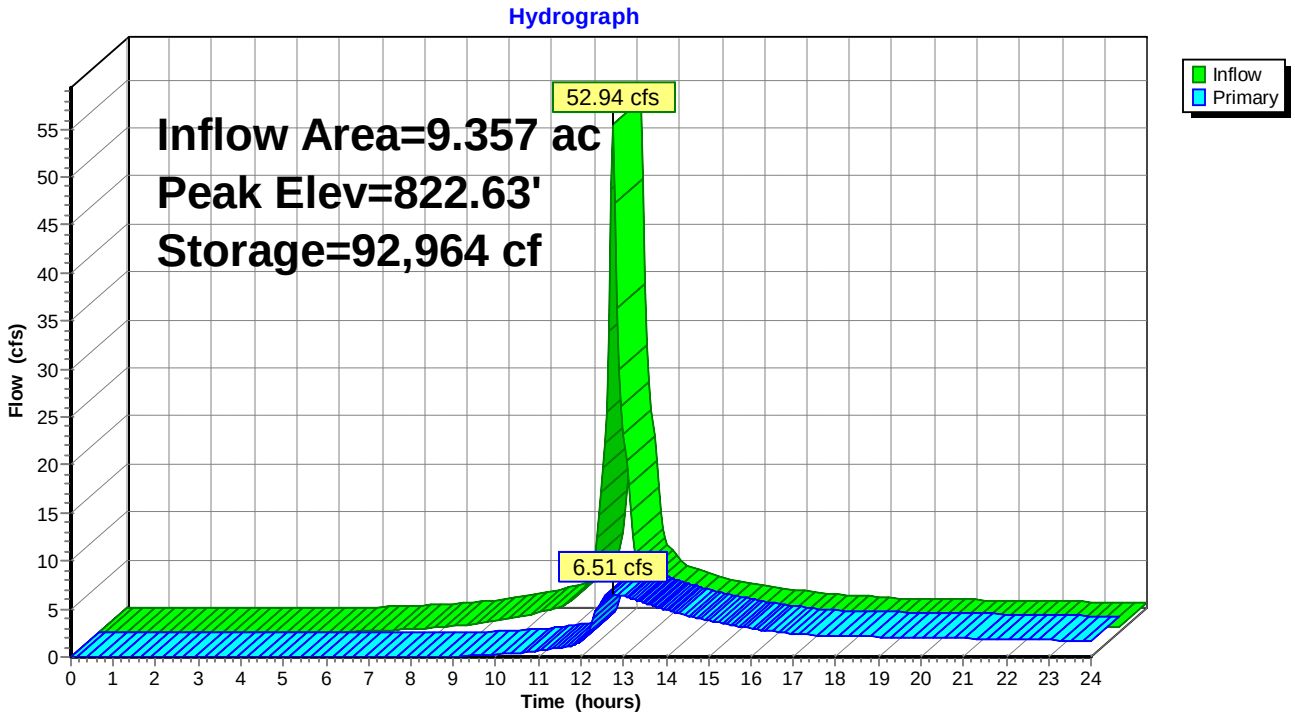
Volume	Invert	Avail.Storage	Storage Description
#1	820.00'	151,470 cf	Basin A (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
820.00	30,856	1,150.0	0	0	30,856
822.00	37,867	1,187.0	68,603	68,603	38,123
824.00	45,105	1,225.0	82,867	151,470	45,805

Device	Routing	Invert	Outlet Devices
#1	Primary	820.00'	15.0" Round Culvert L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 820.00' / 786.00' S= 0.1360 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	820.00'	8.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	822.00'	15.0" W x 12.0" H Vert. Orifice/Grate X 2.00 C= 0.600

Primary OutFlow Max=6.51 cfs @ 12.74 hrs HW=822.63' (Free Discharge)
└1=Culvert (Passes 6.51 cfs of 8.36 cfs potential flow)
  ├2=Orifice/Grate (Orifice Controls 2.54 cfs @ 7.29 fps)
  └3=Orifice/Grate (Orifice Controls 3.97 cfs @ 2.54 fps)

Pond BASIN A: BASIN A



Summary for Pond BASIN B: BASIN B

Inflow Area = 8.286 ac, 15.66% Impervious, Inflow Depth > 4.42" for 100-Year event
Inflow = 20.64 cfs @ 12.58 hrs, Volume= 3.052 af
Outflow = 12.07 cfs @ 13.01 hrs, Volume= 2.853 af, Atten= 41%, Lag= 25.9 min
Primary = 12.07 cfs @ 13.01 hrs, Volume= 2.853 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 824.20' @ 13.01 hrs Surf.Area= 16,730 sf Storage= 41,639 cf

Plug-Flow detention time= 96.0 min calculated for 2.853 af (93% of inflow)
Center-of-Mass det. time= 63.2 min (906.4 - 843.3)

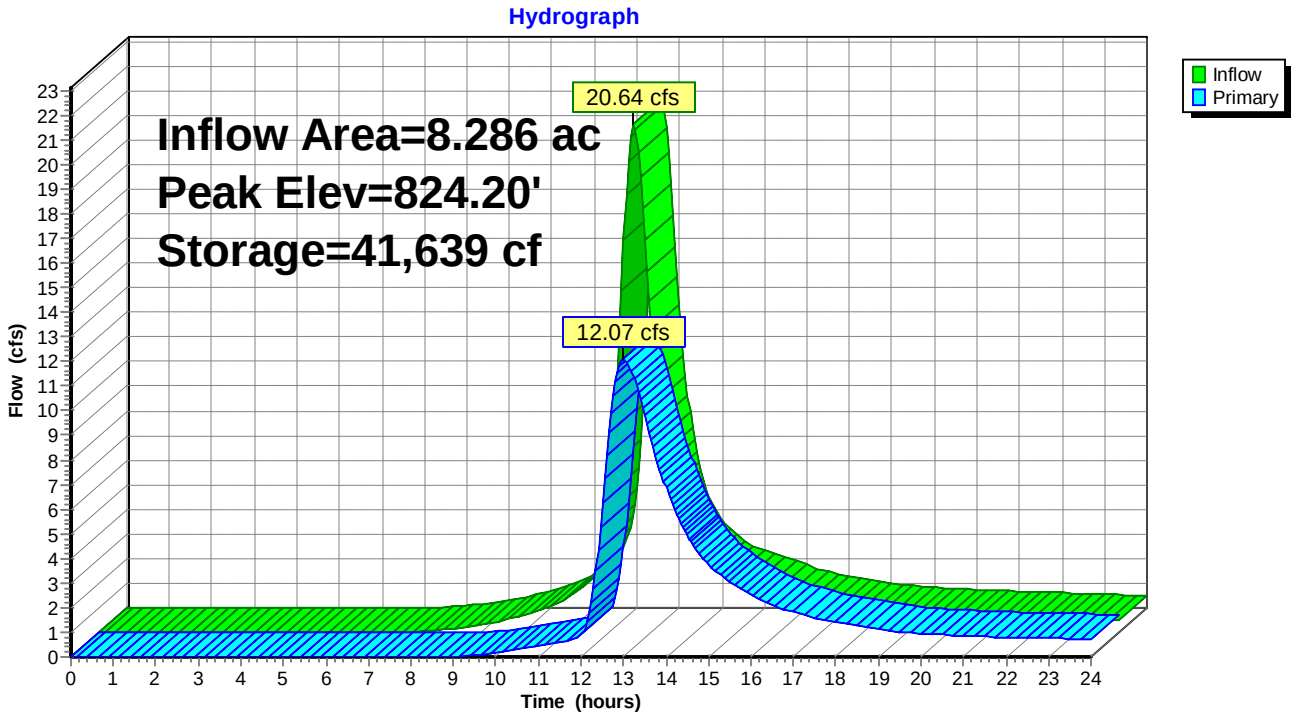
Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	122,878 cf	Basin B (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
821.00	9,468	729.0	0	0	9,468
822.00	11,682	748.0	10,556	10,556	11,820
824.00	16,283	786.0	27,838	38,394	16,706
826.00	21,113	824.1	37,292	75,685	21,846
828.00	26,170	850.0	47,193	122,878	25,681

Device	Routing	Invert	Outlet Devices
#1	Primary	821.00'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 821.00' / 797.00' S= 0.2400 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	821.00'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	822.00'	12.0" W x 30.0" H Vert. Orifice/Grate C= 0.600
#4	Primary	825.00'	24.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=12.07 cfs @ 13.01 hrs HW=824.20' (Free Discharge)
- 1=Culvert (Passes 12.07 cfs of 13.31 cfs potential flow)
  - 2=Orifice/Grate (Orifice Controls 1.62 cfs @ 8.26 fps)
  - 3=Orifice/Grate (Orifice Controls 10.44 cfs @ 4.76 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)

Pond BASIN B: BASIN B

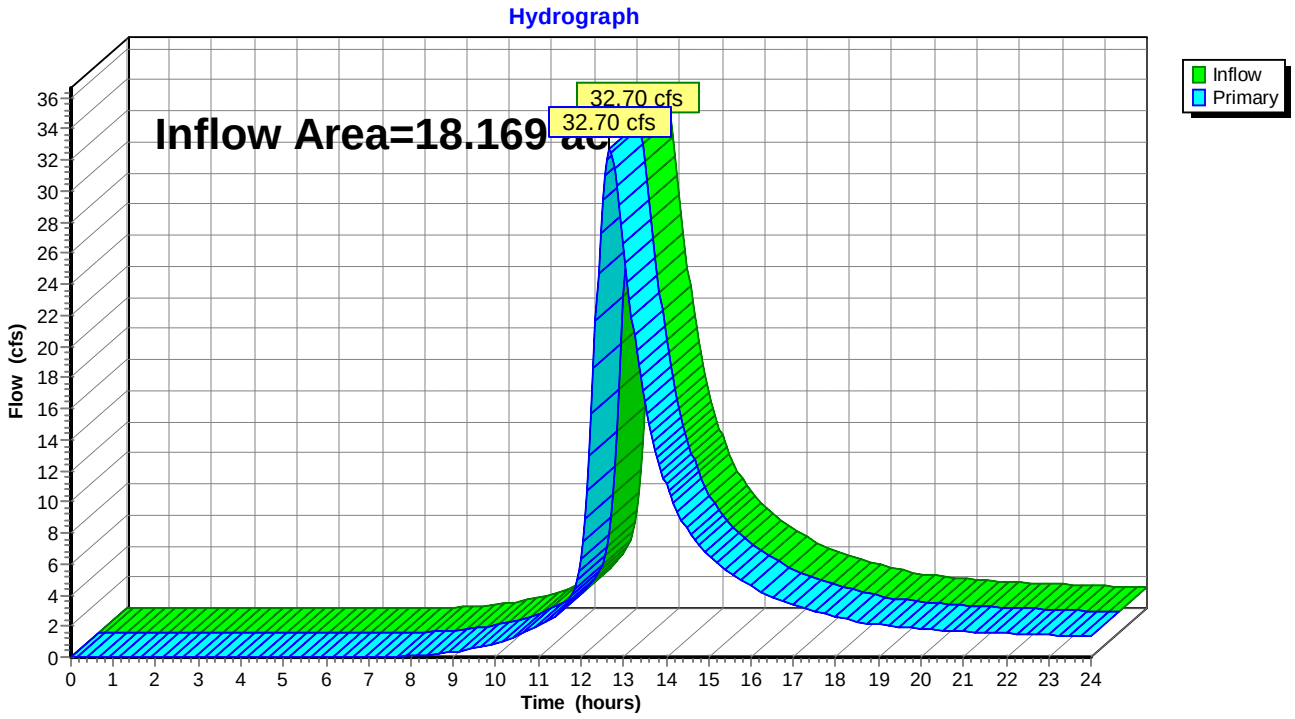


Summary for Link DP1: DP-1

Inflow Area = 18.169 ac, 14.68% Impervious, Inflow Depth > 4.23" for 100-Year event
Inflow = 32.70 cfs @ 12.68 hrs, Volume= 6.403 af
Primary = 32.70 cfs @ 12.68 hrs, Volume= 6.403 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DP-1

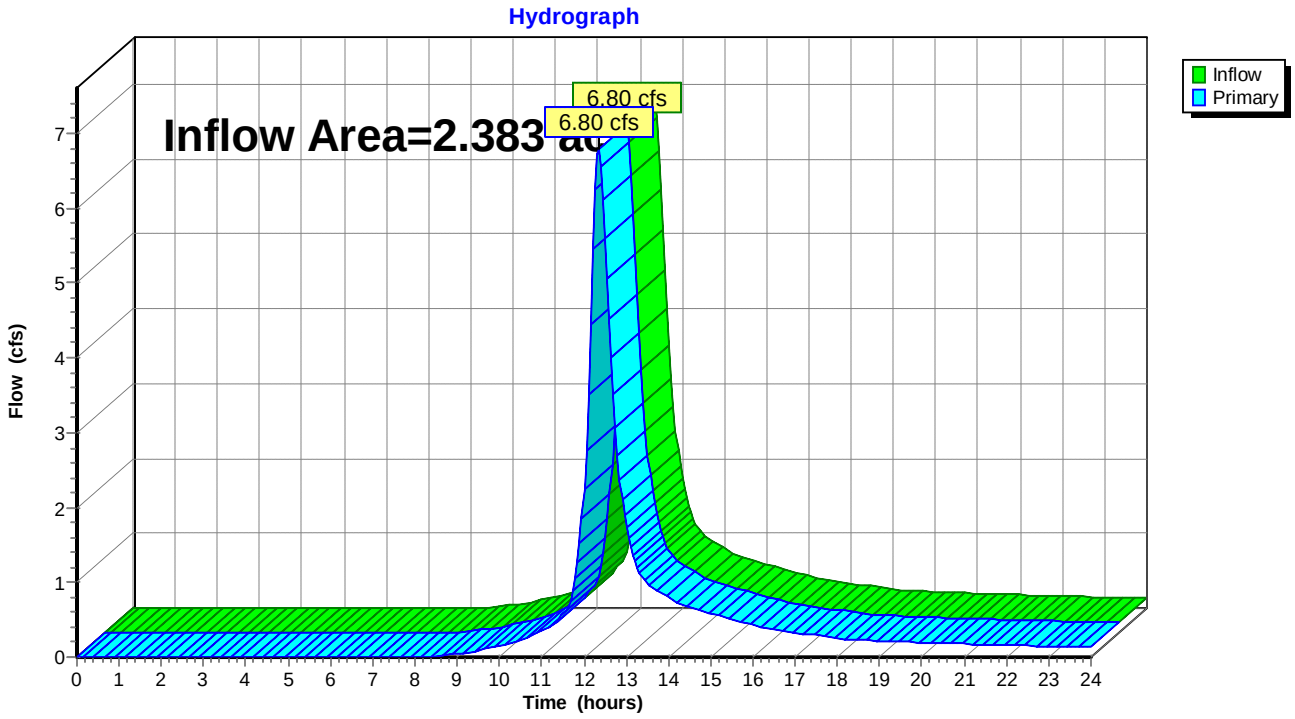


Summary for Link DP2A: DP-2A

Inflow Area = 2.383 ac, 0.00% Impervious, Inflow Depth > 3.90" for 100-Year event
Inflow = 6.80 cfs @ 12.34 hrs, Volume= 0.774 af
Primary = 6.80 cfs @ 12.34 hrs, Volume= 0.774 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2A: DP-2A

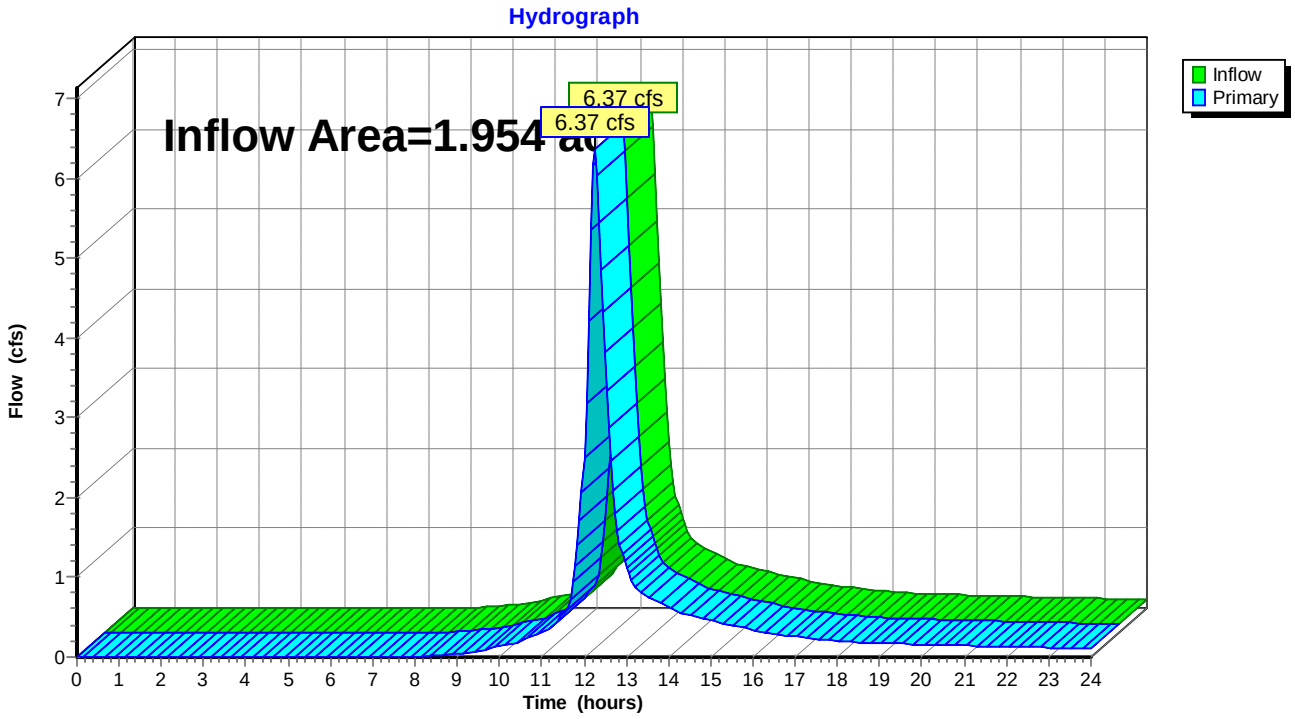


Summary for Link DP2B: DP-2B

Inflow Area = 1.954 ac, 0.00% Impervious, Inflow Depth > 3.90" for 100-Year event
Inflow = 6.37 cfs @ 12.24 hrs, Volume= 0.635 af
Primary = 6.37 cfs @ 12.24 hrs, Volume= 0.635 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2B: DP-2B

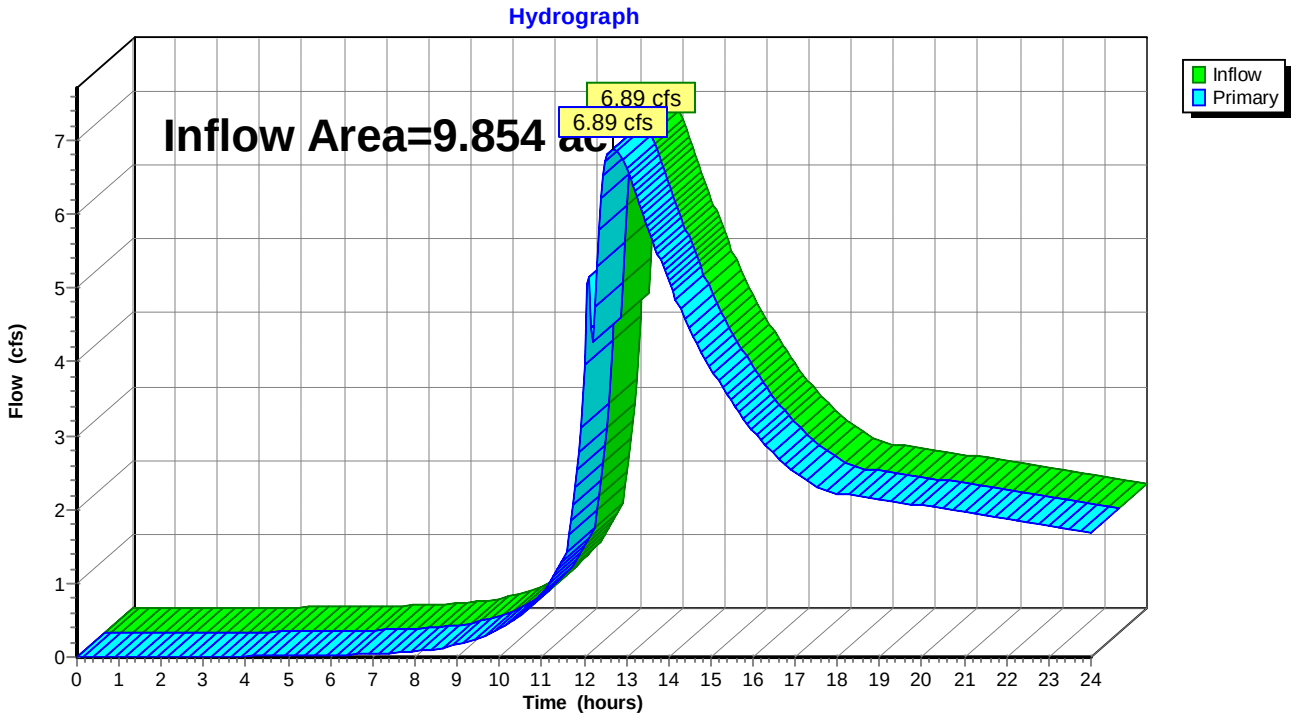


Summary for Link DP3: DP-3

Inflow Area = 9.854 ac, 38.11% Impervious, Inflow Depth > 3.97" for 100-Year event
Inflow = 6.89 cfs @ 12.69 hrs, Volume= 3.260 af
Primary = 6.89 cfs @ 12.69 hrs, Volume= 3.260 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: DP-3

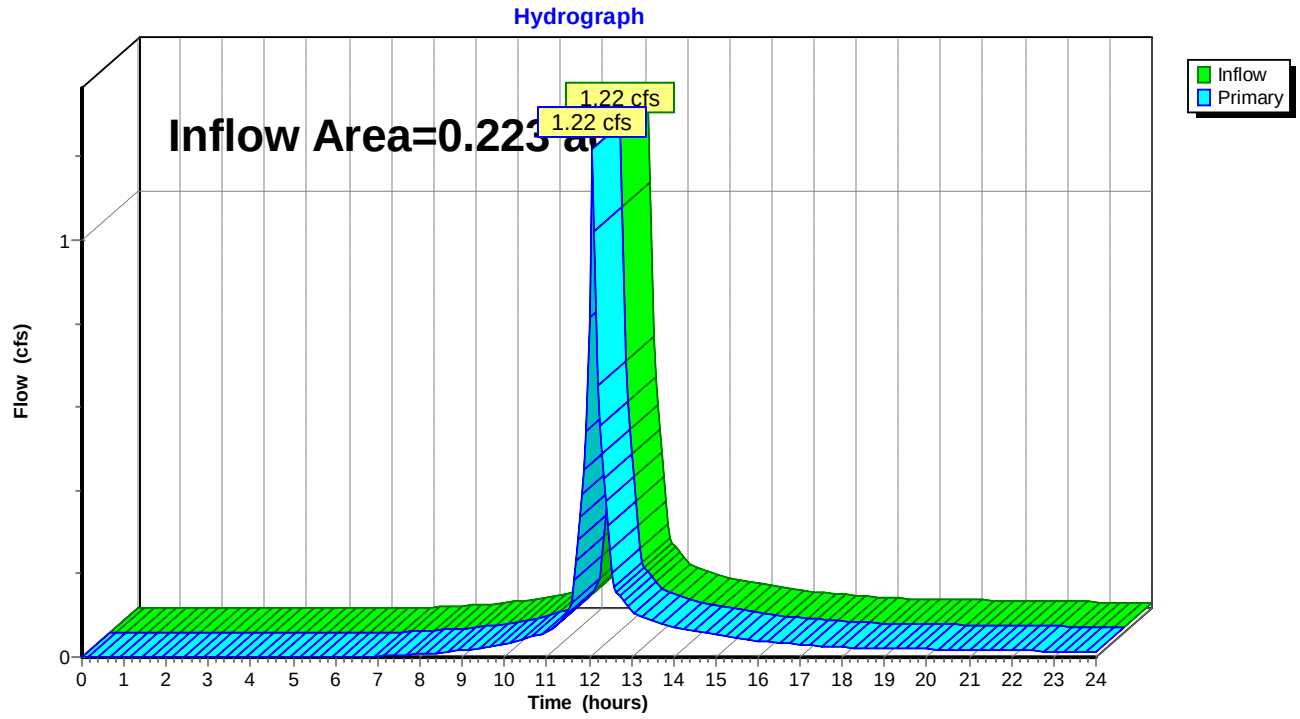


Summary for Link DP4: DP-4

Inflow Area = 0.223 ac, 20.57% Impervious, Inflow Depth > 4.67" for 100-Year event
Inflow = 1.22 cfs @ 12.07 hrs, Volume= 0.087 af
Primary = 1.22 cfs @ 12.07 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP4: DP-4

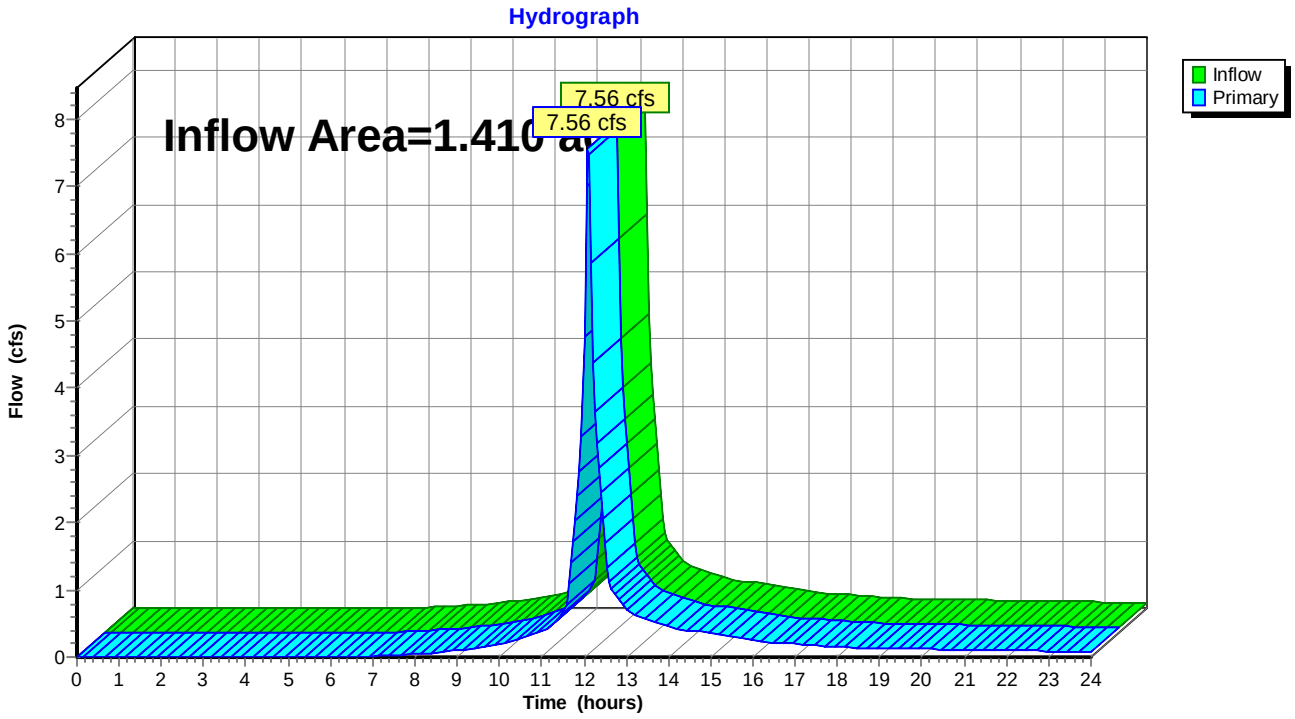


Summary for Link DP5: DP-5

Inflow Area = 1.410 ac, 22.51% Impervious, Inflow Depth > 4.67" for 100-Year event
Inflow = 7.56 cfs @ 12.09 hrs, Volume= 0.549 af
Primary = 7.56 cfs @ 12.09 hrs, Volume= 0.549 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP5: DP-5

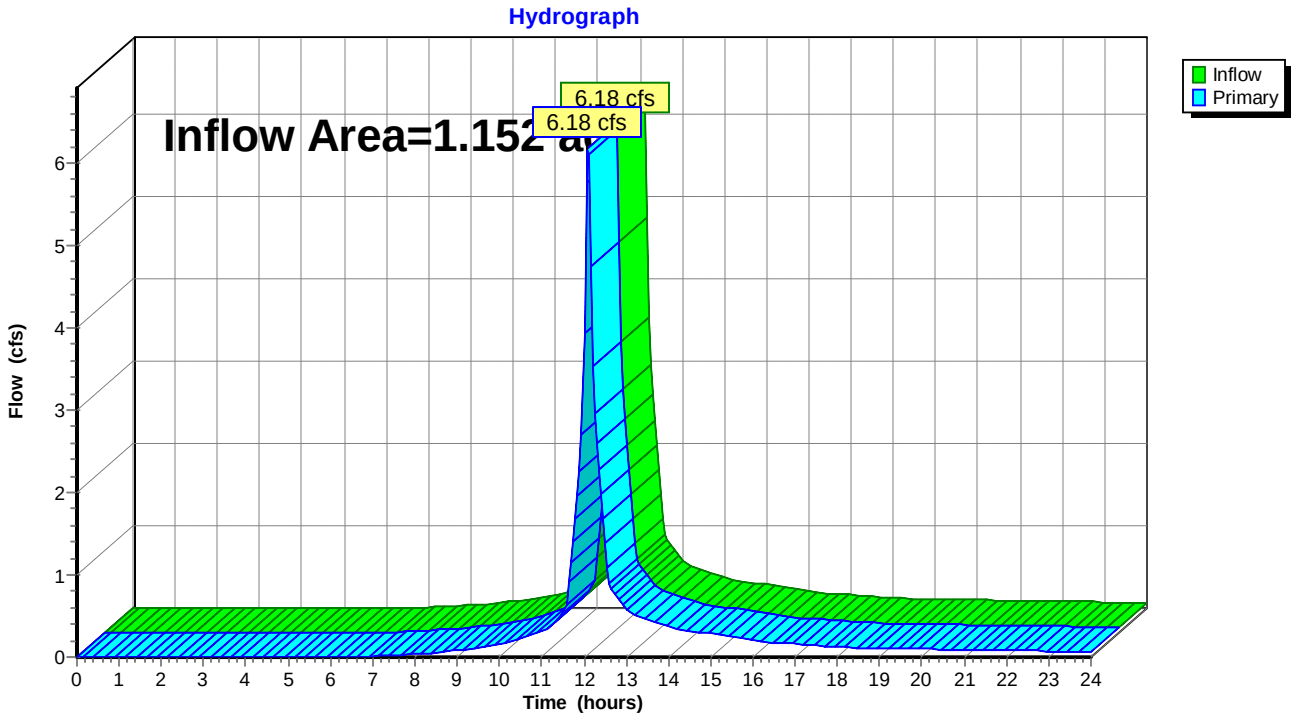


Summary for Link DP6: DP-6

Inflow Area = 1.152 ac, 19.16% Impervious, Inflow Depth > 4.67" for 100-Year event
Inflow = 6.18 cfs @ 12.09 hrs, Volume= 0.449 af
Primary = 6.18 cfs @ 12.09 hrs, Volume= 0.449 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP6: DP-6



Attachment D – Rational Method Pipe Sizing

STORM SEWER SYSTEM DESIGN
CPV Towantic Energy Center
Oxford, CT
25 Year Design Storm

Drainage Area	Impervious (0.9)	Grass or Crushed Stone (0.3)	Wooded (0.2)	Total Area (Ac.)	Average C	Sum of AxC	Tc
STDA A1	0.078	0.000	0.000	0.078	0.90	0.07	5.00
STDA A2	0.066	0.240	0.000	0.306	0.43	0.13	5.00
STDA A3	0.101	0.163	0.000	0.264	0.53	0.14	5.00
STDA A4	0.108	0.282	0.000	0.391	0.47	0.18	5.00
STDA A5	0.085	0.000	0.000	0.085	0.90	0.08	5.00
STDA A6	0.039	0.000	0.000	0.039	0.90	0.03	5.00
STDA A7	0.151	0.014	0.000	0.166	0.85	0.14	5.00
STDA A8	0.096	0.002	0.000	0.098	0.89	0.09	5.00
STDA A9	0.484	0.063	0.000	0.547	0.83	0.45	5.00
STDA A10	0.068	0.053	0.000	0.121	0.64	0.08	5.00
STDA A11	0.134	0.126	0.000	0.261	0.61	0.16	5.00
STDA A12	0.041	0.017	0.000	0.059	0.72	0.04	5.00
STDA A13	0.049	0.302	0.000	0.350	0.38	0.13	5.00
STDA A14	0.108	0.237	0.000	0.345	0.49	0.17	5.00
STDA A15	0.260	0.236	0.000	0.495	0.61	0.30	5.00
STDA A16	0.040	0.214	0.000	0.254	0.39	0.10	5.00
STDA A17	0.011	0.540	0.000	0.552	0.31	0.17	5.00
STDA A18	0.040	0.249	0.000	0.290	0.38	0.11	5.00
STDA A19	0.055	0.213	0.000	0.268	0.42	0.11	5.00
STDA A20	0.041	0.088	0.000	0.129	0.49	0.06	5.00
STDA A21	0.198	0.024	0.000	0.222	0.83	0.19	5.00
STDA B1	0.074	0.192	0.000	0.266	0.47	0.12	5.00
STDA B2	0.096	0.080	0.000	0.175	0.63	0.11	5.00
STDA B3	0.112	0.304	0.000	0.416	0.46	0.19	5.00
STDA B4	0.073	0.302	0.000	0.375	0.42	0.16	5.00
STDA B5	0.083	0.196	0.000	0.279	0.48	0.13	5.00
STDA B6	0.038	0.295	0.000	0.333	0.37	0.12	5.00
STDA B7	0.132	0.226	0.000	0.358	0.52	0.19	5.00
STDA B8	0.102	0.070	0.000	0.172	0.66	0.11	5.00
STDA B9	0.127	0.148	0.000	0.275	0.58	0.16	5.00
STDA B10	0.035	0.565	0.000	0.600	0.34	0.20	5.00
STDA B11	0.000	0.496	0.000	0.496	0.30	0.15	5.00
STDA B12	0.000	0.289	0.000	0.289	0.30	0.09	5.00
STDA C1	0.120	0.347	0.000	0.467	0.45	0.21	5.00
STDA C2	0.123	0.013	0.000	0.136	0.84	0.11	5.00
STDA D	0.059	0.303	0.000	0.362	0.40	0.14	5.00
STDA E1	0.081	0.516	0.000	0.597	0.38	0.23	5.00
STDA E2	0.091	0.555	0.000	0.646	0.38	0.25	5.00

STORM SEWER SYSTEM DESIGN
CPV Towantic Energy Center
Oxford, CT
25 Year Design Storm

LINE SEGMENT	DRAINAGE AREA	SEGMENT TYPE	TIME TO INLET	TIME IN PIPE	ACCUM. TIME	SUM OF AxC	ACCUM. AxC	RAINFALL I	SYSTEM Q (cfs)	PIPE SIZE (in)	PIPE (ft) LENGTH	SLOPE (ft/ft)	Vfull (fps)	Qfull (cfs)	N'	CAPACITY CHECK	HW/D
CB A1 - CB A2	STDA A1	I	5.00	0.14	5.00	0.07	0.07	6.70	0.47	15	46	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	<0.5
CB A2 - CB A3	STDA A2	C	5.00	0.24	5.14	0.13	0.20	6.70	1.35	15	77	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.5
CB A3 - CB A4	STDA A3	C	5.00	0.31	5.38	0.14	0.34	6.70	2.29	15	101	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.7
CB A4 - CB A5	STDA A4	C	5.00	0.11	5.69	0.18	0.52	6.70	3.51	15	34	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.9
CB A5 - CB A6	STDA A5	C	5.00	0.70	5.80	0.08	0.60	6.70	4.02	15	226	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	1
CB A6 - CB A7	STDA A6	C	5.00	0.05	6.50	0.03	0.63	6.70	4.25	15	17	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	1.05
CB A7 - BASIN A	STDA A7	C	5.00	0.22	6.55	0.14	0.78	6.70	5.19	15	115	0.0195	8.69	10.66	0.0110	WITHIN CAPACITY	1.1
CB A8 - CB A9	STDA A8	I	5.00	0.10	5.00	0.09	0.09	6.70	0.58	15	32	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	<0.5
CB A9 - CB A11	STDA A9	C	5.00	0.69	5.10	0.45	0.54	6.70	3.63	15	224	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.9
CB A10 - CB A11	STDA A10	I	5.00	0.02	5.00	0.08	0.08	6.70	0.52	15	17	0.0700	16.46	20.20	0.0110	WITHIN CAPACITY	<0.5
CB A11 - DMH A1	STDA A11	C	5.00	0.19	5.79	0.16	0.78	6.70	5.21	15	62	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	1.25
DMH A1 - CB A14	N/A	C	5.00	0.29	5.98	0.00	0.78	6.70	5.21	15	93	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	1.25
CB A12 - CB A14	STDA A12	I	5.00	0.05	5.00	0.04	0.04	6.70	0.28	15	17	0.0100	6.22	7.63	0.0110	WITHIN CAPACITY	<0.5
CB A13 - CB A14	STDA A13	I	5.00	0.25	5.00	0.13	0.13	6.70	0.90	15	140	0.0231	9.46	11.60	0.0110	WITHIN CAPACITY	<0.5
CB A14 - DMH A2	STDA A14	C	5.00	0.28	6.27	0.17	1.12	6.70	7.52	**18**	102	0.0075	6.08	10.75	0.0110	WITHIN CAPACITY	1.15
CB A15 - CB 16	STDA A15	I	5.00	0.39	5.00	0.30	0.30	6.70	2.04	15	167	0.0133	7.17	8.80	0.0110	WITHIN CAPACITY	0.65
CB A16 - DMH A2	STDA A16	C	5.00	0.28	5.39	0.10	0.40	6.70	2.71	15	120	0.0133	7.17	8.80	0.0110	WITHIN CAPACITY	0.75
DMH A2 - CB A20	N/A	C	5.00	0.16	6.55	0.00	1.53	6.70	10.23	**24**	72	0.0075	7.37	23.15	0.0110	WITHIN CAPACITY	0.85
CB A17 - CB A18	STDA A17	I	5.00	0.56	5.00	0.17	0.17	6.70	1.15	15	232	0.0125	6.96	8.54	0.0110	WITHIN CAPACITY	<0.5
CB A18 - CB A19	STDA A18	C	5.00	0.05	5.56	0.11	0.28	6.70	1.90	15	22	0.0125	6.96	8.54	0.0110	WITHIN CAPACITY	0.6
CB A19 - DMH A3	STDA A19	C	5.00	0.13	5.61	0.11	0.40	6.70	2.66	15	54	0.0125	6.96	8.54	0.0110	WITHIN CAPACITY	0.75
DMH A3 - CB A20	N/A	C	5.00	0.15	5.74	0.00	0.40	6.70	2.66	15	69	0.0148	7.57	9.29	0.0110	WITHIN CAPACITY	0.75
CB A20 - CB A21	STDA A20	C	5.00	0.12	6.71	0.06	1.99	6.70	13.31	**24**	54	0.0075	7.37	23.15	0.0110	WITHIN CAPACITY	1.05
CB A21 - BASIN A	STDA A21	C	5.00	0.31	6.84	0.19	2.17	6.70	14.55	**24**	145	0.0083	7.75	24.36	0.0110	WITHIN CAPACITY	1.1
CB B1 - CB B2	STDA B1	I	5.00	0.11	5.00	0.12	0.12	6.70	0.83	15	34	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	<0.5
CB B2 - DMH B1	STDA B2	C	5.00	0.24	5.11	0.11	0.23	6.70	1.57	15	76	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.55
DMH B1 - CB B3	N/A	C	5.00	0.35	5.34	0.00	0.23	6.70	1.57	15	114	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.55
CB B3 - CB B4	STDA B3	C	5.00	0.42	5.69	0.19	0.43	6.70	2.86	15	137	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.8
CB B4 - DMH B2	STDA B4	C	5.00	0.17	6.12	0.16	0.58	6.70	3.90	15	56	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	1
DMH B2 - CB B12	N/A	C	5.00	0.20	6.29	0.00	0.58	6.70	3.90	15	95	0.0155	7.75	9.50	0.0110	WITHIN CAPACITY	1
CB B5 - CB B6	STDA B5	I	5.00	0.05	5.00	0.13	0.13	6.70	0.89	15	17	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	<0.5
CB B6 - DMH B3	STDA B6	C	5.00	0.37	5.05	0.12	0.26	6.70	1.72	15	149	0.0115	6.67	8.19	0.0110	WITHIN CAPACITY	0.6
CB B7 - CB B8	STDA B7	I	5.00	0.06	5.00	0.19	0.19	6.70	1.25	15	20	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	<0.5
CB B8 - DMH B3	STDA B8	C	5.00	0.41	5.06	0.11	0.30	6.70	2.00	15	132	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.65
CB B9 - DMH B3	STDA B9	I	5.00	0.02	5.00	0.16	0.16	6.70	1.06	15	24	0.0683	16.26	19.95	0.0110	WITHIN CAPACITY	<0.5
DMH B3 - CB B10	N/A	C	5.00	0.24	5.42	0.00	0.71	6.70	4.78	15	76	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	1.15
CB B10 - CB B11	STDA B10	C	5.00	0.44	5.66	0.20	0.91	6.70	6.13	**18**	160	0.0075	6.08	10.75	0.0110	WITHIN CAPACITY	1
CB B11 - DMH B4	STDA B11	C	5.00	0.14	6.10	0.15	1.06	6.70	7.13	**18**	51	0.0075	6.08	10.75	0.0110	WITHIN CAPACITY	1.1
DMH B4 - CB B12	N/A	C	5.00	0.30	6.24	0.00	1.06	6.70	7.13	**18**	108	0.0075	6.08	10.75	0.0110	WITHIN CAPACITY	1.1
CB B12 - BASIN B	STDA B12	C	5.00	0.10	6.49	0.09	1.73	6.70	11.61	**24**	48	0.0083	7.75	24.36	0.0110	WITHIN CAPACITY	0.95
CB C1 - CB C2	STDA C1	I	5.00	0.08	5.00	0.21	0.21	6.70	1.42	15	31	0.0100	6.22	7.63	0.0110	WITHIN CAPACITY	0.5
CB C2 - DMH C1	STDA C2	C	5.00	0.07	5.08	0.11	0.33	6.70	2.19	15	102	0.1430	23.52	28.87	0.0110	WITHIN CAPACITY	0.65
DMH C1 - DP1	N/A	C	5.00	0.19	5.16	0.00	0.33	6.70	2.19	15	161	0.0500	13.91	17.07	0.0110	WITHIN CAPACITY	0.65
CB D1 - WQS D2	STDA D	I	5.00	0.11	5.00	0.14	0.14	6.70	0.97	15	40	0.0100	6.22	7.63	0.0110	WITHIN CAPACITY	<0.5
CB E1 - DP5	STDA E	I	5.00	0.11	5.00	0.48	0.48	6.70	3.19	15	36	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.85

Attachment E – Outlet Protection Calculations

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Sep 25 2014

CB A7 to Basin A

Circular

Diameter (ft)	= 1.50
Invert Elev (ft)	= 820.00
Slope (%)	= 1.95
N-Value	= 0.011

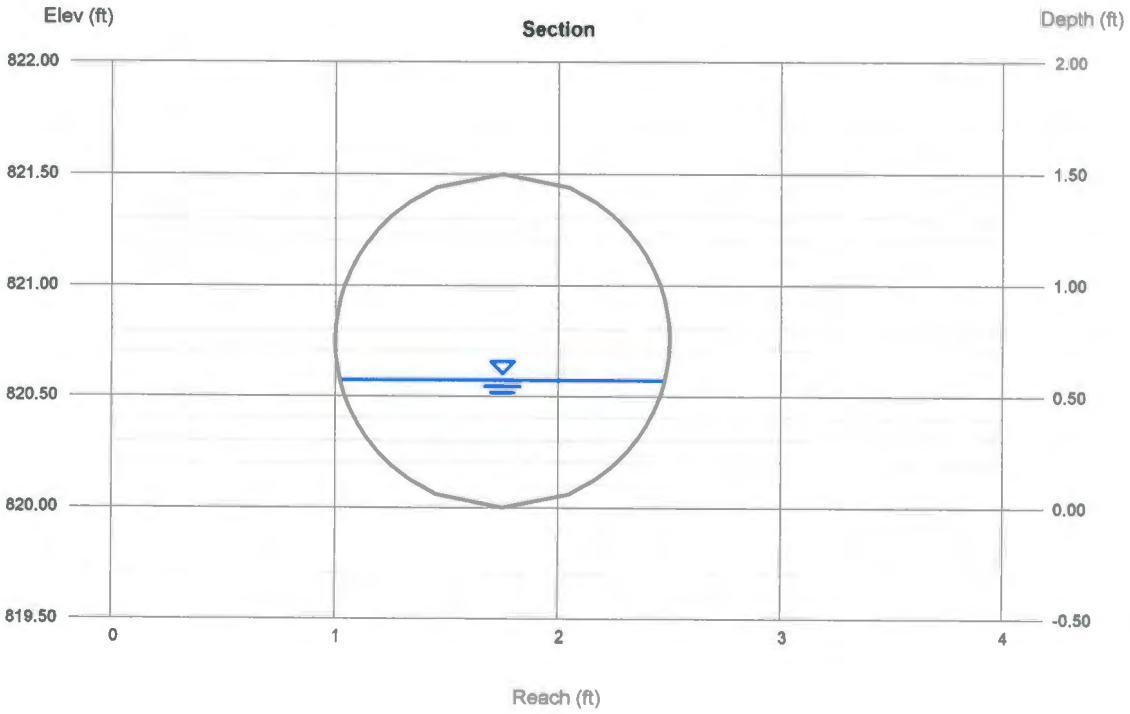
Calculations

Compute by:	Known Q
Known Q (cfs)	= 5.19

Highlighted

Depth (ft)	= 0.57
Q (cfs)	= 5.190
Area (sqft)	= 0.62
Velocity (ft/s)	= 8.40
Wetted Perim (ft)	= 1.99
Crit Depth, Yc (ft)	= 0.88
Top Width (ft)	= 1.46
EGL (ft)	= 1.67

INTERMEDIATE RIPRAP



OUTLET PROTECTION - OUTLET VELOCITY ≤ 14 feet/sec

DISCHARGE (cfs)	OUTLET PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
0-5	*10*	*10*		*USE*						
6	12	11								
7		13	*12*							
8		14	13	*12*		*MINIMUM*				
9			14	13						
10			15	13						
11			16	14				*LENGTH*		
12				14						
14				16	*14*					
16				17	15	*14*			*OUTLINED*	
18				18	16	15				
20					17	15	*14*			
22		*USE*			18	16	15			
24						17	15	*14*		
26						17	16	15		
28						18	16	15		
30						19	17	16		
35						20	18	17	*16*	
40			*PREFORMED*				20	18	17	*16*
45							21	19	18	16
50							22	20	18	17
55								21	19	18
60								22	20	19
65								24	21	20
70					*SCOUR*			25	22	20
75								26	23	21
80									24	22
90									26	24
100									28	25
110										27
125							*HOLE*			29
130										30

Table 8-6.1 - Length - L_a (feet)
Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum L_a to be used for a given pipe diameter or span.
2. Rounding and interpolating are acceptable.

$W = 3S_p + 0.4L_a = 9.3'$

USE 9.5'W × 12'L Intermediate Riprap.

Channel Report

CB A21 to Basin A

Circular

Diameter (ft)	= 2.00
Invert Elev (ft)	= 820.00
Slope (%)	= 0.83
N-Value	= 0.011

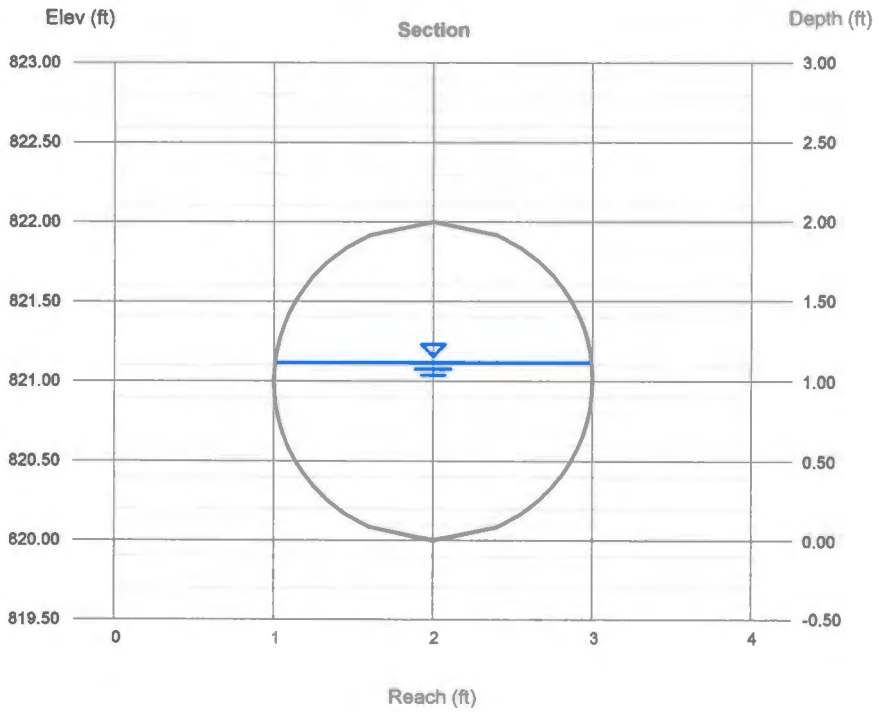
Calculations

Compute by:	Known Q
Known Q (cfs)	= 14.55

Highlighted

Depth (ft)	= 1.11
Q (cfs)	= 14.55
Area (sqft)	= 1.80
Velocity (ft/s)	= 8.09
Wetted Perim (ft)	= 3.37
Crit Depth, Yc (ft)	= 1.38
Top Width (ft)	= 1.99
EGL (ft)	= 2.13

INTERMEDIATE RIPRAP



OUTLET PROTECTION - OUTLET VELOCITY ≤ 14 feet/sec

DISCHARGE (cfs)	OUTLET PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
0-5	***10***	***10***		***USE***						
6	12	11								
7		13	***12***							
8		14	13	***12***		***MINIMUM***				
9			14	13						
10			15	13						
11			16	14				***LENGTH***		
12				14						
14				16	***14***					
16				17	15	***14***			***OUTLINED***	
18				18	16	15				
20					17	15	***14***			
22		***USE***			18	16	15			
24						17	15	***14***		
26						17	16	15		
28						18	16	15		
30						19	17	16		
35						20	18	17	***16***	
40			***PREFORMED***				20	18	17	***16***
45							21	19	18	16
50							22	20	18	17
55								21	19	18
60								22	20	19
65								24	21	20
70					***SCOUR***			25	22	20
75								26	23	21
80									24	22
90									26	24
100									28	25
110										27
125							***HOLE***			29
130										30

Table 8-6.1 - Length - L_a (feet)
Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum L_a to be used for a given pipe diameter or span.
2. Rounding and interpolating are acceptable.

$W = 3S_p + 0.4L_a = 12.4'$

USE 12.5'W × 16'L Intermediate Riprap.

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Sep 25 2014

CB B12 to Basin B

Circular

Diameter (ft)	= 2.00
Invert Elev (ft)	= 821.00
Slope (%)	= 0.83
N-Value	= 0.011

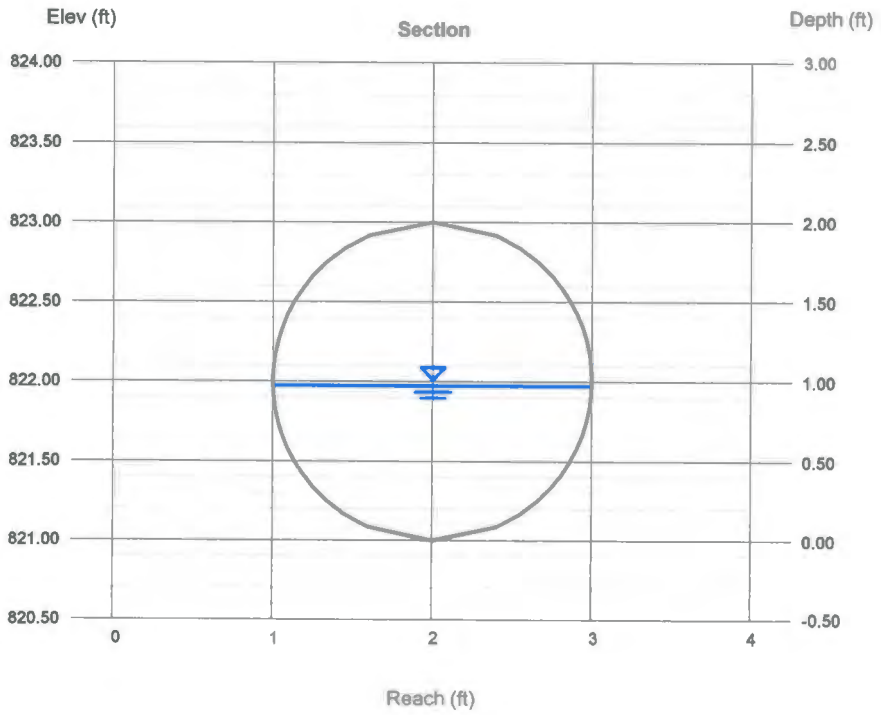
Calculations

Compute by:	Known Q
Known Q (cfs)	= 11.61

Highlighted

Depth (ft)	= 0.97
Q (cfs)	= 11.61
Area (sqft)	= 1.52
Velocity (ft/s)	= 7.64
Wetted Perim (ft)	= 3.09
Crit Depth, Yc (ft)	= 1.23
Top Width (ft)	= 2.00
EGL (ft)	= 1.88

MODIFIED RIPRAP



OUTLET PROTECTION - OUTLET VELOCITY ≤ 14 feet/sec

DISCHARGE (cfs)	OUTLET PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
0-5	*10*	*10*		*USE*						
6	12	11								
7		13	*12*							
8		14	13	*12*		*MINIMUM*				
9			14	13						
10			15	13						
11			16	14				*LENGTH*		
12				14						
14				16	*14*					
16				17	15	*14*			*OUTLINED*	
18				18	16	15				
20					17	15	*14*			
22		*USE*			18	16	15			
24						17	15	*14*		
26						17	16	15		
28						18	16	15		
30						19	17	16		
35						20	18	17	*16*	
40			*PREFORMED*				20	18	17	*16*
45							21	19	18	16
50							22	20	18	17
55								21	19	18
60								22	20	19
65								24	21	20
70					*SCOUR*			25	22	20
75								26	23	21
80									24	22
90									26	24
100									28	25
110										27
125							*HOLE*			29
130										30

Table 8-6.1 - Length - L_a (feet)
Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum L_a to be used for a given pipe diameter or span.
2. Rounding and interpolating are acceptable.

$W = 3S_p + 0.4L_a = 11.6'$

USE 12'W × 14'L Modified Riprap

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc.

Thursday, Sep 25 2014

CB D1 to WQS D2

Circular

Diameter (ft)	= 1.25
Invert Elev (ft)	= 800.35
Slope (%)	= 1.00
N-Value	= 0.011

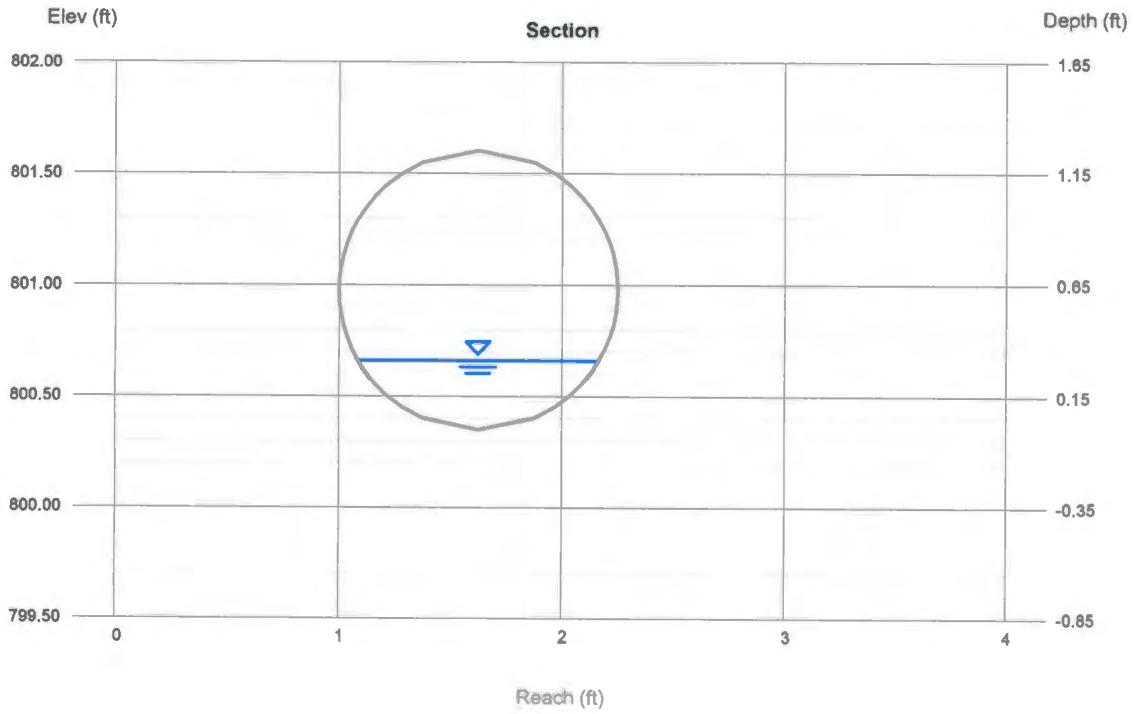
Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.97

Highlighted

Depth (ft)	= 0.31
Q (cfs)	= 0.970
Area (sqft)	= 0.24
Velocity (ft/s)	= 4.06
Wetted Perim (ft)	= 1.31
Crit Depth, Yc (ft)	= 0.39
Top Width (ft)	= 1.08
EGL (ft)	= 0.57

MODIFIED RIPRAP



OUTLET PROTECTION - OUTLET VELOCITY ≤ 14 feet/sec

DISCHARGE (cfs)	OUTLET PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
0-5	***10***	***10***		***USE***						
6	12	11								
7		13	***12***							
8		14	13	***12***		***MINIMUM***				
9			14	13						
10			15	13						
11			16	14				***LENGTH***		
12				14						
14				16	***14***					
16				17	15	***14***			***OUTLINED***	
18				18	16	15				
20					17	15	***14***			
22		***USE***			18	16	15			
24						17	15	***14***		
26						17	16	15		
28						18	16	15		
30						19	17	16		
35						20	18	17	***16***	
40			***PREFORMED***				20	18	17	***16***
45							21	19	18	16
50							22	20	18	17
55								21	19	18
60								22	20	19
65								24	21	20
70					***SCOUR***			25	22	20
75								26	23	21
80									24	22
90									26	24
100									28	25
110										27
125							***HOLE***			29
130										30

Table 8-6.1 - Length - L_a (feet)
Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum L_a to be used for a given pipe diameter or span.
2. Rounding and interpolating are acceptable.

$W = 3S_p + 0.4L_a = 7.75'$

USE 8'W x 10'L MODIFIED RIPRAP

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Sep 25 2014

DMH C1 to DP1

Circular

Diameter (ft)	= 1.25
Invert Elev (ft)	= 778.50
Slope (%)	= 5.00
N-Value	= 0.011

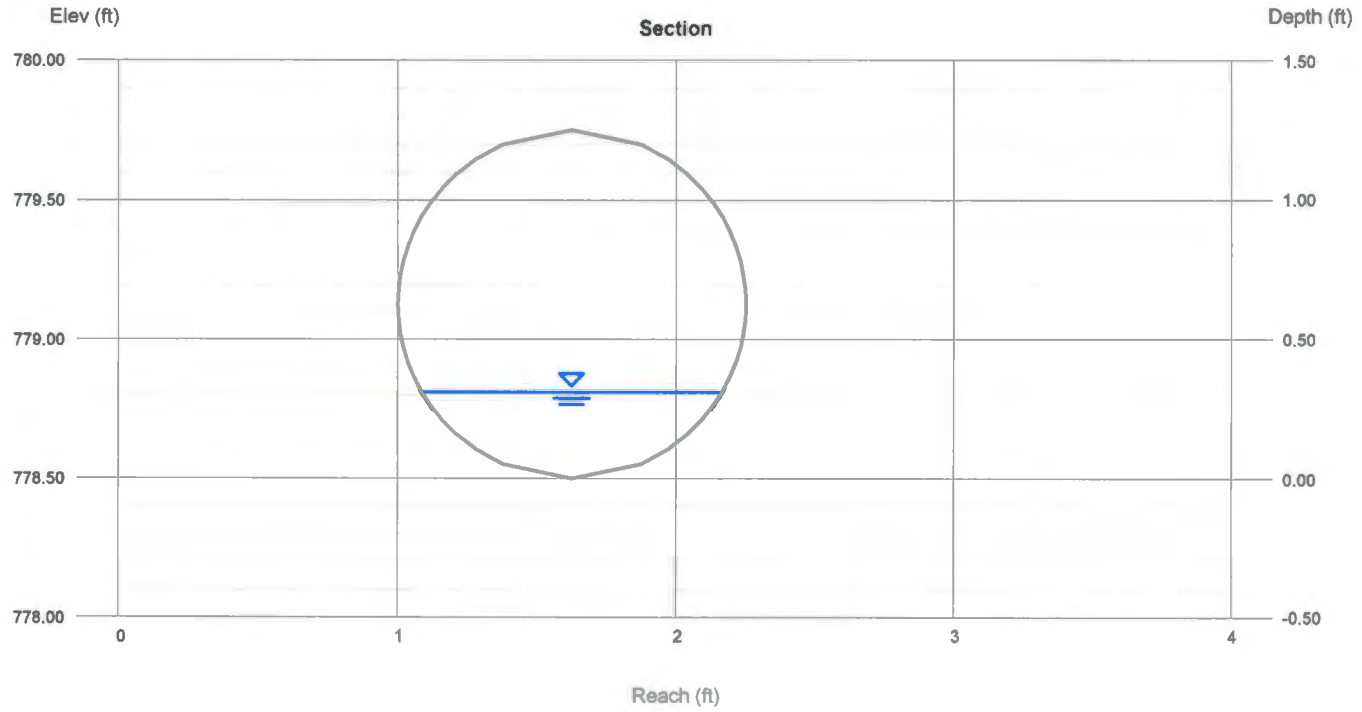
Calculations

Compute by:	Known Q
Known Q (cfs)	= 2.19

Highlighted

Depth (ft)	= 0.31
Q (cfs)	= 2.190
Area (sqft)	= 0.24
Velocity (ft/s)	= 9.18
Wetted Perim (ft)	= 1.31
Crit Depth, Yc (ft)	= 0.60
Top Width (ft)	= 1.08
EGL (ft)	= 1.62

INTERMEDIATE RIP RAP



OUTLET PROTECTION - OUTLET VELOCITY ≤ 14 feet/sec

DISCHARGE (cfs)	OUTLET PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
0-5	**10**	**10**		USE						
6	12	11								
7		13	**12**							
8		14	13	**12**		MINIMUM				
9			14	13						
10			15	13						
11			16	14				LENGTH		
12				14						
14				16	**14**					
16				17	15	**14**			OUTLINED	
18				18	16	15				
20					17	15	**14**			
22		SE			18	16	15			
24						17	15	**14**		
26						17	16	15		
28						18	16	15		
30						19	17	16		
35						20	18	17	**16**	
40			PREFORMED				20	18	17	**16**
45							21	19	18	16
50							22	20	18	17
55								21	19	18
60								22	20	19
65								24	21	20
70					SCOUR			25	22	20
75								26	23	21
80									24	22
90									26	24
100									28	25
110										27
125							HOLE			29
130										30

Table 8-6.1 - Length - L_a (feet)
Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum L_a to be used for a given pipe diameter or span.
2. Rounding and interpolating are acceptable.

$W = 3S_p + 0.4L_a = 7.75'$

USE 8'W × 10'L Intermediate Riprap

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Sep 25 2014

DMH B9 to DP1

Circular

Diameter (ft)	= 2.00
Invert Elev (ft)	= 778.50
Slope (%)	= 2.50
N-Value	= 0.011

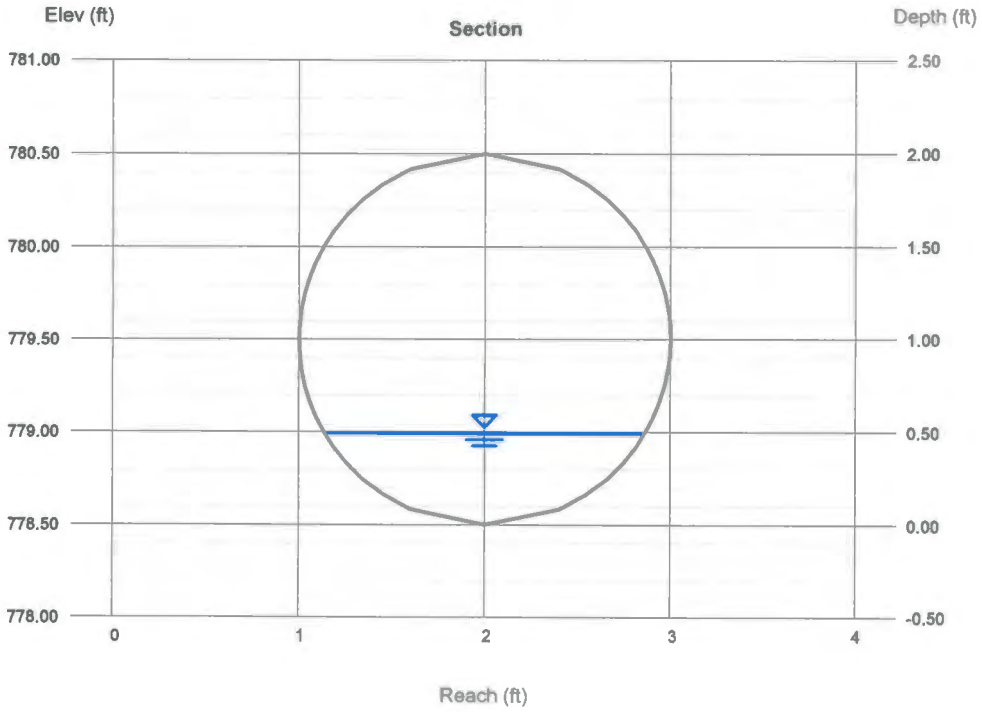
Calculations

Compute by:	Known Q
Known Q (cfs)	= 5.43

Highlighted

Depth (ft)	= 0.49
Q (cfs)	= 5.430
Area (sqft)	= 0.60
Velocity (ft/s)	= 9.00
Wetted Perim (ft)	= 2.08
Crit Depth, Yc (ft)	= 0.83
Top Width (ft)	= 1.72
EGL (ft)	= 1.75

INTERMEDIATE RIP RAP



OUTLET PROTECTION - OUTLET VELOCITY ≤ 14 feet/sec

DISCHARGE (cfs)	OUTLET PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
0-5	*10*	*10*		*USE*						
6	12	11								
7		13	*12*							
8		14	13	*12*		*MINIMUM*				
9			14	13						
10			15	13						
11			16	14				*LENGTH*		
12				14						
14				16	*14*					
16				17	15	*14*			*OUTLINED*	
18				18	16	15				
20					17	15	*14*			
22		*USE*			18	16	15			
24						17	15	*14*		
26						17	16	15		
28						18	16	15		
30						19	17	16		
35						20	18	17	*16*	
40			*PREFORMED*				20	18	17	*16*
45							21	19	18	16
50							22	20	18	17
55								21	19	18
60								22	20	19
65								24	21	20
70					*SCOUR*			25	22	20
75								26	23	21
80									24	22
90									26	24
100									28	25
110										27
125							*HOLE*			29
130										30

Table 8-6.1 - Length - L_a (feet)
Type A Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum L_a to be used for a given pipe diameter or span.
2. Rounding and interpolating are acceptable.

$W = 3S_p + 0.4L_a = 10.8'$

USE 11'W × 12'L Intermediate Riprap

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Feb 24 2015

DP1 Outlet

Circular

Diameter (ft)	= 2.00
Invert Elev (ft)	= 760.00
Slope (%)	= 13.50
N-Value	= 0.011

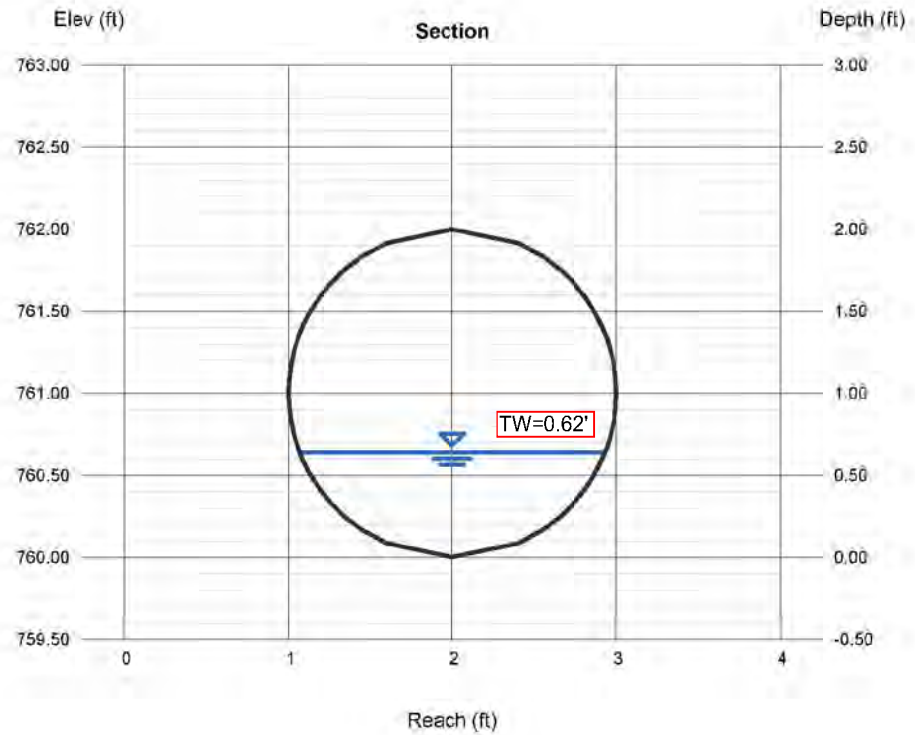
Calculations

Compute by:	Known Q
Known Q (cfs)	= 21.65

Highlighted

Depth (ft)	= 0.64
Q (cfs)	= 21.65
Area (sqft)	= 0.87
Velocity (ft/s)	= 24.86
Wetted Perim (ft)	= 2.41
Crit Depth, Yc (ft)	= 1.67
Top Width (ft)	= 1.87
EGL (ft)	= 10.25

TYPE 1 PREFORMED SCOUR



OUTLET PROTECTION
OUTLET VELOCITY > 14 feet/sec or Length of Apron exceeds limits shown on Tables 8-6.1 and 8-7.1

Preformed Scour Hole										
(See Figure 8-11)	PIPE DIAMETER (in)									
	12	15	18	24	30	36	42	48	54	60
Type 1										
B	5	6	8	10	13	15	18	20	23	25
C	6	8	9	12	15	18	21	24	27	30
d	Depends on riprap type(see Figure 8-11)									
$2S_p$	2.0	2.6	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
$3S_p$	3.0	3.9	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
$F = 0.5\ S_p$	0.5	0.625	0.75	1	1.25	1.5	1.75	2	2.25	2.5
Type 2										
B	8	10	12	16	20	24	28	32	36	40
C	9	11	14	18	23	27	32	36	41	45
d	Depends on riprap size (see Figure 8-11)									
$2S_p$	2.0	2.6	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
$3S_p$	3.0	3.9	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
$F = S_p$	1.0	1.3	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0

Table 8-8.1 - Dimensions of Preformed Scour Hole (Feet)

$d_{50} = (0.0125\ R_p^2/TW)(Q/R_p^{2.5})^{1.333} = 0.483'$

$0.42' < d_{50} < 0.67'$ Use Intermediate Riprap

$10'W \times 12'L \times 1'D$ Type 1 Scour Hole

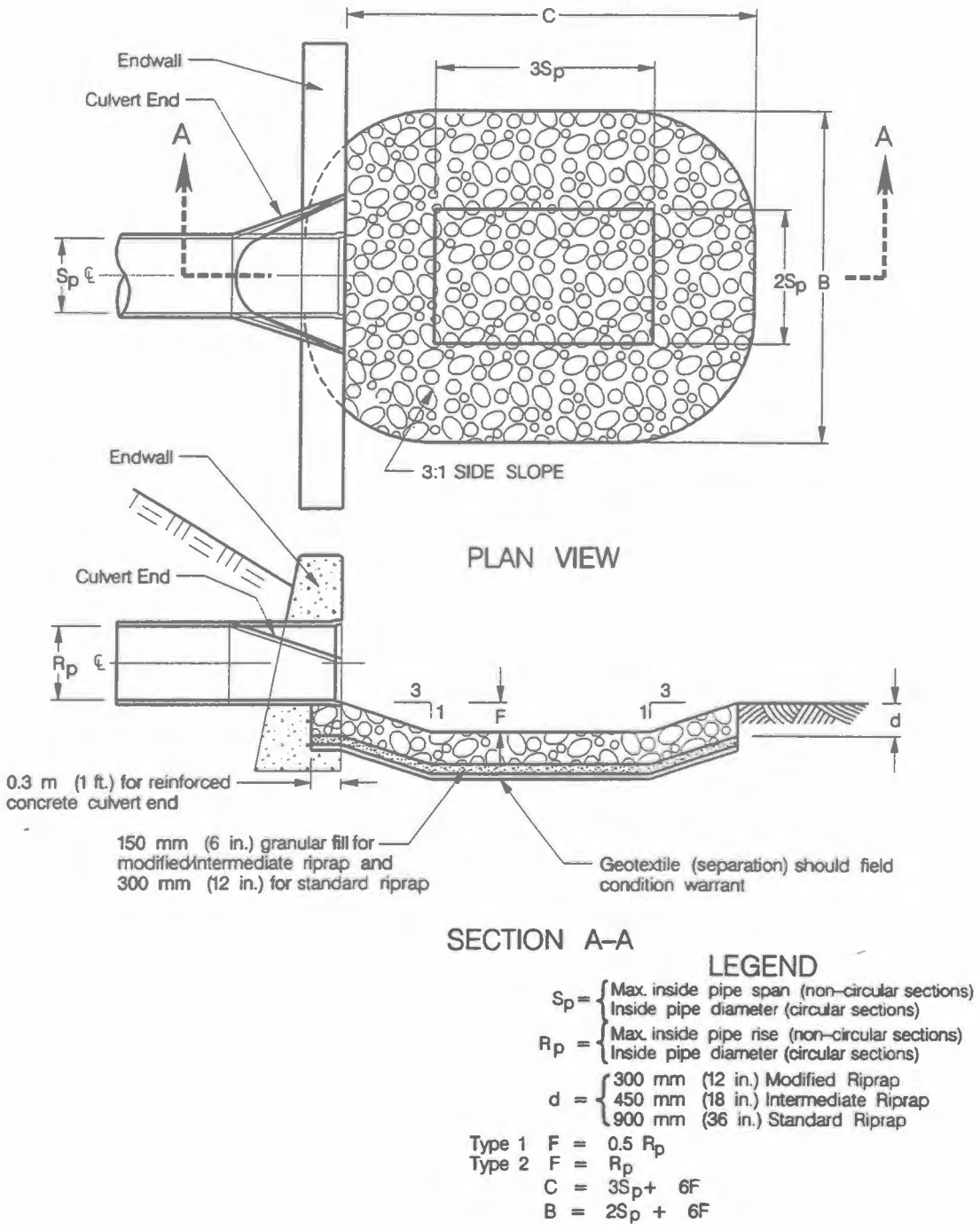


Figure 8-11 Preformed Scour Hole Type 1 and Type 2

Attachment F – Water Quality Volume Calculations

WATER QUALITY VOLUME CALCULATIONS FOR
CPV Towantic Energy Center
(PER DEP 2004 STORMWATER QUALITY MANUAL)
9-23-14
Revised 2-13-15

Water Quality Volume (WQV) = 1" x R x A/ 12

Where: R = Volumetric Runoff Coefficient = 0.05 + 0.009 x I
I = Percent impervious cover
A = Site area in acres

TO STORMWATER RENOVATION AREA "A"

A = 8.81 acres
I = 2.28 ac = 25.9%
R = 0.05 + 0.009 × 25.9 = 0.283
WQV (Drainage Area) = 1" × 0.283 × 8.81 / 12 = .208 ac-ft = 9,050 CF
WQV Required = 9,050 CF

WVQ Provided in Forebay Area = 6,025 CF
WVQ Provided in Low Marsh Swale = 4,050 CF
WQV Provided in Micro-pool = 5,200 CF

Total volume provided by Forebay and Micro-pool in Renovation Area "A" = 15,275 CF (169% of required)

TO STORMWATER RENOVATION AREA "B"

A = 8.72 acres
I = 0.92 ac = 10.6%
R = 0.05 + 0.009 × 10.6 = 0.145
WQV (Drainage Area) = 1" × 0.145 × 8.72 / 12 = .105 ac-ft = 4,590 CF
WQV Required = 4,590 CF

WVQ Provided in Forebay Area = 1,140 CF
WVQ Provided in Low Marsh Swale = 2,160 CF
WQV Provided in Micro-pool = 3,650 CF

Total volume provided by Forebay and Micro-pool in Renovation Area "B" = 6,950 CF (151% of required)

Attachment G – Water Quality Swale Analysis

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Sep 25 2014

WQS C

Trapezoidal

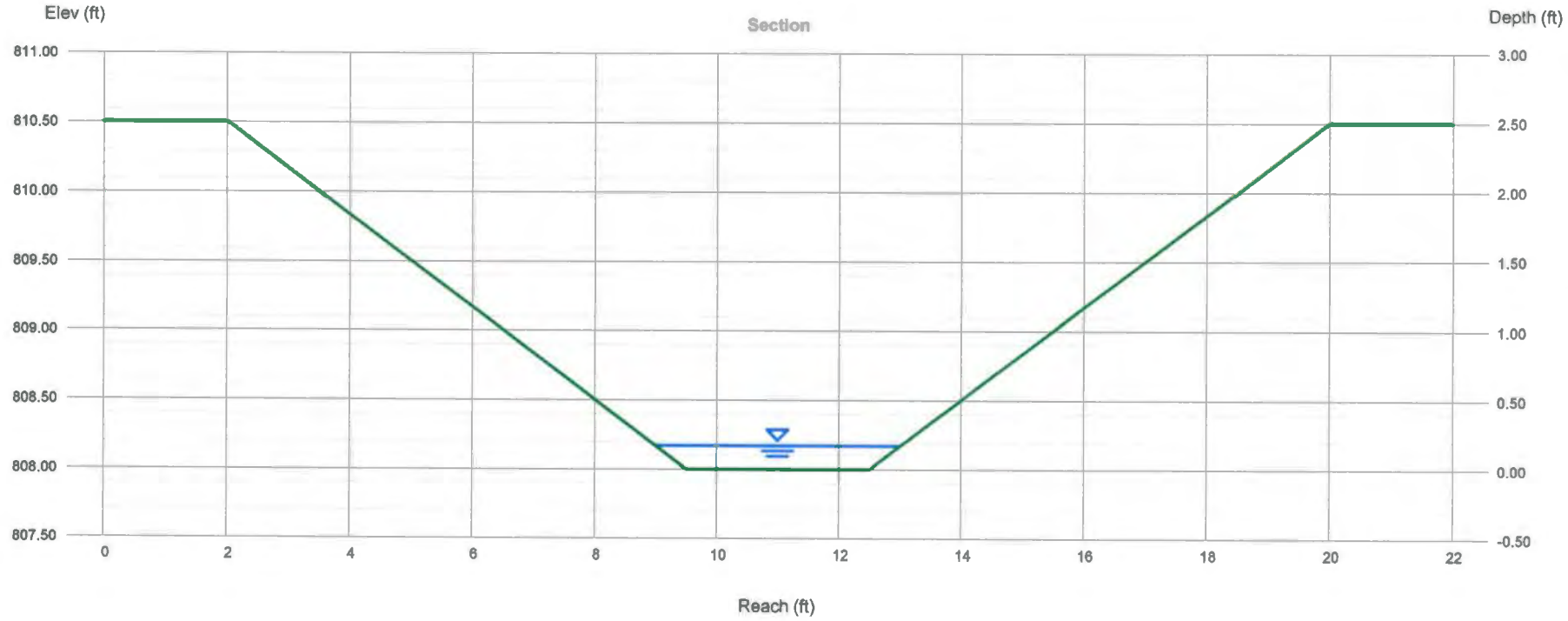
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 808.00
Slope (%)	= 5.00
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.42

Highlighted

Depth (ft)	= 0.17
Q (cfs)	= 1.420
Area (sqft)	= 0.60
Velocity (ft/s)	= 2.38
Wetted Perim (ft)	= 4.08
Crit Depth, Yc (ft)	= 0.18
Top Width (ft)	= 4.02
EGL (ft)	= 0.26



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Sep 25 2014

WQS D1

Trapezoidal

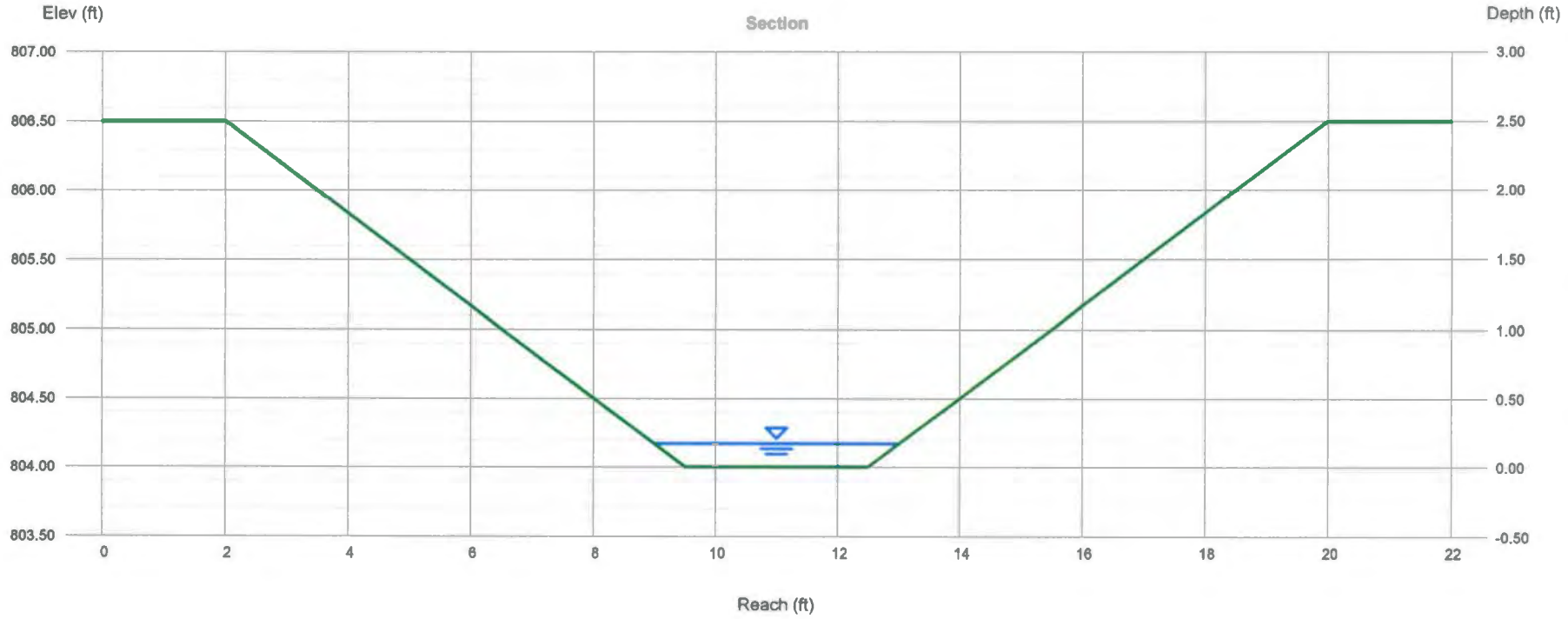
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 804.00
Slope (%)	= 2.00
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.97

Highlighted

Depth (ft)	= 0.17
Q (cfs)	= 0.970
Area (sqft)	= 0.60
Velocity (ft/s)	= 1.63
Wetted Perim (ft)	= 4.08
Crit Depth, Yc (ft)	= 0.15
Top Width (ft)	= 4.02
EGL (ft)	= 0.21



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Sep 25 2014

WQS D2

Trapezoidal

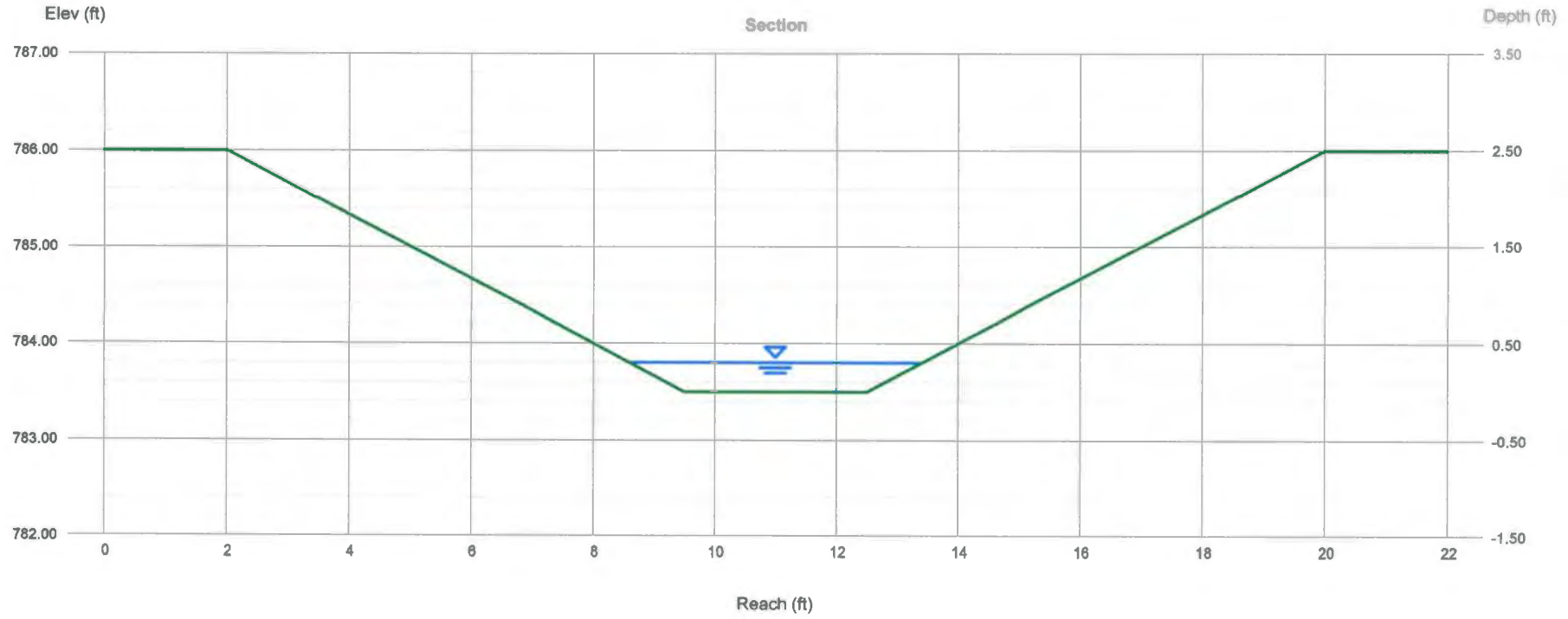
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 783.50
Slope (%)	= 5.50
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 4.43

Highlighted

Depth (ft)	= 0.30
Q (cfs)	= 4.430
Area (sqft)	= 1.17
Velocity (ft/s)	= 3.79
Wetted Perim (ft)	= 4.90
Crit Depth, Yc (ft)	= 0.36
Top Width (ft)	= 4.80
EGL (ft)	= 0.52



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Sep 25 2014

WQS E1

Trapezoidal

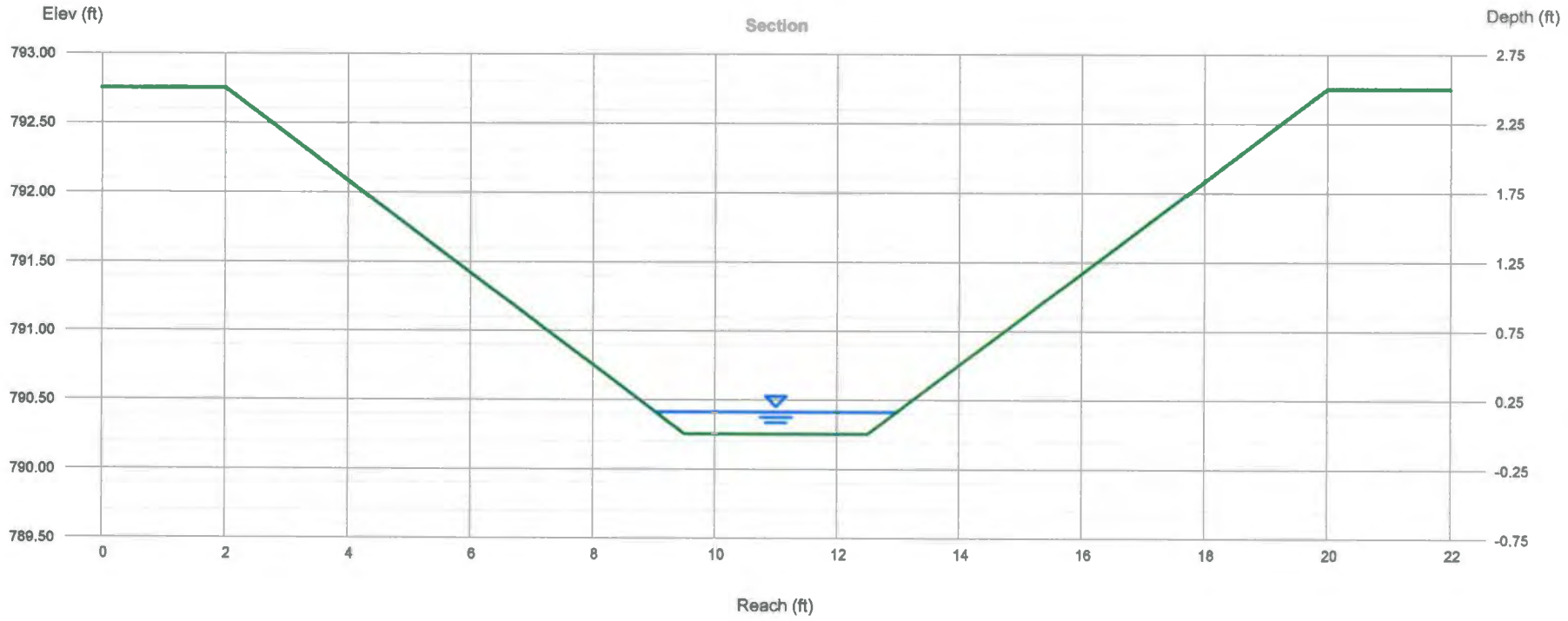
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 790.25
Slope (%)	= 6.00
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.52

Highlighted

Depth (ft)	= 0.16
Q (cfs)	= 1.520
Area (sqft)	= 0.56
Velocity (ft/s)	= 2.73
Wetted Perim (ft)	= 4.01
Crit Depth, Yc (ft)	= 0.19
Top Width (ft)	= 3.96
EGL (ft)	= 0.28



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Sep 25 2014

WQS E2

Trapezoidal

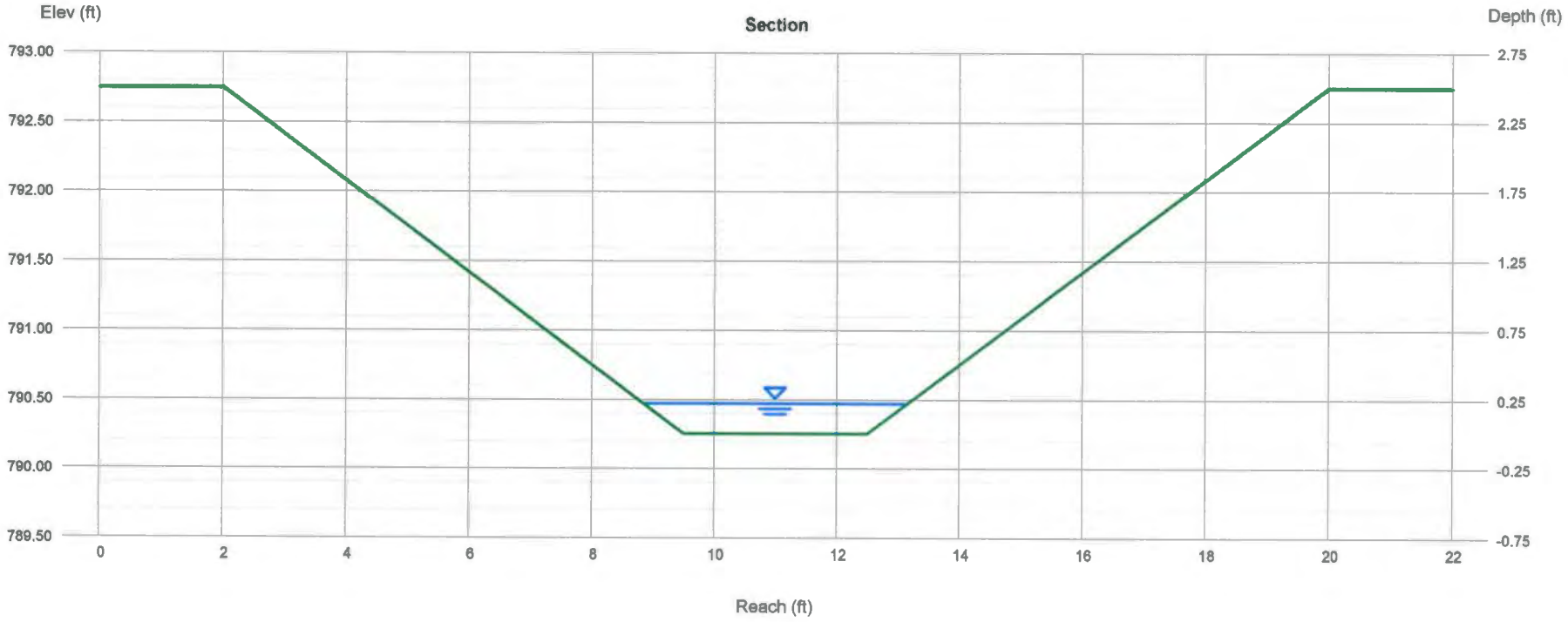
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 790.25
Slope (%)	= 2.50
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.66

Highlighted

Depth (ft)	= 0.22
Q (cfs)	= 1.660
Area (sqft)	= 0.81
Velocity (ft/s)	= 2.06
Wetted Perim (ft)	= 4.39
Crit Depth, Yc (ft)	= 0.20
Top Width (ft)	= 4.32
EGL (ft)	= 0.29



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Feb 13 2015

WOODRUFF HILL ROADSIDE SWALE

Trapezoidal

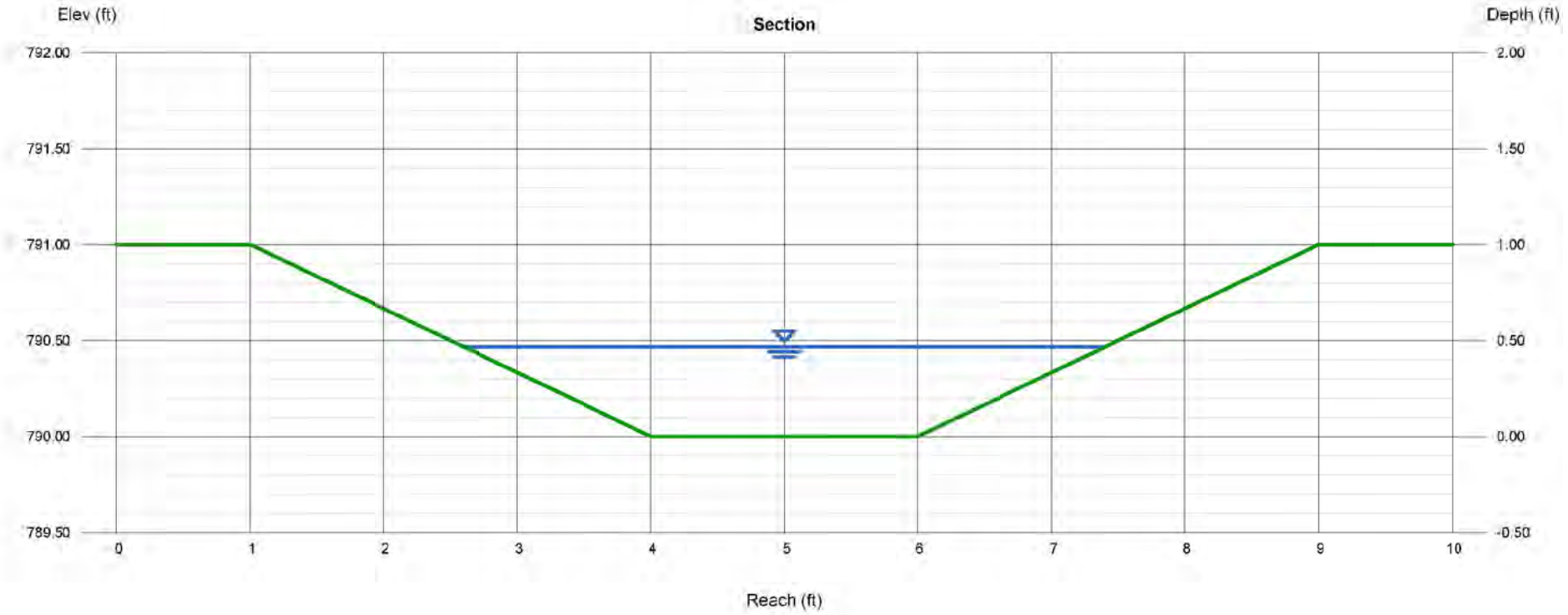
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 790.00
Slope (%)	= 1.21
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 3.47

Highlighted

Depth (ft)	= 0.47
Q (cfs)	= 3.470
Area (sqft)	= 1.60
Velocity (ft/s)	= 2.17
Wetted Perim (ft)	= 4.97
Crit Depth, Yc (ft)	= 0.38
Top Width (ft)	= 4.82
EGL (ft)	= 0.54



Channel Report

WOODRUFF HILL ROADSIDE SWALE

Trapezoidal	
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 790.00
Slope (%)	= 12.50
N-Value	= 0.035

Calculations	
Compute by:	Known Q
Known Q (cfs)	= 3.47

Highlighted	
Depth (ft)	= 0.26
Q (cfs)	= 3.470
Area (sqft)	= 0.72
Velocity (ft/s)	= 4.80
Wetted Perim (ft)	= 3.64
Crit Depth, Yc (ft)	= 0.38
Top Width (ft)	= 3.56
EGL (ft)	= 0.62